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Editorial

Welcome to *JMM*9!

In fact, welcome to an entirely new version of *JMM: The Journal of Music and Meaning*!
As you have probably already noticed, we have radically changed the look and structure of *JMM*. Allow us to use this first Editorial in the new website format to introduce and discuss the background for the changes we have made.

A Structure of Blogs

During the first seven years of the journal's existence, we chose to publish entire, finished issues at once. Due to the fact that all members of the Editorial Staff have had busy (and often conflicting) schedules outside of the editing processes, this has often resulted in long delays and at times uneven publication intervals. With the new structure of *JMM* we will now be able to publish individual articles as they become ready for publication. The articles will, however, still be associated with a specific issue of *JMM*.

From now on, each issue will have its own unique URL, such that (starting with *JMM*9) for *JMM* vol.x, the web address will be jmmx.musicandmeaning.net. Consequently, *JMM*9 is found at jmm9.musicandmeaning.net,   and   the   next   issue,   *JMM*10,   will   be   found   at jmm10.musicandmeaning.net.

Each issue has the structure of a blog. When an article goes online, the blog is updated with a post assigned to one of the categories "Invited Papers", "Peer-Reviewed Papers", "Research Reports", "Essays" or "Book Reviews". The post contains a description of the content and a link to the full article. Clicking a category name in the right hand navigation panel will yield all the posts that announce material published under the relevant category. Likewise, the Editorial and list of Recent Publications will be found by clicking the categories "Editorial" and "Recent Publications", respectively.

The main page of *JMM* (with the direct URL jmm.musicandmeaning.net) now also has the structure of a blog. The categories here are "Issues", where you will find a full list of issues (including direct links to those published in the old format of *JMM*), "About *JMM*", where you will find a list of the Editorial Staff and Editorial Board of *JMM*, as well as an updated description of *JMM*'s scope, "Guidelines for Submission" where you will find - yes - guidelines for submission, and "Forum" where you will find information about *JMM*'s new forum and a link to the old one.

The Forum

In the new version of *JMM*, we have chosen to make the forum a blog of its own with the URL forum.musicandmeaning.net.   To   register   with   the   forum,   please   send   an   e-mail   to forum@musicandmeaning.net stating your name, affiliation and research interests within the scope of *JMM*. Once you have received an invitation from one of our forum moderators and registered with an account, you will be able to write posts and comments on the forum page. **Please note that your username and password will only grant you access to posting or commenting on the forum page, not the main or issue pages of *JMM*.** The "log in" options on other pages than the forum is for the Editorial Staff and its collaborators only.

The forum requires that you post under one of the following categories: "Commentaries on

Articles", "Viewpoints", "Book Reviews" and "Announcements". In the post "Forum Rules" posted by Søren R. Frimodt-Møller under the category entitled "Forum Rules", you can see the rules of proper conduct that we require readers to follow when posting as members of the forum. Please read these rules thoroughly before posting anything.

New Formats, New Functionalities

Starting with *JMM*9, we are now only publishing articles as PDF documents. Does this mean that we are sacrificing our strong profile as a journal which encourages the use of multimedia examples? **Not at all**. In recent years, it has become possible to integrate sound and video into Adobe PDF documents, and although *JMM*9 sports a selection of articles which purely as a matter of coincidence does not contain a single embedded sound or video file, we will be bringing you articles that do contain such material in future issues, and strongly encourage the submission of articles which contain multimedia examples.

The PDF format allows us to make the final "camera readiness" of an article the full responsibility of the author (which we will do from *JMM*10 and onwards). The staff will of course do its best to help, if, for instance, the authors do not have the software required to integrate multimedia in the documents. In any case, please consult the updated guidelines for submission before sending us anything - you should especially pay attention to the updated stylesheet for *JMM*.

Another thing that has changed dramatically since the first issue of *JMM*, is the amount of social media on the Internet. The new format of *JMM* allows you to easily "share" anything posted at one of the journal subdomains (jmm.musicandmeaning.net, jmm9.musicandmeaning.net, forum.musicandmeaning.net etc.) on four of the most popular social networking sites of this day and age, Facebook, Twitter, Myspace and Linkedin. Simply click the option "share" right underneath the relevant post.

The Content of *JMM*9

In the future, the Editorial is likely to be the last text published in an issue of *JMM*. Whereas the Editorial has until now been meant as an 'introduction' to an issue, it will from *JMM*10 and onwards have the character of a overview of and commentary on developments during the preceding months. Consequently, future editorials will not include the usual short descriptions of the content we have chosen to publish. Instead we have moved these to the blog posts concerning the individual articles. In *JMM*9, we have mainly let the blog posts contain the authors' own abstracts and short biographies, but we will consider including editorial remarks here in the future.

The present issue includes three peer-reviewed papers: "Luciano Berio's *Sequenza V* Analyzed along the Lines of Four Analytical Dimensions Proposed by the Composer" by Niels Chr. Hansen, "Meaningful Scribbles: An Approach to Textual Analysis of Unconventional Musical Notations" by Douglas Wadle, and "Through Thick and Thin: The Ontology of Tape Music" by Adam Stansbie. In addition, Felipe Otondo has contributed the research report "Rediscovering Artaud's Sonic Order", and David Hebert has written a review of Amanda Bayley's 2010 book *Recorded Music: Performance, Culture and Technology* under the heading "Why Recorded Music Matters: A Review Essay". Finally, our Book Review Editor Jens Hjortkjær has, as usual, provided a list of recent publications related to the study of music and meaning.

New People

We are pleased to announce that Gary L. Hagberg, William Westney, Joel Rudinow and David Clowney have joined our Editorial Board.

We also welcome David Hebert (who has been on our Editorial Board for a while) as part of our Editorial Staff as well. David's help has been instrumental in getting the material for this issue camera-ready. Finally, Søren Arani Mortensen and Daniel Frandsen have taken on the tasks as Forum Moderators (the people who will service you, if you write to forum@musicandmeaning.net).

The Future

The next issue of *JMM*, *JMM*10, will be the first issue not to be published in its entirety in one fell swoop. Instead, the articles and other entries will be published as they become ready. The Editorial for future issues will therefore have the character of a "wrap-up" before a new issue page is launched. If you register with the forum and do not disable e-mail notifications, we will let you know when the issue page for *JMM*10 is online and updated via announcements in the forum.

For now, we hope you enjoy reading!

Best regards, on behalf of the Editorial Staff,

Søren R. Frimodt-Møller, Managing Editor
Jens Eichler Lorenzen, Editorial Assistant
Cynthia M. Grund, Editor-in-Chief

Rediscovering Artaud's Sonic Order

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1. Introduction

The article describes some of performance artist Antonin Artaud's ideas that shaped the implementation and performance of the music theatre work *To have done with the judgement of Artaud*. The first part of the text discusses Artaud's ideas related to the use of the voice and sound in his late radiophonic work *To have done with the judgment of god*. The second part of the article describes different approaches for the use of the voice and the physical space in the devised work using a flexible array of portable loudspeakers during performance. The final part of the article provides some concluding remarks about the potential of using high quality wireless loudspeaker technology as a way to enhance a truly immersive audiovisual experience in music theatre works.

2. Artaud's Sonic Order

From the beginning of his short but productive artistic career Antonin Artaud (1896-1948) was interested in using sound as an active component in theatre (Hollier, 2002). In *The theatre and its double*, arguably Artaud's most remarkable text, he explains some of his innovative ideas regarding the use of voice and sound in the theatre (Artaud**,** 1974). Artaud felt that an original approach to the use of the human voice was a key element in creative efforts to break 'theatre's subjugation to the text and rediscover the idea of a kind of language somewhere between gesture and thought' (Artaud, 1974: 68) in order to give words 'the importance they have in dreams' (Sellin, 1968: 84). As a way of transcending the meaning of words Artaud developed his own particular glossolalic language: a manifestation of language at a level of pure sound in order to 'reveal its possibilities of physical shock and to actively divide and distribute it in space' (Weiss, 1994). Artaud wanted to investigate the possibilities of speech outside words, trying to relate it to an active use of the physical space as a way to connect with audience sensitivity in an attempt to blur the boundaries between the stage and the public, having 'the spectator in the middle while the spectacle surrounds him' (Artaud, 1974: 103; McAuley, 2000: 5-6). Artaud was interested in creating a *spatial language* that would effectively integrate the performers' movements with vocal onomatopoeic sounds, sound effects and lighting. The idea was to eliminate the stage so that 'the spectacle can spread to the entire theatre and, taking off the ground, will surround the spectator in the most physical ways leaving him in a constant pool of lights, images, movements, and sounds' (Artaud, 1974: 150).

Paradoxically, probably the only work where Artaud implemented some of his ideas concerning the use of the voice and sound was in one of his last works, the radiophonic creation *To have done with the judgment of god*. This piece, originally commissioned by Radio France in 1947 and banned because of its strong anti-American and anti-religious content, was written and

conceived by Artaud as a combination of intense texts with interludes of instrumental and vocal improvisations (Artaud, 1995; Finter, 2002). Table 1 shows the structure of the radio play as recorded by Artaud at the studios of Radio France with a group of actors in November 1947 (Barber, 2001; Artaud, 2006).

Section	Title	Content
1	Opening	Text read by Antonin Artaud
2	Sound effects 1	Shouts and percussion sounds by Antonin Artaud and Roger Blin
3	Tutuguri	Texts read by María Casares
4	Sound effects 2	Xylophones sounds played by Artaud and Roger Blin
5	Research on fecality	Text read by Roger Blin with glossolalia sections
6	Sound effects 3	Voice and percussion improvisation by Antonin Artaud and Roger Blin
7	To raise the question of..	Text read by Paul Thevenin
8	Sound effects 4	Voice and percussion improvisation by Antonin Artaud
9	Conclusion	Text read by Antonin Artaud
10	Sound effects 5	Percussion improvisation by Antonin Artaud

Table 1. Sections of the radiophonic work *To have done with the judgment of god* as recorded by Artaud and a group of actors in 1947.

Inspired by the original text and recordings of the radio piece a collaboration was developed with musicians and dancers from the company *Base Theatre* to create a devised dance-theatre piece for the 2007 Edinburgh Fringe Festival entitled *To have done with the judgment of Artaud* (Base Theatre, 2007). The main goal of the project was to explore different types of relationships between sound and physical movement using the original radio play in its written and recorded version as a way to reassess the relevance of Artaud's work today. In the following sections some of the ideas developed in the devised piece in connection with the use of the voice and sonic spatial design will be described.

3. Shaping Boundaries with the Voice

One of the most interesting aspects of Artaud's radio play as source material for a devised piece is the fact that the radiophonic work exists both as text as well as recordings. This allowed the possibility of developing the piece creating different types of sonic relationships between Artaud's recorded voice, the performers' voices and diverse transformed sounds. These relationships were framed with the intention of using the voice as a flexible tool exploring glossolalia texts as a 'manifestation of language at the level of its pure materiality, the realm of pure sound, where there obtains a total disjunction between signifier and signified' (Weiss, 2004). Figure 1 shows a diagram of the different types of sonic relationships explored in *To have done with the judgment of Artaud*, and table 2 shows the glossolalia texts used in the devised piece.
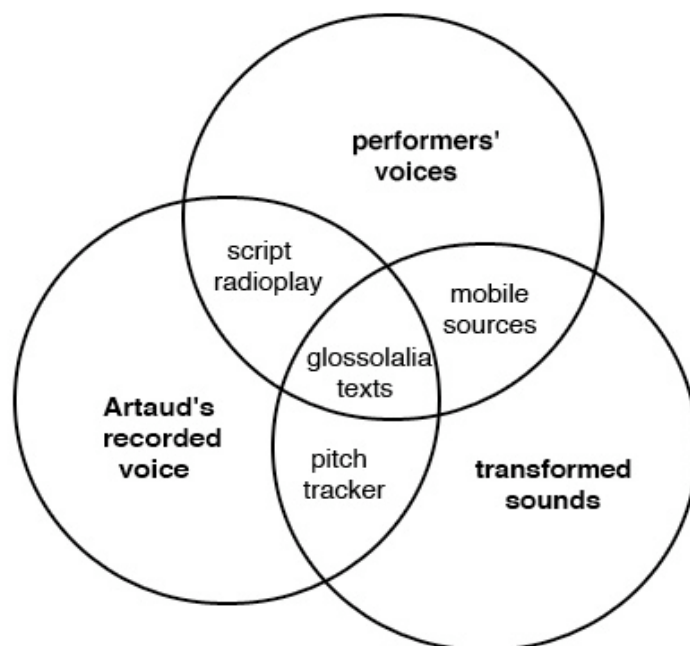
Figure 1. Diagram of different types of sonic relationships explored in *To have done with the judgment of Artaud.*

kré	puc te	o reche modo
kré	puk te	to edire
pek	li le	di za
kre	pek ti le	tau dari
e	kruk	do padera coco
pte		

Table 2. Glossolalia texts from Artaud's radio play original script used in *To have done with the judgment of Artaud.*

The first type of sonic relationship explored in the piece was the connection between the performers' voices and Artaud's recorded voice. The basis for this relation was provided by the script of the play used as a framework to develop phonetic and semantic aspects of the original materials. This was emphasized by the fact that the radiophonic piece was originally recorded in French, whereas the devised piece was developed from English translations of the text. This also allowed the possibility of building different types of relationships between spoken and recorded material using the glossolalia texts as the main driving force to develop material with the performers.

The second type of sonic relationship examined in the piece was the relation between Artaud's voice and transformed sounds created using diverse voice samples. These sounds were developed using mostly a pitch tracker that captured the attacks and pitch changes of Artaud's original voice to

create a gamut of tonal and percussive sounds for the desired character of different sections of the piece. These generated sounds were combined and blended with some of the recordings of the original play and played through individual mobile sources that the speakers carried with them in different parts of the piece, as will be explained in further detail within the next section. This approach allowed the possibility of creating an effective transition from the intense and dramatic nature of the original recordings to organic tonal and percussive textures closely bounded to the performers' movements, inspired by Artaud's idea of developing vocal sound material as an extension of the body (Hollier, 2004). This method also proved to be a very effective way of relating the speech articulations with glossolalia texts in a way similar to Eric Sleichim use of amplified voices (Verstraete, 2004).

The third relationship investigated in the piece was the one between the performers' voices and the transformed sounds. This relation was established using mobile sound sources that the performers carried with them in different sections of the piece, as will be explained in detail in the following section.

Figure 2. Performers delivering speech and holding mobile sound sources during a performance of *To have done with the judgment of Artaud* at the Northern School of Contemporary Dance in Leeds, England.

4. Building Spaces with Sound

Inspired by some of Artaud's ideas related to the use of the physical space, the initial goal for the devised piece was to develop a sonic framework that would allow an effective use of the spatial sound design, keeping a clear sonic reference for the audience and, at the same time, exploring the idea of sonic mobility in connection to the choreographed movement of the performers. After

experimenting with different devices it became clear that the most effective way of doing this was to use portable CD players to be carried by the performers in specific sections of the piece. On the one hand this would allow the audience to make the connection with the radio as an object linked to the nature of the radio play and the intensity of Artaud's voice, and on the other hand, it allowed the possibility of creating relationships between the performers' movements and specific sounds on stage. In general terms, the piece itself was created considering a spatial design that could be easily implemented but would still contain interesting and detailed timbral and spatial developments (Otondo, 2008). This was achieved by composing the work as a multi-channel piece, combining throughout the piece the two stationary loudspeakers of the PA in the venue with the two mobile sources carried by the performers. This allowed the possibility of developing a compositional framework to explore different types of spatial relationships between the performers' movements, their voices and reproduced sounds as shown in table and figure 3.

Throughout the development of the music and spatial design for the piece the idea was to incorporate as much as possible the use of sound across the stage, integrating specific sounds with the actions of performers on stage in a similar way to that proposed by Barker (Bicât and Baldwin, 2002). As shown in table and figure 3, different types of spatial design arrangements were carefully devised in connection with the development of the choreographed movement for the different parts of the work. One effective way of doing this was to use the glossolalia excerpts recorded by Artaud and Roger Blin for the radio play to develop vocal material with a close relationship to the new movement material created by the dancers. Through an intense series of workshops a whole section of the piece was developed as a combination of vocal and dance improvisation based on the sounds of some of the glossolalia texts shown in section 5 of table 3. The use of this newly generated vocal material in close connection with the use of spatialisation of sound mentioned above proved to be an effective way of keeping the attention of the audience throughout the performance, as one reviewer of the show noted:

"*To have done with the judgment of Artaud* is just as innovative, if not more so, in its use of sound to help create the appropriate atmosphere. At times the sound effects are so consuming, it is hard to distinguish their origins. Which sounds are the performers making? Which from the overhead speakers? What about those hand-held radios? At one point, the performers leave the stage. There is nothing, but the sudden, violent bursts of sound - behind the curtain, overhead, all around you. The next moment, one of them has moved so silently, you only now notice they're right beside you and have started muttering again" (Powell, 2007).

Section	Spatial design
1	Sparse use of speech in relation to reproduced sound through a four-channel soundtrack using the PA system and two mobile sources. Two performers move with mobile sound sources while the others two move delivering speech (figure 3a).
2	Use of a 2-channel mix with noise for two mobile sources synchronized with speech spoken by the four performers. The noise bursts give the delivery of speech by performers according to a prepared text score (Figure 3b).
3	Use of one mobile source playing the voice of Artaud that blends and masks the speech of the performer carrying it.
4	Dance duo with a stereo mix played through the PA system.
5	Improvisation by three performers that combine glossolalia texts with choreographed movement material. The fourth performer carries a mobile source playing noise that masks the voices of the rest of the performers marking the end of that section.
6	Dance duo with a 4-channel mix played through the stereo PA system and two mobile sources. Performers carrying mobile sources move on the sides of the stage while the other two performers dance in between (Figure 3c).
7	Small percussion instruments played by the four performers synchronized with a stereo mix played through the PA system. The performers deliver speech while they move across the stage (Figure 3d).

Table 3. Examples of the spatial design in different sections of the devised piece *To have done with the judgment of Artaud*, as presented by Base Theatre at the Edinburgh Fringe Festival 2007.
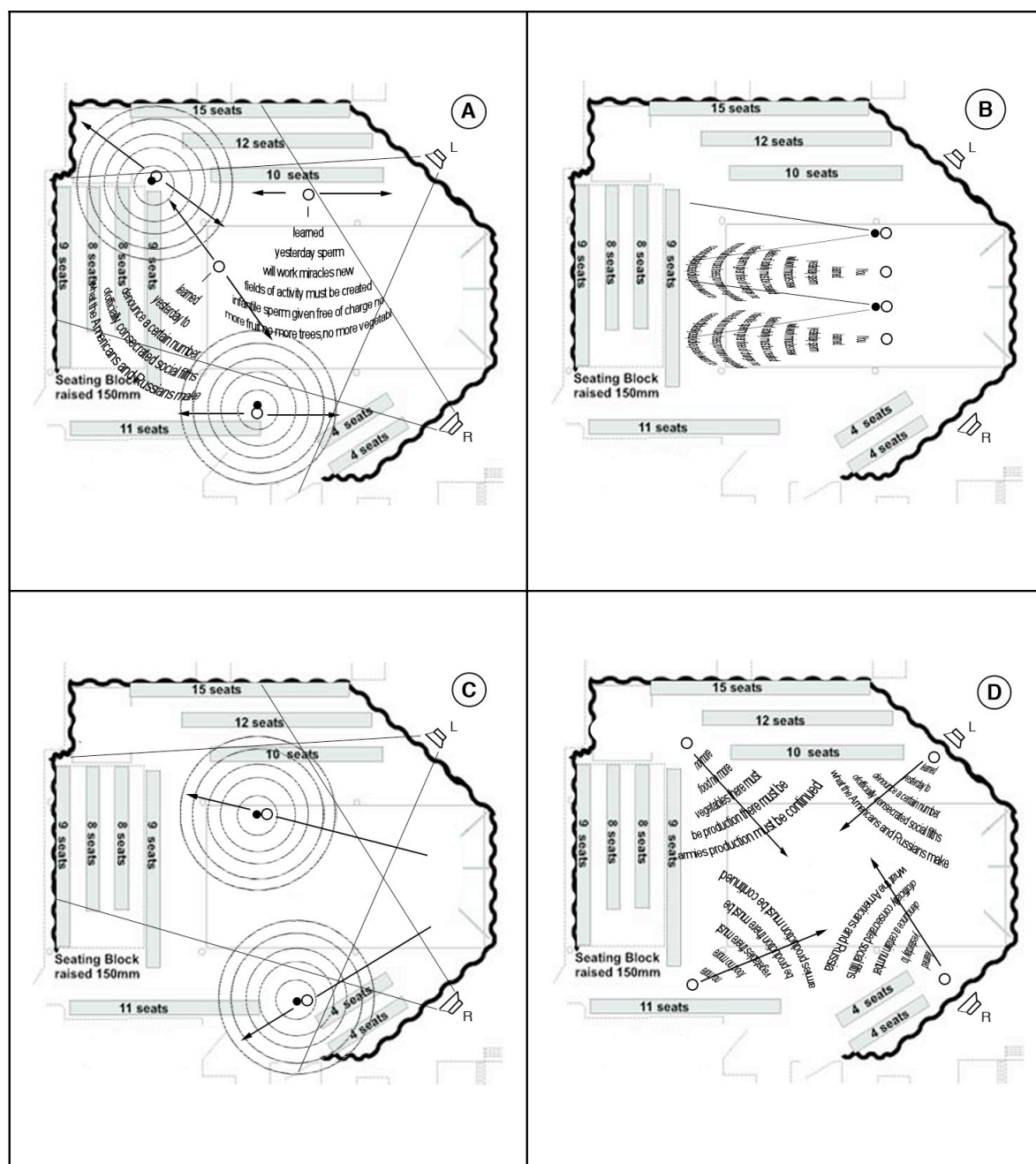
Figure 3. Performers' position and movements with and without portable radios in relation to the main PA system in the venue at the 2007 Edinburgh Fringe Festival. Numbers refer to positions and movements of one or both sources in different sections of the piece as shown in table 3.

5. Conclusions

The developments of the music theatre project presented here showed that many of Artaud's original ideas related to sound and performance can be effectively implemented as a way to enhance the aural and visual experience of music and theatre audiences. Simple but effective solutions like

the ones described above proved to be powerful tools when engaging with different kinds of audiences. Further developments of this project will consider expanding some of the ideas presented here using an extended audiovisual platform based on wireless loudspeaker technology (Otondo, 2010). This could allow the possibility of developing further the idea of sound mobility in relation to choreographed movements of performers on stage following Artaud's vision of a true integration between gesture and sound. The challenge for the development of such a platform will be to devise a performance approach that can effectively incorporate mobile sources as part of a larger spatial design in order to integrate the performers' movements into a composed sonic landscape, thus creating the truly immersive audiovisual experience that Artaud once dreamed of.

References

Artaud, A. (2006). *Pour en finir avec le jugement de dieu*. Sub rosa records.

Artaud, A. (1995). "To have done with the judgment of god". In: Eshleman, C. and Bador, B. (eds.), *Watchfriends and Rack Screams: works from the final period of Antonin Artaud*. Boston: Exact change.

Artaud, A. (1974). *The theatre and its double*. In: Artaud, *Collected works* vol. 4, (Translation Victor Corti). London: Calder and Boyars.

Barber, S. (2001). *The screaming body.* London: Creation books.

Base Theatre's website. Retrieved from http://www.otondo.net/fringe/.

Bracewell, L. (2002). "Sound and dramatic art". In: Bicât, T. and Baldwin, C. (eds.), *Devised and collaborative theatre*. London: The Crowood Press.

Finter, H. (2004). "Antonin Artaud and the impossible theatre: the legacy of the theatre of cruelty". In: Sheer. E. (ed.), *Antonin Artaud: A critical reader*. London & New York: Routledge, 47-58.

Hollier, D. (2004). "The death of paper, part two: Artaud's sound system". In: Sheer. E. (ed.), *Antonin Artaud: A critical reader*. London & New York: Routledge, 159-168.

McAuley, G. (2000). Space in performance: Making Meaning in the Theatre. Ann Arbor: The University of Michigan Press.

Otondo, F. (2008). *Composition*. PhD thesis, University of York, United Kingdom.

Otondo, F. (2010). "Mobile sources in two music theatre works". In: *Proceedings of the 2010 International Computer Music Conference*, New York, 446-449.

Powell, T. (2007). "Review of 'To have done with the judgment of Artaud'", In: *Broadway Baby Edinburgh Fringe Festival reviews, http*://www.broadwaybaby.com/.

Sellin, E. (1968). *The dramatic concepts of Antonin Artaud*. Chicago: The University of Chicago Press.

Verstraete, P. (2004). "Eric Sleichim's Men in tribulation, a total theatre of sound and extended voice*". E-view, 2. Retrieved from http://comcom.uvt.nl/e-view/04-2/verstraete.PDF

Weiss, A. (1994). "Radio, death, and the devil, Artaud's Pour en finir pour le jugement de dieu". In: Kahn, D. and Whitehead, G. (eds.), *Sound Radio and the Avant-garde*. New York: MIT Press, 269-307.

Why Recorded Music Matters: A Review Essay

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Libraries may sometimes appear to be overflowing with books that mean rather little to most people, and as the pressure of accountability for maximized research outputs is increasingly placed on universities, an inexcusable number of trees is sacrificed for the reams of paper bound in obscure publications that seem to offer little new knowledge of consequence. The appearance of yet another new scholarly book about music is, therefore, only rarely heralded as a significant event. Amanda Bayley's latest book even has a rather generic title: *Recorded Music: Performance, Culture and Technology* (Cambridge University Press, 2010); However, looks can be very deceiving, and upon careful reading I do not hesitate to suggest that this may turn out to be one of the very most important music books of the decade.

The astonishing array of insightful essays compiled in *Recorded Music* collectively offer a revolutionary view of mediated musical experience, and its scholarship, and compellingly assert that across recent generations a new field, aptly called "phonomusicology," has covertly emerged, consisting of analyses of the art of musical sound recording. The editor of this volume, Amanda Bayley, is a specialist in 20th century European art music and previously served as editor of another important text *The Cambridge Companion to Bartok*. In *Recorded Music: Performance, Culture and Technology*, Dr. Bayley and her colleagues offer an expansive vision of the role that technological developments have played in shaping the production and consumption of music across the past century. Many leading contemporary music scholars have contributed to this unique book, including John Baily and Jonathan Stock (two of the most prolific and forward-thinking ethnomusicologists alive today), influential popular music scholar Allan Moore, and an array of other notable specialists in the fields of popular music, jazz, contemporary art music, and the history of sound recording, including Stephen Cottrell, Peter Johnson, Andrew Blake, Adam Krims, James Barrett, David Patmore, Peter Elsdon, Catherine Tackley, Serge Lacasse, John Dack, Virgil Moorefield, Albin Zak, and Tony Gibbs. This star cast of interdisciplinary musical thinkers - mostly hailing from the UK - covers a broad range of topics associated with the theme of sound recording as a musical and cultural phenomenon.

In recent years, British musicologists in particular have rejected the widespread disdain toward recent popular music that had characterized more traditional forms of musicology. It follows that the authors of this volume offer an inclusive vision of music in their discussion, boldly acknowledging the artistry associated with popular music genres. Passages of this book refer to the work of several important popular music performers from recent years, including Peter Gabriel, Tori Amos, Alanis Morissette and Ben Folds

Five, as well as (unsurprisingly) some revolutionary classic performances by the Beatles, Beach Boys, jazz masters Miles Davis and John Coltrane, and many others. Contemporary art music composers and ensembles are insightfully discussed as well, including conductor Simon Rattle, composer Michael Finnissy, the Kreutzer Quartet, and several notable figures from European art music who became influential partly through recordings during the 20th century, including Leonard Bernstein, Benjamin Britten, and Gustav Mahler.

It is unusual to have the opportunity to review such an important book, and impossible to do justice to all it contains. Although there is not a weak chapter in the book, some stand out as particularly worth detailed mention. First, a bit more about the form seems in order. Following its editorial Introduction, *Recorded Music* is divided into four parts, each of which contains either four or five chapters. The four major divisions are entitled "Recordings and their Contexts," "The Recording Process," "Recordings as Texts," and "Sonic Creations and Re-Creations."

Part 1 "Recordings and their Contexts" contains chapters by Stephen Cottrell, Peter Johnson, Andrew Blake, and Adam Krims. To begin, Stephen Cottrell reflects on various ways that the emergence of sound recordings has challenged the field of musicology to develop new paradigms and analytical techniques, and even to reconsider its ultimate objectives. He declares that "Only in the domain of Western art music recordings have issues of reception and consumption of music been too frequently overlooked" (p.29), and suggests that scholars of art music may still have much to learn from other branches of musicology in which recordings (rather than musical scores) have long been recognized as cultural artifacts. Cottrell outlines a field he calls phonomusicology, which he defines as "the study of recorded music, including its contexts of production and patterns of consumption" (pp.15-16), and identifies an abundance of potentially rewarding approaches to the study of musical recordings. Peter Johnson challenges readers to reconsider what listeners seek from sound recordings versus live performances. He notes that "recording can promote the illusion of the perfect product in ways that are always compromised in live performance" (p.48), and suggests that further attention is needed to the myriad ways that exposure to recordings affects our expectations and, ultimately, our perceptions of live performances. Andrew Blake expertly probes an array of ethical issues associated with the rise and popularized distribution (and manipulation) of digital sound files, while Adam Krims vividly demonstrates how music reception is largely shaped by its role within other media, including television and movies.

Part 2 "The Recording Process" contains chapters by James Barrett, John Baily, David Patmore, and Peter Elsdon. James Barrett writes of the evolution of sound technology and recording studio techniques, with particular attention to the role of the record producer as a form of creative artist. John Baily's chapter concerns the evolution of conventional ways for producing "world music" recordings, with particular attention to the three cases of (1) Hugh Tracey's collection in the International Library of African Music, (2) Baily's

own work on the music of Afghanistan, and (3) Peter Gabriel's WOMAD and Real World projects. He acknowledges an array of perspectives and practices, and expresses concern that cultural rights be appropriately respected by any who would profit from sound recordings, particularly of traditional music from throughout the world. David Patmore offers an insightful profile of conductor Simon Rattle and his use of sound recordings as an effective strategy for enhancing both the public profile and artistic integrity of professional orchestras he has conducted. Peter Elsdon's chapter offers a rich and provocative discussion of jazz saxophonist John Coltrane's work, centering on analysis of an extreme array of interpretations evident in Coltrane's performances of his own tune "Chasin the Trane." Elsdon's work challenges readers to reconsider what a "tune" actually is in jazz, and the extent to which different performances of the same tune might be seen as different pieces of music, or alternatively, offer unique windows into the creative process of the artist. Analysis of different "takes" in the process of producing studio recordings, or even live performances, enables rigorous examination of such questions.

Part 3 "Recordings as Texts" contains chapters by Catherine Tackley, Jonathan P. J. Stock, Amanda Bayley, Serge Lacasse, and Allan Moore. The chapter by Catherine Tackley – a jazz studies specialist with expertise on the history of jazz in the UK – discusses the reception of two of the most influential jazz recordings of the twentieth century: "Livery Stable Blues" by the Original Dixieland Jazz Band (1917), and Miles Davis's album *Kind of Blue* (1959). Her chapter documents the array of responses to these recordings across time, among musicians, critics, and the general public. Jonathan Stock offers four fascinating cases from his own ethnomusicological field work (mostly in China) that illustrate various uses of recordings: (1) recordings as documents of field research, (2) recordings as tools in performance research, (3) recordings as tools for historical research, and (4) playback as a tool in music research. Taken as a whole, the techniques demonstrated by Stock enable ethnomusicologists to acquire a far deeper understanding of musical cultures than would otherwise be possible. Contributing editor Amanda Bayley also offers a very insightful chapter, which consists of an ethnography of the process of studio recording. Her study focuses on the intensive musical interactions associated with the Kreutzer Quartet's studio recordings of Michael Finnissy's Second String Quartet, and demonstrates the role of creative decision-making within the sound recording process. Serge Lacasse's chapter is also beautifully written, offering a probing analysis of the use of paralinguistic expression among popular music vocalists. Part 3, which already contains enough insights to be published as a separate book, concludes with a brilliant chapter entitled "The Track" by the influential rock musicologist Allan Moore. Moore provocatively argues that the recorded "track" should replace "song" as a major category for musicological analysis, and demonstrates how such a perceptual shift would lead to a more meaningful understanding of recorded music.

Part 4 "Sonic Creations and Re-Creations" contains chapters by John Dack, Virgil Moorefield, Albin Zak III, and Tony Gibbs. John Dack's chapter discusses the

development of acousmatic music, an influential style of contemporary art music composition based on sound collage that may be traced to the innovative work of French composer Pierre Schaeffer. Next, Virgil Moorefield writes about the phenomena of covers, remixes, and mash-ups in popular music, offering interesting examples that clarify the development and delineations of these approaches to music recording. Albin Zak's chapter discusses the creative artistry of studio engineers who produce distinctive sounds through the use of particular recording studio effects that contribute significantly to the definition of a musical style. Tony Gibbs concludes the book with a visionary essay on possible musical futures that have been opened by the democratization of access to sound recording technology and interactive new media.

This book would be ideally suited as a required textbook for the humanistic component of any music technology program, as well as for university courses designed for the training of researchers who will work in sound archives or recording studios, or who intend to conduct studies that take analysis of recorded performances as a main point of departure. The latter would certainly include the majority of recent research in jazz studies as well as innovative forms of music theory scholarship, and also certain kinds of work in the fields of popular music studies and ethnomusicology. *Recorded Music* will also be an essential resource for any sound archive that aspires to be utilized more broadly as a research collection.

Although professional reviewers of academic publications are usually expected to offer at least a few criticisms, it is difficult to conceive of any significant shortcomings in the case of this book. Perhaps inclusion of a specialist in music education or music therapy among the contributors would have offered some additional perspectives on the role of musical recordings in other important domains of music participation and consumption, and it would also be interesting to see what scholars from outside Europe and the Americas would write about the role of recorded music in their own societies, but these seem to be projects for another book. To conclude, *Recorded Music* is very well conceived and makes a unique contribution to the field. Moreover, it is expertly written and impeccably edited, and arguably belongs in every music library.

Amanda Bayley, (Ed.), *Recorded Music: Performance, Culture and Technology.* Cambridge University Press, 2010.

Luciano Berio's *Sequenza V* Analyzed along the Lines of Four Analytical Dimensions Proposed by the Composer

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Abstract

In this paper, Luciano Berio's *Sequenza V* for solo trombone is analyzed along the lines of four analytical dimensions proposed by the composer himself in an interview from 1980.

It is argued that the piece in general can be interpreted as an exploration of the 'morphological' dimension involving transformation of the traditional image of the trombone as an instrument as well as of the performance context. The first kind of transformation is revealed by simultaneous singing and playing, continuous sounds and considerable use of polyphony, indiscrete pitches, plunger, flutter-tongue technique, and unidiomatic register, whereas the latter manifests itself in extra-musical elements of theatricality, especially with reference to clown acting. Such elements are evident from performance notes and notational practice, and they originate from biographical facts related to the compositional process and to Berio's sources of inspiration. Key topics such as polyphony, amalgamation of voice and instrument, virtuosity, theatricality, and humor – of which some have been recognized as common to the *Sequenza* series in general – are explained in the context of the analytical model.

As a final point, a revised version of the four-dimensional model is presented in which tension-inducing characteristics in the 'pitch', 'temporal' and 'dynamic' dimensions are grouped into 'local' and 'global' components to avoid tension conflicts within dimensions. Furthermore, in the 'morphological' dimension a distinction is made between transformation of 'instrumental idiomatics' and of the 'performance context'. Hence, the revised model accounts for theatricality and performance without failing to realize the increasing transformation of the instrumental idiom which constitutes a key aspect of the musical meaning communicated in this piece.

1. Introduction

Undoubtedly, the *Sequenzas* for various solo instruments composed by Luciano Berio (1925-2003) constitute a major contribution to Western art music of the twentieth century. That the *Sequenzas* establish a suitable starting point for exploration of musical meaning has already been pointed out in a recent review published in this journal (Gallon, 2009). Here I will elaborate on Gallon's general overview, by addressing a single piece in detail*,* namely *Sequenza V* for solo trombone (1966),[1] along the lines of an analytical model proposed by the composer himself in relation to another piece in the series: namely the first *Sequenza* for solo flute.

In an interview with Rosanna Dalmonte in 1980, Berio introduced four so-called 'dimensions' within the framework of which, according to him, the flute *Sequenza* evolves:

> The temporal, dynamic, pitch and morphological dimensions of the piece are characterized by maximum, medium and minimum levels of tension. The level of maximum tension (which is also an exceptional one relative to the norm of conventional playing) within [1] the temporal dimension is produced by moments of maximum speed in articulation and moments of maximum duration of sounds, the medium level is always established by a neutral distribution of fairly long notes and fairly rapid articulations, and the minimum level entails silence, or a tendency to silence. [2] The pitch dimension is at its maximum level when notes jump about within a wide gamut and establish the tensest intervals, or when they insist on extreme registers: the medium and minimum levels follow logically from this. The maximum level of [3] the dynamic dimension is naturally produced by moments of maximum sound energy and maximum dynamic contrast. What I call [4] the morphological dimension is placed, in certain aspects, at the service of the other three and is, as it were, their rhetoric instrument. It seeks to define degrees of acoustic transformation relative to an inherited model which in this case is the flute with all its historical and acoustic connotations. Thus a level of maximum tension within the morphological dimension is obtained when the image, my image of the flute, is drastically altered with flutter tongues, key clicks and double stops […] (Berio 1985: 97-98, underlining by the present author).

Berio evidently described his model specifically with respect to the flute piece. Nevertheless, since one does indeed recognize many similarities between the *Sequenzas* as regards compositional strategy – a fact which is also acknowledged by the composer himself (Berio 1985: 90-97) – it would both be possible and relevant to make an attempt to transfer Berio's concepts to other *Sequenzas* composed for other instruments and to make the model operational for analytical purposes. Therefore, taking the composer's words into consideration, the current analysis of *Sequenza V* will concentrate on testing whether the 'four-dimensional' model can be applied to this particular piece as a practical means of analysis.

This endeavor will take up most of the second part of the essay whereas the first part will briefly place the piece in a biographical and historical context as part of Berio's *Sequenza* series and as a contribution to Western music from the twentieth century in general. More specifically, the performance notes for *Sequenza V*, certain issues related to notational practice and relevant information on the inspiration for the piece and its compositional process will be included here. This is due to the fact that the ways in which

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[1]I would like to thank Prof. Rokus de Groot for drawing my attention to this piece and for inspiring discussions of this as well as of other pieces during my stay in Amsterdam in the Fall 2008.

this piece relates to and breaks with tradition, namely with respect to theatrical elements, the role of the musician and the use of the instrument, are especially relevant to the third part of the essay.

Following the musical analysis, the third part deals with different ways of illustrating how this piece might be interpreted as an exploration of the *morphological dimension*. Since one of the composer's main aims with his *Sequenzas* was to communicate the results of his experimentation with the limits of various musical instruments sometimes even resulting in a transformation of their very identity (Halfyard 2007a: xx),[2] a study of the morphological aspects from the four-dimensional analytical model seems essentially valuable from the perspective of musical meaning.

Given the role of this dimension as the "rhetoric instrument" (Berio 1985: 98) of the other three dimensions, my argument will to a certain extent be grounded on the preceding analysis of musical characteristics. Additionally, this interpretation will be substantiated by exploring to what extent key concepts such as polyphony, virtuosity, and transformation of an instrumental idiom (in this case specifically through theatrical elements, irony and amalgamation of voice and instrument), which have all been recognized as dominant elements throughout the *Sequenza* series (Berio 1985: 90-91, 93, 97; Halfyard 2007a: ix), can be placed in the context of this model as representing significant factors of morphological tension.

In the course of the analytical process outlined above, the brevity and informal character of Berio's description regarding the flute *Sequenza* become problematic. For instance, the composer only mentioned characteristics of all three tension levels within the temporal dimension. As for the other three dimensions, he contented himself with specification of the maximum level and then asserted that "the medium and minimum level follow logically from this" (Berio 1985: 98). Finally, and very importantly, Berio refrained from describing mutual interaction between dimensions. In the concluding section of the essay I will therefore attempt a provisional evaluation of the analytical method based on my interpretation of the analysis, and thus make suggestions as to how the model could be improved for possible future application.

The table below sums up the tension-inducing musical characteristics stated by the composer. Moreover, additional derived criteria appear in square brackets.

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[2]As pointed out by Halfyard (2007a: xx), "the extent to which the Sequenzas often challenge conventional ideas of the nature of the instruments" is a general theme emerging in various essays from the volume Berio's Sequenzas: Essays on Performance, Composition and Analysis (2007, Aldershot: Ashgate Publishing Ltd.). A remarkably apt example is the contribution by Kirsty Whatley (2007) on Berio's transformation of the traditional image of the harp in Sequenza II.

LEVEL OF TENSION DIMENSION	Maximum	Medium	Minimum
Temporal	Maximum speed of articulation [i.e. staccato, accents, and fast notes], maximum duration of sounds	Fairly long notes, fairly rapid articulation	Silence or tendency to silence
Pitch	Jumping notes, wide ambitus, tense intervals	[Medium pitch stability, medium register]	[Repeated notes or scalar motion in stable register]
Dynamic	Loud dynamics, dynamic contrasts	[Medium dynamics, medium stability]	[Soft and stable dynamics]
Morphological	[Very untraditional use of the instrument]	[Both fairly traditional and untraditional use of the instrument]	[Very idiomatic use of the instrument]

Table 1. Overview of the four-dimensional analytical model proposed by Berio (1985: 97-98).

2. Context

Aside from teaching at prominent schools of music in the United States, Berio also directed the electro-acoustic section at IRCAM in Paris 1974-80 and served as artistic director of both *Orchestra Regionale Toscana* in 1982 and *Maggio Musicale Fiorentino* in 1984. Moreover, Berio was granted the *Ernst von Siemens Musikpreis* in 1989 and received honorary doctorates from the *City University of London* and the *University of Siena* (Griffiths 2008). These accolades testify that unlike many other brilliant composers of the twentieth century, Berio managed to draw the attention of a wide public to his works (Griffiths 2008). This was partly due to his formidable creative energy, but also arguably due to the fact that his approach to composition was not quite as dogmatic as that of many other representatives of the 'Darmstadt School' (Gravesen & Knakkergaard 2003: 63-64). Instead, his music draws on theatrical performance elements, musical gestures as well as other extra-musical components such as text, all of which are easily recognizable and thus become intuitively meaningful to the listener.

In *Sequenza V*, extra-musical elements of theatricality are evident from performance notes and notational practice, and they have their roots in biographical facts related to the compositional process and to Berio's sources of inspiration. Later on, theatrical elements will be related to the analytical model with respect to the way in which they carry musical meaning, predominantly in the morphological dimension.

2.1 Composition and First Performance

Sequenza V belongs to the first group of the series of 14 *Sequenzas* that came into existence throughout most of Berio's career, namely in the years from 1958 to 2002. The first in the series was *Sequenza* for flute in 1958. After a few years, Berio decided to extend this concept to other instruments which in the 1960s resulted in *Sequenza II* for harp (1963), *Sequenza III* for female voice (1965-66) *Sequenza IV* for piano (1965-66), *Sequenza V* for trombone (1966), *Sequenza VI* for viola (1967), and *Sequenza VII* for oboe (1969). Then a break followed before further compositions emerged in the following decades: *Sequenza VIII* for violin (1976-77), *Sequenza IX* for clarinet (1980, transcribed for saxophone as *Sequenza IXb* in 1981), *Sequenza X* for trumpet with piano resonance (1984), *Sequenza XI*

for guitar (1987-88), *Sequenza XII* for bassoon (1995), *Sequenza XIII* for accordion (1995-96), and finally *Sequenza XIV* for cello (2003).

Although part of the B section of *Sequenza V* was first performed in April 1965 by the Slovenian composer and trombonist Vinko Globokar (1934-) as the unpublished work *Essay* (Baker 1994: 32), Berio had as early as 1964 expressed his intention to compose a *Sequenza* for Stuart Dempster (1936-) (Halfyard 2007b: 100), a renowned American trombonist and composer. The complete *Sequenza* was eventually also both commissioned and officially first performed by Dempster in San Francisco in March 1966 (Berio 1985: 179; Osmond-Smith 1991: 133). In the entry on Globokar in *Grove Music Online*, Niall O'Loughlin gives the impression that this piece was written for Globokar (O'Loughlin 2008), even though Globokar himself maintains that he did not even contribute to the initial *Essay* (Halfyard 2007b: 101). Hence, we must acknowledge that this composition seems to be written for Dempster. This is also consistent with Berio's indications in the score as well as with Dempster's own words: "I would occasionally goof around in rehearsals like I goof around generally […] Berio said that I am like Grock – he said that several times – and I think that was the inspiration for the piece" (Baker 1994: 30-31).

2.2 Grock the Clown – An Essential Source of Inspiration

The 'Grock' that Dempster refers to above was the famous Swiss circus clown Karl Adrien Wettach (1880-1959) who played 24 different instruments and introduced musical sketches in many of his routines.[3] According to Dempster, Grock also inspired Berio's *Sequenza III* for voice (Baker 1994: 31). In the score of *Sequenza V* as well as in the following statement Berio acknowledges that the piece was dedicated to the memory of this ingenious comedian:

> Grock was my neighbour at Oneglia: he dwelt in an odd and complex country house in the hills, in a sort of oriental garden with small pagodas, small lakes, bridges, streams and weeping-willows. With my school fellows I used to climb over his garden gates to steal oranges and tangerines. During my childhood the closeness, the excessive familiarity with his name and adults' indifference prevented me from comprehending his genius. Only later - I was 11 years old - I had the chance to see him in performance at Teatro Cavour in Porto Mauricio I realized it. During that performance, just once, he suddenly stopped and, staring at the audience, he asked 'Warum?' (why?). I didn't know whether to laugh or cry, I wished I could do both of them. After that experience I haven't stolen oranges from his garden anymore. *Sequenza V* is a tribute to that 'Warum?' in English: why. (Conant 2005)

Thus, in an analysis of *Sequenza V* it would be a mistake not to bear in mind theatrical elements represented by various references to Grock the Clown as a character and as a representative of clown acting in general.

2.3 Performance Notes

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[3]See for instance the website http://www.osborne-conant.org/Grock.htm for video clips of some of Grock's routines.

In his performance notes, Berio states that the performer should be dressed in white tie and tails and be illuminated by a spot from above.[4] Interestingly, this is in fact the only *Sequenza* where the composer calls for specific attire.

In his commentary to the performance notes Stuart Dempster suggests that the spot be a follow spot following the performer who is entering the stage, standing while playing the A section and sitting while playing the B section. He also adds an alternative possibility of lighting. Of course, the composer's own words would normally take precedence over later remarks, but, on the other hand, as the first performer who definitely corresponded and collaborated intensely with the composer, Dempster's comments certainly originated in hands-on experience with the piece and should thus be viewed at least as an important appendix to the composer's own words. Consequently, the introduction of the follow spot generally seems to support the idea of solemnity also indicated by the composer (i.e. "perform section B as though rehearsing in an empty hall") and thus makes up a well-informed, though not compulsory, choice.

Dempster also suggests that the low stand that should be on stage according to Berio be removed and the piece be completely memorized. Nevertheless, one cannot completely exclude the notion that Berio indeed had a specific intention with this stand, as it supports the composer's idea of "rehearsing in an empty hall" (in the B section). Hence, in this case, Dempster's suggestion is to be taken with a grain of salt. The same applies to many of Dempster's other comments (i.e. "look upward for imaginary prey while at the same time slowly 'taking aim' with trombone", "playing as though shooting", "give audience a grin", "section B is best performed with closed eyes, and the final bows should be somewhat stiff") which may express Dempster's own personality on stage as much as they represent the actual intention of the composer. Dempster admitted this possibility in an interview from 1988 (Baker 1994: 31).

2.4 Notational Practice

For his notation Berio developed distinctions between vocal sounds with exact and approximate pitch as well as between short notes and notes held until the next sound. Although breathing is decided by the performer in the A section, Berio uses a specific sign for inhaling, and in the B section breath units are indicated by bar lines. However, he asks for "the length of the breath units to be different" between performers and performances thus introducing a certain aleatoric component. Such improvisation is also perfectly consistent with the fact that he wants movements to "appear spontaneous" – another element of theatricality.

Interestingly, Berio preferred to use the numbers from ① to ⑦ to indicate dynamics. The choice of seven numbered dynamic markings probably has its roots in Olivier Messiaen's *Mode de valeurs et d'intensités* (1949), thus showing Berio's serialist pedigree,[5] but, unlike in Messiaen's piano piece, Berio's numbers do not refer to specific dynamic indications such as *piano*, *forte* etc. It is difficult to tell exactly why Berio chose this manner of notation, but he may have wanted to prevent any of the sort of expressive associations that he – as a native

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[4]The following paraphrases and quotations have all been taken from either Berio's performance notes (Berio 1966) or from Dempster's commentary (Dempster 1966).

[5]I kindly thank an anonymous reviewer for drawing my attention to this point.

speaker of Italian – might have found performers often mistakenly applied to such terms. In this context, ① simply means "as *p* as possible" whereas ⑦ means "as loud as possible" (cf. Berio 1966). That is, Berio establishes the two extreme borders in a notational practice which is otherwise infinite (there is normally no limit, at least in theory, to how many *p*'s or *f*'s a composer can write). This tendency towards extremities also extends to the *temporal dimension* due to Berio's notational devices for notes that are to be played "as short as possible" or "as long as possible". In this way, in the name of theatrical performance, the composer can indeed demand the utmost from the trombonist as regards the *dynamic* and *temporal dimensions*.

In a short passage in the A section, Berio notates the movements of the slide with a semi-graphic notation, and throughout the piece the position of the metal plunger (open, closed, and completely closed) and when the mute should be rattled inside the bell is indicated on a line under the staff. Finally, the position of the instrument (raised or lowered) is sometimes indicated with dotted arrows. Thus, degrees of morphological tension not only emerge from alternative playing techniques, but also from various ways of notating new, particularly theatrical, elements – such as the position of the slide when not played, as well as that of the instrument as a whole.

3. Music Analysis

According to the composer's own words, the title *Sequenza* is meant to draw attention to the fact that these compositions are all constructed of consecutive sequences of 'harmonic fields', "from which the other, strongly characterized musical functions were derived" (Berio 1985: 97). Consequently, it seems necessary to divide the piece into formal units before we can proceed to characterize the music in terms of the four analytical dimensions.

As we have seen, in the performance notes Berio speaks about an A and a B section, and also in the score he has notated A and B, obviously in order to clarify the binary division of the piece. The rather short A section gradually gets more intense and finally leads to a culmination where the performer utters a bewildered "Why?". The early climax – one is nearly tempted to call it an 'inverted Golden Section' – provides a sense of disproportion which makes the B section seem even longer than it actually is. Such displacement in time is a well-known dramatic device that also refers to stereotypical clown acting.

3.1 The A Section

The piece is initiated with three loud, very short *a*'s in the high register separated by approximately 4-6 seconds of silence. The third sound is varied with a crescendo from ④ on a note with closed plunger anticipating the loud accent. The fourth tone is a loud *e-flat* thus emphasizing the tense, descending tritone interval. The combination of rapid articulation and silence, of constant register and the tense tritone interval as well as of constant and loud dynamics causes us to assign the *temporal*, *pitch* and *dynamic* dimensions to a medium level of tension.

The beginning has a certain resemblance with a fanfare, although the tritone interval does not conform to the natural harmonic series. That is, even though tritone intervals are essentially far from unidiomatic for a modern trombone, one could still argue that a certain potential for morphological tension is present already in the opening seconds of the piece.

The instrument is supposed to be raised for each note and lowered in between, which is also done after the fourth note. Surprisingly, no note is played at this point in the piece. Such surprises are not uncommon in performances by clowns, and the very fact that this effect only works – i.e. transmits its meaning – when someone is actually watching the performer reveals the strong dependency on theatricality which is characteristic of this piece. The raising and lowering of the instrument thus seem to constitute the central topic of this subsection of A which we will name a1.

Conversely, the central topic of the following subsection (a2), persisting until the "Why?" in the third system, is the presence of quick and short notes with large skips spanning over a wide ambitus and containing considerable dynamic contrasts. The level of tension is thus at a maximum in the temporal, pitch and dynamic dimensions.

In a2 the plunger is used as a means of variation in sound, and the composer calls for the vowel sounds [u a i], first as [u] alone, then as [u a] and later in its complete form as [u a i]. This seems to be a partly deconstructed, 'preverbal' foreshadowing of the bewildered "Why?" which apparently adds a sort of human sensibility to the instrument itself, thus increasing tension in the morphological dimension. Further consequences of the amalgamation of voice and instrument will be taken up later in section 4.2.

In the third system a 10-tone figure is repeated once. This figural repetition seems to be starting up a 'motor' of nervous motion of the slide indicated in a kind of quasi-graphic notation. The occasional notes are accompanied by two accented notes in the low register echoed by notes in the high register. The movement of the slide obviously is a physical gesture rather than a musical one. In the final moment before "Why?", Berio calls for audible inhaling of the air in the instrument – a subtle effect that, simultaneously, recalls the displacement after the fourth note in the beginning and foreshadows the dominant inhaling sounds found in the subsequent B section.

Hence, the A section can be regarded as constructed from two compositional concepts (a1 and a2) overlapping with considerable internal and especially external references as indicated by the arrows in example 1 below.
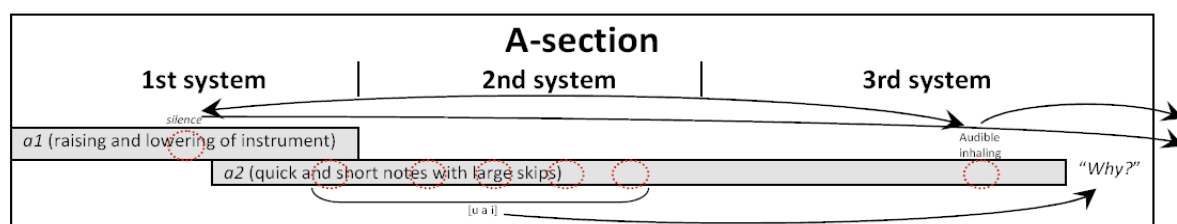
Example 1. Formal division including internal and external references in the A section of Berio's *Sequenza V*.

In the tables below, the previous observations about a1 and a2 have been compared with the criteria of the four-dimensional analytical model. By comparing the two tables we can detect a general intensification from a1 to a2 with respect to all four dimensions. Importantly, the morphological dimension is so far only inflicted with a moderate level of tension – that is, despite a certain potential for morphological tension, until now the instrument behaves more or less as expected.

a1 LEVEL OF TENSION / DIMENSION	Maximum	Medium	Minimum	Characteristics
Temporal		✕		Rapid articulation, but with much silence
Pitch		✕		Constant register, but tense tritone interval
Dynamic		✕		②-⑦. Loud, but constant dynamics
Morphological			✕	Traditional use of the instrument

Table 2. Analysis of subsection a1.

a2 LEVEL OF TENSION / DIMENSION	Maximum	Medium	Minimum	Characteristics
Temporal	✕			Many quick and short notes
Pitch	✕			Big leaps spanning over wide ambitus
Dynamic	✕			②-⑦. Generally loud with many contrasts
Morphological		✕		Leaps are rather idiomatic, but vowel sounds are novel

Table 3. Analysis of subsection a2.

Before moving on to the B section, I will take a look at the pitch-class structure of the A section. It is of course arguable to what extent a detailed pitch-class structure and namely the occasional – and often quite hidden – introduction of new pitches is perceived by an average listener. However, the very fact that this structure might have had significance to the composer on its own justifies the inclusion of such deliberations in the analysis.

In the musical examples below, pitches are listed in the order of appearance throughout the A section. From the figure following the musical examples, it is evident that a gradual pitch-class expansion takes place with the two initial notes *a* and *e-flat* as a starting point. In the second system, the space between these two centers is filled out, and in the third system further notes are added in descending direction (order of appearance: 9, 10, 11) finally reaching chromatic completion (assuming octave equivalence) with *b-natural* in the slide movement passage at the end of a2. Already in the beginning of the third system, the filling out of the tritone between *e* and *b-flat* in descending direction is predicted in an ascending glissando. Thus, the gradual pitch-class expansion contributes extensively to the development towards the climax on "Why?". Both the increase in rhythmic density and the gradual pitch accumulation have previously been noticed by Webb (2007).

Many new pitches are introduced with short notes – *d* even with a glissando. There seems to be no systematic pattern of note duration, or in terms of the number of repetitions of other pitches before the introduction of a new pitch class. This can be understood as yet another element of surprise related to clown acting. To some extent, the gradual expansion beyond chromatic completion finally introducing unspecified 'chance pitches' can also be interpreted as a reference to the development from strict serialism towards aleatoricism which found expression in works by some of Berio's contemporaries.

Example 2. Overview of the gradual pitch-class expansion in the A section of Berio's *Sequenza V*.

3.2 The B Section

Whereas the A section mostly explored discrete pitches, Berio makes use of the ability of the trombone to create glissandi in between the exact pitches of the chromatic scale in the B section. Moreover, the fact that the performer is now sitting, in addition to the inclusion of longer note values (if you can speak of 'note values' at all in proportional notation), and the constant sound as well as the call for simultaneous playing and singing clearly distinguish the B section from the preceding one. Whereas the A section could be described as extroverted, the B section is generally much more introverted in character (Halfyard 1997: 100). Nevertheless, this section is far from completely stable, and by degrees other compositional devices are introduced. In the following discussion of the B section, I will assign bar numbers to the breath units naming the first one after "Why?" as no. 1.

The first subsection of B – i.e. b1 – begins immediately after "Why?" in mm. 1-2 where the trombone plays the ascending interval of a tritone (*b-flat* to *e*) representing an inversion of the initial interval of the piece. Whereas the A section began from the top, the B section begins from the bottom with the instrumental pitches gradually rising chromatically. The clear opposition between the two main sections is thus established.

The b1-subsection is generally governed by remarkably soft and constant dynamics (①-②) and a focus on certain central tones in a narrow, medium register. The tension levels in the dynamic and pitch dimensions are thus at a minimum.

The note values are long, and the articulation is slow – thus motivating us to assign a minimum tension level in the temporal dimension. However, the absolute lack of silence runs counter to this intuition. The question of internally conflicting tension-inducing characteristics within the individual dimension will be taken up in the evaluation of the analytical method in the final section of this essay.

Instead of silence, Berio calls for continuous sound in the B section. Inhaling is done while singing a vocal sound and rattling with the plunger inside the bell. In the performance notes the composer states: "The transition between inhaling and exhaling must always occur without noticeable interruptions so that throughout section B there is no break in sound […]" (Berio 1966). In this way Berio effectively hides the practical necessity of breathing and creates an impressive sobbing snuffle. The 'sad clown' is a fixture of circus routines, but in this case we do not know exactly whether this is real or not; whether we should laugh or cry (cf. Berio's own account of his first attendance of a Grock-show as quoted from Conant [2005] above). Berio breaks with the traditional prevention of secondary 'noise' sounds, and

his prevailing concern for the physical aspects of the musician playing an instrument must have appeared rather novel at the time.

The commissioner of the piece, Stuart Dempster, was especially interested in new sounds and techniques and also researched those of non-Western instruments, most notably the traditional Aboriginal instrument *didgeridoo* (Tarr 2008). Playing this instrument requires command of circular breathing (Knopoff 2008), and this technique was later on thoroughly explored by Berio in his *Sequenza XI* for bassoon (1994). However, already in the B section of *Sequenza V* we see that the composer approached the technique by calling for continuous sound, preferably with no interruption. It is of course difficult to say whether Dempster's fascination with the didgeridoo was an actual inspiration for Berio when composing this piece, namely because the B section appeared independently as *Essay* before Dempster commissioned *Sequenza V* and because Dempster's stay as a Fulbright scholar in Australia did not take place until 1973; but it suggests that Dempster must have had the potential to fulfill Berio's requests with respect to a constant tone.

b1	LEVEL OF TENSION	*Maximum*	*Medium*	*Minimum*	*Characteristics*
DIMENSION					
Temporal			———————×——		Long notes and slow articulation, but no silence
Pitch			———————×——		Rather constant pitch around central notes, narrow register
Dynamic			———————×——		①-②. Very soft and constant
Morphological		|—×——————————|		Simultaneous playing and singing, continuous sound, flutter tongue, microtonal glissandi, rattling plunger

Table 4. Analysis of subsection b1.

The continuous sound, the rattling of the plunger in the bell, the omnipresent *flutter-tongue* technique as well as the simultaneous singing and playing and the microtonal glissandi all deviate from standard performance practices of the trombone. Thus, a maximum level of tension in the morphological dimension is encountered in b1.

If we take a closer look at the pitches that Berio chose for the inhaling intermissions, we will discover that a certain development is taking place. After four instances of *e-flat*, Berio makes a small detour to *f* in m. 11, returning to *e-flat* in m. 13. Subsequently, there is a shift to '*approximate f*' (indicated by a diagonal line through the note). In this way the central tone is blurred before the transition to *b-flat* from m. 17 and onwards. This section is less stable than the previous one with quite a few detours. The ambiguity is also due to the fact that more than one breath unit is now inserted between the inhaling intermissions. However, the two main tonal centers still seem to be *b-flat* and *e-flat* (from m. 35) returning to *b-flat* (in m. 40). The 'competing' central tones are evident from the attempt below to make a reduction of central-tone development throughout the B section.

Example 3. Central tones used for the inhaling intermissions in the B section of Berio's *Sequenza V*.

The fact that the central tones become unstable from m. 17, and that several breath units are inserted between the inhaling intermissions from m. 24 and onwards, ultimately results in dissolution of the compositional concept that identified the subsection b1. Consequently, a new subsection (b2) appears beginning from m. 17. The transition takes place very gradually so this bar number only indicates the very first introduction of new material (i.e. the new tonal center *b-flat*). Elements from b1 persist throughout the remainder of the piece, albeit to a lesser extent.

Another indication that something new seems to be happening is the chromatic motif (*e*, *f-sharp*, *f-natural*, *e*) in short, accented notes in the low register in mm. 16-25. Gradually more and more of these short notes with rapid articulation on discrete pitches are added, and also the double and triple staccatos in mm. 30, 34 and 43 provide increasing temporal tension and remind us that the 'good, old trombone' has now returned (i.e. decreasing morphological tension). However, foreign elements are still present in the form of *harmonic glissandi* (mm. 18, 24 and 29), simultaneous playing and singing, inhaling intermissions, flutter tongue, rattling plunger, and the unidiomatic use of the very high register in mm. 44-46. The extremely wide register leads to increased pitch tension though not reaching the maximum level since the extreme registers are primarily reached through stepwise motion and not by leaps. Also three instances of completely closed plunger appear in mm. 28, 33 and 34. This technique is not specifically well-developed in this piece and only appears in these three instances as a means of creating an effective crescendo to the loudest dynamic possible. The dynamic dimension is also subject to raising tension in b2 with many contrasts spanning from ② to ⑦.

b2	LEVEL OF TENSION	Maximum	Medium	Minimum	Characteristics
DIMENSION					
Temporal		|—✕———————————————|		Occasionally quick, accented notes, double and triple staccato, no silence
Pitch		|————————✕————————|		Very wide register, but mostly stepwise and not many leaps
Dynamic		|————————✕————————|		②-⑦. Medium loud with many contrasts
Morphological		|————✕————————————|		Simultaneous playing and singing, continuous sound, glissandi, flutter tongue, rattling plunger; but also double and triple staccatos and accented notes

Table 5. Analysis of subsection b2.

The quick notes, double and triple staccatos, and ascent to the extreme high register in mm. 43-46 create a climax which is somewhat related to that in the end of the a2-subsection. Also here the result is a "Why?", but this time it is uttered by the trombone, and not by the performer, in a register which is rather contrasting to the preceding one. This is the beginning of the next subsection (b3) where we experience a decrease in dynamic tension (①-⑤) as well as in temporal tension due to a single inhaling breath unit of silence as well as a return to the long notes of the simultaneous singing and playing that we recognize from b1. The breath unit of silence refers back to both the beginning (a1) and to the inhaling intermissions of b1 and b2 whereas the vowel sounds [u a i] in mm. 46, 47, 49, 52, and 54

refer back to a2, and the flutter tongue in mm. 48-49 back to b1 and b2. The ascending tritone on long notes (*b-flat, e, f*) in mm. 54-56 refers back to the beginning of b1, which was in itself an inverted reflection of the opening interval (a1).

Naturally, the polyphony between voice and instrument in mm. 50-58 reminds us of b1 and b2. This time, however, the development is slightly more logical contracting from a perfect fifth (m. 50) to a perfect fourth (50) which is inverted around *e-flat* to *e-flat/a-flat* (51) contracting to a minor second and a minor third (52) ending in unison on *f* (52, 56, 57) and later *e* (58).[6] In conclusion, the highly expressive final b3-subsection contains numerous references back to all of the previous subsections thus providing a concluding sense of formal coherence.
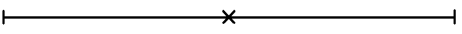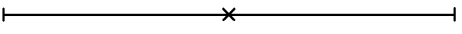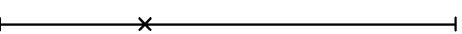
b3 DIMENSION	LEVEL OF TENSION	Maximum	Medium	Minimum	Characteristics
Temporal			—————×—————		Long as well as quick notes, some silence
Pitch			—————×—————		Not only leaps, but also stepwise motion, fairly wide register
Dynamic			————————×——		①-⑤. Generally soft, though with some contrasts
Morphological			———×————————		Simultaneous singing and playing, vowel sounds, glissandi; but also single, accented notes

Table 6. Analysis of subsection b3.

3.3 Formal Considerations

I will now elaborate on the *formal micro- and mesostructure* (i.e., the individual subsections and the two sections A and B individually) and the *formal macrostructure* (i.e., the interaction and transition between the two main sections as well as the overall form). In this connection the analytical figures from the four-dimensional analysis constitute a useful tool for pinpointing development and contrasts in tension levels.

In the A section, the temporal, pitch, dynamic, and morphological components evidently follow each other moving steadily towards an increasing tension level from a1 to a2. The morphological tension is generally relatively low.

Conversely, in the B section the morphological tension is at its highest, and the interaction between the four dimensions becomes slightly more ambiguous. This is especially prominent in the transitions between the three subsections of B where tension levels of some dimensions change while others remain the same.

As we experienced from the analysis of pitch structure, the B section can furthermore be understood as an arch form where the central tones of b1 and b3 concentrate in a relatively stable manner around the pitch *e-flat* whereas the central tone in b2 is much more unstable. This subsection begins and ends with the same central tone *b-flat* thus making b2 an arch form on its own.

Interestingly, one might perceive *b-flat* as the dominant of *e-flat* (which would be the case in a traditional, tonal context). Then the initial pitch pair of the piece – the tritone *a* and *e-flat* – would constitute a harmonic antithesis to *e-flat/b-flat,* with the same 'tonic' (*e-flat*),

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[6]Moreover, m. 56 is a retrograde of m. 52, and m. 57 is a repetition of m. 56 with voice exchange between voice and instrument.

as if, from a global perspective, the vibrant, extroverted tritone of the A section had been subdued into a dominant/tonic relationship in the B-section.[7]

Regardless of whether one is willing to attribute a tonal interpretation to the *e-flat* and *b-flat* in the B-section, it does at least seem incontrovertible that these two pitches represent some kind of harmonic contrast. Hence, the pitch-structure development in the B section seems to constitute an appropriate manifestation of Berio's previously mentioned idea of "harmonic fields" (Berio 1985: 97).

As stated earlier, various references across formal boundaries create a general sense of formal coherence with respect to the global form. Nevertheless, the local transition between the two main sections is strongly characterized by contrast, which was for instance due to difference in register and playing techniques, the introduction of continuous sound, and the fact that the performer is sitting instead of standing. Furthermore, this sense of contrast becomes clearly evident when comparing the analytical tables for the subsections a2 and b1 (tables 3 and 4 above). The way that B complements A is shown in the fact that the shape of table 4 is almost a perfect inversion of table 3.

From a global perspective the development in the temporal, pitch and dynamic dimensions seems to represent an arch form where the initial medium tension level eventually returns in b3. Meanwhile, the morphological tension level starts out from an absolute minimum in a1, moving towards higher tension in a2, reaching a climactic level of maximum tension in b1, before finally stabilizing at a relatively high morphological tension level in b2 and b3.

Hence, a remarkable formal discrepancy seems to exist between the morphological dimension and the remaining three dimensions. The instrument seems to have undergone a transformational process towards higher morphological tension in the course of the piece, and Berio's piece might even be interpreted as representing a transformation of the instrument throughout the history of Western art music.

4. Exploring the Morphological Dimension

In the discourse on Berio's *Sequenzas* certain topics seem to reoccur frequently, thus binding the series together as a whole. Polyphonic playing and virtuosity were mentioned by the composer himself (Berio 1985: 90-91, 97); furthermore, Janet K. Halfyard (2007b) has argued that theatrical elements are present in many of the *Sequenzas*, in particular through "the idea of virtuosity as a specifically musical form of theatricality" (Halfyard 2007b: 99). In *Sequenza V* theatricality is especially prominent, and, as argued above in the section on context, this was probably due to Berio's personal admiration for Grock and certain aspects of the compositional process. As a special case of theatricality, clown acting inevitably manifests itself in humor, which is arguably a general trait of Berio's music (Griffiths 2008). Another topic specific to this particular *Sequenza* is the amalgamation of voice and instrument, which the composer calls for in the score as well as in his performance notes by stating that "[i]nstrumental sounds are often combined with vocal sounds: the performer should always obtain a similarity of color and attack between the two" (Berio 1966).

Although some of these topics – polyphony, amalgamation of voice and instrument, virtuosity, and humor – were already mentioned in passing in the analysis above, I will now

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[7] I kindly thank an anonymous reviewer for drawing my attention to this point.

deal with them in further detail and discuss the way in which they fit the four-dimensional analytical model.

4.1 Finding Polyphony in the Trombone

In the texture of *Sequenza V* we have encountered quite a few implications of *polyphony*: (1) the accented notes in the passage with slide movement in a2; (2) the chromatic motif in the low register in mm. 16-25 of the B section; (3) the polyphony through dynamics and contrasting registers in mm. 40-41; (4) the registral polyphony in mm. 46-48; and finally, (5) the concluding two-voice polyphony between voice and instrument in mm. 50-52. All occurrences of simultaneous singing and playing must be considered as extensions of this tendency towards polyphonic thinking.

In the interview which probably represents his most extended discussion of the *Sequenzas*, Berio (1985) emphasized the prominence of harmony and polyphony as a common element of the *Sequenzas*. Specifically, he claimed polyphony to be a prevailing theme in his pieces for monodic instruments:

> All the other Sequenzas for solo instruments are intended to set out and melodically develop an essentially harmonic discourse and to suggest, particularly in the case of the monodic instruments, a polyphonic mode of listening […] I wanted to establish a way of listening so strongly conditioned as to constantly suggest a latent, implicit counterpoint. The ideal was the 'polyphonic' melodies of Bach […] although it was a bit utopian, the experience was extremely useful to me. (Berio 1985: 97)

Since polyphony is not at all idiomatic to monodic instruments, an exploration of polyphony on the trombone may indeed sound like a contradiction. Thus, polyphony is certainly one of the main issues making the B section stand out with a relatively high level of morphological tension.

Despite the 'utopian' nature of polyphonic playing on the trombone, we must acknowledge that Luciano Berio succeeded in his quest. It is worthy of notice, however, that he did not confine himself to the well-known pseudo-polyphony of J.S. Bach (see 1-4 above). Berio refers to this in the quotation, but he also developed a means of creating 'true polyphony' via simultaneous singing and playing.

4.2 Amalgamation – When Your Instrument Becomes Your Voice and Vice Versa

The latter, so-called 'true polyphony' is a clear example of the *amalgamation between voice and instrument* that the composer asks for already in the performance notes: "Instrumental sounds are often combined with vocal sounds: the performer should always obtain a similarity of color and attack between the two" (Berio 1966). Truly, the whole B section brings numerous brilliant examples of this amalgamation finally culminating in the very last bar where they definitively end on the same tone. Also the vowel sounds [u a i] referring to the vocal outburst "Why?" represent Berio's effort to literally let the musician speak through his instrument.

Dealing with the effect of performance and theatricality, Halfyard states:

> When we look at the concert platform, we tend not to see a person holding a violin, for example, we see a violinist. Built into that preconception of what a violinist is are various assumptions and expectations about the gestural vocabulary of performance: how the player stands, how the instrument is held, how the bow moves, and so on. As a result of this, in the action of performance, the body of

the player and the body of the instrument become, in effect, a single entity: the body of the performer becomes subsumed into the action of performance. (Halfyard 2007b: 110)

Shortly, we will consider the consequences of such listener assumptions and expectations being violated, but with respect to the current issue, it is essential to realize that in *Sequenza V* union of body and instrument is not only obtained through performance and theatricality, but also through essentially musical means, namely through the amalgamation of voice and instrument.

This close relation between musician and instrument supports the assumption that *Sequenza V* is not only intended to present a musical portrait of the trombone as an instrument but also of the trombonist as an instrumentalist. Due to the amalgamation of voice and instrument, it seems as if the musician is drawn into the morphological dimension, and, consequently, our perception of morphological tension does not only depend on distortion of our traditional image of the instrument, but also on distortion of our traditional image of the musician. This interpretation will have consequences for the evaluation and further development of the analytical model in the concluding section of this essay.

Berio once referred to the amalgamation of voice and instrument in *Sequenza V* as the "vocalization of the instrument" and the "instrumentalization of the voice" (Berio 1985: 93), and, putting this process into perspective, it seems to be very much comparable with the general concern for music and language found throughout Berio's oeuvre. In many different ways, Berio has explored the overlap between – and possible amalgamation of – music and language (Griffiths 2008). In *Thema (Omaggio a Joyce)* music is constructed from three recorded readings of an excerpt from *Ulysses* by James Joyce which are transformed in various ways. Now and again, the words are rendered unrecognizable, and also the combination of three languages supports the assumption that Berio was assigning more value to the sound of the words than to the literal meaning itself. In semiotic – i.e. Saussurean terms – this can be referred to as a preference for the *signifier* at the expense of the *signified*, and it affirms Berio's awareness of this distinction in language and also indicates his awareness that these concepts might be similarly applied to music. Hence, all the different instrumental transformations of the word "Why!" as well as the vocal imitations of the trombone sound found in *Sequenza V* can be regarded as essential exponents of the important process of amalgamation between music and language that endured to be a primary concern for Luciano Berio as a composer.

4.3 The Virtuosity of Performance

The call for simultaneous singing and playing is just one – perhaps the most challenging – of many different *virtuoso features* found in this piece of music. The frequent, sudden changes of register and the quick tones, namely in the high register, also make *Sequenza V* inaccessible to all but the most virtuosic of trombonists. According to Berio himself, "[v]irtuosity often arises out of a conflict, a tension between the musical idea and the instrument, between concept and musical substance" (Berio 1985: 90). Every time Berio exposes the limitations of the instrument or even transgresses the borders of traditional idiomatic playing, he also violates the assumptions and expectations of the listener, and thus a certain morphological tension arises. Such morphological tension caused by virtuosity often appears in combination with tension in one or more of the remaining three dimensions.

Nevertheless, virtuoso elements in *Sequenza V* are not limited to demonstration of mere technical skills, but also include techniques that imply musical substance in themselves: "My own Sequenzas are always written with this sort of interpreter in mind, whose virtuosity is, above all, a virtuosity of knowledge" (Berio 1985: 91). In this sense not only the performer's technical skill on his instrument, but also his ability to perform and influence the audience are put to a test in *Sequenza V*. To Berio, Grock was an ideal role model as a possessor of the rare talent of theatrical virtuosity which he intended to transmit through the musical domain.

4.4 Humor, *Verfremdung*, and the Performative Turn

The whole theatrical setting of the fifth *Sequenza* as prescribed in the performance notes as well as formal disproportion and many of the peculiar sound effects most certainly envelop the piece in a *humoristic atmosphere*. However, although Paul Griffiths (2008) has argued that humor is an omnipresent trait below the surface even in Berio's more serious works, it does not manifest itself in its purest and most traditional form in this piece. Instead, various manifestations of morphological tension, including the essentially theatrical setting, actually create a characteristic *ironic distance* between the audience and the music being performed in front of them.

This distance effect can very well be conceived of as exposing the concept of "Verfremdung" developed by the German poet and playwright Bertolt Brecht whom Berio also acknowledged as an inspiration (Osmond-Smith 2007b: 3). In David Osmond-Smith's words,

> [a]lienation [i.e. Verfremdung] is essentially the critical suspension of empathy – of the pleasing illusion that we 'know how some other person feels'. In its simplest and crudest form, it is achieved when an actor giving a 'realistic', post-Stanislavskian performance suddenly steps out of role. The spectator is confronted by the fact that the actor is giving a performance, and is implicitly invited to consider whether one is equally 'performing' one's everyday 'self'. (Osmond-Smith 2007: 3)

The Danish composer and music theorist Karl Aage-Rasmussen (1998: 199) once very aptly described the "Why?" uttered in the middle of the piece as resulting in "a staggering balancing act between a clown act and a question of life and death".[8] Rasmussen's point seems to be that the performer temporarily steps out of his role – both as a trombonist and as a clown – while giving words to a rather unexpected juxtaposition of existential and trivial matters. In this context, a classical trombonist is not supposed to act as a clown on stage, and the average audience neither expects a clown nor a trombonist to suddenly address the audience with existential questions in the middle of a performance.

Berio's use of Brechtian *Verfremdung* in *Sequenza V* is thus an example of the special kind of morphological tension representing a distortion of our traditional image of the role of the musician. Such kinds of tension go hand in hand with the original kind of morphological tension relating exclusively to the "acoustic transformation relative to an inherited model" (Berio 1985: 98) of the instrument.

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[8] The translation from Danish has been made by the author of this essay. The original text sounds as follows: "Når basunisten midt i den 5. sequenza pludselig udbryder 'Why?', er resultatet en svimlende balanceakt mellem et klovnenummer og et spørgsmål om liv og død, lykkes det, tror man et øjeblik på at det er musikken selv, der spørger!" (Rasmussen 1998: 199).

Consequently, the listener's understanding of theatrical elements has become absolutely crucial in being able to decipher musical meaning communicated in this piece. This alters the identity of the musical work in such a way that the focus changes from the given score to the actual performance. In other disciplines within the humanities this paradigm shift has sometimes been referred to as the 'performative turn' (Guldbrandsen 2006) which has been put to words by the Norwegian music scholar Erling E. Guldbrandsen in the following way:

> Despite its plurality of functions, the term 'performativity' displays a deepening actuality in aesthetics and in arts. This may be seen as an indication of a general change from essentialist conceptions to a more dynamic understanding of the art work, which may eventually instigate a stronger interest in the temporal and transitory aspects of the work of art. Rather than focusing on 'given' structural characteristics of the work, a performative perspective can enhance an inquiry into how the work takes on form through a play where the author, the performer, the interpreter, the reader, the spectator, or the listener are mutually conditioned by aesthetic practices, cultural processes, and regulations. (Guldbrandsen 2006: 141)[9]

Violation of the norms established by this mutual conditioning described by Guldbrandsen results in morphological tension, and since the score constitutes an act of the past and the performance an act of the present, one consequence of the 'performative turn', especially when combined with Brechtian *Verfremdung*, is that the musical work becomes more existentially pertinent to the listener.

Hence, in the view provided above, elements such as polyphony, amalgamation of voice and instrument, virtuosity, theatricality, and humor – of which some are common to all the pieces of the *Sequenza* series – can be interpreted as different ways of exploring the morphological component of the four-dimensional analytical model. This exploration is consistent with the global formal outline of the piece in which development in this dimension clearly diverges from the remaining three dimensions.

5. Evaluation of the Analytical Model

Despite the fact that Berio's four-dimensional approach originally referred specifically to the flute *Sequenza* and was possibly not intended as an analytical tool in the first place, our application of the model has indeed been shown to provide a reliable way of detecting different kinds of tension in the *Sequenzas* – and potentially, in many other compositions. In the paragraphs on formal considerations we have similarly seen that the tension analysis had strong implications for the sense of formal coherence and contrast.

Moreover, the analysis of *Sequenza V* emphasizes the importance of conceiving of tension as a multidimensional phenomenon, and it seems most appropriate not to exclude the possibility that dimensions other than the four in use here might be relevant. Even though the various dimensions often work together supporting each other in many typical musical contexts, they are not mutually conditioned. Development in tension across the four dimensions can thus easily move in diverging directions simultaneously, which was the case in the B section; in spite of the role that the composer assigned to the morphological

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[9]Importantly, Guldbrandsen does not consider performativity in the musical domain as unique to aesthetics of twentieth-century art music. Rather one of his aims is to refine the general concept of 'performative turn' by arguing that "the distinction between musical writing and playing is not as sharp as some may think. The study of musical performativity needs to be rehistoricized, knowing that the 19th century idea of the 'work' already implies questions of interpretation, aesthetic experience, and change" (Guldbrandsen 2006: 140).

dimension as the "rhetoric instrument" of the remaining three dimensions (Berio 1985: 98), this piece is indeed a good example of the emancipating potential of this dimension.

There are, however, some limitations to the four-dimensional analytical model. For instance, the analytical tables only provide a static picture – an 'up-to-the-minute account' – even though a dynamic process might in fact be taking place underneath. Consequently, the initial formal segmentation chosen by the analyst becomes fundamental to the final interpretation of the piece, and one has to pay particular attention to linear development in the tension levels within and across formal boundaries.

As was mentioned in the introduction and confirmed by the analysis, not all tension-inducing characteristics are yet sufficiently well-defined, and specifically their mutual interaction within dimensions raises certain problems when assigning tension levels to musical passages; for tension in a given dimension is mostly due to a combined effect of separate tension-inducing characteristics which can be mutually diverging.

For instance, in b1 the total lack of silence runs counter to our intuition about assigning a minimum level of tension in the temporal dimension due to the long tones and slow articulation. Additionally, the extremely high register in b2 only results in medium pitch tension because it is reached nearly exclusively through stepwise motion; and b3 is assigned approximately similar tension levels to a1 although the texture of this subsection is remarkably different from that of the beginning of the piece.

In the first subsection of A – a1 – mutually conflicting characteristics (rapid articulation and silence, constant register and tense intervals, constant and loud dynamics) lead to a medium level of tension in the temporal, pitch and dynamic dimensions. This is, however, a compromise which seems slightly unfaithful to the musical reality. Thus, we failed to notice that the tension increase from a1 to a2 was due to lack of silence (and not to a change in articulation) in the temporal dimension and due to greater variation in loudness (not to less constant dynamics) in the dynamic dimension. On the contrary, in the pitch dimension, tension increase was not only caused by increasing interval sizes, but also by gradually increasing pitch density as evident from the analysis of pitch-class expansion.

5.1 Revision of the Temporal, Pitch, and Dynamic Dimensions

Tension conflicts within dimensions as the ones mentioned above thus support the notion that a revision of the model would be necessary in order to avoid missing significant analytical nuances. Therefore, I propose that all of the three first dimensions are subdivided into two separate tension categories each.

In the temporal dimension, 'articulation density' will refer to the speed in articulation or the concentration of separate tones being played whereas 'sound density' will refer to the overall presence of sound as opposed to silence. Long, sustained tones will thus result in relatively high 'sound density' and low 'articulation density' whereas many repeated, staccato tones will result in relatively high 'articulation density', but not necessarily high 'sound density'.

In the pitch dimension, 'interval size' will obviously refer to the size of intervals in use. Generally, larger intervals will result in a higher level of tension, but also the quality (i.e. the degree of dissonance and consonance) of the intervals will influence tension levels in the 'interval size' category. For instance, dependant on musical context, a major seventh might very well entail more tension than an octave. The second tension category in the pitch

dimension will be 'registral extremity' where use of extremely low or high register will induce tension. Importantly, the listener's estimation of high and low will depend both on the confines of human perception and the idiomatic range of the instrument(s) in question. The latter tension category is thus likely to interact with the morphological dimension in certain ways.

In the dynamic dimension, I will distinguish between 'loudness' and 'dynamic contrast' which refer directly to Berio's (1985: 98) initial distinction between "moments of maximum sound energy and maximum dynamic contrast", respectively.

To aid application of the revised analytical model the six tension categories will furthermore be grouped into 'local' and 'global components'. For the 'local components' (articulation density, interval size, and dynamic contrast), the starting point is either the time-span, the interval size, or the dynamic contrast between two neighboring tones, respectively. Subsequently, considerations for each pair of adjacent tones are generalized to obtain an overall tension level for a given musical segment. Conversely, the 'global components' (sound density, registral extremity, and loudness) start out from the overall image of either the concentration of sounds, the register, or the loudness, respectively.

In table 7 the six tension categories of the three first dimensions including the grouping in 'local' and 'global components' have been summarized and compared with Berio's initial presentation of the four-dimensional model (Berio 1985: 97-98):

GROUPING DIMENSION	*Local component*	*Global component*

Temporal	'Articulation density':
	"speed in articulation" (Berio 1985)
	   i.e. concentration of tones.
		'Sound density':
		"duration of sounds" (Berio 1985)
		   i.e. overall presence of sound.

Pitch	'Interval size':
	"when notes jump about within a wide gamut and establish the tensest intervals" (Berio 1985)
	   i.e. size and quality of intervals.
		'Registral extremity':
		"when they [the notes] insist on extreme registers" (Berio 1985)
		   i.e. the use of extreme high and low registers.

Dynamic	'Dynamic contrast':
	"moments of [...] maximum dynamic contrast" (Berio 1985)
	   i.e. range of dynamics.
		'Loudness':
		"moments of maximum sound energy" (Berio 1985)
		   i.e. absolute dynamic level.

Table 7. Revised model of the temporal, pitch, and dynamic dimensions with grouping of tension categories in 'local' and 'global components'.

5.2 Revision of the Morphological Dimension

As argued earlier, amalgamation of voice and instrument and the presence of theatrical elements encourage us to extend our definition of morphological tension to include distortion of our traditional image of the musician and his role in the performance context (in addition to the "acoustic transformation relative to an inherited model" of the instrument originally mentioned by Berio [1985: 98]). This was also evident from the composer's notational practice where certain novel devices were indeed introduced to change the acoustic properties of the instrument (a typical landmark of morphological tension) whereas others were rather introduced to influence the musician's appearance on stage (i.e. to promote theatricality).

However, if we extended our definition of morphological tension without making a distinction between transformation of the instrumental idiom and performance context, we would have had to assign a relatively stable, high level of morphological tension throughout the piece due to (or in spite of) the fact that theatrical elements are prominent in the A section and transformation of the instrumental idiom is at its highest in the B section. More specifically, morphological tension with respect to the performance context is created, primarily in the A section, by raising and lowering the instrument, surprisingly avoiding a tone, moving the slide without playing, preferring aleatoricism to serialism in pitch-structure (e.g. in a2, possibly, as a comment to some of Berio's contemporaries), and by uttering the strange "Why?" at the end of the A section. Conversely, tension-inducing characteristics – chiefly with respect to instrumental transformation – are dominant in the B section as polyphony, continuous sounds, amalgamation of voice and instrument, use of metal plunger, flutter tongue, vowel sounds, extremely high register, noise sounds, and indiscrete pitches. This analysis supports an interpretation where the 'performance context' category of the morphological dimension is at a high tension level in the A section, and the 'instrumental idiom' category is at a high tension level in the B section.

The analytical distinction between the two tension categories of the morphological dimension appears in table 8 below. Notice here that only the 'instrumental idiom' category was explicitly referred to by Berio (1985: 97-98). This was most probably due to the fact that the composer presented his four-dimensional model only with respect to the first *Sequenza* for flute which does not make considerable use of theatrical elements.

Morphological dimension	*'Instrumental idiom':* "when the image, *my* image of the flute [or any other relevant instrument] is drastically altered" (Berio 1985)	*'Performance context':* Not explicitly mentioned by Berio in his discussion of the flute *Sequenza* (which does not make considerable use of theatrical elements).

Table 8. Revised model of the morphological dimension.

Consequently, the general increase in morphological tension through the course of the piece, which was pointed out in the formal considerations above, takes place primarily in the 'instrumental idiom' category whereas the morphological tension of the 'performance context' category already present in the A section subtly conceals the fact that the instrument itself is close to its traditional image in the initial section of the piece. That is, by acknowledging the two independent, but mutually related, kinds of morphological tension explored in *Sequenza V*, the revised analytical model succeeds in accounting for theatricality and performance elements without failing to realize the increasing transformation of the instrumental idiom which, as argued above, seems to constitute a key aspect of the musical meaning that the composer wanted to communicate in this piece.[10]

References

Baker, Buddy (1994). "Why? How about Who, Where, What, When? The Development of Berio's *Sequenza V*." *The International Trombone Association Journal* 22 (2), 30-32.

Berio, Luciano (1966). Performance notes for *Sequenza V* for trombone solo. Universal Edition.

Berio, Luciano (1985). *Two interviews with Rossana Dalmonte and Bálint András Varga*, translated and edited by David Osmond-Smith, New York/London: Marion Boyars Publishers.

Conant, Abbie (2005). "Grock the Clown and Berio's *Sequenza V*". Available online at www.osborne-conant.org/Grock.htm .

Dempster, Stuart (1966). Commentary on performance of *Sequenza V* for trombone solo. Universal Edition.

Gallon, Emma (2009). Review: "Halfyard, Janet, ed., *Berio's Sequenzas: Essays on Performance, Composition and Analysis* (Aldershot: Ashgate, 2007)." *Journal of Music and Meaning* 7, <http://www.musicandmeaning.net/issues/showArticle.php?artID=7.7>

Gravesen, Finn (ed.) & Martin Knakkergaard (ed.) (2003). *Gads Musikleksikon* [in Danish], Copenhagen: Gads Forlag.

Griffiths, Paul (2008). "Berio, Luciano." In: Alison Latham (ed.), *The Oxford Companion to Music*, accessed the 31st of October 2008, <http://www.oxfordmusiconline.com>

Guldbrandsen, Erling E. (2006). "Modernist Composer and Mahler Conductor: Changing Conceptions of Performativity in Boulez". Studia Musicologica Norvegica 32 (1), 140-162.

Halfyard, Janet K. (2007a). "Foreword." In Janet K. Halfyard (ed.), *Berio's Sequenzas*, Aldershot: Ashgate Publishing Limited, ix-xxii.

Halfyard, Janet K. (2007b). "Provoking Acts: The Theatre of Berio's *Sequenzas*." In Janet K. Halfyard (ed.), *Berio's Sequenzas*, Aldershot: Ashgate Publishing Limited, 100-116.

Knopoff, Steven (2008). "Didjeridu." In Grove Music Online, accessed the 31st of October 2008, <http://www.grovemusic.com>

O'Loughlin, Niall (2008). "Globokar, Vinko." In Grove Music Online, accessed the 31st of October 2008, <www.grovemusic.com>

Osmond-Smith, David (1991). *Berio*, Oxford/New York: Oxford University Press.

Osmond-Smith, David (2007). "Introduction." In Janet K. Halfyard (ed.), *Berio's Sequenzas*, Aldershot: Ashgate Publishing Limited, 1-8.

Rasmussen, Karl-Aage (1998). "Made in Italy – Luciano Berio." In Karl-Aage Rasmussen, *Kan man høre tiden – essays om musik og mennesker* [in Danish], Copenhagen: Gyldendal, 196-201.

Tarr, Edward H. (2008). "Dempster, Stuart (Ross)." In Grove Music Online, accessed the 31st of October, <www.grovemusic.com>

Webb, Barrie (2007). "Performing Berio's *Sequenza V*." *Contemporary Music Review* 26 (ii), 207-18.

Whatley, Kirsty (2007). "Rough Romance: *Sequenza II* for Harp as Study and Statement". In Janet k. Halfyard (ed.), *Berio's Sequenzas*, Aldershot: Ashgate Publishing Limited, 39-52.

Meaningful Scribbles:
An Approach to Textual Analysis of Unconventional Musical Notations

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Abstract

This paper draws upon recent studies of writing systems, buttressed with material drawn from general linguistics and semiotics, to develop an approach to the analysis of musical notation as a system of signification in its own right (as opposed to a mere representation of musical sound). Scores are herein understood, following Nicholas Wolterstorff's formulation in his paper "Towards an Ontology of Artworks" (1975), as "a record of the artist's determination of correctness-conditions." Our analysis must, then, provide a clear explication of the means by which these conditions are communicated – even where these means are not readily understood as drawing on any known signifying convention. With this in mind, the method of analysis is designed to be flexible enough to accommodate any notated document purporting to be a musical score regardless of the particular notational conventions used. A description of the relevant linguistic and semiotic terminology and its uses is followed by a discussion of their application to the study of elements of standard notational practice. A sequence of steps, through which the analysis of an unconventional "graphic score" is to proceed and by which musical meanings are to be assigned to the score's markings, is presented. This sequence is illustrated through a progressive sample case that offers a range of possible musical interpretations for variations on a simple notation of the author's devising. Finally, a discussion of the possibilities for evaluating unconventional notations, once musical meanings have been ascribed to all markings within the score, will be undertaken with reference to John Cage's "Variations I".

1. Introduction

While scholarly attention has been paid to the notational component of music, these studies[1] do not explicitly outline a method whereby a musical notation can be treated as a distinct system of signification (as opposed to a mere representation of musical sound). The extant study that has come closest to this aim is Leo Treitler's "The Early History of Music Writing in the West" (1982), which applies Peircean semiotic terminology to the classification of regional musical scripts of the late medieval period. Recent studies[2] in linguistics reveal some fundamental properties of writing systems for which Treitler's study does not fully account. It is my intention to build upon these studies, augmented by relevant ideas from semiotics and general linguistics, in proposing an approach to the analysis of any notated document purporting to be a musical score regardless of the particular notational conventions (or lack thereof) used. The desire to undertake such an analysis may strike some as odd. After all, the purpose of a musical notation, if it is to be a *musical* notation, is to describe or guide the performance of the musical work notated. How, exactly, a notation does this is still a matter of some philosophical debate, but for present purposes, Nicholas Wolterstorff's formulation will suffice: "Most scores function and are meant to function to guide performances. But what is true of every score is that it is a record of the artist's determination of correctness-conditions" (1975: 136). Given this function, the importance of a clear understanding of the medium by which these "correctness-conditions" are communicated should be evident. If we are to identify proper instances of a work (of notated music), then we must know what the notation signifies.

This paper was written with the radical notational experiments – so-called "graphic scores" such as those created by the New York School[3] in the 1950s and 60s and their followers in more recent decades – in mind. In these works, the notation is not construed simply as a means of describing a sound structure or delimiting performance techniques. Rather, a level of strategic ambiguity is introduced by the use of unconventional and often newly-invented symbols. These symbols, when not tied by tradition to a pre-existing musical meaning, interfere

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[1] For a recent sampling, see Leo Treitler (1982, 1992), Kenneth Levy (1987), Anna Maria Busse Berger (1993), and Alma Colk Santosuosso (1989) regarding the historical development of musical notation; see Gardiner Reed for a practical guide to modern notational practice and (1987) for a survey of proposed notational innovations; see Jane Alden (2007) for a recent study of the historical precedents for Earle Brown's notational innovations and Mieko Kanno (2007) on modern innovations in prescriptive notation.

[2] See Coulmas (2003), Harris (1995), as well as Gerhardt Augst, ed. (1986), *New Trends in Graphemics and Orthography* (Walter de Gruyter).

[3] "The New York School" is a term that has gained some currency in referring to the collected works of composers John Cage, Morton Feldman, Earle Brown, and Christian Wolff.

with our ability to identify the "correctness-conditions" indicated by the score. In such cases a new reading strategy is required (often aided, but not fully accomplished, by the inclusion of performance instructions, though in some cases no directions are provided at all[4]). The piece of music notated in such a way results from a dynamic interaction between the ambiguities of the notation and the fixing of those ambiguities into particulars to guide a performance. The approach presented herein should serve as a basis for such readings. This approach is presented as a sequence of steps through which the analysis of an unconventional "graphic score" is to proceed and by which musical meanings are to be assigned to the score's markings (section 4). A progressive sample case (section 4.1) walks us through this sequence, offering a range of possible musical interpretations for variations on a simple notation of the author's devising. In preparation for this, necessary concepts from linguistics and semiotics are introduced (section 2) and applied to conventional musical notation, which serves as a background for our consideration of unconventional notations (section 3).

While my primary concern is with radical notational experiments, the present techniques can also be applied to other notational approaches, including wholly traditional ones. For instance, a study of the prescriptive notational innovations of Helmut Lachenmann, would reveal much about the composer's conceptualization of the performance techniques he calls for. A study of the relative success of several of these innovations might, in turn, reveal something of the way musicians experience and interpret musical notation. An analysis of the use of (usually) standard notation to represent the spatial conceptions of musical sound in the work of composers such as Varese, Xenakis, and Tenney might prove similarly illuminating of their work. It should also be stated that the discussion will raise philosophical questions regarding reference and meaning as well as the ontology of the musical work. These will have to await future studies for their full treatment. The question of the evaluation of musical works notated by unconventional means will be addressed in reference to John Cage's "Variations I" (section 4.2) with the following caveat: I will confine myself to the evaluation of the appropriateness and inventiveness of the notational means employed weighed against the apparent intent of the composer. I am not, at present, concerned with establishing criteria for the aesthetic assessment *as works of music* of works of music notated by unconventional means. That issue can only be properly addressed once the full analysis of such works – merging a textual analysis of the sort I propose with phenomenological analyses of a sampling of performances of the work in question and ethnographic study of the decision-making processes required for each realization/performance

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[4] See, for instance, Cornelius Cardew's *Treatise* (1967) and *The Great Learning* (1971).

of the work – has been undertaken. Obviously, to present such an analysis, in addition to outlining the proposed method for undertaking the first part of that analysis, would require more space than I could reasonably devote in a single article.

2. The Study of Writing Systems

This section will introduce the requisite terminology for the analysis, defining terms from linguistics and semiotics and explaining their interrelated functions. Most studies of writing systems draw upon the tools developed by linguists to make possible the analysis of spoken language. Such analysis is predicated on the assumption that:

> … no matter how we answer the question of whether writing followed, preceded or accompanied the recognition of different levels of linguistic structure, it is clear that, by virtue of the fact that every writing system maps onto a linguistic system, it embodies and visibly exhibits the dissection of units of language and thus linguistic analysis. (Coulmas 2003: 151)

A writing system marks distinctions appearing, at some level, in the sonic form of a language. In so doing, writing can function as a medium for the analysis of spoken language (at the level of those distinctions). In broader terms (not privileging spoken language), two distinct expressions, the written and the spoken forms of an utterance, are correlated by a structural analogy. For instance, if we have symbols representing complete spoken words, then we have a logographic writing system. If we have symbols representing each possible syllable of the language, then the writing system is syllabographic. Where letters correspond to phonemes, the system is alphabetic. These smallest units are those by which the structural analogy is articulated. However, the units of these expression-planes (written or spoken) can be further analyzed – though not always (or often, even) into meaningful parts – for the conventions governing their formation.

> Like linguistic sound systems, writing systems are structured and can, accordingly, be analysed in terms of functional units and relationships. The distribution of these units is governed by restrictions limiting their linear arrangement in forming larger expressions. These restrictions can be understood as operating on the graphic level alone. In this sense every writing system is to be analysed as a system in its own right irrespective of other kinds of linguistic structure to which its units and compound expressions may refer. (Coulmas 2003: 34)

Our purpose then includes, not only, an explication of the nature of the analogy between expression-planes, but also a study of the sub-analogical structures of one or the other expression-plane (i.e. the structural aspects of an expression-plane that exist below the level of

the analogy coordinating that expression-plane with another).

According to linguist Roy Harris, the most fundamental characteristic of writing systems, at least in reference to their analysis, is the presentation of the writing within a graphic space. The graphic space makes available two- and three-dimensional spatial structures for the representation of one-dimensional, time-bound activities to which writing is taken to correspond, such as spoken language or musical performance (Harris 1995: 46). Harris distinguishes two forms of writing systems, scripts and charts. Charts may be understood as graphic communications that assign meaning to locations within the graphic space, scripts those that assign meanings to arrangements of marks in relation to one another (Harris 1995: 93). Of course there is no absolute instance of either case – a chart with no markings conveys no meaning, neither does a set of symbols with no arrangement in graphic space. A chart operates by assigning a gradation of values in some parameter to (at least some of) the graphic space's dimensions, as in a map, a seismograph, etc. Scripts still depend on temporal axes determining the order in which the symbols are to be read. In written English, a primary temporal axis is assigned along the horizontal, a secondary temporal axis along the vertical dimensions of the graphic space. Given the syntagmatics of the graphic space in charts, one need only assign the correct parameter and demarcation of unit values to each axis in order to read the chart.

Any script is comprised of marks made within a graphic space. For these marks to be meaningful, they must create a distinction within the expression-plane that is understood to correspond to a distinction in the content-plane of an intended message[5]. Nina Catach, following the influential linguist Louis Hjelmslev, has referred to such marks as "pleremes". In certain cases, a plereme may be divisible into smaller markings that do not carry meaning in themselves. Such is the case with the morpheme/grapheme (word/letter) distinction in alphabetic writing[6]. Marks that do not carry meaning within a writing system are called "cenemes" (Catach 1986: 3-4). The plereme/ceneme distinction is similar to André Martinet's notions of *first* and *second*

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[5] In some instances this content-plane will be construed as the analogous structure in the expression-plane of spoken language, which, in turn, refers to another content-plane with which it shares some structural analogy (and so by extension with which the written expression shares an analogy) though the analogy to the content-plane is not necessarily of the same structural form as that between the spoken and written expressions that refer to it. For example, the word /book/ as spoken and "book" as written share a structure based upon phoneme/grapheme correspondences, but either /book/ or "book", as singular units distinct from other nouns in the English language, refer to the object //book// as a singular entity among other physical objects – a grosser analogy than existed between the two expression-planes.

[6] Actually the graphemes do have a reference – to some phoneme – but it is not a reference that is operative in the consideration of the reference of the word. This phonemic reference operates at a different level of description, the determination of which will be described later in this section. But even this phoneme correspondence runs into trouble, as some phonemes require two letters (digraphs) while single letters can refer to more than one phoneme.

articulation – the smallest units of meaning and the non-meaningful units of which those meaningful units are comprised, respectively[7]. As we shall see below, the concept is not flexible enough to deal with all of our concerns with regard to writing systems; however, it will be seen to be adaptable into a useful tool for specifying the level of description at which (a given portion of) an analysis operates. The identification of marks as either cenemes or pleremes will be contingent upon a tradition, the writing system, which is comprised of an inventory of symbols (themselves, pleremes or combinations of pleremes), a code governing the correlation between a symbol and its meaning, and a convention governing the structural arrangements of subordinate markings into meaningful units. In the case of cenemes, we will have either marks that are combined to form a plereme or that are supererogatory visual information added to the plereme, serving to make clarifying distinctions between similar (but distinct) pleremes or functioning merely as ornamentation. An example of such a clarifying mark would be the horizontal line through the middle of the Arabic numeral, 7, which some people use to help distinguish 7 from other marks to which it might bear a resemblance – T or Z, for instance. The serifs that adorn the letters of various fonts are an example of ornamental cenemes.

The set of rules by which written symbols are constructed from visual marks (cenemes and/or pleremes) is one instance of what Umberto Eco calls an "s-code" (meaning structural code): "S-codes are systems or 'structures' that can also subsist independently of any sort of significant or communicative purpose… They are made up of finite sets of elements oppositionally structured and governed by combinational rules that can generate both finite and infinite strings or chains of these elements," (Eco 1976: 38). While a code governs the functional correlation between the symbol and referent, creating a sign, an s-code governs the structuring of larger units from smaller units irrespective of the semantic import (or lack thereof) of either level[8]. It is this irrelevance of semantic import that allows us to describe an s-code for the combination of cenemes into pleremes within a script-based writing system. Eco tends to highlight binary oppositions of strings of elements in discussing s-codes; however, he explicitly states that this binary opposition is not a necessary feature of s-codes. An s-code may even operate as positioning elements within a continuum (Eco 1976: 178). This observation is crucial when regarding writing systems – the arrangements of cenemical markings is not a simple binary

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[7] The idea of articulation is based upon a mono-linear conception of *spoken* language, understood by linguistics as a concatenation of phonemes partitioned into morphemes (Martinet 1964: 25).
[8] This immateriality of meaning is more evident in the following description of a sample s-code: "… we should think of magnetized marbles which establish a *system of attraction and repulsion*, so that some are drawn to one another and others are not," (Eco 1976: 124).

function but occurs at some number of positions within the two-dimensional graphic space – think of the possible positions of vertical and of the horizontal lines allowed in the Latin alphabet's capital letters as exhibited in L, T, and H. This structuring of non-significant elements (cenemes) rests upon the fact that the symbols of writing can be divided beyond the level of *second articulation*, in a seeming contradiction to André Martinet's original use of the term[9].

The theory of articulation, when wed to the designations of first and second articulations at the level of morpheme/phoneme only, presents limitations that are particularly acute when applied to the study of writing systems. It does not account for the ability to combine meaningful units of different hierarchical levels and to allow them to function, within a particular syntax, as equal to other elements that include a greater or lesser number of hierarchical levels. For instance, a noun phrase containing several words, each of which is independently meaningful, still operates as a single part of speech and can, as such, be paired with a single-word verb to make a complete sentence as in the case of "The jogging man fell." This fact is represented in the tree diagrams of linguists. Hjelmslev refers to elements that operate at the same hierarchical level as being of the same degree and points out that identical elements may differ in degree depending on context: "…an entity can sometimes be of the same extension as an entity of another degree…" (1963: 43). Eco has noted that phonemes, themselves, may be analyzed into component parts, their combination into the recognizable phonemes of a language being governed by an s-code (1984: 169-179). This has particular relevance to the study of writing systems. Consider the following example from the historical development of the Latin alphabet as related by Stephen Roger Fischer in his *History of Writing*:

> In the third century BC, Rome's first headmaster of a private school, Spurious Carvilius Ruga, observed that the Roman alphabet needed a /g/, so he took the Etruscan C and gave it a hook – G – to supplement their alphabet with this sound. In this way, Ruga 'voiced' the Roman C with a single stroke, displaying his recognition that the only difference between the two sounds was a voiceless (C)/voiced (G) contrast… (2001: 142)

Now, suppose the innovation Ruga introduced was adopted as the convention by which all voiced consonants were graphically distinguished from their otherwise identical unvoiced counterparts. The addition of the "hook" would take on the meaning "voiced" in reference to the

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[9] It is important to remember that Martinet explicitly stated that the study of writing was outside the realm of linguistics, though having obvious relations to it (Martinet 1964: 17). He clearly understood that writing operates according to different rules than does spoken language. This is due to the one-dimensional nature of spoken language, on the one hand, and the (generally) two-dimensionality of writing (as per Harris and in contradiction to the characterization by Coulmas, above). This two-dimensionality can be further expanded by the possibility of mixed systems, like musical notation, where a single mark may simultaneously signify as a position in a chart and as a symbol in a script (more on this in section 3).

other phonetic attributes indicated by a basic letter-form. Note, also, that the mark would be irrelevant in respect to vowels, as they are all voiced and have no unvoiced counterparts. A repeatable marking is here used to carry a particular meaning in reference to the larger symbol to which it is applied. It is not merely a distinguishing characteristic, it is a distinguishing characteristic that takes on a definite meaning at each instance of its appearance and, therefore, is entitled to be called a plereme.

In accommodating these observations, we can adapt Martinet's terminology to indicate a moveable distinction that defines a level of description pertinent to a given discussion. By way of example consider the sense of the statements "Please sit down" and "Have a seat". We identify the first articulation (in the sense I am proposing) at the level of the proposition and the second articulation at the level of the words. *At this level of description*, the individual words are not meaningful. It is the meaning of the proposition that is relevant. This is why the two propositions can have the same meaning without sharing any words. We can say that an s-code, for a given level of description, will govern the formation of elements of first articulation from those of second articulation. Furthermore, these elements of second articulation will, by definition, be of the same degree and will comprise an inventory. We can now state that "degree" is the status of an element as being of first or second articulation at a given level of description. The inventory will be the collection of elements of second articulation at a given level of description. Members of this inventory may be compound, formed in whole or in part by units that are meaningful (pleremes) at another level of description, and they or their constituent parts may function as members of other inventories (of elements at different degrees). Similarly, an element within one of these compounds may also be a member of the same inventory as that compound. This is a technical explication of what we have already seen in the example of the noun clause. Each word within the noun clause can serve as some part of speech, just as the clause itself does. So, the inventory of elements that function as some part of speech will include "the running man", "the", "man", and "running". The subclass of that inventory, nouns, will include "the running man" and "man".

The last piece of this puzzle, prior to turning our attention to musical notation, is a consideration of the relation between semantics, syntax, and s-codes. For a syntactical structure to be present it is necessary for the elements of the inventory to be defined according to their function within that syntax. This is not tantamount to assigning a semantic reference. The semantic reference is essential for meaning but not for the proper functioning of syntax (hence the possibility of grammatically correct nonsense). These functions are assigned to subclasses

within the inventory of parts of speech, as seen above. The s-code is broader still, as it determines the disposition of potentially (but not necessarily) meaningful units within a particular system. We might say, then, that linguistic syntax is the ordering of the subclasses of functional uses of morphemes and certain combinations of morphemes operating as single parts of speech, so syntax is a particular sort of s-code. In the case of alphabetic writing, an s-code governs the concatenations of alphabetic characters (graphemes) in the formation of words (morphemes). In relation to musical notation, an s-code provides the convention for the proper formation of symbols in the script. For instance, it identifies the locations, in reference to a notehead, at which we may place a stem, but it does so without any concern as to whether that stem indicates anything. At another level of description, a different s-code governs the proper formation of a sequence of notes. At yet another level of description, another s-code rules the proper formation of a sequence of groups of notes – chords – within a harmonic system. As chords can be said to fulfill functional roles in respect to a system of tonality, we can state that this last s-code is syntactic.

Where a symbol violates the s-codes normally in operation in the sort of text in which it appears, the correlation between expression and content is hindered or broken. Such hindrances can be introduced intentionally, so as to require an active engagement with the text on the part of the reader. It is precisely this type of symbolic production[10] that we consider when we turn to "graphic scores". In deciphering such works, the interpreter will need to refer back to the physical forms of the symbols, themselves, as well as their arrangement in graphic space, in order to find a basis for the interpretation. Before presenting a method for that undertaking, we should examine the workings of standard notation, employing the terminology developed in this section, as "graphic notations" often deliberately play upon aspects of standard notation.

3. Conventional Musical Notation as a Writing System

As with linguistics, it is almost always the sounded aspect of music that is considered in analysis. When applying the methods of linguistic and semiotic analysis to music, this presents the problem of reference[11]. This problem does not arise, however, when we discuss musical notation

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[10] This sort of symbolic production is referred to as "invention" by Eco (1976: 245).

[11] Nicolas Meeùs, for instance, has circumvented the problem of reference by introducing the notion of "analytical pertinence" (Meeùs, 2002: 166) to replace "meaning". An intuitive move of the same sort seems to be made by many music theorists, linguists, and cognitive scientists (see Patel (2008)) who have compared the operations of music and language, arriving at the formulation: music has syntax but no semantics. If we understand "analytical pertinence" to mean, "having a function in respect to the other elements of the same degree", then we see that it is precisely analytical pertinence that makes musical syntax a possibility.

because the notated symbol does, in fact, have a referent, in the traditional sense[12]. This will allow us to circumvent certain observations of musical semioticians: "Notes cannot be further segmented, but they can be further analysed into what linguists would call their 'distinctive characteristics' – their parameters. Neither pitch nor duration can be realised in themselves outside the note to which they belong, of which they are qualities..." (Meeùs 2002: 164). Such statements reflect the same focus on the sequential processing of sound-as-heard evident in the work of Martinet and other linguists. We have already seen, with respect to language, that a different principle is at play within a writing system – one that unfolds in a multi-dimensional expression-plane. And so, we will find that those very properties, which Meeùs calls unrealizable in themselves when considering musical sound, can be indicated by distinct musical notations. For example:

$$\text{given } \quad \mathbf{\downarrow} = 60, \qquad \mathbf{\downarrow}$$

A duration has clearly been indicated, though we have no designation as to what sort of sound should instantiate that duration. But, of course, Meeùs is right to claim that duration cannot be *realized* in itself because there is no physical representation of these properties of sound except as a constituent element of a sound. In philosopher's terms, this is the distinction between the intension of the note and its extension – between the properties constituting the notes and the class of realizations of the note as notated. However, in musical notation, we have markings that *signify* these intensional properties. It is these marks that we study when we study music as a writing system. The physical manifestations of these markings constitute the extension of the pleremic units comprising the writing system (musical notation). The identity of a marking as a member of some pleremic content-class connects that marking to its signification – some intensional property of musical sound – within the notational system.

The means of indicating these properties within the graphic space are multiform, as Harris points out:

> … notes are different from one another in shape… and their sequence relative to one another is significant, but the location of each in the graphic space provided by the five-line stave, functioning as a chart, is also essential to the musical message… In order to 'read' music, we have to deploy two different processing techniques simultaneously. (1995: 94)

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[12] This referent seems to be some combination of a description of a sound to be realized and an indication of a performance technique to be employed. These descriptive and prescriptive aspects of notation have led to interesting arguments regarding the function of the score in respect to the ontology of the musical work. See in particular Goodman (1968), Wolterstorff (1975), and Levinson (1980).

Indeed, I am unaware of any system of writing that is as thoroughly mixed as musical notation. This suggests that we should identify what is signified by the placement of various notational markings, and what is signified by the script elements (the shape of these notational markings). Immediately, we note that pitch is designated by the chart-aspect of musical notation and duration and sequence are determined via the musical script. As Gardiner Read states in his manual of notational practice:

> Properly written, a musical note… indicates without question two aspects of musical sound. It is first a symbol indication – by its position on the staff and by the clef used – a definite *pitch* to be played or sung. And second, it establishes – by the exact appearance of its three integral parts – the relative time *duration* of this musical sound. (1979: 63)

This basic division of the chart and script aspects of musical notation has deep historical roots going back perhaps as far as the ninth century (Levy 1987: 61). The earliest notation indicated pitch contours, correlated to script forms, to be applied to syllables in the recitation or chanting of liturgical texts. The left-to-right sequencing of events, then, is directly derived from Latin writing. These early *neumes* served as mnemonics to aid performance, only. There was no indication of the pitch relationship between successive syllables, and the contours did not represent exact intervals. It was not until about the tenth century when neumes started to be placed in vertical relation to one another according to pitch-height, thus introducing the first chart-based notation (Treitler 1982: 244). As the chart-based representation of pitch became increasingly refined with the introduction of the staff (first a single line, then having lines added one by one) and the clef, the original neume forms were simplified. The specificity of the chart-based pitch notation had made the shapes of their script forms redundant, allowing that script form to accrue other meanings distinct from the designation of pitch. The adoption of script forms to convey duration was first fully codified in the Franconian notation of the thirteenth century. Now specific note-forms signified specific durational values (Parish 1957: 110). It was in the Baroque era that our modern notation was codified (Parish 1957: 195). As musical practice demanded new indications, as with the shift from the modal to the tonal system, script elements were added. Accidentals, for instance, were introduced into notational practice to indicate harmonic relationships of the pure fifth, an innovation derived from the performance practice of early polyphonic music in which (unnotated) *musica ficta* where used to avoid tritones notated in the score. In other instances already existing features of notation were used to make new distinctions. This led to a situation in which many of the markings contributing to the

form of the musical note have reference within one or both realms of notation (chart and script). Both of these realms have their own s-codes or set of s-codes. In the case of the chart-aspect, the matter is relatively simple: the staff and clef create localized gradations of pitch height, positions upon which are marked by noteheads. Within a multiple-staved system, there are as many localized gradations as there are staves. However, the staves of a system share a localized axis determining the sequence of events, which runs left to right from the beginning of one system to the next, the order of systems being sequential from the top of the page to the bottom. The various s-codes operating at different levels of the script is a more complicated matter.

We can identify distinguishing marks constituting a given note-form (notehead, stem, flags or beams) and analyze the functions they serve in the different planes of notation, the chart and the script. Let us take, first, the notehead. Whether or not the notehead is filled-in or hollow is immaterial to its ability to signify the property of musical pitch as represented graphically on the staff. Furthermore, nothing in the shape of the note, itself, has any reference in respect to pitch. As script, however, it is the placement on the staff that is immaterial. The exact form of the notehead is one of the identifying characteristics of a given durational value indicated by the script. Considering the filling or emptiness of noteheads within the script-based aspects of notation, does not, in itself, mark any significant difference. In fact, we see four different notehead forms: hollow with double lines on either side, hollow, hollow and slanted, filled and slanted. The slanted distinction, however, is too easily lost – particularly in handwritten scores – to be trusted as a clear distinguishing characteristic, so we find the stem attached to instances of the slanted notehead (either filled or hollow as in the quarter note or the half note). The stem, itself, does not represent any alteration in the durational property of the note indicated by the note-form. Indeed, the stem is redundant as a distinguishing mark, serving simply to aid in the distinction of slanted note-forms from their non-slanted counterparts: as there are two attributes of the note form that contribute to its identity as half note or whole in respect to one another (the slanting or not of the notehead and the presence or absence of the stem), neither attribute alone can be said to carry durational meaning (hence making them pleremes); they can only be said to be distinguishing marks (cenemes). The status of the stem as ceneme is further reinforced by the fact that its presence carries no information in making the distinction between a half note and a quarter note, for instance.   The filling-in of the notehead serves as the distinguishing characteristic between our half and quarter notes. Why, then, does the note require a stem, if the filled-in notehead is a clear enough distinction on its own? Durations have always been conceived as proportionally related and have proceeded from a smaller number of distinctions to

a greater number of distinctions over time. New note-forms, marking smaller temporal divisions, were often created by adding additional distinguishing marks to the next larger (or when creating larger units, the next smaller) temporal unit. The intricacies of the Renaissance mensuration system make the identification of singular mathematical relationships between these successive temporal divisions impossible – each level of the hierarchical system could be divided into two or three units in a three-tiered system[13]. Also, the distinguishing marks were not repeated. Each new note-form carried a unique distinguishing mark.

This changed with the adaptation of the flag – first introduced as a distinguishing mark added to the minim to form the semiminim (Parish 1957: 144) – as a means of indicating a halving of the value indicated by the rest of the note-form. This is only applied to a certain subset of note-forms in musical script, namely those with filled-in noteheads (and stem). The resulting note-forms indicate a relation to some duration, *d*, as follows:

double whole note:	$2d$
whole note:	$1d$
half note:	$\frac{1}{2}d$
quarter note:	$\frac{1}{4}d$
eighth note:	$\frac{1}{2}(\frac{1}{4}d)$
sixteenth note :	$\frac{1}{2}[\frac{1}{2}(\frac{1}{4}d)]$
thirty-second note:	$\frac{1}{2}(\frac{1}{2}[\frac{1}{2}(\frac{1}{4}d)])$
sixty-fourth note:	$\frac{1}{2}[\frac{1}{2}(\frac{1}{2}[\frac{1}{2}(\frac{1}{4}d)])]$
one hundred twenty-eighth note:	$\frac{1}{2}(\frac{1}{2}[\frac{1}{2}(\frac{1}{2}[\frac{1}{2}(\frac{1}{4}d)])])$.

To the objection that the marking of the flag is merely a distinguishing element (a ceneme) in musical script, as with the various forms of the notehead, I answer that the repeatability of the flag always carrying the same meaning, which is easily expressed as a mathematical function, makes this mark a plereme. The flag functions much like the dot, which is also additive, and can also be expressed as a mathematical function: $d + \frac{1}{2}d$ for one dot, $d + \frac{1}{2}d + \frac{1}{2}(\frac{1}{2}d)$ for two, etc. The situation becomes very similar to the hypothetical on Ruga's introduction of the hook to form the grapheme, G, discussed in section 2. It will be remembered that the hook expresses the phonemic distinction "voiced" when applied to consonant graphemes (letter-forms). This creates a subclass of graphemes that are compounds of pleremes. Our musical analogy to the hypothetical on Ruga's innovation would make the notes with open noteheads analogous to the

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[13] See Anna Maria Busse Berger (1993) for a detailed study of the origins and development of the symbols used to indicate the mensuration of early music.

vowels, the closed noteheads analogous (in reference to their compound nature) to consonants, those with flags being analogous (to a point) with the voiced consonants. The compound script-form of the eighth note functions as a unit of the same degree as a whole note, though the whole note is not a compound symbol. They are both meaningful at a shared level of description.

We have reviewed, up to this point, the function of the notehead in both the graph-based and script-based dimensions of musical notation, and the function of the stem and flag in the script-based dimension. The distinct characters of the two dimensions of the mixed writing system of musical notation lead to the immediate intelligibility of (by now conventional) unconventional notations in which, for instance, the filled notehead without stem or flag is placed on a staff to indicate pitch without any specified rhythmic content. Or, on the other hand, when we see stems and flags absent noteheads – as in some notations for spoken word rhythms or lute tablature, or where we have x-shaped noteheads attached to stems (with and without flags) to help visually differentiate metal instruments from others in compound percussion parts – we have no problem assigning durational values to the second tier of script-based note-forms (quarter notes and smaller values). This is reinforced by the fact that multiple noteheads may be attached to a single stem and that two stems may be attached to the same notehead – the graph-based designation of the stem as identifying which voice a pitch belongs to in instances where more than one voice is notated on a single staff. While the stem serves only as a ceneme, marking a distinction between certain note-forms, in the script-based dimension, it serves this wholly different (pleremic) purpose (at times) in the graphic dimension.

I alluded, above, to the introduction of script elements to accommodate changes in musical practice. The use of accidentals, for instance, leads to two different indications regarding different aspects of pitch perception: pitch-height, designated (roughly) by the chart-based aspects of musical notation, and harmonic relationships, designated by the script-based aspects of musical notation (in combination with the chart aspects). Articulation markings are attached to particular note-forms as additional descriptive information about the intensional properties indicated by the composite note. Accidentals and articulation markings both tend to be simple, visually, and cannot be further analyzed, as script, into lower level pleremes. They can, however, be compounded. I won't concern myself with their structure here, but rather with their combination with note-forms to create a composite whole. There is a rule for the proper combination of these markings with a note-form – they are members of an inventory that are combined according to an s-code. We may have a single note-form, one appended with a staccato marking, and another with an accent and a sharp sign, all on a single staff. We refer to

all of these as a singular note, and the note is the unit of first articulation at this level of description. Each of the units of second articulation – the note-form, the accidentals, the articulation markings, and the staff position of each – serve one or more of three functions: a descriptive indication of some property of sound, a prescriptive indication to undertake some action resulting in a sound, or the modification of some indication of another marking within the notation. The note-form and the notehead, for example, are members of the class of descriptive functions. Tablature notation and fingering indications are members of the class of prescriptive notation. The flag, dot, and accidentals (when considered in respect to pitch-height)[14] are members of the class of modificatory functions. These functional classes allow us to describe a syntax (as a special kind of s-code) for the formation of notes at the level of description at which we are operating. We see that the main descriptive elements are indicated by the primary note-form and its placement on the staff, with secondary descriptions being located immediately above or below the notehead (articulation markings). This is also the location for certain prescriptive indications, such as fingering markings, and the status of articulation markings as unequivocally descriptive (rather than prescriptive) is in no way secure. Modifiers occur to the left of the notehead, in the case of those applied to pitch (accidentals), and to the right of the notehead or the stem if applied to rhythm (the dot and the flag, respectively). We are able to give the description above because each element of the inventory can be assigned a functional class membership. We cannot speak of a syntax for the formation of note-forms from the inventory of notehead, stem, and flag, because these are not all functional units – as a ceneme, the stem does not serve a function in respect to the other parts of the script. We can, however, speak of the s-code for the formation of note-forms, as the s-code has no requirements regarding reference or function. Enough has been said in relation to standard notation for present purposes. Let us now

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[14] A detailed consideration of the prescriptive and descriptive aspects of notation, and certain conditions for the acceptance of innovations in these areas has been offered recently by Mieko Kanno (2007). Unfortunately, the discussion is marred by the absence of any criteria by which a notation can be assigned an unequivocal identity as either descriptive or prescriptive and by a too ready acceptance of the idea that any given notation is wholly one or the other. Leo Treitler was closer to the mark when he stated that "… in varying degrees, people read even staff notation [as prescriptive], translating the signs directly into finger movements," (Treitler 1982: 241). It is likely that different musicians fall in different locations upon a spectrum in which notations are considered, at one end of the continuum, wholly descriptive and at the other, wholly prescriptive. Among the factors that would seem to play into an individual's position on this spectrum for any given notation are the quality of one's ear, the instrument one plays, and the use to which one puts the notation. A pianist is probably more likely to conceive staff notation as prescriptive as there is only one action that instantiates a given pitch within the instrument's range. A trombonist, by contrast, can play certain notes in the middle to upper register in a wide variety of slide positions, suggesting a more descriptive interpretation of staff notation. Certainly, though, some notations, such as tablature, are unequivocally prescriptive, some notations are unequivocally modificatory, but descriptive notations can always be construed, by the performing musician, as prescriptive. The implications for this fact bears further examination.

turn our attention to the synthesis of the information presented in this and the previous section into an approach to the analysis of any – even the most radically idiosyncratic – musical notation.

4. Outlining an Analytical Approach to Alternative Notations

The dominant conventions treating the dimensions of the graphic space, in a particular class of texts, may be expected to be operative where one expects the chart aspect of a text to be meaningful and where no marking indicates otherwise. In the case of musical texts of this type, we can expect the default treatment of graphic space in two dimensions to be a temporal progression from left to right along the horizontal axis and a pitch height continuum along the vertical axis. In certain instances, such treatment may be insufficient and recourse to other methods of ordering the elements will be preferable, such as those used in the analysis of visual art (in reference to composition, color, etc.) and the psychology of visual perception[15]. In other instances, the composer will designate unconventional parameters attached to each dimension of the graphic space.

The case is much different with the markings contained within that graphic space (the script-based elements of a writing system), which may be independently identified as pleremes or cenemes. These might be further arranged, at various levels of description, into compound symbols. The analysis should begin by 1) determining what parameters are to be assigned to the two-dimensional axes of the graphic space construed as a chart – where there is no internal indication suggesting otherwise, it would be wise to follow the standard temporal and pitch continuum interpretations of the graphic space. Then, beginning with the lowest perceived level of description and repeating these steps for each subsequent level of description, 2) identify the s-code for the script-based aspects of the notation (i.e. the *apparent* logical structure governing the formation of the symbols at the given hierarchical level); 3) determine which marks are to be treated as pleremes and which are to remain cenemical at the present level of description. Once all levels of description to be addressed are defined, proceed as follows for each, revising the analysis as necessary: 4) assign functional class designations to pleremes (descriptive, prescriptive, modificatory) in the script- and/or the chart-based aspect(s) of the notation; 5) propose a syntax existing between the functional classes, once assigned (this will require that all members of the inventory under consideration be pleremes, though their exact reference, beyond

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[15] See, in particular, Rudolph Arnheim (1974), *Art and Visual Perception: A Psychology of the Creative Eye* (University of California Press).

membership in a functional class, need not yet be assigned); 6) propose semantic references (in the script- and/or the chart-based aspect(s) of the notation) that will not lead to nonsense when building outward from the lowest hierarchical level containing pleremes (i.e. the lowest level of description). In practice, this step may precede or coincide with step 4. When attempting to assign semantic meaning to pleremes, follow the course: (i) identify all markings that have equivalences in conventional musical notation correlated to some musical meaning[16]; (ii) identify marks, designated as pleremes, that do not have equivalents in conventional musical notation but which may be identified as meaningful within some other conventional system of writing; (iii) identify the remaining marks that are to be treated as pleremes; (iv) build a catalog of candidate meanings for each mark, drawing on the results from steps (i) and (ii), where possible, and checking the candidate designations against one another within the perceived syntax for intelligibility; (v) once having eliminated nonsensical candidate designations, determine some preference criteria by which one set of coherent designations is selected; (vi) assign semantic references to pleremes according to the preference criteria of step (v). Of course, in the majority of cases, the composer has already provided much of this information in the performance instructions, substantially lightening the work load of the analysis.

The progressive sample case, to which we now turn, is not intended as an exhaustive instance of the approach detailed above. Rather, it serves as an illustration of certain aspects of this approach as they arise when attempting to assign musical meanings to unconventional notations when they are not accompanied by clarifying performance instructions. As such, reference will be made to the specific steps, introduced above, as they appear.

4.1. A Progressive Sample Case

Imagine a graphic space of undifferentiated background on which outlines in black of equal-sized diamond-shapes are arranged (ex. 1). There is nothing to distinguish one from the next except for its placement within the graphic space. If we are to interpret this as a text, we will need to look to the spatial distribution of the diamond-shapes as the potential locus of meaning. There is no differentiation amongst the forms of the constituent symbols, so any potential meaning is conveyed through the coordinates of the mark's location in the graphic space – a

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[16] For instance, in an eighth note in which the flag is placed adjacent to the un-stemmed, filled notehead, we can still identify the usual meanings of each component present: notehead marking a vertical position within a gradated pitch height spectrum, the flag halving the durational value of the rest of the notation. This example possesses a deviant morphology that violates the s-code for the formulation of a proper note (in musical script), yet we are still able to incorporate the musical correlations of the pleremes present in whatever interpretation we ultimately give to this symbol.

prime example of a chart. It is as though the text indicates "*x* here" at every instance of a diamond-shape and "*x* not here" at every other location. All that would be required to give the text a concrete meaning would be the identification of the parameters to be correlated to each of the two dimensions of the graphic space (step 1 of the preceding section).
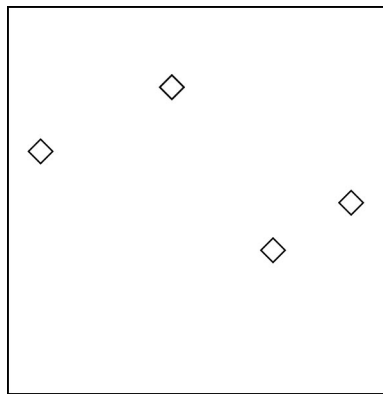
Example 1

Imagine now that some of those diamond-shapes are filled in. Having introduced a distinction in the script forms, we can address step 3 (the designation of which marks of the script are to be construed as pleremes and which are to be construed as cenemes), in which cenemes/pleremes will be isolated through the perception of differences that are taken to be substantial enough to constitute some new class or subclass of marks in relation to the others. The text now indicates "*x* here" for all unfilled diamond-shapes, "*y* here" for all filled diamond-shapes, and "neither *x* nor *y* here" for all other points within the graphic space. These marks take on the qualities of a plereme and so may be assigned a functional and a semantic reference in the later steps of our analysis. A vertical line descending from the lowest point of the diamond-shape, if occurring on each diamond-shape and if equal in length, color, width, etc., makes no new distinction between the (potential meanings of) symbols within the graphic space – adding these always-equivalent marks does not change the formulation "*x* here", "*y* here", "neither *x* nor

y here" (ex. 2). Indeed, it is the composite of the diamond-shape and the vertical line that now forms the plereme. This plereme is constructed of two marks, which will be considered cenemes at this level of description. However, where some diamond-shapes lack this added mark while others possess it or where these vertical lines are not uniform throughout, the vertical line becomes at least a distinguishing mark and at most a plereme that, combined with the diamond-shape, creates a compound symbol.
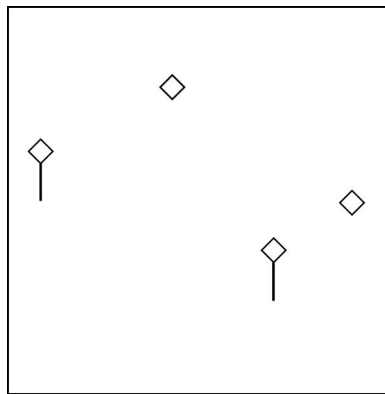
Example 2

The reader may have noticed that we have proceeded from step 1 to step 3, the reason for which is that the marks discussed at the outset of the example are not (perceived as) reducible to subordinate parts. Now that we have introduced a second mark, we can approach step 2, on the s-code governing the combination of the discrete marks of the script into compound symbols. On this front, though this example is still quite simple, we can note that diamond-shapes are permissible as free-standing entities while vertical lines only appear as components of a compound symbol. Furthermore, according to the description above, vertical lines only appear as descending from the lowest point of a diamond-shape. So, if we accept descending vertical lines of uniform length from either form of diamond-shape and those two diamond-shapes, themselves, we have four distinct classes of symbols defined by this s-code. While it is possible (in a return to step 3 with this revised example) to treat these four classes as indicating *x*, *y*, *p*, and *q*, the repetition of the pleremes indicating "*x* and *y*" within the markers designating "*p* and *q*" seems to suggest that the more appropriate way of understanding the four classes of symbols would be "*x* (without *p*)", "*y* (without *p*)", "*x* with *p*", and "*y* with *p*". My preference for this treatment derives from the identification of the line and the diamond-shapes as discrete elements of the same hierarchical level, which appear as such by their combination according to an s-code

at the level of gestalt perception[17]. If we consider an alteration to our example in which the line exists as a free floating mark, not always attached to a diamond-shape, then the diamond plus line suggests a compound proposition ("*x* and *p*"). Where the line only appears appended to a diamond, it may still be meaningful as a compound proposition, or it may be construed as a modification of the proposition expressed by the diamond-shape, resulting in a new, singular proposition.

The role these pleremes take in such a proposition will comprise their functional designation, the subject of step 4. If, as first proposed, we consider each plereme to be an independent proposition, we can ascribe a function to each, as seen in section 3, whereby each represents some intensional property of a sound, whether that be an intensional property regarding the qualities of that sound (descriptive) or its manner of production (prescriptive). When we accept the vertical line as a modifier, it modifies whatever intensional property is assigned to the diamond-shape (filled or un-filled). For example, we might construe the line (or its absence) as indicating a duration, the diamond-shapes as indicating two different timbral qualities.   In this case, the line and the diamond-shapes perform descriptive functions. Alternatively, we might decide that the presence or absence of a vertical line designates which of two instruments or instrumental groups should perform the sound, while the different diamond-shapes indicate that the sound should be either loud or soft. In this case, the vertical line is prescriptive, the diamond-shapes descriptive. If the line forms a modificatory role – let us say that it indicates that the designation of the diamond-shape is to be exaggerated – and the diamond-shapes perform the descriptive function of designating a loud or soft dynamic, we will get a result, not of compound propositions, but of four distinct singular propositions indicating one of four dynamic levels. Once such functions have been defined, a syntax regarding the combination of these functional symbols into a composite text can be proposed (step 5, which will be addressed once the example becomes complex enough to sustain this aspect of the

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[17] In other words, prior to considering any ascription of meaning, the diamond and the vertical line seem to be, visually, of the same hierarchical level – we see them each as self-contained (irreducible) and complete in themselves. As such they comprise an implied inventory that can be combined by an s-code into higher level structures (diamond-shape with vertical line). Where one element of some inventory is taken as meaningful and where we do not possess a code for the ascription of meaning to each mark, I prefer to take a liberal stance, allowing the possibility of meaning to elements of the same level. This is not always the way things work in notational systems – it certainly is not in the case of musical notation – but it is a possibility in a case where we are attempting to derive the code from a document without any known convention behind it. The liberal stance is taken out of a desire to present the richest possible interpretation of the text. Should a substantial statistical sampling of the markings in the text strongly indicate that an element is a ceneme, by its relations to other markings, even though it combines with pleremes at some level of description, then this liberal stance should, of course, be abandoned.

discussion).

Now, if we take this grouping of diamond-shapes and vertical lines as a member of the class of texts "musical scores", we have recourse to the code of musical notation in correlating the pleremes and symbols contained therein to musical meanings (step 6.i.) and notational functions (step 4). For instance, we may note that the current usage of diamond-shapes in musical notation is (primarily) to designate a nodal point along a string at which a finger is lightly placed so as to produce a harmonic. A graphic space of undifferentiated background with some distribution of unfilled diamond-shaped figures (ex. 1) understood as a musical score may then be interpreted as demarcating nodes of varying pitch heights along the length of a string. Notice that the addition of the designation "musical score" suggests two things: first, the marks, even though undifferentiated, can be ascribed a meaning derived from the traditional musical script; second, the chart's dimensions can now be interpreted according to the s-code of the chart-based aspect of standard notation[18]. The addition of further pleremic content, such as the staff (ex. 3), also taken from the inventory of symbols used in musical notation, will alter the interpretation by introducing new elements that must either be treated traditionally or not, possibly to the exclusion of treating some other element in the traditional manner. Whatever semantic designations are ultimately derived from standard practice will depend on which aspects of that practice are perceived as the least violable.

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[18] These dimensional designations are hardly unambiguous, particularly in reference to the vertical axis, which is conventionally correlated with pitch height in a musical score but may also, in this example refer to some placement along a string. Nodes do not produce pitches the pitch height of which corresponds to a shortening length of string as the finger "ascends" along the string. They are related to proportions of strings: the 5th partial will sound at any node dividing the string into some number of 5th parts. So placing one's finger according to the height indicated by the vertical axis of the text will not (necessarily) produce pitches that express the same contour, resulting in possible cognitive dissonance between sound and symbol – one reason that sounding pitch is often notated in parenthesis above the nodal designation. An alternative interpretation would be to produce harmonics that do represent this contour.
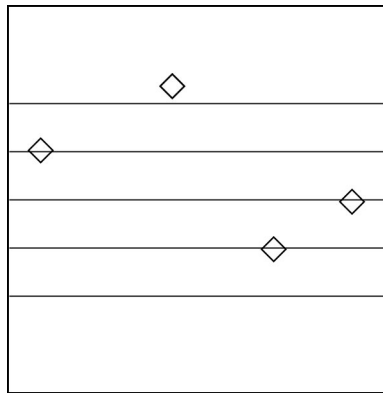
Example 3

Accepting the lines, added to example 3, as a musical staff, a systematic demarcation of pitch height or diatonic pitch identity can be understood to have been introduced, though there is no definite reference (a clef) anchoring this demarcation. An ambiguity as to whether it is pitch-height or node that the notation indicates remains, though it might be clarified (for instance) through a designation of a specific string, on which each node is placed. This designation may be made (according to convention) by connecting the diamond-shape to a standard notehead below it by a vertical line or by placing a Roman numeral immediately above or below the diamond-shape, indicating a natural harmonic on one of the numbered strings of some instrument such as the violin, viola, cello, bass or guitar. This last additional mark (the Roman numeral), therefore, implies an instrumental designation (and serves a prescriptive function). Where before we were thinking in terms of "some string" we are now thinking in terms of "some instrument containing some number of strings," at the very least, and are implying, by the numerals indicated, the minimum number of strings the instrument must have. Should a particular instrument be decided upon, a host of considerations leading to possible revisions of the interpretation, based upon the performance practices and notational conventions associated with that instrument, are introduced. These would include the inference of some tuning relationship between strings, which will drastically affect the resulting sound of our interpretation.

If we proceed, not by designating particular strings but by drawing vertical lines descending from the lowest point of each diamond-shape of example 3, we obscure the musical significance of the marking "◊" and introduce a symbol with no conventional musical meaning, initiating steps 6.ii. and 6.iii. Should only some diamond-shapes contain this additional mark, we might interpret it as some alteration of the nodal interpretation – a plereme serving an as yet undefined modificatory function in relation to the prescriptive function of the diamond.

Assuming that some have flags, as in a conventional eighth-note, at the end of their stems (ex. 4), the diamond reasserts itself as a plereme, as interpreted before, while the vertical line becomes the musical notation, "stem" (here we have completed step 6.vi., circumventing 6.iv. and 6.v. for the sake of brevity). The stem, no-stem, stem-and-flag configurations take on conventional rhythmic meaning, granting them the status of plereme constructed of these elements according to an s-code resembling (though not identical to) that which governs the construction of note-forms from stem, flag, and notehead in traditional notation. We can read the rhythmic meaning of these new symbols because the stem and flag distinction can convey rhythmic meaning, as pleremes in musical script, absent any notehead or reference to the chart-aspects of musical notation, as seen in our discussion of lute tablature, etc., in section 3. As the stem, itself, is not, generally, a plereme but only becomes one in such headless notations, the presence of the flag, which is a plereme in standard notation, upon some stem is necessary for the establishment of the rhythmic meaning of the isolated stem within the notation.
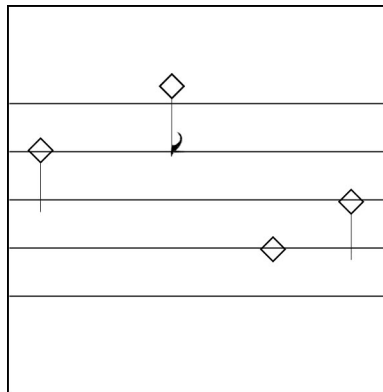
Example 4

If we fill some of these diamond-shapes seen in example 4, we upset our conventional interpretation, as the nodal pleremes depend on an open diamond-shape. Yet, this filling of some of the diamond-shapes may bring to mind the white notation of the 15th and 16th centuries, particularly if applied only to stemmed note-forms and always occurring in the case of stemmed *and* flagged note-forms. If, as a further variation on the example, we introduce the option of a half-filled diamond, some of our symbols will resemble certain note-forms employed in Italian Quattrocento notation, an idiom that falls outside the standard knowledge base of present-day performing musicians. For those that see these affinities with historical notation schemes , the

note-forms of our example might be interpreted as conveying the rhythmic information ascribed to their historical counterparts[19]. If, instead, we introduce certain logical operators such as "&" (and), "⊃" (if… then…), and "∨" (or) between the various note-forms of example 4, these will upset the left-to-right temporal sequencing of events for those interpreters that know symbolic logic notation. For instance, two note-forms appearing on either side of "&" might be taken to coincide with one another, whereas two note-forms appearing on either side of "∨" might be interpreted as indicating the performance of one, the other or both note-forms at a given moment[20]. In both the case of symbolic logic and Quattrocento notation, this sort of designation of semantic content derived from a writing system other than that of standard (modern) notational practice (even when that other writing system is a musical one), is an instance of step 6.ii.

The example has now taken on sufficient complexity for the consideration of possible syntactic relations between symbols (step 5). If the pleremes (diamond, diamond-plus-stem, diamond-plus-stem-and-flag) are identified as comprising an inventory of script elements, and each is assigned a functional meaning, we can attempt to derive a syntax for their combination into larger meaningful structures. The same can be done regarding the chart-based indications of the markings. If their positions are assigned a function in respect to other allowable positions within the chart, then a syntax ruling the combination of larger meaningful units from the designation made by chart placements can be described. The simplicity of example 4 still does not inspire much in the way of a syntactic interpretation, but on the script level, if we assign rhythmic values of one unit to the diamond, half a unit to the diamond-plus stem, and a quarter unit to the diamond-plus-stem-and-flag, we could extrapolate the rule: sequential groups of two symbols will always have the internal relation $d + .5d$, where d is the durational value of the first symbol of the grouping. Without assigning specific durational references, we can state this as: sequential groups of two symbols will always have their second element be the next smaller durational unit from their first element.

This example has walked us through many of the steps of the analysis, hopefully

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[19] See Phillip Schreur (1989), for a critical translation of the *Tractatus Figurarum*, which details the intricacies of *ars subtilior* notation in Italy in the Quattrocento.

[20] The use of "∨" is potentially ambiguous as it is also a bowing indication within standard musical notation; however, the placement suggested (between, rather than over, note-forms) and the presence of "&", which has no musical counterpart, make the ascription of meaning based upon the symbolic logic denotations of these symbols the more defensible conclusion. Similarly, once meanings drawn from symbolic logic notation are allowed, the diamond-shape might be interpreted as it is in modal logic, indicating "it is possibly the case that…"; however, the use of these diamond shapes within more complex note-forms and the absence of logical quantifiers within the notation support a non-logical interpretation.

demonstrating the exactitude with which they should be completed. It must be pointed out that the discussion did not move through various levels of description. This is a function of the simplicity of the sample case. However, a situation in which the necessity to treat other levels of description arises can easily be imagined. Picture a larger graphic space comprised of an arrangement of squares containing the same elements as example 4 but in varying configurations. Now the analysis at the level of description already undertaken will have to account for the contents of these additional squares, and a higher level of description will have to be explicated in the analysis of a) those squares' relationships to one another in the graphic space as, possibly, chart indications and b) whether the individual arrangements of their contents are to be taken as compound script configurations, which might take on functional and/or semantic meanings. Other levels of description can be added, ad infinitum, by introducing ever larger graphic spaces in which squares of the next lower level are arranged in reference to one another and/or serve as compound script elements. And so the discussion of levels of description has not been for naught.

Of course, it is usually the case that graphic scores include detailed performance instructions that answer the various steps of the analysis, assigning musical meanings to the symbols found within the score. Often some ambiguities remain – ambiguities that can be fixed with recourse to the method introduced here. The possibility of evaluating radical notational experiments, once the notational ambiguities have been resolved (by the application of our method, by the performance instructions, or by a combination thereof), will be demonstrated with reference to Cage's "Variations I", below.

4.2. The Evaluation of "Graphic Scores" After the Analysis: John Cage, "Variations I"

The forgoing presentation indicates that musical notations (conventional and otherwise) have the character of compound propositions designating intensional characteristics of a sound, whether descriptive or prescriptive, modified or not; and that, owing to the mixed nature of musical notation, the propositions will generally be compounds of indications made by the script- and chart-based aspects of the notation. Returning to Wolterstorff's definition of the function of the score in reference to the musical work, the specificity of the intensional properties indicated in the notation determines the conditions by which a proper performance of the work (i.e. a proper member of its extension) can be identified. Where the composer has specified instrumentation, articulation, pitch, rhythm, and dynamic, these are all selected as relevant to evaluations of the extension of the sonic structure notated in the score. Where some of these attributes are not

notated or are left ambiguous, we say that these intensional characteristics of the sound are left indeterminate, leading to a wider latitude for a performance's acceptance as a member of the class of a score's extension. It is through an involvement with such works, particularly those of the New York School, that the present study found its impetus.

"Variations I" is one of several pieces by John Cage, the scores of which consist of a number of transparencies that are to be overlaid upon one another in some manner to make determinations, according to the (rather cryptic) performance instructions, regarding the sonic elements of the particular performance (ex. 5). It is striking that, in using transparencies, Cage has made, not only the markings contained within it, but also the score, itself, indeterminate. In this case, Cage has created six transparencies. One of these contains an assortment of dots of four different sizes, which are to indicate (based upon their size) the number of individual events contained within the larger identity of that dot. The thirteen smallest are to be individual sounds, the next tier of seven dots indicate two sounds, the three of the second largest size represent three sounds, and the four largest represent four sounds. These sounds may be played simultaneously or as what Cage terms "constellations", which I interpret as meaning temporally distinct yet in close proximity to one another. The remaining transparencies each contain five lines at varying angles and points of intersection. Beginning with the dot-bedecked transparency, one goes about making determinations for the performance of each plurality (the three larger sizes of dots), each individual sound of which has five intensional properties decided by a different one of the five lined transparencies, or by a different orientation (always aligned with the edges of the dot transparency) of the same lined transparency[21]. Each line is to be assigned a different intensional property, which it defines by the relation of that line to the position of one of the dots indicating a plurality of sounds. The five properties are: "lowest frequency, simplest overtone structure, greatest amplitude, least duration, and earliest occurrence within a decided upon time" (Cage 1960b: i). The shortest distance from the dot to that line determines its relation to the correlated characteristic. The distances are "to be measured or simply observed" (Cage 1960b: i). Note that these properties are all relational designations meaning that, for instance, the dot that is closest to the line selected to represent the earliest occurrence will be the first sound heard. It is left to the performer to assign particular properties to particular lines.

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[21] Note a perplexing ambiguity in the instructions to the score: pluralities are to be played simultaneously or as "constellations", and yet each individual constituent of a plurality is subject to determinations made by different lined transparencies or a different arrangement of the same lined transparency, one of the lines of which is used to determine the temporal placement of that individual sound in reference to the total duration of the piece.
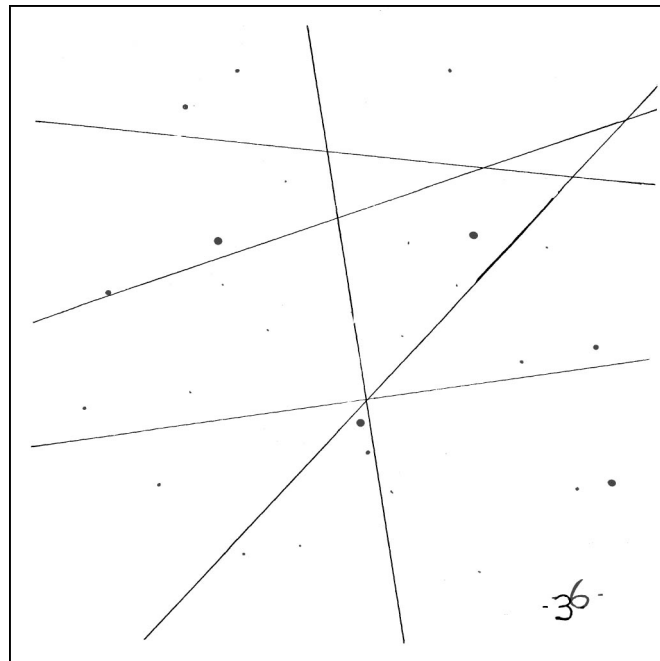
Example 5 (John Cage, "Variations I")

In spite of their cryptic nature, these instructions have answered the various points of the analysis laid out in section 4. The designation of meanings ascribed to the chart dimensions (step 1) are addressed through the rules for use of the lined transparencies. The simplicity of all the symbols employed by Cage, as single marks with no subordinate parts, obviates the need to identify the s-code governing the formation of the symbols (step 2). These symbols, straight lines and dots, all take on some meaning designated by the performance instructions, making them pleremic (and so step 3 is completed). The identification of functional class designations for script elements (step 4) is also made (implicitly) within the performance instructions. The dots are grouped into four categories each indicating a different number of events. The actual determination of the five intensional properties for each sound is made by bringing the lined and dotted transparencies together according to the syntax outlined in the instructions (answering step 5). As for semantic reference (step 6), this too is provided when Cage defines the number of events per dot and the properties to be assigned. This leaves us with little work to do in reference to the analytical method, but it allows us to proceed to the assessment of the score as a piece of (musical) writing.

Given the exceedingly large number of possible sonic realizations of this score[22], we are in the situation alluded to at the beginning of this section regarding the evaluation of extreme notational experiments. If the score is the record of the conditions defining a proper instance of the associated musical performance and if that record is conveyed by intentionally ambiguous means, then we must conclude that the composer intends any justifiable interpretation of this record as a proper interpretation, upon which a proper performance of the work may be built. This allows us to rescue a criterion for the judgment of extreme cases of graphic notation, as works of music; namely, these performances must be based upon a justifiable interpretation. By moving through the steps of section 4, as we have, we can arrive at a basis for these justifiable interpretations. Though it would be impossible, in almost all cases, to reconstruct the arrangements of transparencies used in a given performance from that performance, this does not preclude the possibility of the performers making a determination as to whether or not the performance was a proper instance of the particular arrangements of the transparencies used in its construction[23]. This sort of assessment, however, lies outside of our present purpose and requires a confluence of various methodological approaches (noted in the introduction). We do have another approach to the evaluation of the work available to us (one that does conform to the interests of the present inquiry); namely, the assessment of the ingeniousness with which Cage connects sound to notation for the reader/performer of the score.

The economy of means by which Cage creates this immense web of possibility is quite remarkable: dots of four sizes and four sets of five lines. He has managed to transcend the two-dimensionality (and its traditional musical interpretation) of the graphic space his notation occupies: The system of measuring a dot's distance from the lines of an overlaid transparency

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[22] For each of the seven points that represent two sounds, there will be 20 x 19 possible arrangements of the transparencies to determine the intensional properties of the elements of the plurality in question. Similarly for each of the three dots representing pluralities of three sounds there will be 20 x 19 x 18 possible arrangements of the transparencies and for each of the four dots representing pluralities of four sounds, there will be 20 x 19 x 18 x 17 possible arrangements of the transparencies. For each transparency configuration, there will be 5! Possible assignments of intensional properties to the lines contained within the transparency. This totals a possible 3,046,528,558,080,000 variations of assigned properties to be applied to the pluralities. A close reading of the performance instructions reveals that there is no direction for making determinations for the thirteen individual sounds: "In using pluralities, an equal number of the 5 other squares (having 5 lines each) are to be used for determinations, or equal number of positions – each square having 4" (Cage 1960b: i). It would appear that Cage is leaving the determination of all performance aspects of the smallest dots to the player's discretion, adding one more layer of indeterminacy to the work.

[23] A key ontological point is thereby raised; namely, that the interaction with the score is a necessary condition for any instance of this work. This is in contrast to more traditionally notated works where a performer might learn his or her part by ear without any impact on the identity of the performed work. This also suggests that an audience is not in a position to pass judgment on performances of the work (a suggestion which is, incidentally, perfectly in line with Cage's aesthetics).

completely avoids any left to right (or right to left) or top to bottom (or bottom to top) readings. Each line may be thought of as a zero point elongated in a single dimension and from which all the various dots of the ground score may be conceived to radiate. And so any given arrangement of a transparency creates a two-dimensional text, the graphic space of which is to be reinterpreted as a network of five independent one-dimensional charts. The intensional properties of a sound – all clearly descriptive, in this case – are expressed through chart relationships, each line taking a meaning, as in a plereme, but also functioning as the instantiation of one of these one-dimensional charts. Dots indicate some number of events or, equivalently, some number of graphic spaces, in which the dot is to mark a single position. That number is indicated by distinctions in the script (the size of the dots). Cage's use of the dot bears a resemblance to the chart-based function of the notehead in conventional notation. Both the traditional notehead and Cage's dots are used to designate locations in a chart that determine intensional characteristics of the event(s) the dot marks – the traditional notehead designating the approximate pitch height of a given event as well as its numeric position in a sequence of events, Cage's dots determining timbre, temporal position, duration, volume, and pitch height in reference to one or more sets of five axes. The choice of five lines for the remaining transparencies suggests an analogy with the traditional musical staff. Having already detailed how these lines redefine the graphic space by operating as simultaneous radial axes, we need only note that the traditional staff is the symbolic marker of both the localized vertical/pitch height axis and the general horizontal/temporal axis to see how the idea of five lines, correlating the chart-based aspects of the notation to musical properties (two of which *are* pitch height and temporal placement), have been so inventively reconceived.

"Variations I" requires a radically different approach to its interpretation than does a work in traditional musical notation. It is no longer possible to read the instructions to the score, open to page one and proceed. The act of reading becomes the primary function of the performer. It requires a substantial amount of preparatory work (including the resolution of ambiguities in the instructions) before the generation of any sound. Indeed, it requires a direct physical manipulation of the materials of the notation. Notation ceases to be a means of arriving at a particular sound construction or even a constrained range of possible sound constructions. It becomes a task of creative engagement with the score that, in the end, will sound. That sounding, however, is not conditioned by the aesthetic preferences of the composer or (to a lesser extent) the performer. It is, rather, the complicated outcome of a reading strategy that must, in this case, be non-linear, keeping track of multiple axes of information at conflicting angles. It

will most likely require the creation of a secondary document synthesizing the determinations made by the particular arrangement of the indeterminate score.

5. Conclusion

It is my hope that the framework presented in this paper – a set of relevant terms, drawn from recent studies of writing systems and buttressed with material from semiotics and general linguistics (sections 2 and 3), along with a systematic procedure for their use (section 4, illustrated in section 4.1) – will facilitate fruitful discussion regarding the very real (and very particular) complexities contained within "graphic scores". Moving beyond the physical contents of the score and their interpretation, the discussion enlarges to embrace strategies for the evaluation of the work (section 4.2). Even where the sonic extension of the score is so variable as to admit almost any collection of sounds, as we saw with "Variations I", we can still have grounds for judgments of the score as a text setting forth intensional properties of sounds to be satisfied in a performance of the work. This, in turn, forms the foundation of judgments regarding particular performances (even if the judgments can only be made by the performers, themselves). What constitutes the "work" as a whole, and whether this work is a work of music or something else, remains an open question on both ontological and definitional fronts. A complete analysis of the work will depend on the answer to this question. Once answered, the complete analysis will need to employ a combination of ethnographic, phenomenological, and textual approaches applied to those performances, interpretations, etc., construed as forming a part of the work.

References

Alden, Jane (2007).   "From Neume to *Folio*: Medieval Influences on Earle Brown's Graphic Notation". *Contemporary Music Review* 26(3/4), 315-332.

Busse Berger, Anna Maria (1993). *Mensuration and Proportion Signs: Origins and Evolution*. Oxford: Clarendon Press.

Cage, John (1960b [1958]). "Variations I". For Any Number of Players. New York: Henmar Press.

Catach, Nina (1986). "The Grapheme: Its Position and Its Degree of Autonomy with Respect to the System of Language". In: Augst, Gerhard (ed.), *New Trends in Graphemics and Orthography*. Berlin: Walter de Gruyter. (1-10).

Coulmas, Florian (2003). *Writing Systems: an Introduction to Their Analysis*. Cambridge: Cambridge UP.

Eco, Umberto (1979). *The Role of the Reader: Explorations in the Semiotics of Texts*. Bloomington: Indiana UP.

Eco, Umberto (1984). *Semiotics and the Philosophy of Language*. Bloomington: Indiana UP.

Eco, Umberto (1976). *A Theory of Semiotics*. Bloomington: Indiana UP.

Fischer, Steven Roger (20101). *A History of Writing*. London: Reaktion Books.

Goodman, Nelson (1968). *Languages of Art: An Approach to a Theory of Symbols*. New York: The Bobbs-Merrill Co.

Harris, Roy (1995). *Signs of Writing.* New York: Routledge.

Hjelmslev, Louis (1963 [1943]). *Prolegomena to a Theory of Language*. Whitfield, Francis J. (trans.). Madison: University of Wisconsin Press.

Kanno, Mieko (2007). "Prescriptive Notation: Limits and Challenges". *Contemporary Music Review* 26(2), 231-254.

Levinson, Jerrold (1980). "What a Musical Work Is". *Journal of Philosophy* 77(1), 5-28.

Levy, Kenneth (1987). "On the Origin of Neumes". *Early Music History* 7, 59-90.

Martinet, André (1964 [1960]). *Elements of General Linguistics*. Palmer, Elisabeth (trans.) London: Faber and Faber.

Meeùs, Nicolas (2002). "Musical Articulation". *Musical Analysis* 21(2), 161-174.

Parish, Carl (1957). *The Notation of Medieval Music*. New York: W. W. Norton and Co.

Patel, Aniruddh C. (2008). *Music, Language, and the Brain*. Oxford: Oxford UP.

Read, Gardiner (1979). *Music Notation: A Manual of Modern Practice, 2nd ed.* New York: Taplinger Publishing Co.

Read, Gardiner (1987). *Source Book of Proposed Music Notation Reforms*. New York: Greenwood Press.

Santosuosso, Alma Colk (1989). *Letter Notation in the Middle Ages*. Ottowa: The Institute of Medieval Music.

Schreur, Phillip E (1989). *Tractatus Figurarum (Treatise on Noteshapes): A New Critical Text and Translation*. Lincoln: University of Nebraska Press.

Treitler, Leo (1982). "The Early History of Music Writing in the West". *Journal of the American Musicological Society* 35(2), 237-279.

Treitler, Leo (1992). "The 'Unwritten' and "Written Transmission' of Medieval Chant and the Start-up of Musical Notation". *Journal of Musicology* 10(2), 131-191.

Wolterstorff, Nicholas (1975). "Towards an Ontology of Art Works". *Noûs* 9(2), 115-142.

Through Thick and Thin: The Ontology of Tape Music

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Abstract

The ontology of music is a lively and much debated branch of metaphysical philosophy. Most of the available literature focuses upon works of the Western classical tradition, however; as a result, the various challenges posed by tape compositions are either marginalised or ignored. Coupled with this is the familiar claim by some musicologists and philosophers that such works cannot be described as being music; one such philosopher, Linda Ferguson, claimed that tape compositions are ontologically distinct from scored musical works and, as a result, are "in search of their metaphysics" (Ferguson 1983). This paper will address such claims through an investigation of the ontology of tape music. It will be argued that such works share their metaphysical status with scored compositions and that the various differences can be ascribed to the "extent, depth, and saturation of their work-determinative properties" (Davies 2004: 26-27). Ultimately, it will be noted that there are some significant differences between these two art forms. Tape music is not "in search of its metaphysics", however; it is merely lacking an accurate philosophical assessment.

1. Introduction

In 1983, Linda Ferguson attempted to compare and contrast pieces of tape music with works of the Western classical tradition (Ferguson 1983). In doing so, she made two fundamental observations; firstly, that tape works cannot be identified with musical scores and, secondly, that it is not possible to perform tape works since they are fixed onto a medium. These observations led her to conclude that tape compositions cannot be accurately described using the term *music* and that this form of artistic practice is subsequently: "in search of its metaphysics" (Ferguson 1983)[1].

The strength of Ferguson's convictions may surprise, or even offend, the tape composer who typically works without need, or inclination, to develop a metaphysical rationale to support his or her actions[2]. Despite this, Ferguson's view is far from uncommon among philosophers of music, many of whom refuse to accept that works of this genre should be referred to as *genuine* pieces of music. Although Ferguson's thesis is somewhat dated, the ideas that she presents remain prevalent; similar claims have surfaced in several recent publications that undermine (while stopping short of denying) the metaphysical status of tape works (Davies 2004, Godlovitch 1992, Kania 2005, Thom 1993). Perhaps more significantly, the vast majority of philosophical studies simply marginalise or completely ignore tape music; many focus exclusively upon works of the Western classical tradition and thus overlook the various challenges that tape compositions present[3].

This paper aims to address this imbalance; in doing so, a variety of metaphysical (mainly ontological) theories regarding the nature of music will be presented and evaluated. Few of these are original and this brief survey is certainly not exhaustive[4]. This

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[1] In recent years, the term "tape music" has been superseded by a number of alternatives; these include, computer music, acousmatic music, electronic music, kinetic music, plastic music, electroacoustic music, and so on. In order to address Ferguson's argument, the term "tape" will be used throughout this paper.

[2] Trevor Wishart (1996) famously refused to engage with such arguments, preferring instead to use the term *sonic art* rather than *music:* "one problem I have had in my own musical career is the rejection by some musicians and musicologists of my work on the grounds that 'it is not music'. To avoid getting into semantic quibbles, I have therefore entitled this book *On Sonic Art*" (Wishart 1996: 4).

[3] Kania recently broadened the scope with an evaluation of rock and jazz (Kania 2005) and Gracyk has taken a similar approach regarding popular music (Gracyk 1997); unfortunately, however, such studies are relatively uncommon.

[4] Most can be found in the writings of Davies (2004), Kania (2005), Levinson (1990), Kivy (1991, 1997), Thomasson (2004), Ingarden (1986), and Scruton (1999).

paper focuses specifically upon tape works, however, and the various challenges that they present. Initially, Ferguson's approach will be outlined; following this, several major ontological categories will be discussed in order to compare the ontological status of tape works with their scored counterparts. Ultimately, it will be noted that there are some significant differences between these two art forms. However, tape music is not "in search of its metaphysics"; it is merely lacking an accurate philosophical assessment.

2. Abstract or Concrete? An Ontological Approach

Linda Ferguson is primarily concerned with questions of ontology, the branch of metaphysical philosophy concerned with the nature of being or existence. Ontology is: "the study of what exists and the nature of the most fundamental categories into which those existents fall" (Rohrbaugh 2005: 1). The central questions for the musical ontologist are as follows: What sort of entities are musical works? How do they exist? Are they mental, physical, concrete, abstract, imaginary, or do they have some other mode of existence? Under what conditions does a musical work come into being? How do such entities maintain their being? Under what conditions do they cease to exist?

In this context, Ferguson's central argument is relatively straightforward; she claims that tape works *exist* in a manner that differs from the way in which works of the Western classical tradition exist. Her position may be summarised as follows: *musical* works have an *abstract* existence whereas *tape compositions* have a *concrete* existence:

> the product of musical composition is inaudible and abstract, while the product of tape composition is audible and concrete... Performances [of scored musical works] particularize and concretize the abstract ideal of the composition. But tape compositions are not abstract ideals; they are already particularized and concretized, as are sculptures and films. (Ferguson 1983: 20)

In the statement above, Ferguson's use of the terms *concrete* and *abstract* is intended in the ontological sense. She concludes that musical works and tape compositions differ in terms of their modes of existence and therefore works that are characterised as being of one type or the other do not share the same metaphysical status. In other words: "tape composition is not music because it is in essence something other than music as it has been traditionally understood" (Ferguson 1983: 17). Before evaluating the ontology of tape works, it is worth exploring what Ferguson means when using the phrase

"traditionally understood"; the following section will therefore provide an introduction to some views of the ontology of (Western classical) music.

3. Musical Works as Abstract Entities

Ferguson claims that the product of musical composition is "inaudible and abstract" (Ferguson 1983: 20). This view may be somewhat surprising; common sense dictates that pieces of music are necessarily audible and, in some senses, concrete. For example, one may listen to a recording or performance of a work and, if one is so inclined, hold and read a copy of the musical score. Yet Ferguson, like many ontologists, notes that neither score nor performance can be directly identified with a given piece of music. This is because scores and performances exhibit various features that musical works do not share and as a result these entities are ontologically distinct. We will briefly consider this argument, starting with musical scores before evaluating performances.

Many ontologists have pointed out that scores are *not* musical works (Ingarden 1986, Levinson 1990, Goehr 1992, Kania 2005, Thomasson 2004, Wollheim 1980, Wolterstorff 1980); one can give three main reasons why this is not the case: firstly, a score contains many features that a performance does not contain and vice-versa; a score has a variety of visual properties, but does not share any sonic properties with the work (Kania 2005: 36). Secondly, it is common to talk about *the* score as if there were a single document that uniquely identifies the musical work; this is misleading. Scores, unlike the works to which they relate, are not unique; they can be copied endlessly and thus no individual score *is* the musical piece. One could destroy any version of the score without altering a single aspect of the related composition. Andrew Kania points out that there may be many *tokens* of a musical score yet no particular physical object which is *the* score (Kania 2005: 37). *The* score is a *type* of representation and, as Kania explains, it is best to avoid identifying score-types with musical works: "if we are to open the door to types, there are more plausible types with which to identify a musical work, such as a type of sonic event." (Kania 2005: 37)[5]. Thirdly, although there is clearly a relationship between the work and the score, not all musical pieces are notated. Works of folk music, for example, often exist as a result of both oral and aural traditions, yet they continue to

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[5] The terms *type* and *token* are defined and discussed in detail below.

hold the same metaphysical status as their scored counterparts; scored music is not somehow more musical, or more physically endowed, than non-scored music.

A similar position may be taken with regard to performances; many ontologists have considered whether performances are identifiable with musical works. However, most have concluded that this is not the case; cancellation of a scheduled performance will fail to alter any part of a work. Likewise, when they are not cancelled, performances, invariably contain features that the work does not contain. These features may be essentially negligible, such as fluctuations in timbral detail or dynamics. However, they may be highly significant; mistakes such as out-of-time phrases, incorrect notes or other such errors frequently occur during a performance (Ingarden 1986). Such elements are not parts, or features, of the musical work. Instead, they belong exclusively to the performance. As a result, performances and scores both contain a variety of features that are not shared by the work; this fact prompts Goehr (1992) to ask the following question:

> What kind of existence do works enjoy, given that they are: a) created b) performed many times in different places c) not exhaustively captured in notational form, yet d) intimately related to their performances and scores? (Goehr 1992: 3)

At this stage, one can begin to appreciate Ferguson's ontology of music; copies of scores and performances are concrete entities that have spatio-temporal features. One may hold a particular copy of the score[6] and attend a specific performance. Works of music are abstract entities, however; there is no place in which the work of music can be directly encountered since it is not spatio-temporal. Instead, one merely encounters an *instance* of the work.

In order to concretise this point, Ferguson draws attention to the separate endeavours of composer and performer: "both engage in individual processes which result in products of different natures, the one purely conceptual, and abstract; the other, audible and concrete" (Ferguson 1983: 19). In other words, the act of composition is necessarily separate from the act of performance; a musical work requires a performance in order for the various abstract elements to be realised or concretised. This claim is supported by the vast majority of philosophers of music and Ferguson quotes several to

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[6] One may hold a token of the score-type and not *the* score itself.

bolster her argument:

> Let us accept as helpful Leonard Meyer's explanation that a performance at once "actualizes and particularizes the potential information contained in the score." And let us also follow Edward Lippman in defining the musical composition as "a nonaudible entity that exists only as an object of intention," and further, that "Ontologically the musical work is a conceptual object; it is not an aesthetic object in a literal sense but in the extended sense of its meaning and implications, its associated imagery and sonorous realization.... The work is quite distinct from any of its performances and from the totality of them. (Ferguson 1983: 19)

Ferguson's approach to the ontology of scored music is relatively common; works are abstract and generic entities, whereas their various instances are concrete and particular. As demonstrated above, many philosophers agree with that works of the Western classical tradition have an *abstract* existence (Davies 2004, Ferguson 1983, Ingarden 1986, Kania 2005, Kivy 1997, Levinson 1990, Rohrbaugh 2005, Spier 2007, Scruton 1994b, Thom 1993, Wollheim 1980). There are many different sorts of abstract categories, however: universals, types, kinds, classes, and so on[7]; Ferguson does not specify which particular theory she adheres to; we will subsequently consider the most popular of these theories, the *type-token hypothesis,* as developed by Wollheim (1980).

The type-token hypothesis appears to fall somewhere in-between abstract and concrete categories of existence since it accommodates elements that are typically ascribed to both (Scruton 1994a: 84); on the one hand there are *types*; abstract, generalised things that do not have spatio-temporal properties. On the other hand there are individual instances of the type, known as their *tokens;* these entities have concrete physical properties and exist at a specific time and place. Scruton (1994) provides the following simple example to demonstrate the relationship between a type and its tokens:

> If I refer to the Ford Cortina, I do not refer to one particular car but to a 'type' of car. The individual Cortinas are 'tokens' of this type... [The type can] be described and explained in terms of concrete processes in the spatio-temporal world. Nevertheless, there is no place where the Ford Cortina is. It remains aloof from the world of its tokens, just as numbers do. (Scruton: 1994a: 84-85).

One may apply the same terminology to the elements of a musical work; the work is a type, an abstract entity without particular spatio-temporal features. By contrast, scores,

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[7] Both Kania (2005) and Rohrbaugh (2005) claim that the difference between these categories are very subtle; Kania provides a detailed overview and ultimately assimilates them.

performances, recordings, and other such related entities, are all tokens of the type. One may note that the various copies of a score and performances of a work are unique, concrete entities; as a result, they may contain features that are not shared by the work itself.

In *Art and its Objects*, Wollheim (1980) explored the relationship between types and tokens. He noted that a type and the various tokens of the type are necessarily associated. They are not identical, however; tokens can be destroyed without affecting any aspect or element of a type. For example, a printed copy of a poem can be destroyed without affecting any features of the work; likewise, a poem will survive the cancellation of a planned recital. Despite this, Wollheim noted that the type-token distinction does not apply equally to all works of art. For example, an oil painting has just one token; the painted canvass. In this case, the token is again concrete and unique. Destruction of this entity would necessarily lead, however, to the destruction of the actual work.

Wollheim went on to note that tokens necessarily share certain properties with the type in question. For example, a musical work (type) should be just as loud as its various performances (token) and must contain the same sequence of notes. Thus, properties belonging to the type must be shared by all of the various tokens. The opposite does not always apply; tokens will invariably contain features that the type does not contain. For example, an instrumental performance may contain out-of-time phrases, incorrect notes, or any number of deviations from the instructions set out in the score; these features belong to the token, but not to the type:

> something can qualify as a performance of a given piece despite containing imperfect renditions of features normally regarded as crucial to the work's identity. A less than accurate rendition of Beethoven's Symphony No. 5 may qualify as an instance of the work. A departure from the appropriately specified notes violates the work's integrity, thereby generating an error in performance, but not all such departures move so far from the piece that the attempt to perform it fails... not all of a work's identifying features will be present in all its instances, given that performances with mistakes qualify as among its instances. (Davies 2001: 46-47)

Kania appears to share this view, arguing that a work is always "tokened" (Kania 2005: 60) when a performer aims to follow the instructions provided by the composer, even if the different tokens differ significantly:

some theorists turned to a closer examination of the nature of performance... One of the things that came to light about performance during these discussions was that there is an intentional relationship between a performance and the composer's specification of the work the performance is of. A performance can only be of a particular work if the performers intend to follow the instructions that the composer set down as to be followed in performing that work. (Kania 2005: 60)

When discussing scored instrumental works, Linda Ferguson does not align herself with the type-token hypothesis. Instead, she states that musical works of the Western classical tradition have some sort of abstract existence: "The musical composition is not identical with any one performance of its score, nor with the sum of all possible performances, for its existence is general and abstract. A composition is not "used up" by repeated realizations, not consumed by "definitive" performances, nor deteriorated by inept ones..." (Ferguson 1983: 5). In this short statement, Ferguson clearly distinguishes between works, performances and scores. This distinction, as we shall discover in next section, is not applied to tape compositions, to which we will now turn our attention.

4. Tape Works as Concrete Entities: Some Ontological Inaccuracies

We are now in a position to consider Linda Ferguson's ontology of tape composition. Unlike scored instrumental works, which she believes to be fundamentally abstract, tape compositions are, according to Ferguson, concrete. Her rationale can be summarised as follows: tape compositions are not scored and as a result they cannot be performed. The sounds encountered when a tape work is presented have been pre-selected by the composer. As a result, there is no need for interpretative acts of performance and this invariably means that tape works are identical each time they are presented or instanced. For this reason, Ferguson concludes that tape works are not abstract entities: "they are already particularized and concretized, as are sculptures and films" (Ferguson 1983: 20).

Ferguson's attempt to associate tape composition with sculpture and film may appear intuitive; after all, tape composers frequently articulate the haptic, kinaesthetic, proprioceptive nature of their compositional acts in terms of crafting, shaping and sculpting sound in the studio, terms that have much in common with the creative acts and processes used in the plastic arts. In this context, Ferguson's association may be appropriate. Her intention is clearly different, however; Ferguson does not merely refer to

compositional acts or processes. Instead, she makes an ontological claim: "they are already particularized and concretized" (Ferguson 1983: 20). This claim goes beyond the mere creative processes employed during the creative acts and implies that tape compositions are actual physical entities in their own right. We will now consider whether there is any truth in this claim.

Unfortunately, Ferguson does not tell us what sort of physical, concretised thing, or entity, a tape composition might be. As a result, we must consider the three possibilities which Ferguson *might* have in mind: the physical medium upon which it is stored, a score (or a surrogate score) and a performance or instance in which the work is directly sounded; we will consider these three options in sequence.

When Ferguson compares the existence of the tape composition with that of the work of sculpture we gain a possible insight into her intended meaning. Works of sculpture are often assumed to be little more than physical things; they can be moved, bought or sold, and destruction of the constituent physical properties will invariably lead to a destruction of the work (Thomasson 2004: 2). In other words, one might assume there to be a direct relationship between the particular physical properties of a sculpture or painting and the properties of the work itself. This view, often referred to as the *physical-object hypothesis*[8], has been subject to much criticism (Ingarden 1986, Johnston 1997, Levinson 1990, Thomasson 2004, Wollheim 1980, Wolterstorff 1980):

> Many arguments have been raised both within aesthetics and in the literature on material constitution, against identifying statues, paintings, and other artefacts with their constituting matter since the two may have different identity or persistence conditions (i.e. the statue can survive the replacement of one of its fingers with a different piece of clay, while the lump of clay cannot survive such changes; and the clay can survive the reorganization of its parts into a ball, while the statue cannot); or different essential properties (the statue is essentially an artefact, created or at least selected by an artist, the lump of clay is not). (Thomasson 2004: 7 – 8)

Such arguments may suggest that Ferguson is incorrect in her assumption that a sculpture is a concrete entity. The problem is unresolved, however; many theorists dismiss the above claims as mere technicalities and Ferguson has the support of several notable theorists who take the moderate view that *some* works of art can be identified with physical objects (Wollheim 1980, Wolterstorff 1980); objects, such as sculptures and

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[8] This term was originally proposed by Wollheim (1980) but is now widely used in ontological writings.

paintings, are, in some senses, physical and unique. Many others are not, however; works of music, literature, poetry, film and tape composition can be *repeated* and thus may have many occurrences; in such cases there is no obvious physical or unique object that *is* the work. This is particularly true of musical arts since they present us with the clearest case of something that is not easily identified with a simple physical entity or object (Kania 2004: 43); as discussed above, a piece of music does not occupy a defined spatio-temporal region and therefore it cannot be moved, bought or sold in the same way as a painting or sculpture.

When comparing tape works with works of sculpture, it is possible that Ferguson is focusing her attention on the physical medium upon which the work of tape composition is 'stored' or 'fixed'; she states that:

> [the composer of tape music] works in the concrete rather than the abstract, directly with the sonorous matter of his art; he need not imagine time's passage as a progression of measures, for he works materially with time as lengths of tape. The tape composer, manipulates the audible physical reality of his object, as painters, sculptors, and (most aptly) filmmakers do their visible physical realities. (Ferguson 1983: 19)

If at this moment she is intending to identify the work with this particular piece of tape then she is surely making an ontological error.

There is clearly some sort of relationship between the physical medium and the finished work. The composer typically requires some means of fixing elements of the composition so that it can be heard and performed multiple times. In addition, some forms of media have objective qualities and we may consider whether they relate to the composition in any meaningful way. Certain relationships can be evidenced; early recording technologies can be directly manipulated to affect the sounds recorded onto them. For example, magnetic tape can be spliced and reordered or stretched and slowed down and vinyl disks can be revolved at varying speeds, manipulated and disfigured. These examples suggest that we can relate certain sonic properties to properties of the physical medium; as we manipulate those properties of medium, we may find isomorphic changes with the properties of the sounds fixed onto them. This suggests that correlations between tape works and the physical properties of the recording medium can be derived. Despite this, there are various problems in identifying a musical work with a physical

medium.

The physical medium upon which the work is stored is similar, in terms of its ontological status, to that of the musical score in the sense that although the medium may have objective qualities, these are often features that the music lacks. Likewise, the music will invariably have features that the medium lacks. This is essentially the same argument used to reject the physical reduction to scored materials (Kania 2005: 36). Ten Hoopen supports this view, claiming that the tape piece has a "perfect material existence" but claims that this objectivity becomes subjectivity as soon as the music is performed (Ten Hoopen 1997: 14). She considers this to be the *paradox* of tape music[9]. In addition, destruction of a single copy, or multiple copies, of a tape work will take nothing away from the existence of the work itself[10]. The copy is required to facilitate performance. The medium, which is fixed and unique, is, however, like the musical score, not directly identifiable with the work. One may subsequently argue that the medium is merely a token of the work and thus not identical with it.

The lack of musical scores may account for Ferguson's initial suspicion of tape works; scores do (occasionally) exist but the act of notation rarely forms a part of the compositional process[11]. In most cases, scores have been created in retrospect, often for the purpose of analysis or sound diffusion[12]; as a result, these entities rarely relate to the creative process in the same way as traditional scores. The tape composer does not require a musical score in order to arrange and prepare sound materials; instead, he or she works directly with sounds, choosing and manipulating sonic artefacts in order to fulfil a specific compositional intention.

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[9] Ten Hoopen uses the term *acousmatic music* instead of *tape music; acousmatic* refers to music that is composed on a fixed medium and performed using loudspeakers instead of live performers. The term implies that auditory focus takes precedence over other sensory factors and thus vision is not intended to form a purposeful part of the acousmatic experience. Despite this shift in emphasis, Ten Hoopen's argument transfers directly to the current discussion.

[10] Unless, of course, only one copy exists; in such a case, one could argue that the work *would* be destroyed. However, this would seem a strange stance to take when dealing with an artistic practice that developed alongside recording and reproduction technologies.

[11] For example, Rainer Wehinger's listening score that accompanies György Ligeti's *Artikulation* (1970); this score is not required in order for the piece to be performed or heard.

[12] Sound diffusion is "the real-time, usually manual, control of relative levels and spatial deployment during performance [of tape music]" (Harrison 1999: 1). In this context, a diffusion score provides a visual representation of some of the sonic content of the work usual with time delineated on the horizontal dimension. The sound diffuser is able to follow the development of the musical discourse by reading the score and thus make real-time adjustments to the levels and spatial deployment of the sounds.

The method of working 'concretely' with sound materials was defined by Pierre Schaeffer's use of the term *musique concrète* (Schaeffer 1966). Schaeffer used the term *concrète* to imply that a composer is working *directly* with sounds; he contrasted this method with that of the instrumental composer who is typically working *indirectly,* or *abstractly,* engaging with a system of notion in order to instruct a musician how to create or perform a particular sound (Emmerson and Smalley 2001, Dack 2002, Schaeffer 1966)[13].

Initially, Ferguson does appear to be referring Schaeffer when she claims that tape works are concrete entities[14]. Her intended meaning is significantly different, however. When using the term *concrete,* Pierre Schaeffer was not referring to the *being* or *existence* of musical works. Likewise, he was not concerned with the ontological status of a music entity. Instead, he was concerned with the compositional *processes* involved in the creation of a work and the way in which sound materials could be prepared and arranged. Thus, he was concerned with "the implication of "actuality", of dealing with the "stuff" or "matter" directly presented" (Dack 2002: 4). By contrast, Ferguson uses the term *concrete* in the ontological sense; when she says that: "tape compositions are... particularized and concretized" (Ferguson 1983: 20) she is not merely referring to the method used during the compositional process but also to the way in which the work exists from that point onwards. As a result, Schaeffer and Ferguson have significantly different intentions.

Ferguson claims that the distinction between the compositional process and the performance process is no longer apparent:

> To compose music has traditionally been, as Barthes put it, "to give to do." Since the late 1940s and the beginnings of tape composition, it no longer need mean that, although it usually does. We are concerned here with those cases where "to compose" means something other than "to give to do," since the tape composer does not ultimately provide symbolic formulae or directives. He works in the concrete rather than the abstract, directly with the sonorous matter of his art. (Ferguson 1983: 20)

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[13] Schaeffer intended the term *concrète* to be understood in a number of different ways; Dack (2002) provides a comprehensive overview of the various differences, noting that the specific meaning is often unclear since the term *concrete* can be used as both an adjective and a noun.

[14] Ferguson references his involvement with *musique concrète* (1983: 21) but does not list any of his written works in her bibliography.

Ferguson claims that the direct manipulation of sounds offers a radical departure from traditional forms of musical composition: "the sonorous aspect of music has been traditionally understood to be the product of the process of performing, not the product of the process of composing" (Ferguson 1983: 19). With the above in mind, it is unsurprising that Ferguson does not view tape works as part of a performing tradition:

> Just as the preparation of a motion picture may require an actor to "act," so the preparation of a tape composition may require a musician to perform, but such a performance in either case is not integral to forms, nor is it a property of subsequent displays of the works. And in both cases, the final product is considerably more than a preservation of the images produced by the performances. (Ferguson 1983: 20)

Interestingly, Ferguson is not alone in this assumption; many ontologists have refused to accept that tape works can be performed. In the following statement, for example, Davies (2004) prefers to use the term *playback*:

> Some kinds of works are created for playback, not for performance. The entire piece is stored as code and, when sounded, is retrieved in a mechanical fashion. Pieces of this kind are created for a particular storage medium and for the kind of decoder that can replay the work as sound... As archetypes, I mention Pierre Schaeffer's Étude Pathétique (1948), one of the first examples of musique concrète. (Davies 2004: 25)

Others, such as Kania (2005), prefer to use the term *instance*:

> Shortly after the Second World War, some classical composers began focusing on producing works that did not require any performance. Using technology developed to record and reproduce the sounds of performances, they began creating tapes that when played back produced sound events that could not be considered an accurate record of any performance occurring in the studio, in any sense. Any authentic copy of the master tape produced an authentic instance of the work when played back. (Kania 2005: 134-5)

Clearly, many ontologists are uncomfortable with the suggestion that tape works can be *performed*[15]. As a result, we must consider the relationship between the production of the

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[15] It is tempting to search for a clear definition of the term performance to see whether it can be rightfully applied to tape works. However, this ontology is not concerned with the development, or analysis, of terminology. Instead, it aims to delineate the various ontological features that characterise a traditional musical performance so that these can be compared with the presentation of the tape work. The actual term that is used, whether it is *performance*, *instance* or *playback*, is of little interest. Instead, we are concerned with ontological similarities or differences between traditional musical works and their tape music counterparts.

tape work and the product itself. Ferguson's claim that tape works are concrete appears to originate with her belief that each instance (or playback, or performance) contains *exactly* the same sounds as the previous instance; the sounds are fixed in the same way that the sculpture contains fixed or concrete physical materials. Thus, it appears that Ferguson's use of the term *concrete* should be understood within the context of *instances* or *play-backs* of the work. In this respect, Ferguson may note that there are no tokens of the work; instead there is one fixed, concretised sound entity.

Ferguson's entire argument centres upon the notion that the sounds used in a piece of tape music have been fixed. However, this is incorrect; the sounds that are heard during an instance are not *fixed*. Each time the tape composition is *instanced,* the specific sounds encountered are specific to that particular instance; they are not specific to the work. The sounds encountered during two *instances* of a tape work may appear identical in various respects. They invariably differ according to the influence of numerous factors, however; these include the attributes of the sound-system that is used, the specific configuration and colouration of the loudspeakers that present the sound, the acoustic influence of the concert hall or listening space, the position of the audience, the perceptual experiences of the listeners, and so on.

The above factors may seem marginal, even pedantic, to those unfamiliar with the tape music genre. Composers are well aware of the influence that such factors exert upon their musical works, however. To demonstrate this point, consider the concert hall in which tape compositions are often performed. Unlike acoustically-treated studios, in which tape music is invariably composed, concert halls are frequently large, reverberant spaces. Accordingly, the presentation of such works in a concert hall may, if left unchecked: 'have consequences for the perception of the musical content and structure' (Smalley 1991: 123); certain frequencies may be exaggerated or de-emphasised, the dynamic range may be distorted, certain articulations or gestures may be swamped with early or late reflections, the spatial image of the composition may be stretched or compressed, and so on. Factors such as these are far from marginal.

It might be tempting to view such factors as somehow extraneous to the composed work; the affect of the concert hall, for example, may be seen as something

that exists aside from the composition itself and is therefore not an intrinsic feature but rather an extrinsic one. This might be true in cases where composers are ignorant of such factors. This is rarely the case, however; tape music composers do not, for example, leave the transition from studio to concert hall to chance. Instead, they consider the concert hall during the compositional process and work with this in mind. For example, a composer may choose to leave an articulation or gesture free of synthetic reverberation in the knowledge that natural reverberation will be given during the concert presentation. Alternatively, a composer may produce a specific mix of a composition, recognising that a particular hall emphasises or de-emphasises certain frequencies more than others. Tape music is necessarily tailored to the space in which it is presented.

In the above context, Ferguson's claim, that tape music is fixed, is clearly flawed; it is, as Jonty Harrison points out, the support which is fixed and not the music:

> [a] poor translation which causes confusion is "music on a fixed medium". In the French original (musique de support) the fixity is implicit rather than explicit – and it is worth pointing out that, even in English, it is the medium which is fixed, not the music. (Harrison 1999)

The sounds heard in a performance, or instance, of a tape composition are not fixed. A second performance will involve sounds that are identical in many of their properties but these are not the exact same sounds that were encountered in the previous performance. Ingarden makes a similar point when he refers to (traditional) musical works as *quasi-temporal* entities; the musical work does not exist in a defined point in time but does have qualities that resemble temporal dimensions. By contrast, the instance *does* exist at a particular point in time. As a result, time is implied in the work but is not literally given until the moment of performance (Ingarden 1986). One could say the same about the spatial dimensions of the work; the work is quasi-spatial since it has space-like features but these are only "concretised" during an instance or performance (Ingarden 1986).

One can clearly distinguish between the work and the performances, (or instances, or playbacks) of the work; the work is an *abstract* entity, and is quasi-spatio-temporal, whereas the instance is a *concrete* entity, and is literally spatio-temporal. This distinction applies to works of the classical tradition and works of tape music alike; it also applies to works of poetry, film, ballet and any other repeatable works of art. Although perhaps

technical in nature, this view is widely acknowledged and supported (Davies 2004, Ingarden 1986, Levinson 1990, Kania 2005, Thomasson 2004, Wollheim 1980, Wolterstorff 1980); repeatable works of art cannot be identified with any single repetition or group of repetitions and thus one cannot identify them with purely concrete entities.

5. Tape Works as Abstract Entities: Thick and Thin Descriptions

In the previous section we attempted to identify the work of tape composition with various concrete entities, including scores, performances and the medium upon which the work is 'fixed'. Given the various problems encountered, it should be clear that Ferguson's central thesis is, from an ontological perspective, incorrect. As a result, one may conclude that tape works, like their scored counterparts, are also abstract entities. We will now consider the abstract nature of the tape work and consider whether it is possible that both sorts of work share the same kind of abstract existence, despite their various differences.

Ferguson may claim that the type-token hypothesis does not apply to works of tape music since all of the various tokens will be essentially identical. However, as discussed above, this is not the case; the various tokens will be very similar but not the same.

Instead, one may note that many of Ferguson's arguments can be resolved by applying the following distinction as proposed by Stephen Davies' (2004): all repeatable works of art can be described as either *thick* or *thin* in terms of their constitutive features:

> If it is thin, the work's determinative properties are comparatively few in number and most of the qualities of a performance are aspects of the performer's interpretation, not of the work as such. The thinner they are, the freer is the performer to control aspects of the performance... By contrast, if the work is thick, a great many of the properties heard in a performance are crucial to its identity and must be reproduced in a fully faithful rendition of the work. (Davies 2004: 20)

Whereas Ingarden claimed that performances fill-out areas of indeterminacy, Davies suggests that musical works are always thinner than the various performances that they receive; this is because it is not possible to notate every single performance instruction, no matter how detailed the score.

The idea that works are *thick* or *thin* has nothing to do with the quantity of sonic

materials that instantiate the performance; an orchestral work is not *thicker* than a solo piano recital, even though there are typically many more musicians generating musical sounds during an orchestral performance; this is because: "performances of thin works are as replete with acoustic information as are those of thick works, but, for performances of thin works, more of this information is referable to the performance than to the work" (Davies 2004: 20). Thus, Davies' notion refers to the various ontological features that are instantiated by both the *type* and the *token*. If the type contains many of the same features as the token then the work is correctly described as being *thick*. Alternatively, if the type contains very few of the features contained in a performance then the work is very *thin*.

The notion that musical works are either thick or thin enables one to clearly distinguish between the type and the token and to relate the two by outlining areas of determinacy or indeterminacy. As a result, Davis' distinction is particularly useful to the current thesis; firstly, as Rohrbaugh points out, it: "has the potential to defuse some apparent disagreement between type-theorists about which features of works are relevant to their identity, for in many cases, the answer will simply vary with the thickness of the works at issue" (Rohrbaugh 2005: 7). Secondly, it enables one to collect both tape works and scored instrumental works within the same category of existence; their differences can be articulated in terms of the relative thickness of tape works in contrast to the relative thinness of instrumental works.

Unfortunately, Davies appears to use this notion as a platform to launch certain value judgements (Davies 2004)*;* he claims that *thicker* works are of more interest than thinner works, and that a thin work is only of interest during performance:

> very thin works are not usually of interest in themselves and the prime candidate for appreciation is the performance. As pieces become thicker they become more worthy of interest. (Davies 2004: 22)

The idea that works are more or less worthy of attention according to their relative constitutive properties is indeed questionable. For example, imagine a folk melody that has been passed from generation to generation via oral traditions; this would be very thin, since a performer would be required to make numerous performance decisions in order to instance the work. By contrast, an highly complex piece, for example a work by

Ferneyhough in which few of the performance decisions are left un-specified, would be very thick; one may note that Ferneyhough's *Etudes Transcendantales* would, in some respects, be thicker than a given performance of the work since some aspects are too thick to be accurately played.

It appears from Davies' statement above that *Etudes Transcendantales* should necessarily be more worthy of interest than the folk work because there are fewer areas of indeterminacy. This is not necessarily the case, however; it depends upon ones criteria for judging worth; unfortunately, Davies fails to explain how or why something should be more or less worthy of our interest with respect to the thickness-thinness distinction. One could easily argue that the folk work is of more interest due to its *lack* of designated properties and that the Ferneyhough piece is much less worthy of our interest precisely because too many features are prescribed.

Despite such value judgements, the idea that works of music can be ontologically *thick* or *thin* is particularly interesting when used to discuss tape music. This is because, as discussed above, tape works contain relatively few areas of indeterminacy; most of their various features have been fully determined in the studio at the point of composition. In this context it is difficult to distinguish between the type and the various tokens of the type. Davies recognises this fact, noting that:

> electronic works differ considerably from [works of the Western classical tradition]
> in the extent, depth, and saturation of their work-determinative properties... Because
> an electronic work is sounded directly when it is instanced, the properties defining
> it are at the same level of detail as those characterising performances. (Davies 2004:
> 26-27)

Davies is primarily concerned with electronic music. His argument may be applied to tape works, however, which are, like their electronic counterparts, (almost) as thick as their various performances. As we discussed above, performances of tape works invariably contain features that the related work does not contain; these include reverberations, frequency alterations, dynamic modifications, and so on. Despite this, tape works and their performances invariably share a large number of features; tape works do not require interpretation through performance and, as a result, are

appropriately viewed as 'thick' entities[16].

The *thickness* of the tape work is an extremely important feature of the genre; the tape composer makes compositional decisions in the knowledge that *tokens* of the completed work will share many of their features with the *type*. The language of tape music reflects the possibilities that thick works invariably afford; in order to demonstrate this point, we will consider the tape composer's frequent interest in timbre. Since it is extremely difficult to notate timbral details most traditional instrumental composers were primarily concerned with the evolution of pitch parameters over time (Wishart 1996)[17]. In this respect, timbre is subservient to pitch, and therefore the scored instrumental *type* is almost always thinner than its various *tokens*; the latter will display timbral details whereas the former will not. By contrast, the tape composer is able to control and shape the timbre of a sound with precision; as a result, the tape work (type) will necessarily share timbral details with each and every token. Perhaps it is little surprise that composers have harnessed the potential to explore the evolution of timbral detail over time and that this has become a fundamental characteristic of much tape music (Smalley 1997).

6. Conclusion

This paper has contributed to the discussion on the ontology of tape music. It has suggested that tape works have a fundamentally abstract mode of existence. By contrast, performances of tape works are necessarily concrete. Despite this fundamental ontological division, tape works and their performances have an extremely close relationship; tape music performers have relatively few interpretative choices and, as a result, tape works may be described using Stephen Davies' term *thick*. Even so, differences between tape works and their performances should not be marginalised or

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[16] This situation is true, providing that we ignore marginal cases such as tape hiss, distortion or any other sounds that may occur during the performance that are not parts of the work. Another marginal case may occur if the playback system used to facilitate a performance was incapable of accurately presenting the various features of a given work; for example, by having an inaccurate frequency response. In this case, the token would be *thinner* than the work.

[17] This statement should be understood in terms of instrumental works of the Western classical tradition; much modern music focuses upon timbral detail and, over the past sixty years, there have been many successful attempts at scoring such features.

overlooked; there are numerous variables which influence the way in which tape works are performed and these invariably impact upon the way in which tape music is received by an audience.

It is hoped that a greater understanding of the ontology of tape music may initiate further research into both tape music composition and the art of tape music performance; the unique relationship between tape works and their performances may well turn out to be a fundamental driver of compositional decisions and concerns and, likewise, if tape performances are concrete realisations of an abstract work then the notion of performance authenticity requires attention. Ultimately, it is hoped that a greater understanding of tape music ontology will bring music of this tradition into the wider philosophical arena; there can be little doubt that such music will continue to challenge, oppose and, in some cases, undermine established philosophical notions of musical works and their performances.

References

Dack, J. (2002). "Abstract and Concrete." In *Journal of Electroacoustic Music, vol. 14, 2002*. London: Sonic Arts Network: 2-7

Davies, S. (2004). *Musical Works and Performances: A Philosophical Exploration*. Oxford: Oxford University Press.

Dusman, L. (1994). "Unheard-of: Music as Performance and the Reception of the New." *Perspectives of New Music.* 32: 131-141. Seattle: University of Washington Press.

Ferguson, Linda. (1983). "Tape Composition: An Art Form in Search of its Metaphysics." *Journal of Aesthetics and Art Criticism.* 42: 17-27

Goehr, L. (1992). *The Imaginary Museum of Musical Works: An Essay in the Philosophy of Music.* Oxford: Clarendon Press.

Gracyk, T. (1997). "Listening to Music: Performances and Recordings." *The Journal of Aesthetics and Art Criticism.* 55: 139-50

Harrison, J. (1999). Diffusion: theories and practices, with particular reference to the BEAST system. eContact 2.4, ix

Ingarden, R. (1986). *The work of Music and the Problem of its Identity.* Translated by Adam Czerniawski. Berkeley: University of California Press.

Kania, A. (2005). *Pieces of Music: The Ontology of Classical, Rock and Jazz Music.* Unpublished PhD Dissertation. University of Maryland: College Park.

Kivy, P. (1984). *Sound and Semblance: reflections on musical representation.* Princeton: Princeton

University Press.

Kivy, P. (1997). *Philosophies of Arts: An Essay in Differences.* New York: Cambridge University Press.

Levinson, J. (1990). "What a Musical Work Is." In, Levinson, *Music, Art, and Metaphysics: Essays in Philosophical Aesthetics*. Ithaca: Cornell University Press, 215-63.

Levinson, J. (2006). *Contemplating Art: Essays in Aesthetics.* Oxford: Clarendon Press.

Rohrbaugh, G. (2005). "The Ontology of Art." In Gaut and Lopes, Eds. *The Routledge Companion to Aesthetics, 2nd Edition.* New York: Routledge.

Schaeffer, P. (1966). *Traité des objets musicaux.* Paris: Seuil.

Scruton, R. (1994a). *Modern Philosophy: An Introduction and Survey.* London: Pimlico.

Scruton, R. (1994b). "Recent Books in the Philosophy of Music." *Philosophical Quarterly,* 44: 503-18.

Scruton, R. (1999). *The Aesthetics of Music*. Oxford: Oxford University Press.

Smalley, D. (1991) "Spatial experience in Electro-Acoustic Music." In *L'Espace du Son II*. Ohain: Musiques et Researches.

Smalley, D. (1997). "Spectromorphology: Explaining Sound Shapes." In *Organised Sound*. Cambridge: Cambridge University Press.

Spier, E. (2007). "What are Works of Art?" In *Macalester Journal of Philosophy 16 (1), Article 10.* Berkeley: The Berkeley Electronic Press.

Ten Hoopen, C. (1997)*. Perceptions of Sound. Source, Cause and Human Presence in Electroacoustic Music.* PhD dissertation. Amsterdam: University of Amsterdam.

Thom, P. (1993). *For an Audience: A Philosophy of the Performing Arts.* Philadelphia: Temple University Press.

Thomasson, A. (2004). "The Ontology of Art." In P. Kivy, ed. *The Blackwell Guide to Aesthetics.* Oxford: Blackwell Publishing.

Wishart, T. (1996). *On Sonic Art.* Amsterdam: Harwood Academic Publishers.

Wollheim, R. (1980). *Art and its Objects, Second Edition.* Cambridge: Cambridge University Press.

Wolterstorff, N. (1980). *Works and Worlds of Art.* Oxford: Clarendon Press.

Online resources

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Machin, D. (2010). Analysing Popular Music: Image, sound and text. Sage Publications

Mazzola, G. (2011). Musical Performance: A comprehensive approach. Theory, analytical tools, and case studies. Springer

Powell, J. (2010). How Music Works: The science and psychology of beatiful sounds, from Beethoven to the Beatles and beyond. Penguin Books

Rosen, C. (2010). Music and Sentiment. Yale University Press

Schnupp, J., Nelken, I., King, A. (2010). Auditory Neuroscience: Making sense of sound. MIT Press

Tan, S.-L., Pfordresher, P., Harré. R. (2010). Psychology of Music: From sound to significance. Psychology Press

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David Hebert is a member of *JMM*'s Editorial Staff and Editorial Board. For more information on David Hebert, please see his faculty profile:

http://www.hib.no/senter/sekkk/personer/david-gabriel-hebert-eng.asp   (accessible by June 4, 2012).

Felipe Otondo

The online version of *JMM9* did not feature a biography of Felipe Otondo, due to the policies at the time regarding publication of research reports. As of June 4, 2012, information on Otondo can be found at his faculty profile:
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Adam Stansbie is a Senior Lecturer in Music, Sound and Performance at Leeds Metropolitan University. He completed his first degree at the University of Leeds and is currently completing a PhD in Electroacoustic Composition at City University, London, under the supervision of Professor Denis Smalley. Adam's musical works have been presented at festivals and concerts throughout Europe, Asia, North and South America and Australasia and have won a number of international awards; these include a Residency Prize at the Bourges International Competition, France (2006), First Prize (Category A) in the International Acousmatic Competition 'Metamorphosis', Belgium (2006) and First Prize in the Destellos Competition, Argentina (2010). In recent years,

Adam has worked in various prestigious European studios (including the IMEB, France (2007,2008), Musiques et Recherchés, Belgium (2009), VICC, Sweden (2010) and USSS, UK (2010)); during these placements, he has sought to integrate his creative practice with his written work on the ontological and phenomenological status of electroacoustic composition and performance.

Douglas C. Wadle

Douglas C. Wadle is adjunct professor of music theory and analysis at the California Institute of the Arts, where he studied composition with the late James Tenney. He also holds degrees from the University of California, Los Angeles (ethnomusicology), and New York University (comparative literature). Wadle is an active composer and performer (on trombone) of contemporary and experimental music.