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MUSIC BEYOND AIRPORTS

APPRAISING AMBIENT MUSIC

Edited by Monty Adkins & Simon Cummings

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CONTRIBUTORS

Monty Adkins is a composer, performer, and lecturer of experimental electronic music. He has created installations, concert and audio-visual works, which have been exhibited and released worldwide. Having read music at Pembroke College, Cambridge where he studied French mediaeval and Italian Renaissance music, Adkins then studied electronic music with Jonty Harrison at the University of Birmingham where he performed across Europe with the Birmingham ElectroAcoustic Sound Theatre (BEAST), and Simon Waters at the University of East Anglia. He has released 12 solo albums on Audiobulb, Eilean Records, Crónica, and empreintes DIGITALes. He has edited two books on the music of Roberto Gerhard and a third as part of a Leverhulme Fellowship on music and art with Pip Dickens. He is currently Professor of Experimental Electronic Music at the University of Huddersfield where he is Associate Dean for Research and Co-Director of the Centre for Research in New Music.

Axel Berndt studied computer science and music at Otto-von-Guericke University in Magdeburg, Germany where he also did his PhD on the musical scoring of interactive media. From 2012 he worked for three years at Technische Universität Dresden at the Media Design Group and the Interactive Media Lab where his research combined both fields, human-computer interaction and music. In 2015 Axel Berndt moved to the cemfi (Center of Music and Film Informatics) in Detmold, Germany. At this institution, which is run collaboratively by Detmold University of Music and Ostwestfalen-Lippe University of Applied Sciences, Berndt and his

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colleagues work in the fields of digital music editions, new interfaces for musical expression, live electronics, modelling and computer generation of expressive music performances, and music information retrieval and its applications in music production.

Lisa Colton is Reader in Musicology at the University of Huddersfield. Her monograph, *Angel Song: Medieval English Music in History*, was published by Routledge, and has been described as "a masterful account of the medieval history of English music" (*Music and Letters*, 2017). Lisa's recent research has focused on analytical approaches to fourteenth-century English motets,on medievalism in the music of British composer Margaret Lucy Wilkins, and on gendered voices in early French song. With Dr. Catherine Haworth, Lisa co-edited the volume of essays *Gender, Age and Musical Creativity* (Routledge, 2015); a second volume of essays, entitled *Sources of Identity: Makers, Owners and Users of Music Sources Before 1600* was co-edited with Dr. Tim Shephard (Brepols, 2017).

Simon Cummings is a composer, writer and researcher based in the Cotswolds, in south-west England. He composes instrumental and electronic music, both of which focus upon gradual processes of transformation. His acoustic work involves highly intricate algorithmic processes rooted in carefully-defined behaviours, the music emerging from stochastic relationships in which these behaviours are juxtaposed and intermingle. His electronic music explores the juxtaposition of noise and pitch, reappraising what defines each and their boundaries. Cummings studied composition, conducting and organ at the Birmingham Conservatoire, at graduation being awarded the Creative Studies composition prize. Aided by a substantial grant from The Countess of Munster Musical Trust, Cummings undertook the Sonology and Masters degree programmes at the Institute for Sonology at the Royal Conservatory in The Hague, at the same time studying privately with Richard Barrett in Amsterdam. He has recently completed a Ph.D. in composition at the Royal

Birmingham Conservatoire under the supervision of Richard Causton and Howard Skempton. The primary focus of his research is the exploration and development of new algorithmic and stochastic approaches to musical composition. When not composing, Cummings is an accomplished writer about new music; he is the author of contemporary/avant-garde music blog *5:4* and contributes to assorted print and web journals.

Ambrose Field is a British composer. He is Professor and Head of Department of Music at the University of York. His music has been performed at venues such as the Vienna Konzerthaus, Chicago Early Music Festival, and Parco Dela Musica Rome. His album for ECM, *Being Dufay*, was a bestseller on Amazon and achieved five star reviews in BBC Music magazine and from Classic FM. Other highlights include a commission from the Polish National Chamber Choir for his work *In Memoriam for H.M. Gorecki*. This piece, for 25 solo voices with a Polish text, received critical acclaim in the press for a distinctive, lush sound world. Field studied Music Education at the University of Cambridge and Composition at City University, London. Whilst at City, he took Jean-Jacques Nattiez's Ethnomusicology seminar which became an important motivation in his approach towards new music. His work has received a number of international awards, including three Prix Ars Electronica honorary mentions specifically for pieces making use of new technologies, a strand of work which resulted in a performance at the MUTEK festival in Canada with the support of Recombinant Media Labs, San Francisco. Field has served as a panellist on the British Composer Awards, on juries for contemporary music competitions internationally. At the University of York, Field has created a successful international culture through finding new links with education and industry, creating resources which have been invested in new jobs, research, and improved student facilities. Field has acted as a consultant to two multinational businesses, has served on research council panels, and is a frequent guest lecturer on Creativity in Music Education.

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Ulf A. S. Holbrook is a composer, sound artist and doctoral research fellow at the RITMO Center for Interdisciplinary Study on Rhythm, Time and Motion, Department of Musicology, at the University of Oslo. The focus of his research is on the perception of sound objects in spatial audio representation systems at the convergence of signal processing applications and sonic creation. His research proposes the soundfield as a link between a sound object and the spatialisation of sound masses which share the same multidimensional space. His work is performed and exhibited in galleries, as well as at festivals and conferences internationally.

Justin Morey has a background in sound engineering and music production, having set up and run a recording studio in Shoreditch, London from 1995–2003. As a co-writer and producer of dance and electronic music, he has had records released through labels including Acid Jazz, Lacerba, Ministry of Sound and Sony. He has been teaching in higher education since 2001, and has been a member of academic staff at Leeds Beckett University (formerly Leeds Metropolitan University) since 2004, where his teaching specialisms include music production, production analysis and music business. His main research interest is in sampling as a creative practice within British dance and electronic music, the subject of his PhD, which was awarded in 2017. Publications include articles for *Dancecult*, the IASPM Journal, and the Journal on the Art of Record Production, and book chapters for IIPC and Palgrave Macmillan.

Richard Talbot is currently undertaking a PhD at the University of Liverpool. His research topic is the production and consumption of ambient music. He is also a member of Marconi Union, an ambient / electronica band who have recorded albums for a number of labels including All Saints, 30 Hertz and Just Music. Marconi Union have collaborated with a number of artists including the Marina Abramović Institute and Jah Wobble, and a recent Marconi Union remix of Max Richter was released on Deutsche

Grammophon. Their music has also been remixed by Biosphere and Steve Jansen. In 2012, Marconi Union appeared at Punkt Festival curated by Brian Eno. At the same time, they achieved success with *Weightless* which was acclaimed as "the most relaxing track ever". This led to Marconi Union being featured as one of Time Magazine's 2012 inventors of the year list. *Weightless* has now been streamed over 60 million times on Spotify and spent over a year in the top three of the Billboard New Age charts.

David Toop has been developing a practice that crosses boundaries of sound, listening, music and materials since 1970. This practice encompasses improvised music performance, writing, electronic sound, field recording, exhibition curating, sound art installations and opera. It includes seven acclaimed books, including *Rap Attack* (1984), *Ocean of Sound* (1995), *Sinister Resonance* (2010) and *Into the Maelstrom* (2016), the latter a Guardian music book of the year, shortlisted for the Penderyn Music Book Prize. Briefly a member of David Cunningham's pop project The Flying Lizards in 1979, he has released thirteen solo albums, from *New and Rediscovered Musical Instruments* on Brian Eno's Obscure label (1975) and *Sound Body* on David Sylvian's Samadhisound label (2006) to *Entities Inertias Faint Beings* on Lawrence English's ROOM40 (2016). His 1978 Amazonas recordings of Yanomami shamanism and ritual were released on Sub Rosa as *Lost Shadows* (2016). Major sound art exhibitions he has curated include Sonic Boom at the Hayward Gallery, London (2000) and Playing John Cage at the Arnolfini Gallery, Bristol (2005-6). In 2008, a DVD of the Belgian film – *I Never Promised You a Rose Garden: A Portrait of David Toop Through His Records Collection* – was released by Sub Rosa, and in 2017 his autobiography – *Flutter Echo: Living Within Sound* – was published by Du Books in Japan. His most recent record release is *Dirty Songs Play Dirty Songs*, released on Audika in October 2017. He is currently Professor of Audio Culture and Improvisation at London College of Communication.

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INTRODUCTION

Monty Adkins & Simon Cummings

This collection of essays has been assembled and developed from papers given at the Ambient@40 International Conference held in February 2018 at the University of Huddersfield. The original premise of the conference was not merely to celebrate Eno's work and the landmark release of *Music for Airports* in 1978, but to consider the development of the genre, how it has permeated our wider musical culture, and what the role of such music is today given the societal changes that have occurred since the release of that album. In the context of the conference, ambient was considered from the perspectives of aesthetic, influence, appropriation, process, strategy and activity. A detailed consideration of each of these topics could fill many volumes. With that in mind, this book does not seek to provide an in-depth analysis of each of these topics or a comprehensive history of the last 40 years of ambient music. Rather it provides a series of provocations, observations and reflections that each open up seams for further discussion. As such, this book should be read as a starting point for future research, one that seeks to critically interrogate the very meaning of 'ambient', how it creates its effect, and how the genre can remain vital and relevant in twenty-first century music-making.

In the past four decades or so, there has been an explosion of thinking around 'ambience'. As well as ambient music, which is our prime concern here, there has been increasing focus on the ambient materiality of our daily environment. Terms such as ambient marketing, ambient media, and ambient

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intelligence[1] have all come into common parlance since the turn of the century. Similarly, in philosophy we have seen two significant parallel developments: an aesthetics of 'atmosphere' developed by ecocritical philosopher Gernot Böhme,[2] and the concept of 'ambient poetics' from Timothy Morton. In Morton's *Ecology Without Nature* [3] he posits that "the self and the world are intertwined",[4] and advocates for "sonic art works that produce a heightened awareness of self and environments".[5] Seth Kim-Cohen writing in *Against Ambience* states that:

> For Morton, we are living in the Anthropocene, the first epoch of the Earth's history in which human beings are altering the material reality of the planet. As a result, we have a duty to engage the planet as a discrete entity whose being is owed the same ethical considerations as human beings are. Likewise, all entities command equal status. For Morton, ambience is a state of awareness and conduct, a kind of immersion in, and with, other entities, and with the entity of all the entities together.[6]

Morton himself considers that "The *atmosphere* in which the message exists – its ambience – is a significant element of its meaning. In fact, its context *is* its

1 Ambient intelligence describes ubiquitous networked devices in our everyday environment. See Diane J. Cook, Juan C. Augusto, Vikramaditya R. Jakkula, "Ambient intelligence: Technologies, applications, and opportunities," Pervasive and Mobile Computing, vol. 5(4), (2009): 277-298.

2 See: Gernot Böhme, *Atmosphere as the Fundamental Concept of a New Aesthetics*, trans. David Roberts, Thesis Eleven (36), (Cambridge, MA.: The MIT Press, 1993), 119 and Kate Rigby, "Gernot Böhme's Ecological Aesthetics of Atmosphere" in eds. Axel Goodbody and Kate Rigby, *Ecocritical Theory: New European Approaches* (Charlottesvile: University of Virginia Press, 2011).

3 Timothy Morton, *Ecology Without Nature* (USA: Harvard University Press, 2009).

4 Ibid., 69.

5 Jon Dovey, "Ambience and Eco Critical Awareness," accessed May 11, 2019, https://research.ambientlit.com/index.php/2018/01/30/ambience-eco-critical-awareness/.

6 Seth Kim-Cohen, *Against Ambience and Other Essays* (New York and London: Bloomsbury Academic, 2016), 30.

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meaning".[7] Extrapolating such thinking to ambient music we can propose that the 'meaning' is not to be found in an understanding of its sonic components as in traditional musical analysis, but in its creation of atmosphere. Another theoretical consideration of how we engage with our ambient environment is to be found in Luke Jaaniste's *approaching the ambient*. Jaaniste proposes the notion of the 'ambient mode of being' which,

> […] involves a way of engaging with our urban surroundings that eschews the typical logic of foreground and background that grounds our daily and aesthetic lives. Instead, the ambient mode is an altered state in which we attune to the all-around-everywhere materiality of the surroundings […] There are four complementary ways of arriving at the ambient […] (i) *by way of concepts* – developing a theory of ambience and the ambient mode based on Heidegger's realms of world and earth; (ii) *by way of example* – charting practical shifts towards the ambient mode via minimalist [emptying], situationist [drifting] and serialist [patterning] strategies; and (iii) *by way of making* – experimenting in the various moments of creative practice, from in situ making to documenting, presenting and discussing. Most importantly, we also arrive at the ambient mode (iv) *by way of experience* – discovering our surroundings anew through ambient creative works.[8]

This diversity of thinking around musical, conceptual and environmental approaches to 'ambient' and 'ambience' is reflected throughout this collection of essays and demonstrate some of the ways in which consideration of these topics has developed since Eno's *Music for Airports*.

---

7 Morton quoted in Kim-Cohen, *Against Ambience,* 31.

8 Luke Jaaniste, *approaching the ambient: creative practice and the ambient mode of being* (PhD dissertation, Queensland University of Technology, 2007) accessed, May 11, 2019, https://sites.google.com/site/lukejaaniste/writings/phd.

The quartet of releases *Ambient 1–4* (1978–82)[9] presented a ground zero for ambient music challenging ideas of both compositional method and musical listening and perception in relation to our environment. Although its musical origins are often cited as stemming from Erik Satie's 'furniture music', John Cage's *4'33"* (1952), as well as early minimalism and the proto-ambient *kosmische musik* of Tangerine Dream, these four albums presented a fertile ground from which various aesthetic directions and musical trajectories have emerged. As with so many genres, there has been a clustering of activity around certain key proponents of the genre, Eno included, and certain practices and stylistic tendencies have emerged that have come to characterise much of the music produced under the 'ambient' label. At its best, ambient offers a rich musical experience that not only tints our environment but fundamentally changes the way we listen and engage with our surroundings. Lawrence English in his *12 notes towards a future ambient* writes that "Ambient is never only music for escapism. It is a zone for participation in a pursuit of musical listenership that acknowledges sound's potential values in broader spheres (the social, political, cultural etc.). It is a freeing up, an opening out and a deepening, simultaneously". For English, "Ambient is never only music. It is a confluence of sound, situation and listenership; moreover, it's an unspoken contract between the creator, listener and place, seeking to achieve a specific type of musical experience".[10] In its 'tinting' of the environment ambient engenders an individuated listening experience on each hearing.

However, in the forty years since Eno's release of *Music for Airports* our understanding of 'ambient' has developed and changed, musically, sociologically and environmentally. How we engage with sound has also

9 The albums in the Ambient series were: Brian Eno – *Ambient 1: Music for Airports*; Harold Budd and Brian Eno – *Ambient 2: The Plateaux of Mirror*; Laraaji – *Ambient 3: Day of Radiance*; Brian Eno – *Ambient 4: On Land*.

10 Lawrence English, "12 notes towards a future ambient," *FACT Magazine*, accessed May 11, 2019, https://www.factmag.com/2018/02/04/ambient-music-at-40-lawrence-english/.

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radically changed in this intervening time. Since *Music for Airports* and the exponential growth of releases that, to this day, shows no sign of abating, ambient music has, at times, been dismissed as musically deficient and merely functional. It has been seen as socially disengaged, and offering a false panacea of transcendence in an increasingly complex world. Seth Kim-Cohen in *Against Ambience* writes that "Ambience is an artistic mode of passivity. Its politics, that is, the kind of relation it fosters with the world in which it exists, is content to let other events and entities wash over it, unperturbed. Ambience offers no resistance".[11] Such critique is not helped by the 'subtle piano and soft electronics' blueprint of *Music for Airports* "1/1"and "1/2", used so effectively for ambient pieces as diverse as Deadmau5's "Luxuria" [12] and Ben Lukas Boysen's "Nocturne 4",[13] as well as being the staple format of manufactured Spotify mood lists.[14] Spotify's purported licensing of tracks by "fake artists" from Epidemic Sound to fill key playlists such as 'Peaceful Piano'[15] and 'Ambient Chill' at the expense of named artists has left many with a sour taste, and the concomitant feeling that this music has been devalued to the status of a corporate-designed mood sedative – a kind of tranquillised Muzak – rather than exemplifying Eno's original definition of what ambient could be.[16]

However, the fact that there are over five million subscribers to 'Peaceful Piano' and almost one million to 'Ambient Relaxation' on Spotify

11 Kim-Cohen, *Against Ambience*, 32.

12 Deadmau5, "Luxuria" from *Where's the drop*, (USA, Mau5trap Recordings – MAU50164V, 2018).

13 Ben Lukas Boysen "Nocturne 4" from *Spells* (London: Erased Tapes Records – ERATP085CD).

14 See https://www.vice.com/en_uk/article/8xabb3/spotifys-fake-ambient-artists-essay-free-radicals.

15 The 'Peaceful Piano' playlist has over 5,300,628 followers, with "false artists" such as Karin Borg's "Norrsken" having 60,130,570 streams as of May 13, 2019.

16 According to streaming analytics site ChartMetric, the biggest losers in all of this were non-fake ambient/electronic composers. For example, in February 2017, Spotify swapped out 16 tracks on its Ambient Chill playlist by the likes of Brian Eno, Jon Hopkins and Bibio for 28 songs connected to Epidemic Sound. See https://www.musicbusinessworldwide.com/fake-artists-still-dominate-spotifys-chill-playlists-now-real-artists-are-fighting-back-with-apple-music/ accessed May 13, 2019.

demonstrates a significant audience for such work. Anecdotal references to ambient decreasing anxiety or aiding study is borne out by academic research that demonstrates the effect this music can have. Of one study examining ambient music and well-being, Michaela Slinger writes that: "A study at Our Lady of the Lake Regional Medical Center in Baton Rouge determined that ambient music therapy had a positive effect on postoperative patients' recovery by improving pain management and decreasing the negative effects of environmental noise".[17]

Despite research that demonstrates the therapeutic benefits of ambient music and the obvious popularity of such online playlists, Christopher Fox, writing on fragility and resistance in contemporary instrumental music, notes that "[t]his is music which attempts to change the world not through the noise it makes but because, in making so little noise, it requires a change in the way the world pays attention".[18] Listening to a performance by Taylor Deupree and Ryuichi Sakamoto at St. John's, Hackney,[19] certainly seems to exemplify this.

Much of the ambient music produced today, whilst drawing on aspects of the blueprints outlined in *Ambient 1–4*, has little to do with music that occupies the threshold of the listener's attention. It is not a music that "foregrounds a devaluation of foregrounding".[20] Its recording and production quality, and depth of frequency content, demonstrate that this is a music that often aims at immersing the listener in sound. The sense of what ambient music is and its function has shifted in the intervening decades.

17 See https://www.scientificamerican.com/article/ambient-music-eases-pain/ accessed May 15, 2019.

18 Christopher Fox, "Fragility and Resistance," *Tempo* 71(281), 3-4.

19 See https://www.youtube.com/watch?v=0nJ3iKx2AMo for a recording of this concert.

20 Kim-Cohen, *Against Ambience*, 33.

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Although there have been a number of books about Eno himself[21] and the music he has created,[22] there are few books that attempt a critical evaluation of the genre. Mark Prendergast's wide-ranging *The Ambient Century* contains over 150 vignettes of composers and artists central to, and somewhat on the periphery of, ambient music in the twentieth century. Rupert Till's essay "Ambient Music"[23] unearths some fascinating insights into the origins of the genre in the context of a general history. David Toop's *Ocean of Sound*[24] weaves a poetic narrative of ambient sound throughout the twentieth century. In his book, Toop, who was the keynote speaker at the Ambient@40 conference, writes that ambient music "taps into the disturbing, chaotic undertow of the environment".[25] But it does more than that – or at least, perhaps, it should; Toop's chapter in this book poses a blunt question about the way ambient, and our relationship with it, sits in relation to the environment: "Does it supply a perennial refuge for temporarily forgetting the precarity, hysteria and threat of current conditions or can it be a vehicle for engaging with those same conditions?"

The essays in this volume provide a detailed focus on specific aspects of the aesthetics of ambience and ambient music. It is by no means a general reader akin to Mark Prendergast's book or a philosophically informed 'position statement' akin to Seth Kim-Cohen's *Against Ambience.* Although the conference grouped papers under sub-headings, this book is not so rigidly divided. Nevertheless, the reader will observe thematic groupings of chapters that consider 'ambient' from a number of differing perspectives.

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21 David Sheppard, *On Some Faraway Beach: The life and times of Brian Eno* (London: Orion Publishing Co., 2015).

22 See John T. Lysaker, *Ambient 1: Music for Airports* (USA: Oxford University Press - Oxford Keynote Series, 2018).

23 Rupert Till, "Ambient Music," *The Bloomsbury Handbook of Religion and Popular Music,* eds. Christopher Partridge and Marcus Moberg (London: Bloomsbury Academic, 2017).

24 David Toop, *Ocean of Sound* (London: Serpent's Tail, 2018).

25 Ibid., 36.

David Toop's keynote chapter opens this volume. It proposes an alternative discourse of ambient listening located within literature, notably in women writers and mystics including Margery Kempe, Jane Austen, Dorothy Richardson and Virginia Woolf. Toop draws on the work of philosophers such as François Jullien and Byung-Chul Han to argue for "ambient music as a state of mind attuned to inclusivity rather than an industry genre whose aesthetic integrity depends upon withdrawal." Ambrose Field explores the wider implications of ambient listening and what it means today in contrast to 1978. He has proposed that aligned to this change must come a reappraisal of both the soundscape and how listening processes are traditionally defined in order to account for increasing information complexity within ambient information environments. The aim of this chapter is to shift the focus of the discussion from the environment – a previous object of study for ambient music – to the people within it.

Richard Talbot and Ulf Holbrook consider ambient from the perspective of environment. Talbot specifically explores the nature and role of space, with regard to the way listeners inhabit and ambient simulates spatial habitats. Holbrook approaches ambient from its capacity to act in the background and recontexualise our perception of the foreground.

Simon Cummings seeks to recalibrate our understanding and definition of ambient according to the principle underlying Eno's philosophy and musical practice, encapsulated in the 'steady state'. In so doing, Cummings widens the sphere of both the genre's influence and our perceptual understanding of it, to include 'meta-ambient' forms of music-making. Monty Adkins examines atmosphere, fragility and noise as disrupters of this steady state, disturbing the surface prettiness that characterises so much ambient, thereby reintroducing Eno's notion of "doubt and uncertainty".

Lisa Colton and Justin Morey explore sampling in ambient house. Colton's gendered approach is especially revealing, detailing the ways in which female identity and empowerment have been undermined, exaggerated and misrepresented in music from the turn of the 1990s. Morey explores the

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extra-musical implications sampled materials bring to bear on a well-known track by The Orb.

Finally, Axel Berndt discusses the technological implementation of ambient music structures within computer game sound. This highlights an aspect of the liner notes to *Discreet Music* (1975) in which Eno describes a system that "once set into operation, could create music with little or no intervention on my part".[26] The generative and algorithmic aspect of this music is both symptomatic of a genre that can be reduced to a set of rules, entering the territory of Lejarin Hiller's *Illiac Suite* (1957) and more recently the AI musical *Beyond the Fence* (2016) by Nick Collins et al.[27] Such models highlight the contrast between 'lowest common denominator' ambient that can function well within game environments and more engaging and inventive examples of the genre that continue to develop the genre, and to which we are drawn again and again.

26 Brian Eno, liner notes from *Discreet Music*, (London, Obscure/Island Records – obscure no.3, 1975).

27 See https://www.theguardian.com/stage/2015/dec/01/beyond-the-fence-computer-generated-musical-greenham-common

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1

HOW MUCH WORLD DO YOU WANT?
AMBIENT LISTENING AND ITS QUESTIONS

David Toop

This essay examines the deeper implications of ambient music, its potentiality and shortcomings. As a musical form committed (implicitly or explicitly) to an engagement with interpretations and articulations of place, environment, listening, silence and time, how does ambient music negotiate the problematic nature of human-centred ecologies, the unbalanced politics of listening and the imperatives of hyper-productivity and self-realisation that are central drivers within neoliberal capitalist societies?

In particular, this essay proposes an alternative history/pre-history of ambient listening, locating an important but unacknowledged strand of experimental listening practice within literature, notably in women writers and mystics including Margery Kempe, Jane Austen, Dorothy Richardson and Virginia Woolf. This tradition, if it is a tradition, of the repressed made manifest, is also examined through the lens of a recent essay by Rebecca Solnit, in which she writes from a feminist perspective about silence as a symptom of the unspeakable, intimidation, the erased, the unheard and suppressed. Written for a time in which loudmouths dominate – women's voices are frequently shouted down through the ambient noise of social media and the intimacy of quiet is viewed as a weakness – Solnit counters and refreshes the overwhelmingly positive narrative of silence as openness or illusory state – 'there is no such thing as silence' – that has prevailed since the publication of John Cage's collected essays and lectures, *Silence*, in 1961 and the first performance of his proto-ambient 'silent' composition *4'33"* in 1952.

A different kind of silence, and by extension, ambient music, has the potential to affirm and redefine notions of intimacy in the era of ubiquitous

remote, disembodied connection via digital networks. As a music whose compositional methodology is founded in slowness, receptivity and the ambiguities of what is outside and what is inside, ambient music falls easily into evasions of its own potential to explore far more dynamic material, whether political, environmental or phenomenological.

Drawing on the work of philosophers such as François Jullien and Byung-Chul Han, this essay argues for ambient music as a state of mind attuned to inclusivity rather than an industry genre whose aesthetic integrity depends upon withdrawal.

Morton Feldman said: "Up to an hour you think about form but after an hour and a half it's scale".[1]

Late afternoon in September 2012, we – which is to say me and Hélène Breschand, the harp player I was working with at the time – walked along the shingle beach from Aldeburgh to Thorpeness. From the middle of the afternoon the bell-ringers of Aldeburgh Parish Church had been attempting a full peal, a test of concentration which must exceed 5,000 changes or permutations in the order in which the bells are rung.

As Thorpeness grew larger, Aldeburgh smaller, the peal receded, mixing with the soft fritinancy of grasshoppers woken into sound by autumn sun. As we approached Aldeburgh on our return, sometime later, the bells suddenly fell silent, mathematics resolved. I was interested to know more about the peal so looked it up online and quickly found myself plunged into bitter disputes about the bells, incomers and weekenders complaining that their leisure time in the expensive peace of coastal Suffolk was being ruined by this infernal durational noise of church bells. Form they could cope with but not scale. It reminded me of what a tug boat skipper once told me, that the 'yuppies', as he contemptuously called them, who lived in expensive apartments built on Thames-side sites where wharfs once thrived, complained about the noise of river barges bumping together in the night.

1 Paul Griffiths, *Modern Music and After* (New York: Oxford University Press, 2010), 280.

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Two weeks after the Aldeburgh experience I discovered a curiously haunting image within a book I had studied at school in 1966. George Ewart Evans' social history of Suffolk agriculture in the 1950s, *Ask the Fellows Who Cut the Hay*, failed to excite my interest when I was a teenager but now I was in my sixties, more alert to the strangeness of such things, the image leapt from the page:

> But if a company of men was threshing, the work was much easier, simply because they were together at a shared task. They also had certain devices for relieving the monotony. If the company was all bell-ringers they stood round the threshing floor, which was usually made of elm, and they rang the changes with the flail, in exactly the same rhythm as they did in the steeple with the bells, all coming in their proper turn, and changing and changing about at a signal from a leader. From a distance this rhythmic beating of the elm floor made an attractive simulation of the bells.[2]

If this sounds somewhat reminiscent of the rhythmic and percussive vocalisations of African-American work songs and prison songs (the type recorded by Alan Lomax in the southern states of America almost contemporaneously with Evans' researches), then a remark made to Evans by an elderly farm worker underlines the link: "Threshing was real, downright slavery".[3]

This transposition is very interesting. An ambient sound of bells whose purpose is loudness – because rooted in community and calling and gathering from distance and marking all the rituals appropriate to its architectural source, which is the rural church and its physical high point, so worship, births, marriages, deaths and the liturgical year – is aligned with mathematics

2 George Ewart Evans, *Ask the Fellows Who Cut the Hay*, (London: Faber & Faber, 1965), 96-97.

3 Ibid., 96.

and teleology, then transformed into a muted, enclosed version of itself in order to make tolerable that gruelling physical labour that contributes to the sustenance of the parish and its central, symbolic point, the bell tower.

All of this – the bells, the flails and Feldman's notion of duration – homes in on a complicated kind of ambient music that lends itself to understandings about how sounding signifies within social formations, labour, ecologies, spiritual life, auditory space and human perception. It also tells us about change, those fellows who cut the hay having long ago been replaced by machinery and the church bells in their locked towers entered into sharply contesting views of what purpose the picturesque countryside serves for its current inhabitants, both temporary or permanent, not to mention the question of who in the twenty-first century is prepared to listen to a single piece of music in excess of ninety minutes in duration.

Capital-A ambient as a popular music genre affords us fewer insights, I would argue. Last year *Pitchfork* magazine asked me to write an introductory essay for an ambient top hundred they were about to unleash. I declined and when I saw the hundred choices felt glad I had. A lot of it was genre ambient, industry ambient if you like, very little to do with the softening expansions of boundaries I was proposing in *Ocean of Sound* in 1995 and nothing to do with the field of possibilities that existed when I recorded for Brian Eno's Obscure label in 1975. There was no such thing as an ambient genre then, though his curating of the label wound a number of diverse threads into a pattern that intimated a genre, and ultimately led to one. So the question now is what ambient means at this point in time. Is it ossified, cut off from change, eternally fixed as journalists' shorthand for any droning, slow, dreamy, drifting, barely changing, consonant electronic music? Does it supply a perennial refuge for temporarily forgetting the precarity, hysteria and threat of current conditions or can it be a vehicle for engaging with those same conditions?

The first wave official ambient, Brian Eno style, had ideas about music as a tint, an ignorable background. That seems to me increasingly problematic when so much music is now diminished to the level of a design feature, a

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shadowing of life as opposed to something that burrows inside us, shifting emotional glaciers and vibrating ossified ideas, forcing us to move from form to scale, to take harshness alongside smoothness or any of the other ways in which music can push us beyond assumed or imposed identities.

The word 'ambient' refers to the immediate surroundings of a thing and so ambient music is often conceptualised as a landscape, an environment – think of Brian Eno's *Ambient 4: On Land*, or some of its many ancestors, records like Basil Kirchin's *Worlds Within Worlds*, *Alien Bog* by Pauline Oliveros, Sun Ra's *Moon Dance*, John Cage's *In a Landscape*, Alvin Curran's *Songs and Views From the Magnetic Garden*, Gail Laughton's *Pompeii 76 A.D.*, Les Baxter's *Sunken City*, Richard Maxfield's *Pastoral Symphony*, *Winter Trees* by Terry Jennings or Jon Gibson's *Visitations*. All these pieces are about place, a place or environment known or imagined into being. Their creators aspired to be ramblers, birdwatchers, historians, past-life regression therapists, mediums, landscape painters, astronauts, topographers, hauntologists and psycho-geographers; sometimes all at once.

These days anything remotely ambient is described with R. Murray Schafer's term, 'soundscape', a way of conceptualising both listening practice and music-making as being in relation to environment-as-landscape. From this model, 'listener' is reduced to a compass point within a map, rather than a spongy, extendable invisible cluster of audition events within an indeterminate field of sounding potentials. This word, 'environment' – we have to think about how it acts upon us. Is it thought about as nature, as an external field, something within the scope of the eye or range of hearing, complex and tangible, 'out there' beyond the body or sociality or however we think of consciousness? If so, what is its extent, what does it include or exclude, what does it allow or disallow? Things are not always what they seem. Brian Eno's *Music for Airports*, for example, is not really for airports; it's for people who don't want to be in an airport. The purpose was, to quote Eno,

"to induce calm and a space to think".[4]

So ambient was instrumentalised – it was conceived as a functional asset to well-being, an optimisation or facilitation of a thoughtful, tranquil approach to life – and given the fractious, stressful nature of most airports, any calming instrument is welcome. The music's potential for this role is unsurprising. Ambient formed its own specialised branch, off-shooting sometimes in a reactive way, sometimes more benevolently, from a family tree that included yoga, relaxation and meditation tapes, Muzak, easy listening, background and library music and records of bird song aimed at ornithologists, the ultimate use-value lineage.

The same criticism, if it is a criticism, of instrumentalisation and self-optimisation could be levelled at other genres, maybe all genres of music. Disco music's stated purpose – the name is a clue – was to make people dance in clubs. At its peak, nearly 40 years ago, how had this purpose evolved? It had become escapist, a pressure valve, a conduit for hedonism, a spectacle of consumption and decadence. But within the early-1970s origins of disco (and this has parallels with the ancestry of ambient) there was a far more dynamic, unfixed potentiality, as yet without a name but definitely possessing a purpose, which was to create a clandestine space in which gay men could gather together and dance to the kind of music they liked. Each record chosen in those early days defined a territory without being of that territory – in other words it was made for another territory but like the transformation of bell ringing into threshing, it was coerced into a new one in order to make life tolerable. To be versed in the identification and delineation of that territory required the skills of a listener, not just a listener to the formal attributes and atmospheres of music tracks but a listener sensitive to the codes and lore of a clandestine group. This inchoate moment is surprising, rich, unstable, contradictory and vulnerable. In response to vulnerability other forces assert

4 Brian Eno, "Ambient Music", liner notes from the initial American release of *Ambient 1: Music for Airports* (PVC 7908 (AMB 001), 1978).

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themselves – professionalism, commerce, a less nuanced set of social needs and desires – and so the soft skin acquires a carapace.

I would like to prise open this carapace now to investigate the implicit nature of ambient. Ambient music – at least as I understand it – is predicated on ambient listening. By ambient listening I mean listening that projects far beyond the territory of a bounded, individualistic entity, the selfish being who sites itself at the centre of the universe. According to this definition the ears are not passive organs of reception, two penetrated holes in the protective crust that surrounds neurological and other biological work. Let us try to think differently about this, with listening taking the metaphorical shape of an octopus being whose intelligent, sensitive tendril extensions forage in worlds both close and distant, suckering themselves around whatever sound events are compelling, promising, unavoidable, enticing, seductive, nutritious.

Maybe this pixelates reductive ideas of listening as mechanistic – a physical reflex – or intrusively pornographic; maybe it zips around the irresolvable and moralistic duelling between listening and hearing in which one or the other is perceived as being more conscious, more discerning, more industrious and *intelligent* than the other. Those octopus tendrils are always reaching out into the unknown. It is just that some have a very short reach, a quick return to the *me* person, and others are stretchy, flexible, good suction, lively with curiosity and open to entanglements and entwinement.

If we want to increase our knowledge of histories of ambient listening, then we have to go back further than recording. Writing is one of the primary archives. Women's literature is revealing, partly because women's sounded voices were (and often still are) restricted, particularly in relation to politics and power, sex, money, property, social policy, philosophy and all other matters cordoned off within the domain of men. Elizabeth Bennett, who breaks many of the rules of expected behaviour in Jane Austen's *Pride and Prejudice*, is sardonic on the art of polite conversation between a man and a woman both unmarried: "One must speak a little, you know," she says to Darcy. "It would look odd to be entirely silent for half an hour together, and

yet for the advantage of *some*, conversation ought to be arranged as that they may have the trouble of saying as little as possible".[5]

We should remember that the earliest surviving autobiography written (or dictated, to be more precise) in English was by a woman – Margery Kempe, a fourteenth to fifteenth century voice hearer and Christian visionary from Norfolk who spoke extensively about her auditory visions. This is one particularly ambient passage:

> This creature had various tokens in her hearing. One was a kind of sound as if it were a pair of bellows blowing in her ear. She – being dismayed at this – was warned in her soul to have no fear, for it was the sound of the Holy Ghost. And then our Lord turned that sound into the voice of a dove, and afterwards he turned it into the voice of a little bird which is called a redbreast that often sang very merrily in her right ear.[6]

Margery Kempe struggled with this condition of overhearing, unsurprisingly – she was hearing strange, beautiful and sometimes 'terrible' melodies out of thin air or her dreams, a variety of voices and these transforming ambient sounds, rushing air to dove to robin, all of them ambiguous in their source though specific to one ear, as if one ear was reserved for the real, the other for auditory hallucinations. Did they come from outside or inside or both, and if both, what can we do with this word 'ambient' which separates an outside from an inside?

Setting aside their stature as great writers, this silencing is what makes it revelatory to read Jane Austen, George Eliot, the Brontë sisters, Dorothy Richardson, Mary Butts and Virginia Woolf. In many aspects of their lives they were silenced, compelled to listen, or their voices were demanded within a narrow bandwidth on specific, circumscribed occasions or restrictive domestic

5 Jane Austen, *Pride and Prejudice* (1813) (Ware: Wordsworth Classics, 1993), 79.

6 Margery Kempe, *The Book of Margery Kempe* (London: Penguin, 2004), 127.

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settings, so their perception of silences and sounding was acute, often profoundly subversive. "I've seen you *ill* with boredom," wrote stream-of-consciousness pioneer Dorothy Richardson in *Revolving Lights*, published in 1923.

> You hate silence and you hate opposition. You always think people's minds are blank when they are silent. It's just the other way around. Only of course there are so many kinds of silence. But the test of everything in life is the quality of the in-between silences. It's only in silence that you can judge of your relationship to a person.[7]

As Annika J. Lindskog has argued in her essay, *Dorothy Richardson and the Poetics of Silence*, this belief in the centrality of in-between silences extended to her sense of self, an emergent understanding out of silences that stood in conflict to the framing of experience through written and spoken language. Richardson's life's work was called *Pilgrimage*, a vast semi-autobiographical novel in thirteen parts based around a character named Miriam whose life is a transcription of Richardson's own. Full of Proustian memories of listening, it sparkles with passages in which she imagined and wrote of playing with ambient sound, audibility, voices, silences, music, audio technology and the emotional resonance of acoustic spaces with a sensibility that can feel startlingly modern. This passage from *Deadlock*, published in 1921, is typical of her iconoclastic attitude to listening and her frustration with the conservatism of others:

> I used to go down to meals just to be in the midst of the noise. You never heard anything like it in your life. If you listened without trying to distinguish anything it was *marvellous*, in the bright sunshine at breakfast. It sent you up and up, into the sky, the morning stars singing together. *No*. I mean there was something

7 Dorothy Richardson, "Revolving Lights" (1923), *Pilgrimage 3*, (London: Virago Press, 2002), 389.

> wonderful about it. It reminded me of the effect that almost comes when people decide to have a Dutch concert. You know. All singing different songs at the same time. It's *always* spoilt. People begin it not prepared to hear the whole effect. I did. I did not realise there would be a wonderful whole. And always just as the effect is beginning, two or three people break down because they cannot hold their songs, and some laugh because they are prepared only to laugh, and the unmusical people put their fingers to their ears, because they can never hear *sound*, never anything but a tune. Oh, it would be so wonderful, if only it could be really *held*, every one singing for all they were worth.[8]

Throughout *Pilgrimage*, Lindskog writes,

> […] silence is celebrated as a strength, a quality of life that in the end it would be impossible for Miriam to do without. Silence enables, communicates and reveals truth. Yet, silence in Richardson's text also often represents the unknowable: those aspects of existence that move beyond language and that even when grasped and briefly held by Miriam seem to remain hidden from the reader.[9]

Think of the number of women in Jane Austen novels obliged to play the piano as ambient interludes in the insufferably stilted cultural deserts of eighteenth-century country house sociality. Brian Eno's stated desire (in his liner notes to *Music for Airports*) to create a music that is as ignorable as it is interesting was preceded by Erik Satie's frustrated aim to compose ignorable background music. His *Musique d'Ameublement* pieces (furniture or furnishing music, composed between 1917-23) were intended, as far as

8 Dorothy Richardson, "Deadlock" (1921), *Pilgrimage 3*, (London: Virago Press, 2002), 123.

9 Annika J. Lindskog, "Dorothy Richardson and the Poetics of Silence," *Pilgrimages: A Journal of Dorothy Richardson Studies*, no. 5, (2012), 34.

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can be inferred, given Satie's dry wit, as functional or useful music for specific occasions. "Furnishing music played the same part as heating and lighting, as comfort in all its forms," Satie biographer James Harding wrote. "It should be supplied in public buildings, in lawyers' offices, in banks. No marriage ceremony would be complete without furnishing music".[10] During his first experiment in putting the idea into practice, Satie ordered people to talk, keep on talking, keep moving, above all, do not listen, yet they were befuddled by such a paradoxical demand.

The great houses of Regency England would have proved more fertile ground for Satie. A melancholy passage in Jane Austen's *Persuasion* demonstrates the true emotional costs of indifferent listening:

> She played a great deal better than either of the Miss Musgroves, but having no voice, no knowledge of the harp, and no fond parents, to sit by and fancy themselves delighted, her performance was little thought of, only out of civility, or to refresh the others, as she was well aware. She knew that when she played she was giving pleasure only to herself, but this was no new sensation. Excepting one short period of her life, she had never, since the age of fourteen, never since the loss of her dear mother, known the happiness of being listened to, or encouraged by any just appreciation or real taste. In music she had always used to feel alone in the world.[11]

The pianoforte looms – furniture embodying wealth, accomplishment, transactional love-object, opportunity for intimacy, the feminine as diversion – its monolithic stasis symbolic of conspicuous expense, not least the expense of moving such a thing. Austen wrote in *Sense and Sensibility*:

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10 James Harding, *Erik Satie* (London: Secker & Warburg, 1975), 197.

11 Jane Austen, *Persuasion* (1817), (Ware: Wordsworth Classics, 1993), 35.

> The furniture was all sent around by water […] It chiefly consisted of household linen, plate, china, and books, with a handsome pianoforte of Marianne's. Mrs John Dashwood saw the packages depart with a sigh: she could not help feeling it hard that as Mrs Dashwood's income would be so trifling in comparison with their own, she should have any handsome item of furniture.[12]

Property, objects and fortunes are the tangibles (and tangible intangibles) around which Austen's complex narratives are spun yet their dynamic environment is tightly focussed on the volatility and transience of listening. John Wiltshire writes in *The Hidden Jane Austen*:

> Jane Austen's is not a highly visual world but it is, by way of compensation, an intensely and intricate aural one. This is not because Jane Austen often defines or describes the tones in which her characters speak, since this is far from the case: in this too she is a minimalist. Just as the reader must often impute their tones, or imaginatively 'hear' how a character speaks, the effects of spatiality in her novels are imperceptibly present, implicated, left to be garnered or absorbed through the reader's imaginative osmosis.[13]

In reference to Anne Elliot, a character in *Persuasion*, Wiltshire writes a chapter devoted to her 'ambient world' and the frequency with which overhearing is pivotal and inevitable within such a world.[14] To understand what is going on we have to intuit and construct the ambient environment within which conversation and other sounds (including music and the unsaid), their silences, misunderstandings, settings and transactional objects are deployed. Think of

12 Jane Austen, *Sense and Sensibility* (1811) (Ware: Wordsworth Classics, 1992), 18.

13 John Wiltshire, *The Hidden Jane Austen* (Cambridge: Cambridge University Press, 2014), 125.

14 Ibid., 147.

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the harp in Austen's *Mansfield Park*, so ambient in its dissolving into romantic purpose and the pleasurable ambience of a scene that it becomes as ambient as the sandwiches. As Austen wrote in her signature style, the sardonic easily confused with the sincere, tensions easily mistaken for elegance:

> A young woman, pretty, lively, with a harp as elegant as herself, and both placed near a window, cut down to the ground, and opening on a little lawn, surrounded by shrubs in the rich foliage of summer, was enough to catch any man's heart. The season, the scene, the air, were all favourable to tenderness and sentiment. Mrs Grant and her tambour frame were not without their use; it was all in harmony, and as everything will turn to account when love is once set going, even the sandwich tray, and Dr Grant ng the honours of it, were worth looking at.[15]

The scene is picturesque, an image of completion in which music is both central and superfluous. The ambience *is* the music; music, its perceived function, environment and the identity imposed upon its performers are so entangled as to be inseparable. We can imagine it as a silent tableau or installation, conforming to the ancient Chinese Taoist ideal of the best harp being a silent harp, as described in François Jullien's study of Chinese thought and aesthetics, *In Praise of Blandness*. Jullien quotes a passage about a poet, Tao Yuanming, who owned a zither without strings. Whenever he drank wine he would touch the soundless instrument, that being sufficient to "express the admiration of his heart".[16] "The poet did not have to 'trouble himself' to produce individually each note 'from above the strings'," writes Jullien, "The body of the instrument contains, within itself and at the same

15 Jane Austen, *Mansfield Park* (1814) (London: Alma Classics, 2016), 51.

16 François Jullien, *In Praise of Blandness: Proceeding from Chinese Thought and Aesthetics*, trans. Paula M. Varsano (New York: Zone Books, 2008), 77.

time, all possible sounds (the very image, of course, of the Dao)".[17]

I also think of Marcel Proust, whose upstairs neighbour – Mme. Marie Williams – played the harp. Proust apparently never heard her play. His letters to her were exquisitely polite yet contain pained entreaties to keep the noise down, not of music but of abject ambient sounds like carpet beating, heating boilers, plumbers and building work, all of which kept him in bed in various states of angst and asthma. This is an extract from his letter of November 1915:

> How right I was to be discreet when you wanted me to investigate whether the morning noise was coming from a sink. What was that compared to those hammers? 'A sliver of water on moss' as Verlaine says of a song 'that weeps only to please you'. In truth, I cannot be sure that the latter was hummed in order to please me.[18]

Proust's hypersensitivity is legendary but his aversion to disruptive sounds, what we would call misophonia, or selective sound sensitivity syndrome, did not prevent him from writing extraordinary accounts of disturbing ambient sounds: air passing through the bronchial tubes of his dying grandmother, the passage of her breath so altered by the administration of oxygen and morphine that its sound was mistakenly heard by him as a long, happy song.

The world crowds in, teeming, irrepressible. Proust articulated the associative potential of even the most banal sense impression – an annoying or repetitious sound, for example – to become embedded as a trigger and trace of memory. He wrote about a newly-installed heating boiler whose disagreeable sound – a sort of spasmodic hiccup, he called it – forced itself into affinity with the memories of a particular place; whenever he heard the central heating he would remember the place and the afternoon spent in bed listening to its sound.

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17 Ibid., 77.

18 Marcel Proust, *Letters to the Lady Upstairs*, trans. Lydia Davis (London: 4th Estate, 2017), 30.

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Silence is central to the discourse of ambient. Its tinting of the atmosphere is implicitly on a threshold of hearing those near-imperceptible events that constitute each moment of being, seeping into the state we describe as silence but always a variant on other silences. As Dorothy Richardson wrote, there are so many kinds of silence. Unavoidable in its ancestry is John Cage's *4'33"*, a musical form that spoke *to* listening in the same way that writers could speak *of* listening, not with orchestral imitations of a robin singing, a dying breath, a heating boiler, but by opening, then closing, a space in which the ears could forage for heating, breathing or whatever was there, unnoticed and largely unloved.

In her book, *The Mother of All Questions*, Rebecca Solnit talks about the history of silence as being central to women's history. She writes:

> Silence is golden, or so I was told when I was young. Silence equals death, the queer activists fighting the neglect and repression around AIDS shouted in the streets. Silence is the ocean of the unsaid, the unspeakable, the repressed, the erased, the unheard. It surrounds the scattered islands made up of those allowed to speak and of what can be said and who listens. Silence occurs in many ways for many reasons; each of us has his or her own sea of unspoken words.[19]

This makes a refreshing change, a rude jolt perhaps, from the familiar discourse, post-*4'33"*, in which silence is so often non-existent, a phantasm, nostalgically lost, exalted and idealised as a perfect state. Solnit continues:

> English is full of overlapping words, but for the purposes of this essay, regard *silence* as what is imposed and *quiet* as what is sought. The tranquillity of a quiet place, of quieting one's own mind, of a retreat from words and bustle, is acoustically the same as the

19 Rebecca Solnit, *The Mother of All Questions: Further Feminisms* (London: Granta, 2017), 17-18.

> silence of intimidation or repression but psychically and politically something entirely different […] The quiet of the listener makes room for the speech of others, like the quiet of the reader taking in words on the page, like the white of the paper taking ink.[20]

Listening is intimacy. A real ambient music, which is to say an adventurous, truthful ambient music, would engage with this intimacy to explore its potential. This would be a music of ideas as opposed to a music which mimics a very specific sound. We live in a time when loudmouths prevail and to be a listener is to be derided as a snowflake, to be slow or weak or ineffective. There is something of ambient music in this – its quietness, continuity, consonance and softness – but to listen quietly in relation to the harshness, ugliness and injustice of the fragmented world is the real test. That, and the strategy of response. What kind of ambient music can speak back to hostility, collapse?

Silence, this multi-dimensional, contradictory ambient state, can be comfort from within the grip of mourning, as in this passage from Han Kang's book, *The White Book*. She has written about her mother's loss of two premature babies. Now she writes this:

> When long days finally come to a close, a time to be quiet is needed. As when, unconsciously in front of a stove, I hold my stiff hands out to the silence, fingers splayed in its scant warmth.[21]

We speak about ambient lighting and ambient temperature but what is ambient time? Ambient time is the feeling of activity, duration, imperatives and endings happening in a moment and place, radically different in a railway station, boxing gym, hammock, maternity ward or care home for the elderly, radically different according to whether you are ringing the bell or in the ring,

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20 Ibid., 17-18.

21 Han Kang, *The White Book*, trans. Deborah Smith (London: Portobello Books, 2016), 153.

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radically different according to whether it is warm or cold, dark or light, alone or with others, in danger or stoned, young or old.

Time is a word to describe chaos, kept under observation with light, dark and seasonal cycles, kept in check with clocks, timers, alarms, apps, schedules, deadlines and words like 'time', cleverly articulated, subverted and elaborated by music (time's enforcer, all too often). Ultimately, time is death and decomposition, arguably the engine that drives us. There are times when I turn to the kind of ambient music that aspires to the condition of stasis. Momentarily it can feel like the warmth of a stove on a freezing day but the lack of any significant change in the music comes to symbolise a hopeless battle against fluctuations of fortune or death itself. This is not about slowness or duration. To be still is one thing; to be immobile another. Stillness accepts decay; stasis rejects it and so comes to lack vitality or relevance. Like the stove, it offers scant warmth.

François Jullien talks about the silent transformations of change, the way in which we do not see growth in trees or children, only see the stage when they are bigger. Nor do we clearly see age in ourselves, only see the change from an old photograph. But why, with so much talk of seeing, are they silent? This is what he says in *The Silent Transformations*:

> In fact, 'silent' is a more precise word to use in this respect than invisible, or rather it is more telling. Because not only is this transformation in process, even if we do not perceive it, but it operates without warning, without giving an alert, 'in silence' without attracting attention, and as though independently of us: without wanting to disturb us, it might be said, even when it continues on its way within us until it destroys us.[22]

22 François Jullien, *The Silent Transformations*, trans. Michael Richardson and Krzysztof Fijalkowski, (New York: Seagull Books, 2011), 3.

A musical equivalent of this might be Ryoko Akama's recording 'Jiwa Jiwa', created on the Max Brand synthesiser and released on *Code of Silence* in 2014. The piece is founded in an aesthetic that arises not from duration but the complexity of listening and its context and conditions. She translates "Jiwa Jiwa" as "slowly but certainly happening", giving the example of finding a water leak coming through the ceiling, the stain gradually growing in circumference: "You might say – it is getting jiwajiwa there, water is permeating jiwajiwa".[23] So the sound is a type of sculpture (maybe a little like the slower kinetic sculptures of the 1960s by Pol Bury, Gerhard von Graevenitz and David Medalla). Change is taking place but at a rate that is hard to discern, closer to stasis than movement but definitely moving, the ending very different from the beginning. A kind of silent transformation.

Music is a negotiation with chaos. All events are negotiations with chaos but in the realm of human affairs, music seems more acutely so because it deals in the shaping of intangibles, swirling invisibles, subtle feelings and abstractions like time, sound waves and pressure.

"Music is kinship," is a phrase I came across in *Burst of Breath*, a collection of ethnomusicology papers about ritual wind instruments in lowland South America.[24] In my interpretation, this means that music offers alternate formulations of relations within a world in which, hypothetically, all relations might be upturned or even non-existent. By defining itself in relation to ambience, environment, surroundings and the dilemma of what is inside and what is outside, ambient music situates itself quite clearly in this negotiation with chaos. In an ideal world, an ambient musician is asking big questions: what is me; where are my boundaries; what is my music and what is the world's music; is that non-human sound from outside now my sound or is it

23 Ryoko Akama, email to author, March 1, 2014.

24 Jean-Michel Beaudet, "Mystery Instruments," in *Burst of Breath: Indigenous Ritual Wind Instruments in Lowland South America* (eds.) Jonathan D. Hill and Jean-Pierre Chaumeil, (Lincoln: University of Nebraska Press, 2011), 383.

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a chunk of non-humanness making me only partly human? Can it open up my empathy for all those entities, objects and phenomena that are not me?

What do we look for or hope for? We look for stories that can sustain us. If chaos in audio culture is either silence or noise, or an exploratory breakdown in the distinction between inner thought and sound perception and outer sound, then ambient music is full of potential to tell us of great wonders and discoveries brought back from this field of uncertainty. Or are ambient composers, as I wrote in 1995 in *Ocean of Sound*, "mere functionaries, slaves to cool the brows of overheated urban info-warriors",[25] a question that has accumulated far greater force in the present situation, the one we find described by philosopher Byung-Chul Han in *Psychopolitics*: "Now, productivity is not to be enhanced by overcoming physical resistance so much as by optimizing psychic or mental processes".[26] If ambient music only serves as an app to incentivise or a backdrop to productivity, networking and self-realisation, then it has no story of its own, no story worth hearing.

25 David Toop, *Ocean of Sound*, (London: Serpent's Tail, 1995), 279-80.

26 Byung-Chul Han, *Psychopolitics: Neoliberalism and New Technologies of Power*, trans. Erik Butler (London: Verso, 2017), 25.

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SPACE IN THE AMBIENCE: IS AMBIENT MUSIC SOCIALLY RELEVANT?

Ambrose Field

Today, nearly every space that can be filled with digital content *is* filled with digital content. Even contemplative personal reflective time can now be digitally mediated. This is a different world from the one where the idea of 'ambient music' first emerged. In the 1970s and early 1980s, our 'ambient environment' featured no augmented reality overlays, fewer opportunities for distracted attention (unless they were deliberately sought out), and a vastly reduced need for personal multitasking. Then, fewer situations required a high degree of context switching to address incoming information from sources other than those which we have immersed ourselves in out of choice, and ambient music, as an idea, was born within those environmental and cognitive conditions. Now, new definitions of embodied cognition have demonstrated that our ambient environment is crucial for understanding the world through non-mediated forms of information, yet the idea initially behind much historical ambient music was one of inhabiting a space in our perception through which the un-mediated could be addressed. By defining historical ambient music as an 'information overlay' itself where a surrounding environment is displaced temporarily and overlaid with new information (as with an augmented reality), an alternative trajectory of development can be mapped out. Why do we now create specific environments for ambient music listening, rather than allowing ambient music itself the chance to occupy those situations? Has the embodiment brought about by increasing interaction in public ambient art, through technological processes, changed how we respond to artistic material embedded in our own day-to-day ambience? This chapter performs an experimental re-assembly of the situated components

of ambient music, originally inherited from a pre-internet, pre-information society. It provides an assessment of the relevance of 'ambient' as an idea in a world where space in the ambience is already at a premium.

Peripheral information and musical genre

When we think of ambient, it is easy to imagine a type of time where what constitutes 'the present' feels fluid. In ambient time, seconds merge into perceivable moments and boundaries between the past and future dissolve. Today, information provision has ended this type of contemplative now, creating a feeling of the 'perceptual present'.[1] Updates roll in and news feeds proliferate as live video and media from the world arrive at our personal devices. Meanwhile, a new sense of information richness in the perpetual present is changing definitions of the timescale and social reach[2] of our ambient environment. If the framework behind the ambient environment has changed, then what has happened to the music? Has ambient music become aligned more to the past and the cultural values it grew up in, rather than the present? If so, should we seek to reassess the relationship between today's ambient environment and today's ambient music?[3] I will explore this argument in three stages:

- Part one explores the notion of ambience as an environment, and examines existing models for describing soundscapes and listening processes;
- The second part of this chapter challenges the traditional approaches presented in part one by re-thinking ambience as a dynamic and personal quality, rather than as an environment to be observed.

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1 Frederic Jameson argues that this information influx is ending a sense of history from a post-modernist perspective. Frederic Jameson, "Postmodernism and Consumer Society," in ed. Simon Malpas, *Postmodern Debates* (London: Macmillan Education UK, 2001), 22–36.

2 Defined here as the domain in which the ambient environment carries influence in our everyday lives.

3 This is done with a view to re-evaluating the perception of how ambient music fits within today's ambient information environment. This study is not a discussion surrounding changing public taste.

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Musical examples are given from artists seeking to engage with environmental sound in non-traditional ways;

- Thirdly, the idea is presented that ambient space is itself a non-located and embodied concept.

The aim of this chapter is to shift the focus of the discussion from the environment – a previous object of study for ambient music – to the people within it. In determining if there is space in the ambience today for ambient music we need to start by re-assessing the idea of the peripheral, as traditionally, peripheral surroundings play a large (but not exclusive) part in determining a sense of ambience. The word peripheral carries connotations of irrelevance[4] together with a hierarchical discrimination between what is in the forefront of our attention and what falls outside of it. Such a description has a resonance with the positioning of early ambient genres as a type of music that could occupy both the background and foreground of attention. In doing so, a generic view that this music could be stateless and non-invasive began to emerge.[5] Distilled by history, and re-purposed for commercial application, such ambient ideals from the 1970s have become lodged in the semiotics of ambient music genres which exist today. To provide this pervasive, stateless quality, the use of materials such as drones and long looped structures aided a growing perception that there was just one type of ambient music. Have the values from a traditional, common practice reading of 'peripheral' become genre-defining qualities?

Over time, an alignment between such stateless and non-invasive music, and the idea of minimalism, emerged. This proximity also makes it easy to perceive ambient music, as a genre, as being minimal or minimalist. However, such a reading is an artefact of a past time where what was considered to be

4 The Oxford English Dictionary includes 'Of secondary or minor importance; marginal' among the definitions.

5 Satie's *Furniture Music* as reviewed in Hervé Vanel, *Triple entendre: Furniture music, muzak, muzak-plus* (Illinois: University of Illinois Press, 2013).

an 'ambient environment' functioned in a correspondingly simpler manner. Ambient today is not necessarily about minimalism (as a style rather than an aesthetic) but rather, our relationship with the environment. In associating minimalism with ambient music (both terms are used here in the most generic sense) we are dealing with a complex set of contradictions, resulting from overlaps between genres, artistic practices and methods. This chapter introduces ideas that challenge these dynamics in the light of contemporary theories of embodied cognition, the spatial self, and subject-centred organisation. It is necessary to separate the concept of the ambient environment as an information system from the idea of ambient music as a genre. Having done this, we can trace the relative distance between these ideas through history, ending with the proposition that ambient music as a genre has diverged from how the ambient information environment operates today. Daniel Siepmann discusses the nature of interaction between environmental surroundings and music, demonstrating the fragility of the link between genre and environmental surroundings:

> If we put on a record and then proceed to read or engage in other distracting activities, any music may easily be described as ambient, filling the space with sound that we seem to appreciate and enjoy, yet to which we are not quite listening. Thus, the idea of ambient music not only relies on the internal qualities of the music but also the utility that the music holds for the listener.[6]

To understand the human relationships and perceptual processes contained within what is broadly termed ambient music it is necessary first to break any assumed link between genre and environment. In Brian Eno's work, the qualities of site, place, and the actual ambience this music typically inhabits (either in reality or in our imagination) are those of a generalised

6 Daniel Siepmann, "A Slight Delay: Agency and Improvisation in the Ambient Sound World," *Perspectives of New Music* 48 no.1 (2010): 173–199.

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and homogeneous environment. For example, *Ambient 1: Music for Airports* (1978)[7] and *Ambient 4: On Land* (1982)[8]: despite the titles, these pieces are not about specific locations. They function so well because they are non-prescriptive in location, thereby generating a space for the listener's imagination. Conceptual links emerge between the idea of environment as a mass and undifferentiated identity – tagged with a specific set of labels and characters – and the techniques and processes related to minimal musics. Whilst it might be convenient to align environmental sound and minimal music practices, the information systems underpinning minimal music design and environmental perception are not at all the same or even analogous. In the 1970s, ambient visual information displays, ambient audio display, and immersive technologies were present, but in their infancy. Personal ambient space – a factor which I will argue later is key to how we perceive ambient information – had a different relationship to public space than it does today. Today, ambience is filled with digital content on a significant level: even personal reflective time can be mediated by apps and the small details of daily existence – previously forgotten – can be monitored, logged and analysed as a global corpus of data (such as in digital health applications). Ambient information inhabits a new dimension of what I term the 'public data ambience', where local-scale personal source data is available to relatively few people, yet the effects and implications of the public data ambience are global. The ambient information environment today is information-rich: a stark contrast to the one in which I will now term 'historical ambient music' was first presented. R. Murray Schafer, in his introduction to *The Tuning of the World* notes that "the ear demands that insouciant and distracting sounds would be stopped in order that it may concentrate on those which truly matter".[9] Today, what was insouciant and distracting in 1977 when *The*

7 Brian Eno, *Ambient 1: Music for Airports*, (LP) (London: Editions E.G. - AMB001, 1978).

8 Brian Eno, *Ambient 4: On Land* (LP) (London: Editions E.G. - EGED 20, 2335 228, 1982).

9 R. Murray Schafer, *The Tuning of the World*, (New York: Alfred A. Knopf, 1977), 12.

Tuning of the World was first published may in fact be part of the richness of the contemporary sound environment.

The pervasive ambience

Jean-Paul Thibaud introduces the idea of pervasive quality, tracing the notion back to Dewey's philosophy on situation. Thibaud uses the idea of pervasive quality as a perceptual short-hand for describing ambience through the least amount of information possible. Pervasive quality then is very much like a label or a tag by which the components of an ambient environment might be bundled together in order to humanly recognise and assess them. Thibaud writes:

> […] Dewey introduced the notion of 'pervasive quality' (Dewey 1931). This notion is particularly important and is perhaps best grasped as another way of referring to ambiance. The three components used to define pervasive quality certainly all concern the notion of ambiance itself. Quality as Unity First, for a situation to exist, all the components of a context must be integrated within a single quality […][10]

The work of Neuroscientist Eric Miller provides insight into why a generic model of ambience (and hence, listening strategies built upon this idea) has proven so sustainable:

> […] we have evolved the ability to detect the commonalities among experiences and store them as abstract concepts, general principles and rules. This is an efficient way to deal with a complex world and allows the navigation of many different situations with a minimal amount of storage. It also allows us to deal with novelty.

10 Jean-Paul Thibaud, "The Sensory Fabric of Urban Ambiances," *The Senses and Society*, 6(2), (2011): 206, DOI: 10.2752/174589311X12961584845846

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> By extracting the essential elements from our experiences, we can generalize to future situations that share some elements but may, on the surface, appear very different.[11]

Miller's description of this process aligns well with Thibaud's analysis of pervasive qualities. We reduce the world into a set of generalisable situations in order to cope better with the challenges of the future. Ambience then, when viewed as a non-changing, non-personal quantity might be packaged and labelled as a single entity.[12] However, I propose that these simplification processes should be confined to the memory and recall models within perception as Miller intends, and *not* to information-gathering processes. Decoding sound (and music) in our environment concerns *both* recall and situational analysis in real-time.

Ambient overlay and augmentation

A change to reception processes occurs when music acts as a perceptual overlay to an environment. When music overlays an ambient sound environment, traditional musical reception processes struggle to describe the results. In addition, scholarly work in musical analysis, such as that documented by Jonathan Dunsby and Arnold Whittall[13] carries an assumption that the *music* is the sole focus of our attention in such circumstances, and not an *overlay layer* to other information with which it might also have a complex set of relationships. Musical analytical tools, such as Schenkerian analysis or set

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11 Earl K. Miller, David J. Freedman, and Jonathan D. Wallis, "The prefrontal cortex: Categories, concepts and cognition," *Philosophical Transactions of the Royal Society B: Biological Sciences* 357(1424), (August 2002): 1123, https://doi.org/10.1098/rstb.2002.1099

12 See Andrew Bourbon, and Simon Zagorski-Thomas, "Sonic Cartoons and Semantic Audio Process: Using Invariant Properties to create Schematic Representations of Acoustic Phenomena," *Proceedings of the 2nd AES Workshop on Intelligent Music Production, London, 13 September 2016*, 2, who demonstrate this perceptual mechanism happens frequently in Audio in the form of *Sonic Cartoons*.

13 Jonathan Dunsby, and Arnold Whittall, *Music analysis in theory and practice* (London: Faber Music, 1988).

theory, can only function where music, rather than environment *plus* music, is the auditory input. Whilst nobody would expect Schenkerian analysis to include an understanding of the current real-time peripheral audio background in addition to the structural background of the music, traditional Western analytical methodology needs to change to encompass situations where the ambient environment is considered to carry detailed and relevant perceptual information within it.

The idea of overlay is derived from early augmented reality thinking,[14] however, overlays themselves are only a component part of an 'augmented' environment. Overlaying information onto an environment will only become an augmentation when that overlay makes connections between the environment and our perception of it. Simply introducing different or new information (such as music) into an existing environment (our surroundings) does not automatically generate specifically augmentative connections.[15] The purpose of overlaying information, I propose, is one by which affordances[16] are generated. Each new information layer that is added to a situation contributes a new means of exploring and interacting with an environment. Music that is designed to become part of our ambient environment operates as an information overlay in this sense. The nature of the resulting affordances generated may be either limited in scope, through a purposeful lack of semiotic connection (such as in the case of 'background music'), or designed to be interactive and enabling, such as in an installation where embodied behaviours are provoked. This latter idea is demonstrated by Tia DeNora[17] in her description of functionality in music accompanying exercise regimes.

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14 See Thad Starner, Steve Mann, Bradley Rhodes, Jeffrey Levine, Jennifer Healey, Dana Kirsch, Rosalind W. Picard, and Alex Pentland, "Augmented reality through wearable computing," *Presence: Teleoperators & Virtual Environments* 6(4), (1997): 386–398.

15 It will of course generate a multiplicity of other semiotic connections - see Jean-Jacques Nattiez, *Music and discourse: Toward a semiology of music* (Princeton, NJ.: Princeton University Press, 1990) for an introduction.

16 See James J. Gibson, *The Senses Considered as Perceptual Systems* (Boston: Houghton Mifflin, 1996).

17 Tia DeNora, *Music in Everyday Life* (Cambridge: Cambridge University Press, 2000).

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DeNora suggests that music (overlay) enables us to view the environment (ambient information) in ways which afford bodily capacities. In this way, she views music as a "prosthetic technology", permitting the perceiver or participant of an everyday physical event to find new ways of interacting with that situation. The differences between what constitutes overlay (the act of introducing a new layer of information) and what is augmentation (in this context, the ability to perceive an environment in a new way as a result of the overlay) are precisely those which separate today's ambient information environment from ideas presented in ambient music from the 1970s. Augmentation is a concept which requires personal engagement, and new forms of interactivity. It is also those qualities which delineate contemporary approaches to music and sound from the 'ambience', from those which became crystallised and embedded into historical positions on ambient music. Eno's *Ambient 4: On Land* (1982) could be overlaid anywhere. It does not matter where that overlay takes place, or even if it does not take place. However, in contemporary music which accesses the ambient information environment to create augmentation, *where* an overlay takes place is of vital importance to the artwork. In making an overlay, or even an augmentation, it is important to consider what has been suppressed in doing so. Paul Roquet suggests that Eno's *On Land* is a form of landscape painting, quoting Eno:

> The idea of making music that in some way related to a sense of place—landscape, environment—had occurred to me many times over the years preceding "On Land". […] My conscious exploration of this way of thinking about music probably began with "Another Green World" (1975). On that record I became aware of setting each place within its own particular landscape and allowing the mood of that landscape to determine the kinds of activity that could occur.[18]

18 Paul Roquet, "Ambient Landscapes from Brian Eno to Tetsu Inoue," *Journal of Popular Music Studies* 21(4), (December, 2009): 367.

Distilling landscape to generic mood creates the sense of overlay because low-level detail is smoothed out, if not totally suppressed. Malcolm McCullough[19] points out that digitally augmenting everyday life has significant consequences, including a removal of important low-level contextual information. In analysing how digital media creates a sense of "ambient commons" McCullough shows how the information flow from the underlying environment has become suppressed. Beneath the augmentations, he argues, is a "high resolution" environment. In doing so, McCullough uses language similar to that of R. Murray Schafer in describing the situation. However, McCullough's use of "high resolution" is not burdened with having also to account for distinctions in perceived quality between environments ('hi-fidelity' - Schafer).

Part 1: Ambient as environment

The methodology and concepts set out by Schafer within *The Tuning of the World* have been influential in defining the fields of acoustic ecology and soundscape composition. The original definitions and scholarly tools generated by this work are still in widespread use today. This is where the problem lies: the ambient environment today is not at all like the one investigated by Schafer in 1977, and the reasons for understanding the ambient environment have widened within that time to reflect changing cultural needs and situations. Some adjustments are proposed here, by way of starting points, in an attempt to supplement this work.

Rethinking the soundscape

At this point, I will aim to show that encoded within Schafer's methods for describing soundscapes is an assumption that the ambient information environment is a passive presence, constructed using values which draw

19 Malcolm McCullough, *Ambient commons: Attention in the age of embodied information* (Cambridge MA.: The MIT Press, 2013), 102-105.

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on the pervasive characteristic views of Thibaud, Dewey (in Thibaud) and Miller presented earlier.[20] Instead, an alignment between environment and soundscape is advocated which draws on contemporary psychology and information science. It is proposed that the ambient environment is not a singular passive presence, rather a data-rich source of multiple, diverse information streams.

Beyond Lo-Fi and Hi-Fi soundscapes

The first adjustment to Schafer's thinking to consider is that ambient environments, regardless of where they sit in our perceptual focus, are complex and information-rich. In order to make this adjustment, we need to de-construct a hierarchical relationship key to Soundscape theory: the idea itself of lo-fi and hi-fi soundscapes.[21] Schafer quantified the 'fi-ness' of soundscapes by aligning them to a metaphor from electronics and communications: the signal-to-noise ratio. Signal-to-noise ratio is predicated upon the successful transmission of a 'message' free from unwanted polluting 'noise' content. Hi-fi soundscapes were acoustic environments with a high signal-to-noise ratio, and lo-fi those where the 'message' is barely distinguishable over the noise.[22] In both cases, noise is positioned as the opposite of information. While convenient, this dualism has knock-on effects of creating polarised divisions between foreground and background, active and passive listening, focus and far-field, intention and non-intention, urban and rural, private and public. What if that is not how we listen? Could it be that the lo-fi background has greater information content than the foreground? What if the mechanical drones of urbanity carry essential information: city dwellers can tell from sound what time of day it is, what the weather is doing, and when would be a good time to commute – all from the 'din' of the city. Sound within the

20 In doing so, it is acknowledged that some ambient environments may still function is this way.

21 R. Murray Schafer, *The Tuning of the World*, 43-71.

22 Ibid., 71-87.

urban landscape today is as much foreground and private as it is background and public. Likewise, the *hi-fi* soundscape of rural communities in remote locations can still signify the absence of employment today, rather than pastoral bliss.

According to Schafer's theory, a soundscape is labelled lo-fi or hi-fi through the analysis of a low number of dominant features present within it. Yet, in many acoustic environments the absence of certain types of sound are as perceptually important as their presence. If this is the case, then constructing binary relationships between lo-fi and hi-fi soundscapes becomes difficult. Instead, it is more productive to look at the types of information presented by an environment and our human relationships to them.

Soundscapes: who are the listeners?

Barry Truax and Gary W. Barrett point out that a purpose of Schafer's soundscape programme was to try and combat everyday modes of perception that are frequently applied to soundscapes, "to counter the types of soundscapes that produced a *non-listening* habituated response to the acoustic environment".[23] [author's italics]

The idea of a 'listening' response to soundscape has created controversy as authors have sought to question why a composerly, structured reading of the soundscape is any more (or less?) important than a 'non-listening' one. Illustrating this tension, Elizabeth Weybright[24] assesses the sonic descriptions contained within the poetry of Dorothy Wordsworth from circa 1800, and makes comparisons to the ways in which soundscapes were subsequently documented. Weybright concludes:

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23 Barry Truax, and Gary W. Barrett, "Soundscape in a context of acoustic and landscape ecology," *Landscape Ecology* 26(9), (2011): 1203.

24 Elizabeth Weybright, "The Everyday Soundscape: Sound and Mixed Aesthetic Modes in Dorothy Wordsworth's Journals," *European Romantic Review* 28(3), (2017): 325–332.

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> This elevation of mundane non-musical sounds — noise — to the status of soundmarks offers a radical early ecological version of contemporary sound studies' attention to unorganized ambient noises as potentially meaningful long before Western philosophy will begin to concern itself with the possibility that non-musical (i.e., not composed according to a tonal system, not necessarily human) sound might have aesthetic value.[25]

Although human musicality can reside far beyond activity contained within a tonal system, Weybright's central point that the ambient environment carries detailed information content and does so in a way that does not need it to be conceptually adjusted in status to permit it to be of value, is important. Furthermore, the conceptual reduction of sonic environments to musical parameters can create value differences between listeners. Kim Foale writes:

> Schafer judges soundscapes based on the perspective of the connoisseur, judging soundscapes the most pleasurable that have little or no people in, where sound and land respond in tangible, 'beautiful' ways. Truax and Barrett (2011) summarise the concepts in this approach as acoustic composition, temporal dynamics, spatial variability, and acoustic interactions, typical priorities for composers (like Truax), less so perhaps for laypeople.[26]

Ambient sound environments typically communicate information that we need to culturally or physically take notice of. They are not themselves 'temporal dynamics', or functions of 'spatial variability'. These are observed characteristics that reference particular musical aesthetics where elements of flow, pacing and space are organising factors. Unfortunately, this type of

25 Weybright, *The Everyday Soundscape*, 329.

26 Kim Foale, *A Listener Centered Approach to Soundscape Analysis* (Unpublished PhD thesis: Salford University, 2014), 19.

analysis can itself function - through the act of structural metaphor - as a form of reduced listening[27] behaviour. I have previously argued that reduced listening was a convenient way of legitimising the inclusion of real-world sound material for 1950s concert audiences[28] as it packages sound events which may at the time have been considered to be 'non-musical' into structures which can be decoded musically. Reduced listening is a powerful conceit, helping to bind listener to composer. This is not itself a negative proposition, and such structures play a large part in how music communicates to particular audiences. It is also worth noting that Pierre Schaeffer himself did not stray away from the subjective and cultural elements of sound in his assessment of their compositional qualities. Given that we can listen to ambient sound musically, it does not mean that we need to. As Foale points out, this is not in any way a special process, or that not listening 'musically' is any better or worse, thrilling or dull, than if we choose otherwise. Ironically, if we listen 'musically' – even in the broadest sense of the word – could we be limiting our exposure to the underlying ambient information and the relationships it contains by listening through a frame of past aesthetics, criteria and judgements?

Listening modes and the ambient environment

Barry Truax separates definitions of listening modes into *Listening in Search*, *Listening in Readiness*, and *Background Listening*.[29] Truax acknowledges that all forms of listening are not mutually exclusive. However, modes of listening can be understood as being implicitly linked to categories of environment, in a manner consistent with R. Murray Schafer's approach to soundscape. For

27 For an explanation of reduced listening see Pierre Schaeffer, *Traité des objets musicaux* (Paris: Le Seuil, 2016), 114-117.

28 Ambrose Field, 2016, "Simulation and reality: The new sonic objects," *Music, Electronic Media and Culture*, ed. Simon Emmerson (Aldershot: Routledge, 2016), 46–65.

29 Barry Truax, *Acoustic Communication* (2nd Edition) (Westport, CT.: Greenwood Publishing Group, 2001), 19-24.

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example, by extending the scope of Truax's argument it is illogical to expect listening in readiness to occur when we are already listening in search, and for background listening to provide meaningful data to our perception, as in this model, background listening is the 'default' process from which our perception is shifted into other states in order to recover detail.

Background listening is something considered to happen when there is little to no resolvable information content. Carolyn Jennings[30] points out that both top-down and bottom-up processes are responsible for conscious perception, and that these are steered by personal interest. As such, any act of 'generalizing' the ambience will be individual, specific, and will change over time. These parameters are not considered in theories relating to static modes of listening, and the sonic complexity of the ambient environment is still available to the real-time elements of our reception process. Both top-down, and bottom-up perceptual mechanisms are at work in determining the relationship between ambience as background and ambience as information. Notably, the idea of environment as information becomes particularly relevant in Truax's analysis when *Listening in Search* or *Readiness* is activated (and consequently consuming foreground attention). Only at that point is the specific information which caused the change presumed to be present. Meanwhile, for Truax's background listening, the environment appears to be a firmly situated one, located within a spatial domain around ourselves. If an ambient environment is non-situated and self-constructed, a three-tier set of listening processes now seems unable to represent the relationships we can either observe or design within creative work. This notion is explored in Part Two of this chapter. In expanding these definitions, the surrounding ambient environment can become more personal and responsive, a challenge explored by artists placing ideas of embodied cognition at the heart of their practice.

30 Carolyn D. Jennings, "Attention and perceptual organization," *Philosophical Studies* 172(5), (2015): 1265–1278.

Noise, ambience and detail

Peter A. Coates demonstrates that the idea of 'noise' has become intertwined with distinctions between sounds made by humans, technology, and the natural environment. It is not the scope of this study to define or analyse noise[31], rather to draw attention to the persistence of a value set which rejects non-human, environmental sound as being 'other' in perceptual terms. Coates points out that for the American National Parks service, 'quiet' is defined as the absence of human agency,

> […] the park service defines natural quiet as the absence of man-made sounds. This conflation of man-made and technological sounds is common practice among today's crusaders for natural quiet. The problem, of course, is that this reinforces the uncompromising divide between humans and the rest of nature.[32]

Rejecting non-human agency in the ambience has a consequence of creating hierarchical distinctions between sounds, and those hierarchies are not present in how human auditory perception analyses the information content of environments. Peter Lennox, John Vaughan and Tony Myatt have researched the nature and importance of small-scale sonic detail within surround sound audio environments, concluding that audio systems tend to focus on the perceptual foreground, leaving a perceptual lacuna in the form of a lack of low-level ambient detailing:

> From the neurosciences there is strong evidence of innumerable parallel connections between many areas of the cortex at all levels, and from higher levels to more peripheral ones. This provides for

31 See Paul Hegarty, *Noise music: A history* (New York: Bloomsbury Academic, 2007) for an historical context.

32 Peter A. Coates, "The Strange Stillness of the Past: Toward an Environmental History of Sound and Noise," *Environmental History* 10(4), (2005): 653.

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> multiple 'what' and 'where' processing streams, at least in the visual system, and it is reasonable to suppose that analogous processes are available in the auditory domain.[33]

A simple perceptual structure for assessing the binary division of lo-fi versus hi-fi soundscapes and then making value decisions between them is, on this basis, neurologically unlikely.[34] It is time to evolve new descriptions for soundscapes which do not force sound to be measured against cultural and geographic norms from the past.

Silence and mediation in ambient environments

> His most infamous work, *4'33"* (the so-called silent piece), framed an unmediated world of sound; by inviting listeners to attend to an acoustic experience not structured by a performer, Cage effectively asked listeners to themselves become composers.[35]

Often, the ambient environment is understood as being un-mediated, particularly as communication can be accomplished through direct signs and tacit understanding. However, tacit communication does not mean per se that there is no agency or embodiment taking place. Sound is generally produced by agency, even if it is the wind or emitted as a by-product of activity elsewhere within the electromagnetic spectrum. The agencies behind the ambient sound environment are complex and multiple, often transmitted

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33 Peter Lennox, John Vaughan and Tony Myatt, "3D audio as an information-environment: Manipulating perceptual significance for differentiation and pre-selection," *Proceedings of the 7th International Conference on Audio Display (ICAD2001), Espoo, Finland, July 29 – August 1, 2001*, eds. J. Huupakka, N. Zacharov, and T. Takala, International Community for Audio Dispay, 2001: 7.

34 Bregman's definitions of Auditory Streaming do not support such a polarisation in the categorisation of complex auditory objects. See Albert S. Bregman, *Auditory scene analysis: The perceptual organization of sound*. (Cambridge, MA.: The MIT press, 1994).

35 Mitchell Akiyama, "Transparent Listening: Soundscape Composition's Objects of Study," *RACAR: revue d'art canadienne/Canadian Art Review*, (2010): 59.

through tacit mediation rather than overt intervention. Describing the ambient environment as un-mediated is problematic, as it contains the blueprints of mediation: causality, culture and personality.

In *Recording Carceral Landscapes*, Trevor Paglen[36] describes how in his work documenting some of California's toughest penitentiaries the only common thread is one of silence. At this point, we need to question Cage's assumption of musical value (in the widest sense) in the ambience, no matter what that might be, as the 'silence' described by Paglen surely would not have been truly silent. It is the suppression of other sound in the ambience, the humans, which give Paglen's descriptions power and purpose. It would be straightforward to align this situation to that of negative space through the Chinese poetic idea of 意境 (Yi Jing)[37] or the Japanese concept of 間 (ma), inviting us to imagine that what is not present is as essentially as valuable as what is. However, this is not ma: this is a real space, filled with negative content where imagination is not necessary to understand the direct and tacit nature of the communication between environment and human, and this is not Yi Jing: there no sense of poetic connection or *balance* between non-observed and observed elements of the world. Paglen writes:

> After reviewing tapes from the SHU at Pelican Bay, it was the silence that struck me most: the banal uneventfulness at the core of one of the most brutal prisons in the California system – a system that is the paradigm of the "Prison Industrial Complex". The recordings revealed no sinister secrets, no hidden truths, no smoking guns. The silence of the SHU is the silence of both "business as usual" and total domination.[38]

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36 Trevor Paglen, "Recording Carceral Landscapes," *Leonardo Music Journal* 16, (December 2006): 56–57, https://doi.org/10.1162/lmj.2006.16.56

37 意境 literally translated means 'poetic world' or 'artistic conception', used in a manner to express the notion of balance between elements within the design.

38 Paglen, *Recording Carceral Landscapes*, 57.

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Notions of temporal dynamics or spatial variability are not required here to decode this situation. The ambience is mediated through the act of incarceration and the resulting sound world can be clearly connected with a serious societal situation.

Part 2: Ambient as personal identity

In order to understand how music interacts with our present information environment, I will argue that two ideas, the *spatial self*[39] and *subject centred organisation*[40], are particularly important in determining what ambience might be. When coupled with an understanding of *embodied cognition*[41] it is possible to describe ambience from the perspective of the perceiver.

Schwartz and Halegoua's notion of the spatial self suggests that a contemporary sense of external identity is constructed not just through online personal media but in how we choose to interact with and curate the digital information which attaches itself to our geolocation. Importantly, this idea is not specifically concerned with presence within a location[42] but more with the impact that that location has on how we describe and present ourselves. The authors acknowledge that this presence is curated and managed, and that we are actively involved in refining it as time passes. Such techniques are not limited to digital media. In effect, what was once a sense of stasis associated with physical place has become morphed into a dynamic, active and personally-branded phenomenon. The idea that public physical space can be subject to personalisation, comment, viewpoint and subjective association is not new. However, this concept of the spatial self, made malleable through digital media, can shed light on the types of relationship exhibited between ambient music

39 See Raz Schwartz, and Germaine R. Halegoua, "The spatial self: Location-based identity performance on social media," *New Media & Society* 17(10), (2015): 1643–1660.

40 Jennings, *Attention and perceptual organization*, 1265–1278.

41 See Marc Leman, *Embodied music cognition and mediation technology* (Cambridge, MA.: The MIT Press, 2007)

42 Almost a contradiction to the *soundwalks* of acoustic ecology.

and the environment. Martin Dust in 2010's FACT magazine observed a disconnection between a personal view of space and Eno's vision for *Music for Airports*, remarking that: "I understood that [Eno] were pitching it at a utopian vision, but for us it just seemed so out of place, like something from a sci-fi film".[43] Victor Szabo[44] indicates that part of such a disconnect might lie in the absence of sounds from the physical environment, citing The Black Dog's *Music for Real Airports*[45] by way of an alternative. Could it be that rather than lacking in the physical sounds of airports per se, that the 'out of placeness' reported by Martin Dust himself is due to the fact that we sculpt our experience of airports personally: no amount of adding the sounds of jet planes, baggage checks or security officers will necessarily add to our received sense of reality. The spatial self, as a dynamic changing form, is responsible for this and acknowledges that the airport yesterday will not necessarily be the same for us as it is today. The sounds fixed in time in *Music for Real Airports* come from a past reality. Although this is one which travellers might identify with, it is not one which is necessarily part of a spatial self. This incompatibility results in a sense of aural dislocation. Fixing environments in time, without active participation in imagining possible past and future spatial selves, will not automatically help our connection to those environments. Situating environments in a past time also consigns them to the category of ambient overlay rather than augmentation, regardless of whether the music is performed within that environment or appreciated at arm's length in a comfy armchair.

Against pervasive ambience: context switching and detail recovery processes

Human perception of ambient information can be unpredictable and

43 Martin Dust, "The Black Dog: Music for Real Airports," in *FACT Magazine: Music News, New Music.* Accessed: July 20, 2018, https://www.factmag.com/2010/05/12/the-black-dog-strange-cargo/.

44 Victor Szabo, *Ambient Music as Popular Genre: Historiography, Interpretation, Critique.* (Unpublished PhD thesis, University of Virginia, 2015).

45 The Black Dog, *Music For Real Airports*, (UK: Soma Quality Recordings, Soma – TBD003, 2010).

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immediate shifts of attention can occur due to a complex interaction between personal factors and the physical environment. Therefore, it is unlikely that there is any one sense of what a background ambience might be. Perceptual mechanisms for assessing the outside world rely on context-switching to help decode environmental events from a large number of simultaneous sources, as demonstrated by Lauren A. Newell. Newell highlights the concept of context switching as part of an apparatus to deal with ambient information events, stating that "we are born to be interrupt driven".[46]

Newell shows the cost of context switching in mental terms on task performance, suggesting that it is information from our ambient environment which is often responsible for a degree of perceptual steering which occurs within this. Distraction, according to Newell is *not* an information-poor state; being distracted is the result of intensive information processing. Such an idea throws into sharp relief the calm presentation of ambience in 1970s early electronica. Through this lens, this music appears to be the opposite of the ambient environment which surrounds us today. Opposition to the 'real' ambience of today is the contemporary charm of this repertoire. Acknowledging the information richness of today's ambient environments points to a new type of thinking in contemporary approaches to musical creativity which deal with reality at their core. Michael Gallagher[47] has reviewed the field recording practice of sound artists such as John Levack Drever, and this research demonstrates that today's field recording-based creative practices can be associated more with contemporary notions of ambience as detail, than past assumptions of ambience as generic perceptual background. Gallagher extends this notion of specificity into the idea of *Sonic Geography*, enabling places to be experienced in new ways through audio-mediated personal reflection.

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46 Lauren A. Newell, "Redefining Attention (and Revamping the Legal Profession?) for the Digital Generation," *Nevada Law Journal*, Vol.15(2): 763.

47 Michael Gallagher, "Sounding ruins: Reflections on the production of an 'audio drift'," *cultural geographies* 22(3), (2015): 467–485, http://doi.org/10.1177/1474474014542745

Subject-centred organisation

Importantly, *how* perception shifts from analysing complex environmental information to a sense of singular focus is understood to be a highly personal and subjective process. Thibaud[48] suggests that today, the notion of the ambient environment is itself a subjective one. Supporting this assumption is the idea of subject-centred organisation.[49] Subject-centred organisation concerns building environmental meaning around individual value-sets. This idea is not without musical precedent.

The work of Maryanne Amacher, for example, is music which is probably as simultaneously a-contextual and individual as can be. In *Sound Characters*[50] textures are formed through sum and difference tones which are only constructed in the ear itself. It is almost as if audience members are held responsible for bringing the discrete streams of the composition together. In doing so, Amacher demonstrates that details within the ambient environment can carry significant musical information.

Environmental meaning that can be understood through subject-centred organisation theory lies at the heart of Maja S. K. Ratkje's *Desibel* [sic].[51] Powerful electro-acoustic horns are located within a fjord, in which a dispute with a mining firm has taken place. Extremely loud sounds are emitted into the landscape through these devices, encouraging listeners to think carefully about their personal role within the landscape. The difference in scale between the sound of the horns (an unusual and unmistakable intrusion within an environment) and the environmental background sound (the ambience - a 'normal everyday sound') is huge. Ratkje writes:

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48 Thibaud, *The Sensory Fabric of Urban Ambiances*, 213.

49 Jennings, *Attention and perceptual organization*, 1266.

50 See Gascia Ouzounian, "Embodied sound: Aural architectures and the body," *Contemporary Music Review* 25(1-2), (2006): 69–79.

51 Maja S. K. Ratkje, *Desibel* (2009), accessed: June 15, 2018, https://vimeo.com/15852821

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> *Desibel* was also made as a protest against the plans of a major mining project in Vevring, a quiet village situated in the district of Sunnfjord. The concession is owned by Nordic Mining. The mining will cause 200,000,000 cubic meters of contaminated waste to be dumped every year into a valuable national salmon fjord. Only four percent of the mountain will be used in various commercial interests. The mining will go on for 24 hours a day, 7 days a week for 30 years. *Desibel* is a protest against ruthless exploitation of natural resources and against short time profit thinking […] The sound of seagulls is also present – an absurd, over-sized response to the mining company's promise that the mining work will only be as loud as the seagulls.[52]

If, as Dicey Jennings suggests, human processes for switching focus and filtering complexity, are driven in this way through a mechanism which thrives on detail, we can start to unpack the compositional implications for space and place in new ways. The work of Jana Winderen[53] points to values which are important in forming a contemporary understanding of what ambient, and ambient music, might be. Winderen has recorded and produced detailed recordings of environmental scenes. Calling them 'soundscapes' is perhaps a mis-representation, as the term embodies a certain sense of amalgamating detail into a single container form representative of the environment (the 'scape'-ness within *soundscape*). Winderen's work goes far beyond the generic, providing detail in that environmental representation combining insight into geological and living processes in such a way that is well suited to attentive listening and personal discovery. This is particularly the case in *Energy Field* [54] where small-scale sound-events are presented among spectrally dense, rumbling environmental drones. The construction

52 Maja S. K. Ratkje, Notes for *Desibel*, accessed July 21, 2018, http://ratkje.no/2009/10/desibel/

53 As discussed in Cathy Lane, and Angus Carlyle, *In the field: The art of field recording*. (Devon: Uniformbooks, 2013), 147-159.

54 Jana Winderen, *Energy Field*, (UK: Touch Records – TO:73, 2010).

of this work evades specific geographical location from sound alone, but this is not, however, coupled with any reduction in information *about* the environments it portrays. Anette Vandsø argues that this context is externally generated:

> Seen from the point of reception, the very simple answer to how these context-based compositions establish their aboutness is that the context is told (Milutis 2008). Whether we are listening to the sounds of underwater life in Jana Winderen's tape release or the traffic network in the Ruhr district as in Kubisch's installation the context is told by curational notes and titles that are placed in relation to the artwork.[55]

Vandsø is commenting on Winderen's earlier release *The Noisiest Guys on the Planet* [56] with which *Energy Field* shares some constructional methodology: drones feature heavily, against which other materials are exposed each with their own sense of carefully constructed space. If 'aboutness' and Vandsø's ideas of 'context-based composition' are taken to be indicators of geographical location, it may well be hard to determine these qualities from the recording alone. However, following a revised definition of 'ambient', where subtle detail provides high levels of information content, the 'context' presented in this recording is incredibly vivid. I would argue that no 'contextualising narrative' or 'paratext' can substitute for it. It is this difference that separates Winderen's work from a more traditional approach to acoustic ecology. Winderen hints at ambient detail as an uncharted resource:

> Also the fact that the sensitivity to these audible landscapes, invisible but audible, have developed for millions of years. Some

55 Anette Vandsø, "Four Key Concepts for Studying Context-based Compositions," *Organised Sound* 23(01), (Cambridge: Cambridge University Press, 2018): 5.

56 Jana Winderen, *The Noisiest Guys on the Planet* (UK: Ash International – ASH 8.1, 2009).

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> species have adapted to their environment without light for so long. They understand vibrations and sounds in a different way.[57]

If, as Daniel Levitin[58] suggests, detail is *spatially* wedded to the original environment through neural mechanisms for retrieving information, then it is going to be difficult to think that a recorded environment – however vivid – can ever truly 'transport' listeners.[59] In this way, music from the ambience is not necessarily about re-mapping one listening environment onto another. Perceptual cues to location which are locked into real-world environments may have no causal plausibility within the environment in which we are listening. I will propose that, contrary to traditional theory, this does not always create *schizophonia* [60] as our auditory perception can make clear distinctions between recording and reality regardless of any implied semiotics carried by the medium. Whilst two or more distinct spaces can be presented at the same time, through technology or in reality, the element of disunity which lies at the root of the notion of schizophonia is, in fact, not problematic and part of normal perception of complex environments. Megan A. Reich observes a similar situation in Winderen's music:

> By considering all sounds of the soundscape as a source of both data and music (sounds inherently worthy of aesthetic appreciation, whether or not they were "intended" by a composer), the question

57 Tobias Fischer, *Interview with Jana Winderen*, accessed: July 21, 2018, http://www.tokafi.com/15questions/interview-jana-winderen/

58 Daniel Levitin, *The organized mind: Thinking straight in the age of information overload* (London: Penguin, 2014), 83.

59 The argument here is not about 'transport' in a physical sense - but about providing a perceptually convincing sonic representation. The idea of transport - in any form - depends on imagination to function.

60 R. Murray Schafer, *The Tuning of the World*, 90.

of noise for composers like Winderen is no longer even an issue.[61]

In none of these examples is the environment a generic, single entity. Both Winderen and Ratkje frame the listener (rather than the piece) in new ways: we are not asked to *transport* ourselves to another location (as in some acousmatic and soundscape music) but instead re-consider our personal involvement with a situation. Whilst listening to Ratkje's *Desibel*, listeners can consider their role in a political situation – even if they are not part of the specific community affected by the piece. The human relationship with the environment is also questioned through Winderen's piece, via a consideration that the most abundant species on the plant is not humankind, but shrimp.

Part 3: De-situating ambience

Having acknowledged the role of the spatial self in constructing the feeling of situatedness, it is worth noting that not all real-world ambient environments today are permanently situated in any location in particular. Amparo Lasen[62] introduces the idea of portable urban space, a type of space generated through the interaction of mobile technology in urban environments. Lasen is not just speaking of listening to music in a physical location: his argument concerns how presenting our choices, as defined by personal spatial identities, influences the information present within our ambient environment. In a way, this idea is the reverse of the spatial self: here, personal information is generated and flows back to the environment. Lasen says this is done through the means by which music is shared in public, through headphone spill or through group listening. Synthesising the views of Lasen and Schwartz, the definition of ambient urban environments is now one that is no longer situated. Urbanity in sonic terms

61 Megan A. Reich, *Soundscape Composition as Environmental Activism and Awareness: An Ecomusicological Approach*, (University of Puget Sound: Sound Ideas 2016), 21, accessed April 8, 2019, https://soundideas.pugetsound.edu/cgi/viewcontent.cgi?article=1472&context=summer_research

62 Amparo Lasen, "Disruptive ambient music: Mobile phone music listening as portable urbanism," *European Journal of Cultural Studies* 21(1), (2018): 96–110, https://doi.org/10.1177/1367549417705607

is personal, cultural, evolving and dynamic. The notion of portability of space must ultimately have a boundary (spaces cannot simply be made portable to anywhere else by default, and personal information may not be relevant in spaces other than those for which it was originally intended). That boundary is cultural as much as it is physical. When designing music for portable urbanism (the way in which music forms a set of personal and dynamic associations to specific places, times, and locations) we still may need a means to situate that experience in more general terms. Christopher J. Cox and Mirko Guaralda[63] underline this malleability of space, demonstrating how activities ranging from urban hacking to busking can be seen to be the product of an environmentally relevant form of spatial ownership. Jean-Yves Bosseur similarly writes about the musical occupation of Urban ambience. He suggests that music is not just the consequence of space, but that architectural space within our cities can be defined by music. In doing so, Bosseur identifies the effect of musical pollution on our ambient noise environment and assesses the legacy of the Muzak corporation.[64] Today, what is perceived as pollution can come from foreground distractions and not ambience.

We have, at this point, arrived at a sense that there is potential for complex personal interaction within a domain often thought to be 'peripheral'. New 'ambient' musics are responding to the challenges of presenting greater detail and more defined opportunities for *personal* interaction. Thus far we have established that the ambient information environment is feature-rich, personally-directed, portable, and not necessarily situated. This view now seems at odds with well-known definitions of listening strategy and process. In addition, it calls into question the relevance of foreground, feature-based descriptors (such as soundmarks) discussed earlier, due to the absence of structures to capture adequately the human involvement with those features.

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63 Christopher J. Cox, and Mirko Guaralda, "Public Space for Street-Scape Theatrics. Guerrilla Spatial Tactics and Methods of Urban Hacking in Brisbane, Australia," *The Journal of Public Space* 1(1), (2016): 113, https://doi.org/10.5204/jps.v1i1.14

64 Jean-Yves Bosseur, *Musique et environnement* (Paris: Éditions Minerve, 2016), 101-127.

Towards an embodied perception of ambient space

Embodiment[65] plays an important role in understanding the ambient environment, accounting for human ways in which multiple concurrent sources of information can be assessed. Music can engage on a number of levels with embodiment concepts. For example, listeners to 'traditional' concerts of Western art music may not engage with any form of physical reality other than where music is present as sound.[66] This mode of concert presentation has strong similarities with the presentation of much historical ambient music, in that it is passive and detached from embodiment. The view of ambience as perceptual background also embeds within it an assumption that ambience itself is an arms-length quantity. Contrast this approach with that of the proactive exploration of ambient environments, a central feature of the work of Christina Kubisch. Much of her music involves physical agency on the part of the perceiver, and also on the part of the creator (which may, in a vast number of cases be mechanical or non-human). Participants on an *Electrical Walk* (electromagnetic sound walk)[67] are given equipment which 'auralises' information (through electromagnetic transformations) within our ambient environment. The results are astonishing: the environment's hidden rhythms are revealed and a polyphony of unseen and unheard interactions emerges. The action of selection rests with the perceiver and as new physical locations are uncovered, a new sense of connection to those locations emerges through personal choice. Importantly, such a practice is different from the 'sound walking' of the 1980s. There is no intention to define space directly through these sounds: they do not exist as sound, they are not 'soundmarks' as R. Murray Schafer would put it. Instead, an interpretative process, involving

65 See Raymond W. Gibbs Jr., *Embodiment and cognitive science* (Cambridge: Cambridge University Press, 2005).

66 Leaving aside for a moment that any music can be used to accompany virtually any known physical action if so required.

67 Cathy Lane, and Angus Carlyle, *In the field: The art of field recording*, 67.

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both technology and personal choice is at work, and as such it brings the 'spatial self' closer to the everyday.

Conclusion

The embodied, detailed and individual exploration of ambient sound has more in common with contemporary definitions of a complex ambient information environment than musics which specifically carry the ambient genre label. Ambient music as a genre can be seen as an information overlay, not an interaction with an ambient environment. As such, there is space in the ambience for ambient music, but how ambient music is socially connected to the ambient environment has changed in the 40 years since its inception. This chapter has proposed that aligned to this change must come a reappraisal of both the soundscape and how listening processes are traditionally defined, in order to account for increasing information complexity within ambient information environments. At this point, historical 'Ambient Music' seems increasingly divergent from day-to-day experience and how we perceive an information-dense world. Listening and writing about soundscape as an object must give way to understanding ambient environments as an embodied experience. Space in the ambience today is personal.

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A QUESTION OF BACKGROUNDS: SITES OF LISTENING

Ulf Holbrook

In 1951 John Cage entered an anechoic chamber at the University of Harvard. He expected to hear silence; what he heard has now become a legendary anecdote about this experience. Twenty-four years later from his sick bed, Brian Eno had a revelatory experience of listening to music through a broken hi-fi while confined to a hospital bed. Although several years apart, these two individual experiences both stimulated new modes of engaging with, creating, listening to and understanding music. These two distinct creation myths (to use Seth Kim-Cohen's description[1]) are reference points from which the discussions in this chapter develop. The intent in this chapter is to examine the site of listening in which these two events took place, not the physical locus itself, but as the contextual site in which these two events took place: namely, the 'background'. The discussion of ambient music will be centred around Brian Eno's *Discreet Music* (1975) and *Ambient 1: Music for Airports* (1978). *Ambient 1* was the first mention of the term 'ambient music', yet the roots of what led to this development are evident in *Discreet Music*. All references to ambient music will be based on Eno's liner notes from these two albums.

By focussing on the background, we can pose several questions: How can we understand the sonic foreground if we do not consider or disregard the sonic background? What role has the background for the contextual perception of what is in the foreground? I will argue that the background is the context which supports our listening, and that this contextual presence is

1 Seth Kim-Cohen, *Against Ambience and Other Essays* (New York and London: Bloomsbury Academic, 2016).

integral to our understanding of the music we are listening to. This chapter seeks to address these questions through the perspectives of music, film sound, game sound and 3D audio applications.

These different sites of listening share one central aspect which permeates the act of listening, namely the acousmatic. The acousmatic listening situation is one in which the source of a heard sound cannot be seen.[2] In this way, the acousmatic listening experience of a sound becomes a subjective perceptual experience, which has ontological consequences for how we understand the sound. Importantly, acousmatic listening forces us to focus on the sound itself and not the potential source, and this focus implies an intentionality in our listening. Sites of listening share and reference various narratives, and are linked by common conceptual threads and metaphors which intersect and overlap.

Silence in site

Seated on a chair in the anechoic chamber, John Cage heard two sounds – one high and one low. The engineer in charge told him that the high-pitched sound was his nervous system and the low-pitched sound was his blood system.[3] Famously this experience inspired the composition of Cage's 'silent piece', *4'33"* (1952), which is scored for any instrument or combination of instruments, where the performers are instructed not to play their instruments during the three movements. Indeed, the piece is far from silent. Cage wanted to focus the audience's attention on one particular aspect of musical and sonic perception, specifically that when music is silenced, there is still sound. "Until I die there will be sounds",[4] Cage wrote about the experience in the anechoic chamber, arguing that there is no such thing as silence.

2 Pierre Schaeffer, *Treatise on Musical Objects: An Essay Across Disciplines*, trans. by Christine North and John Dack (Oakland, CA.: University of California Press, 2017).

3 John Cage, *Silence: Lectures and Writings* (London: Marion Boyars Publishers Ltd, 2010), 8.

4 Ibid., 8.

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Cage wanted to let sounds be themselves. This was a mode of understanding sound and music on its own terms and not simply "man-made theories of expressions of human sentiments".[5] Yet in the anechoic chamber there was also a third sound. Douglas Kahn observes that,

> […] there was a third internal sound isolated, the one saying, 'Hmmm, wonder what the low-pitched sound is? What's that high-pitched sound?'[6]

This observation indicates a level of mental activity which is in a constant state of analysis, in an ever-present listening situation. This mental mode of analysis could be seen to run counter to the credo of allowing sounds to exist of their own accord and we as human listeners merely to accept them. Cage was faced with the sounds of his own body as an acousmatic experience: first through hearing unidentified sounds; then, by recognising them, understanding that the room was not silent after all. Finally, he realised that this situation was not something he could control and that such sounds are there regardless of surroundings and circumstances.

In *4'33"*, Cage suppresses the traditional structuring of both a musical creation and a musical performance and brings the ambient environmental presence to the foreground. The background, which we 'listen beyond' at concerts, is now the focus of our attention. Like Cage, we hear that it is not only the sounds of the ventilation system, the passing cars and the shifting people next to us which make up this background sound: our own rumbling stomachs, head-scratching and movements also make up the totality of the sonic experience. James Pritchett has observed that:

5 Ibid., 10.

6 Douglas Kahn, *Noise, Water, Meat: A History of Sound in the Arts* (Cambridge, MA.: The MIT Press, 1999), 190.

> Confronted with the silence, in a setting we cannot control, and where we do not expect this kind of event, we might have any number of responses: we might desire for it to be over, or desire for more interesting sounds to listen to, or we might feel frightened, insulted, pensive, cultured, baffled, doubtful, bored, agitated, tickled, sleepy, attentive, philosophical, or, because we "get it," a bit smug.[7]

Cage's text, in which he proclaims that there will be sound until his death, was originally given as a presentation to the Music Teachers National Association in 1957. Like Brian Eno's liner notes for *Discreet Music* and *Music for Airports*, I view these texts as artist statements that both comment on the origins and artistic motivations of the music as much as the technical and creative process. Had Cage never visited an anechoic chamber, such a physical setting would have remained an idealised space in which to experience silence.

As Douglas Kahn has pointed out, the third sound in the anechoic chamber was Cage's internal voice interrogating what he heard. This interrogation is as much a product of the surprise he must have felt at hearing sound in a space where he expected to hear nothing, as it is from a desire to analyse a listening perspective to separate sounds from their causes to hear them as themselves.

The act of 'silencing', or desire to explore silence, was explored by Cage in a number of works, despite his surprise experience in the anechoic chamber. Although *4'33"* has arguably become one of his most famous (silent) musical works, pre-dating it is the unrealised *Silent Prayer* (1948). Cage wanted to compose a work of silent music and sell it to the Muzak Corporation, effectively silencing the utilitarian sonic accompaniment of commercialism.[8] Although never realised, *Silent Prayer* was located outside the traditional confines of the concert hall (where *4'33"* was located) and the "western

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7 James Pritchett, "What silence taught John Cage: The story of *4'33"*," *The anarchy of silence: John Cage and experimental art* (Barcelona: Museu d'Art Contemporani di Barcelona, 2009), 167.

8 Seth Kim-Cohen, *Against Ambience and Other Essays* (New York and London: Bloomsbury Academic, 2016), 17-20.

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compositional tradition, which was, after all, his target".[9] With the silencing of background Muzak, Cage wanted people (all people, not just concert goers) to attend to the sounds of their surroundings and not have them masked by an unobtrusive yet omnipresent soundtrack. Whatever the potential impact of *Silent Prayer*, turning the attention towards the concert hall with *4'33"* engenders more concentrated and focused listening.

Douglas Kahn points out that *Silent Prayer* was more about conventional notions of silence than the silencing of an ever-present soundtrack, yet the result would still have been an increase in the environmental 'background' sound. The question still remains whether listeners would feel a sense of liberation having being freed from such functional music within their ambient environment, and thereby experience a heightened sonic awareness of their surroundings, or would be disconcerted by a sense of absence arising from the ubiquity of such Muzak.

Thresholds of sites

In the liner notes to *Discreet Music* (1975), Eno relates the story of his listening to an album of eighteenth century harp music a friend had brought him whilst in hospital. Having put the album on and gone back to his bed, Eno realised that the volume was set too low and one of the speakers was broken. Lacking the energy to get up and do something about it, Eno instead listened to the album just above the threshold of the background noise. This experience sparked in him a new way of hearing music mediated through or as an additional layer within our everyday environment.

Although pre-dating *Ambient 1* by three years, this experience, which led to *Discreet Music*, helped define the structure and formulation of what Eno came to call ambient music. Later, in 1978, in the liner notes to *Ambient 1: Music for Airports*, Eno introduces the concept of ambient music and describes

9 Ibid., 19.

ambience as atmosphere and "a surrounding influence".[10]

Eno's epiphany arose from the fact that, for the most part, we expect things just to work and when they do we ignore them as objects and only relate to the function each object affords. Only when an object stops functioning in the way we expect it to does our attention or awareness become more intently focussed on it. This functional awareness was exacerbated as Eno was ill and unable to get up easily and rectify the faulty equipment. Had Eno been at home in his living room, the experience could have simply sparked irritation over having to sort out the broken speaker, or the volume dial swiftly cranked to compensate for the lack of volume, so producing a very different listening experience. Listening to music at, or just below, the environmental noise floor, is an attempt to steer listeners away from hearing the music as music per se, and rather as something that melds into the background, interspersing the sounds of cutlery or as soft playback at a shopping centre or in an elevator.

The spatial constructs which surround us provide a state of flux from which to interpret listening as a type of ambiguity, particularly so for the two historical examples cited so far. Both situations – the sick bed and the anechoic chamber – not only provided important insights into modes of listening for both Eno and Cage, but the experience also prompted insights into the sites of listening. Each site prompts a different mode of listening, either to the sounds of your own body or to music which seems to be both audible and inaudible. Listening from his hospital bed prompted in Eno an awareness of his immediate spatial sonic environment and the relationship of the harp music to these surroundings, the music to the listener, and the listener to the surroundings. In one site we expect there to be sounds and the other site we expect silence. Both events bear a resemblance, in the acuity of the listening experience, to what Laurie Spiegel calls "slow change music",

10 Brian Eno, 'Ambient Music', liner notes from the initial American release of Brian Eno's *Ambient 1: Music for Airports* (PVC 7908 (AMB 001), 1978).

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in which there is "little density of change, slow change, minimal change"[11] and as a result causes the ear to be more and more sensitive to subtle shifts in the music. For Spiegel and Eno, there is also an aesthetic emphasis and preference on the types of sounds used to create this perceptual state, while for Cage, it was about the sounds being themselves. Although different in intent, Cage's and Eno's work influences our listening by drawing attention to the subtle changes in the background. Cage's understanding that there was no such thing as silence related to his mode of perceiving his surroundings. Although Cage's oeuvre contains open works of any duration, particularly the happenings (1959-1968), it is Eno's ambient 'surrounding' music – which could last forever. This is in part due to Eno's compositional method, and his use of technology, particularly generative software, where the slow change of sonic materials and variation of their density can become vastly extended.

The site of wallpaper

The wallpaper, furniture and background all come into view when reading Eno's liner notes and listening to his subsequent music productions. One can understand Joanna Demers' comment that "ambient musicians in general seem a highly secure bunch, content to make music to be ignored".[12] Citing Erik Satie[13] and Muzak[14], Eno is clear that his music should be suitable both to be listened to and to be ignored. Long drawn out melodic lines, with no sharp attacks and long decays, lend themselves to music that could be played continuously for extended periods of time. Prolonged listening would enable this music to drift in and out of the background. Indeed, the inspirations from

11 Laurie Spiegel, "She has the technology," interview with Frances Morgan, *The Wire*, October 2012, issue 344.

12 Joanna Demers, *Listening Through the Noise: The Aesthetics of Experimental Electronic Music* (New York and Oxford: Oxford University Press, 2010), 116.

13 Brian Eno, *Discreet Music* (CD) (Virgin Records Ltd., ENOCDX 5, 2009).

14 Brian Eno, liner notes, *Ambient 1: Music for Airports* (CD) (Virgin Records Ltd., ENOCDX 6, 2009).

both La Monte Young and Steve Reich are evident, in their almost hypnotic repetitions. Yet, repetition also indicates a change, which becomes evident over time. The presumed flattening of a music such as ambient propagates a difference between foreground and background in its temporal experience. The object of audition is not changed in any way, rather the change happens in the receiving subject.

It is clear that the intentional act of selecting a piece of music for listening certainly does not warrant a want or desire to ignore the music. Rather, all are intentional acts that have a clear sense of purpose. If the music is experienced in a different setting, say an airport terminal, then we return to the direction outlined in *Discreet Music*, where the music exists at times above and at times below the threshold of background sounds. In this way, ambient music is placed in a space where it cannot be critiqued. Seth Kim-Cohen points out a key aspect in the interpretation and understanding of such art works, namely that "one of the sites to which any work must be specific is the site of art history: of the traditions, works, artists and ideas to which it responds. It doesn't matter if an artwork wants to be engaged thus. It happens anyway".[15] The importance of this insight is that all works will always be viewed in context to some other object, thing or creation to which it stands in some form of relationship.

Being ignorable can be seen both as an insistence on being left to one's own devices as well as an insistence on aspects of timelessness. The long, stretched out, soft passages, with predominantly tonal and simple melodic contours, imply a music that could continue on into infinity (were it not for the listener pressing the stop button). One of the strengths in this type of musical communication is the freedom to hint at and imply spatial relationships both in the musical material and in the listener's reception of the material. Unlike other genres or modes of communication, ambient music can freely move in a perceived spaceless and timeless fashion. However, something timeless

15 Kim-Cohen, *Against Ambience,* 44.

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is perceptually placed 'outside history' and thus has and will always exist. Cage's revelation certainly brought an understanding that the sounds which surround us are always there, regardless of our listening to them, and as such, the background which we listen to and against is always present – but never placed outside our personalised temporal history.

Experiencing broken sound equipment would often lead to irritation but "it is usually broken equipment which comes to conscious attention"[16] and it is precisely this that is at the heart of Martin Heidegger's famous tool analysis. Heidegger discusses this with regard to *being* or "being-there" (*dasein)* in the example of the hammer. The identity of a hammer is not defined by its apparent visual or physical characteristics but its relationship to other things that it references, such as nails and wood. Objects are therefore given their identity in the context of other objects, or in the case of living things, what they encounter and experience. More broadly, identity is constructed in relation to the other things, meanings, perspectives and narratives that exist in relation to it.

For Edmund Husserl, intentionality is related to the objects which lie before the mind – the objects of our perception are objects of *something*: "All perception, judgment, love, and hate is perception, judgment, love, or hate *of some object*".[17] While Heidegger broke with this perspective and found the understanding that all things that reveal themselves to us in consciousness are only a small subset of the objects which surround us. The hammer is one example of this. The identity of the hammer itself is only revealed to us when it no longer functions as a hammer, while previously the hammer was an object in and of itself and taken for granted by accomplishing the tasks which we needed it for.

According to Heidegger, the broken hammer brings the nature of the object itself into focus. In our interaction with the objects which surround us,

16 Graham Harman, *The Quadruple Object* (New York: Zone Books, 2011), 174.

17 Ibid., 173.

only a small part of this awareness makes up our conscious interaction with the world; for the most part objects retreat to a hidden realm, supporting our perceptions but seldom making themselves visible.[18] Heidegger's reference to "tools" is not limited to specific objects such as hammers, drills or wheelbarrows: Eno's broken speaker is indeed one such tool experience.

Unseen site

A site refers to a specific position or location. We are surrounded by objects with a function we take for granted. When the 'ambient' is conceptualised as a "surrounding tint",[19] we experience the ambient not only as something which is all around us, but also as an ever-present entity. When faced with listening to the ambient we are experiencing something that Eno described as a "music to swim in, to float in, to get lost inside".[20] This presumed immersive quality of the music places it outside our ability to discern between the objective and subjective space of our perception. Indeed, this immense immersive experience disintegrates the hierarchy of foreground and background, and with that our ability to discern some contour to the musical experience and our surroundings which makes the experience omnipresent. The consequences of the site of the ambient is highlighted in the work on film sound by Michel Chion, which indeed demonstrates that an ambient surrounding influence is imperative to understanding the foreground.

Our listening is influenced and affected by something which is hidden and Chion refers to this as the *acousmêtre*. The *acousmêtre* is an acousmatic character, hidden from view, who creates a sense of ambiguity to the scene of a film. It is a character who hides "behind curtains, in rooms or hideouts",[21] and who is implicated in the action and all the while on the verge of being part

18 Ibid., 37.

19 Brian Eno, *A year with Swollen Appendices: Brian Eno's Diary* (London: Faber & Faber, 1996), 293.

20 Ibid., 294.

21 Michel Chion, *Audio-Vision: Sound on Screen* (New York: Columbia University Press, 1994), 129.

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of it. The powers of the *acousmêtre* – the cinematic figure of an audible voice without a clearly visible body – depend on "whether or not the *acousmêtre* has been seen".[22] This background, conceived in film, is far from siteless, but the reduction of site is tied to the abstracted nature offered by both film and games. The contextualizing site is acousmatic, it is hidden from view but the sounds themselves are fundamentally *of the* site, as they belong to the context from where we view and hear the foreground. The *place* does not need to be a physical location, but the place as a site of understanding is the central focal point in this mode of listening.

A listening protagonist in the *acousmêtre* is found in both of the two creation myths referenced at the beginning of this chapter, always hidden from view but present in the receiver's consciousness. The immersive site is no longer a protagonist who at one point or another comes into view, rather the site itself is the protagonist and the sounds we hear are *of* the site. In this way, it is something which *is*, and presumably always will be. Eno's experience of listening to an acousmatic ambience in Ghana exemplified this perfectly.[23] Listening on location through headphones, and hearing an unseen nature chorus is interpreted as an acousmatic listening experience of abstracted sound. Through this act of *becoming music*, it then ceases to be music when projected back out onto the landscape as something omnipresent.

Chion refers to ambient sound (which he also calls 'territory sound') as "sound that envelops a scene and inhabits its space"[24] and that does not reveal or embody its source. Becoming music is then becoming site. By being a background, the ambient is a now-ness, an entity which is always present. The now-ness of the ambient in its present-ness is implicit in this immersive experience of our surroundings. The absence of a foreground in ambient

22 Brian Kane, *Sound Unseen: Acousmatic Sound in Theory and Practice* (Oxford and New York: Oxford University Press, 2014), 39.

23 Brian Eno, liner notes, *Ambient 4: On Land* (CD). (UK: EMI -Virgin Records - 50999 6 84530 2 2, ENOCDX 8, 2009).

24 Michel Chion, *Audio-Vision: Sound on Screen*, 75.

music immediately situates the experience of ambient music on the objects closer to us, our own bodies, the room we are in, the relationships we have, and the experience between us and our surroundings. But fundamentally, listening is intentional hearing, and the relationship between the music and our listening initiates a mode of analytic attention where the music not only merges with non-diegetic sounds of the background, but also springs from this background to our diegetic present-ness.

Diegetic sounds are sounds which come from a character or focus present in the foreground, and non-diegetic sounds are from somewhere beyond the foreground. Chion identifies non-diegetic sounds as, among others, musical underscoring[25] to accompany a scene. Indeed, the interplay between these foreground and background sounds represents a kind of self-awareness in its present-ness. There is never any doubt as to what we are listening to – if the music retreats to the background but demands our intentional focus, then it is no longer of the background but wholly in the foreground. This seemingly simple topology is followed in the IEZA framework[26] where the audio of the fictional world of a computer game needs, on the one hand, an environment for individual sounds and sound sources, and on the other, background sounds that create the context for how these sounds are perceived.

The background is, as Cage and Eno both experienced, always present. Indeed, it is inescapable: "We are surrounded by noise. And this noise is inextinguishable. It is outside – it is the world itself – and it is inside, produced by our living body. We are in the noises of the world, we cannot close our door to their reception, and we evolve, rolling in this incalculable swell".[27] This inextinguishable noise is, in Chion's terms, the non-diegetic part of our experience; something that exists outside the scene yet which

25 Ibid., 73.

26 Richard van Tol and Sander Huiberts, "IEZA: A framework for game audio," accessed February 10, 2018, http://www.gamasutra.com/view/feature/3509/ieza_a_framework_for_game_audio.Php

27 Michel Serres, *The Parasite* (Baltimore, Maryland: The Johns Hopkins University Press, 1982), 126.

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plays an important part in how the scene is understood. This inextinguishable noise is what has dominated the examples presented here.

Environments and sites

Sites of listening share overlapping and intersecting narratives and metaphors, and as ambient music is a conceptualised surrounding influence or tint (to paraphrase Eno), then the focus has been on the background and our perceptions of this background. In most, if not all, acts of composition or song-writing there is a preoccupation with the production of space, or implied space, whether it is a large, church-like reverberance or a small, intimate experience of being close to a singer, instrument or environment. This creation space is strongly related to our experience *of* our surroundings and in our relation *to* our surroundings. As such, ambience labelling information is the classification of,

> […] information that is perceptually important but which we don't 'focus' on: 'background'. Without this background, the 'foreground' objects of perception don't actually make sense, and we might regard this background as a *context* for sounding objects, helping us to discern and position them.[28]

The background is the context from where we read and make sense of the sounds which surround us, be it a sick ward or an airport. The musical interpretation is highly dependent on this environmental site as a vantage point for our perception. Indeed, David Griesinger[29] has found that the sonic background of a performance space can have unique timbral and spatial properties, and

28 Peter Lennox, Tony Myatt, and John Vaughan, "3D audio as an information environment." In *Audio Engineering Society Conference: 19th International Conference: Surround Sound-Techniques, Technology, and Perception*. Audio Engineering Society, 2001.

29 David Griesinger, "The psychoacoustics of apparent source width, spaciousness and envelopment in performance spaces," *Acta Acustica united with Acustica* 83, no. 4 (1997): 721-731.

this background can impose very distinct characteristics or timbral colouration on the sound which is experienced in a space. In addition, it is our particular spatial positioning when experiencing music that helps our understanding of what we hear. As listeners, we try to understand our context dependent on the perspective from which we experience our situation, by attempting to recognise patterns and make connections between what we hear.[30]

These patterns can produce a sense of ambiguity, perhaps making it difficult to discern the direct signification of what the sounds represent in the spaces in which we hear them. These ambiguities carry with them implications from the different contexts from where they are experienced, and the acousmatic experience of listening from a site provides psychoacoustic descriptions of audio environments. Then we experience that "no sound event, musical or otherwise, can be isolated from the spatial and temporal conditions of its physical signal propagation".[31] A non-diegetic sound experience is the experience of an acousmatic sound, a sound which carries with it some significations of the space in which it is experienced.

In examining fundamental questions of sound in game audio, the IEZA framework draws on Chion's work on on-screen and off-screen sounds. Listening is a mode and function of gathering information about the environment we navigate, be it against a metaphorical site like an airport, a game or film world. In building fictional game worlds, the challenge is to create a believable environment in which the separate sound sources can exist and be accepted as part of the game environment. Sounds are placed coherently within a space against a texture/background and these must exist against the background to make sense.

The environmental and background stimuli, and the relationship of the perceived sound to the background sound, hovers at and around the

30 Gary S. Kendall, "Meaning in electroacoustic music and the everyday mind," *Organised Sound*, 15(1), (Cambridge, Cambridge University Press, 2010): 63-74.

31 Jean-François Augoyard, and Henry Torgue, eds., *Sonic Experience: A guide to everyday sounds.* trans. Andrea McCartney, and David Paquette, (Montreal and Kingston: McGill-Queen's Press-MQUP, 2014), 4.

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threshold of perception and "the listener […] accepts their symbiosis".[32] But in attempting to *be* the background, to meld into this present-ness of our perceptions, the ambient "foregrounds a devaluation of foregrounding".[33] Importantly, the background and the ambience is interpreted as music. If the insect and bird background chorus can be understood and listened to as music as is, then the synthesised backgrounds that exist acousmatically in (any) site can also be music. Music, in its broadest sense can be "related to a sense of place – landscape or environment".[34]

By pertaining to belong to or be part of a landscape, the aim of such music is ultimately to create a fully acousmatic situation, where the origins and causes of the sounds are erased and the only thing we are left with is a music that *is*.

In the psychoacoustic depictions of audio environments, listening implies an active engagement and intention in discerning the foreground sound and background sound. Chion divides the listening spectrum into three parts: on-screen, off-screen and non-diegetic,[35] and likewise Lennox breaks down the shapes of our space perception to three parts: my space, adjacent space(s) and distant space.[36] The fundamental importance between these spatial perceptions is the connections between them and how the sounds in my space/on-screen is influenced by the sounds of a distant/non-diegetic space.

Conclusion

For the most part, we expect things to work and when equipment ceases to function as we expect it to, it grabs our attention. For Eno, the broken speaker prompted listening focused on the threshold between the music and

32 Seth Kim-Cohen, *Against Ambience*, 33.

33 Ibid., 33.

34 Brian Eno, liner notes, *Ambient 4: On Land*.

35 Michel Chion, *Audio-Vision*, 78.

36 Peter Lennox et al., *3D audio as an information-environment*.

background sounds, while for Cage the anechoic chamber did not function as expected. Whereas Cage subjectively experienced his body's sounds, Eno attempted to present the work outside this sphere into a separate objectivity. The lessons to be learned from both Cage's 'silent' *4'33"* and Eno's ambient works concern our hierarchies of listening. Our attention turns toward the background, past the foregrounded sounding objects to create a new foreground present in our consciousness. This new foreground creates a new perceptual space, a depiction of an audio environment which can encompass references to real, fictional and metaphorical sites of existence or perception. Yet, regardless of the site in which a work is situated, it will always be experienced in relation to the site of history and in context to other objects that reference it or stand in some form of relation to it. A site is not always a physical place but rather it is a process, a set of conditions and something which has perceptual significance. The site of the ambient belongs intrinsically to a site present in our consciousness, and this site is present in its reference to other things, meanings, narratives and other sites.

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4

THREE MANIFESTATIONS OF SPATIALITY IN AMBIENT MUSIC

Richard Talbot

Joanna Demers noted that "we are accustomed to thinking that electronic music, even more than non-electronic music, is concerned with space".[1] I believe this is particularly true in the case of ambient music. In this chapter, I will examine three ways in which space is manifested within the genre. In doing so, I will specifically focus my attention on Brian Eno's album *Ambient 4: On Land*. This is for two main reasons. Firstly, as a recording it mapped a new set of possibilities for the way ambient music could be both made and heard. The second is rather more personal, *Ambient 4: On Land* had a huge impact on me and ultimately inspired me to make my own music, something I continue to do nearly 40 years later.

Robert Morgan observed that "anyone familiar with the philosophical and theoretical literature dealing with music must be struck by the persistence with which spatial terminology and categories appear".[2] Morgan contends that we are unable to discuss music without recourse to spatial terms, particularly when examining pitch, where "one finds it necessary to rely upon such spatially orientated oppositions as 'up and down', 'high and low', 'small and large' (in regard to intervallic 'distances') and so on. Space then […] apparently forms an inseparable part of the musical experience".[3] Although it is worth noting that Morgan's focus is on western art music, much of what he says is equally relevant to ambient music. However, there are important differences between foregrounded music and ambient music, the latter of

1 Joanna Demers, *Listening Through the Noise* (New York: Oxford University Press, 2010), 113.

2 Robert Morgan, "Musical Time / Musical Space" in *Critical Inquiry* 6, no. 3 (1980): 527.

3 Ibid., 527.

which is presumed to exist on the periphery of the listener's attention.

Like Morgan, Edward Campbell approaches the concept of spatiality from a realist perspective. He contends that music displays its spatiality in two 'discrete senses'. The first of these he defines as 'interior spatiality', representing the pitch continuum, the other being 'exterior spatiality', reflecting the space in which the musical performance takes place.[4] This two-dimensional approach might be musicologically satisfying but it fails to take account of the way music can generate space. Jason Toynbee observes there is also a prevailing tendency (clearly visible in ambient music) in which the goal "is to create a sonic environment, a virtual dimensionality which never existed originally".[5]

Space in music

It is useful to think about spatiality in music as being stratified, with overlapping layers of spatiality (both musicological and non-musicological) occurring simultaneously. In order to gain a greater insight into the different forms of spatiality it is helpful to locate three areas where they reside:

1. Composition: In a compositional context, space resides in tonal texture; it can literally be found in the gaps between the notes and in the positioning of sounds in the stereo field. This is where the composer 'writes space' into the music.

2. Text: Whilst the spaces that reside in composition are innate, there are a number of ways that spatial characteristics can also be applied to music. The most common means of doing this is through the use of sound effects such as delay or reverb. It should be noted that not all of these effects have a corollary in the natural world, and we often hear performances which feature echoes and delays of far greater duration or clarity than any earthly phenomenon. It is also not

4 Edward Campbell, *Music After Deleuze*. (London: Bloomsbury Academic, 2013), 68.

5 Jason Toynbee, *Making Popular Music: Musician's Creativity and Institutions*. (London: Arnold, 2000), 70.

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unusual for several of these spatial effects to co-exist simultaneously, with several musicians utilising different spatial effects at the same time. We shall discuss this idea of applied space and its relationship with ambient music in more depth later in the chapter. There is another, more physical, way in which spatiality can be applied. Campbell describes it as 'exterior spatiality', the audio recording of specific spaces such as concert halls and stadiums or the use of field recordings. Live albums frequently exemplify this where we hear music physically enshrining the sonic properties and artefacts of the venue the music was recorded in.

3. Psychological space: The product of the listener's interaction with sound or music, taking account of factors like memory, perception, temporality and imagination. For example, when writing about Trance Music, journalist Heinrich Deisl devised the term *fluchtpunkt* to describe "a space in nowhere that can be filled with all your ideas, projections, dreams, hopes, imaginations. It is not connected to reality at all. A simulation".[6] In the liner notes to the second edition of *Ambient 4: On Land*, Eno recounted how he created a perceptual space. While travelling in Ghana, he had used a stereo microphone "placed to pick up the widest possible catchment of ambient sounds from all directions, and listening to the result on my headphones. The effect of this simple technological system was to cluster all the disparate sounds into one aural frame; they became music".[7]

Whilst it is clear that spatiality is present in different ways across all musical experiences I want to consider some ways in which we can see notions of space at play within ambient music.

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6 Finn Cohen, *In Defence of Trance*, accessed June 1, 2018, https://pitchfork.com/features/article/in-defense-of-trance/

7 Brian Eno, liner notes from *Ambient Music 4: On Land*. (London: E.G. Records, 1986).

The first category is ubiquitous to all musical experiences, irrespective of genre. Doyle[8], describes it as listening space, and Demers defines it as "a composite of the perceived spatial characteristics of a work usually in recorded form, as well as the emotions that those characteristics elicit from the listener".[9] The notion that sound can be a vehicle to convey spatial characteristics corresponds with Smalley's assertion that sounds carry their own space, acting as "space bearers".[10] While the interaction between the listener's knowledge, preconceptions and the music provides an excellent framework for understanding how listening space is constructed, I believe that we should also take into account the role of the listening environment. I suggest that listening space is formed from a triangulation of three elements: listener, music and environment. As listeners, we tend to be very sophisticated about the ways we manage this set of relationships – even unconsciously so. This is illustrated in the way that we employ specific music in a wide variety of situations such as driving, studying or dining. It is likely that we would choose different pieces of music to enhance our experience of each of these scenarios. The listening spaces we create are unique and irreproducible by virtue of the complex factors and interactions involved in their construction. Firstly, each individual's experience and knowledge are unique; this alone ensures that no two people mediate a listening space in the same way. Secondly, listening environments constantly change. Although the differences between separate manifestations of a listening space may, at times, be imperceptible, there will always be some variation - no matter how slight. As we have noted, listening space is present in all musical experiences regardless of genre, however, it is worth noting that ambient music in its first iteration was consciously designed as a form of environmental control to configure the relationship between listener, environment and music. In the liner notes to *Music for Airports*, Eno makes this explicit declaring that:

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8 Peter Doyle, *Echo and Reverb* (Middletown CT.: Wesleyan University Press, 2005).

9 Demers, *Listening Through the Noise*, 116.

10 Denis Smalley. "Space-Form and the Acousmatic Image," *Organised Sound* 12(1), (2007): 38.

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> An ambience is defined as an atmosphere, or a surrounding influence: a tint. My intention is to produce original pieces ostensibly (but not exclusively) for particular times and situations with a view to building up a small but versatile catalogue of environmental music suited to a wide variety of moods and atmospheres.[11]

The second manifestation of space in ambient music is best described as 'manufactured space'; similar to listening space, it is nearly ubiquitous to all forms of recorded popular music. Earlier, we looked at the use of spatial effects to manufacture simulations of real or imaginary spaces. Such use of effects can be broadly delineated into two main categories: 'applied' and 'embodied'. The former includes effects such as delay or reverb that can be added to an instrumental part in order to simulate space, distance or atmosphere. A guitar that was actually recorded in a cellar can, with the judicious use of reverb, be made to sound as if it were being played in a cathedral. This process is additive in that spatiality is literally 'added to the music' at some point between recording and creating a final mix. This is the most prevalent way that effects are utilised in popular music. Embodied effects, however, are a constituent part of the music, and are integral to the rhythmic, melodic or harmonic structures of a musical text. A prime example might include the tape delay system employed by Brian Eno (and subsequently Robert Fripp) to create *Discreet Music*.[12] Two short melodic fragments were fed into a long delay system created by linking two tape recorders.[13] This resulted in a constantly evolving bed of sound generated from a limited musical input. Another commonly heard example is the use of multiple delays to generate complex rhythmic patterns. In these instances, the effects are no longer just a

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11 Brian Eno, "Ambient Music", liner notes for *Ambient Music 1: Music for Airports*. (London: E.G. Records, 1978).

12 Brian Eno, *Discreet Music*. (Obscure / Island Records, 1975).

13 More information on this delay system, can be found in the Discreet Music sleeve notes along with an informative diagram.

'treatment' of sound suggesting distance or presence, rather they are actually embodied in the music, generating rhythmic and sonic attributes.

There is a secondary type of embodiment that should also be acknowledged. Distinct sonic attributes are often associated with individual pieces of technology. These place a sound in terms of cultural association or previous musical use. A prime example of this is the Roland Space Echo. Originally introduced in 1974, it was an extremely popular tape delay unit used by countless artists from different genres and musical generations including: King Tubby, Pink Floyd, The Orb and Brian Eno. The Space Echo was noted for its characteristic 'warm sound' as well as its subtle tape flutter. Although Roland ceased manufacturing them in 1990 (they currently make a foot pedal which simulates the original Space Echo's effects) some original units and a wide variety of modern hardware and software simulations are still in widespread use. This is not because they offer an authentic simulation of space, rather it is because the sonic artefacts of the device are associated with a host of classic and vintage recordings. Effectively, the Space Echo is used as a carrier of sonic information about time and technology.

We tend to think of the use of effects as being a technologically-assisted process. However, we should remember that musicians have always found ways to sonically manipulate playing environments in order to enhance their sound. Doyle[14] recounts an anecdote about Robert Johnson playing into the corners of rooms to achieve a specific sonic effect. Similarly, as we noted previously, certain environments such as places of worship or purpose-built concert halls have been created specifically for their acoustic properties. A number of musicians from different musical backgrounds have sought out places with particular or unique acoustic properties and assimilated the resonances and sonic properties of those spaces into their music. New Age flautist Paul Horn recorded in a number of exotic spaces including the Taj Mahal and the Great Pyramid, while Pauline Oliveros performed in a hugely reverberant underground cistern.

14 Doyle, *Echo and Reverb.*

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The third type of space I wish to discuss could be classed as a type of 'figurative space' and is more specific to the generic conventions of ambient music. This manifestation of space occurs where elements of representation and simulation meet. Unlike the aforementioned examples of spatiality, figurative space is not part of any mechanical, acoustic or technological process. Rather, it is the product of artistic construction, and its purest iteration is found in pieces of music that model or represent real or imagined places or natural phenomena.

Between 1978 and 1982 Brian Eno oversaw the release of a series of four stylistically different records[15] that laid out various templates for ambient music. While the first three albums in the series featured relatively conventional tonal and harmonic material, *Ambient 4: On Land* approached the idea of making ambient music from a completely different direction. Eno stated that the album was "an attempt to transpose into music something that you can do in painting: creating a figurative environment".[16] He explained that:

> What qualified a piece for inclusion on the record was that it took me somewhere, but this might be somewhere that I'd never been before, or somewhere I'd only imagined going to. Lantern Marsh, for example, is a place only a few miles from where I grew up in East Anglia, but my experience of it derives not from having visited it (although I almost certainly did) but from having subsequently seen it on a map and imagining where and what it might be. We feel affinities not only with the past, but also with the futures that didn't materialise, and with the other variations of the present that we suspect run parallel to the one we have agreed to live in.[17]

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15 The albums in the Ambient series were: Brian Eno - *Ambient 1: Music for Airports*, Harold Budd and Brian Eno - *Ambient 2: The Plateaux of Mirror*, Laraaji - *Ambient 3: Day of Radiance* (Produced by Brian Eno), Brian Eno - *Ambient 4: On Land*.

16 Brian Eno, liner notes for *Ambient Music 4: On Land* (London: E.G. Records, 1978).

17 Ibid.

In light of this, it is tempting to view *Ambient 4: On Land* as a proto-hauntology record (albeit one that pre-dates Derrida's use of the term by more than ten years). Eno's suggestion of nostalgia for lost futures is also a recurring theme in hauntological discourse. Mark Fisher notes that:

> In hauntological music there is an implicit acknowledgement that the hopes created by postwar electronica or by the euphoric dance music of the 1990s have evaporated – not only has the future not arrived, it no longer seems possible. Yet at the same time, the music constitutes a refusal to give up on the desire for the future.[18]

Proponents of hauntology contend that it is impossible to fully recreate (or resurrect) the past but spectral versions of it infiltrate the present. However, while *Ambient 4: On Land* shares the hauntologist's preoccupation with the past, and particularly the potential futures that it seemingly offers, there are differences in methodology. Hauntologists generally signify the past by assimilating its musical conventions and technologies into their present day music. On occasion these musical devices even become part of the artist's signature sound, regularly reappearing throughout their catalogues, including: tape flutter (Boards of Canada), disembodied and ghostly voices, (Burial), and analogue synthesis reminiscent of 1970s TV themes (Belbury Poly, The Focus Group). *On Land,* Eno's exploration of memory and lost futures, took a completely different route. During the recording process, Eno gradually abandoned traditional notions of musicology, preferring to draw on his training as a visual artist[19] and to adopt a more painterly approach to sound in order to evoke the ghosts or presence of place:

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18 Mark Fisher, *Ghosts of My Life. Writings on Depression, Hauntology and Lost Futures* (Winchester: Zero Books, 2013), 21.

19 Eno studied at Winchester School of Art from 1966-69.

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> As I made these pieces, I began to take a different attitude towards both the materials and the procedures I was using. I found the synthesiser, for example, of limited usefulness because its sound tended towards a diagrammatic rather than an organic quality. My instrumentation shifted gradually through electro-mechanical and acoustic instruments towards non-instruments like pieces of chain and sticks and stones.[20]

So, does this idea of constructing space within the confines of ambient music work any differently than in other forms of popular music? Giacomo Botta notes that:

> Popular music is as much about places as it is about sounds. Its production is forged in studios, rehearsal areas and bedrooms, places often mythologized in popular music history. Popular music is also recorded using studio techniques designed to recreate space, through reverb and other effects. Its collective consumption happens in concert halls, clubs and bars while its individual consumption takes place in streets, homes and at bus stops; all physical places. In addition, popular music often represents or sounds like certain urban or rural, real or imagined places of various scales.[21]

Certainly, rock and pop records over the last 60 years have generally attempted to replicate the audio dynamics of live performance. Typically, the vocal is foregrounded and supported by the other instruments each of which occupies a sonic space supposedly reflecting their on-stage positioning. Ambient music, however, rejects these conventions by removing the foreground and

20 Brian Eno, liner notes for *Ambient Music 4: On Land* (London: E.G. Records, 1978).

21 Giacomo Bottà, "Unsichtbare Landschaften: Populäre Musik Und Räumlichkeit / Invisible Landscapes: Popular Music and Spatiality." April 12, 2016. Accessed June 1, 2018. https://giacomobotta.wordpress.com/2016/04/12/unsichtbare-landschaften-populare-musik-und-raumlichkeit-invisible-landscapes-popular-music-and-spatiality/.

cuts itself loose from the spatial configurations of popular music, creating a decentralised sound field that solidifies the notion of space rather than those who occupy it.

Botta's contention that popular music frequently represents real or imaginary spaces is somewhat more problematic than it might at first appear. Let us consider "Waterloo Sunset" by The Kinks[22]. On the surface, the song seems to capture a sense of place, nostalgia and yearning beautifully. However, 'place' only exists as a backdrop for the singer and his concerns. In this case, place is reduced to context and consequently the listener is always one step removed from it, as they can only experience it via the singer and their persona. The singer demands our attention, s/he always distracts us from the musical accompaniment. If the listener wanted to explore the place in the record, they would have to achieve the impossible and somehow find a way to listen through, or around, Ray Davies. As Eno noted: "Take a landscape. As soon as there is a human subject, however tiny, it captures all the attention".[23] Ambient music removes itself from the foreground and sheds the focal point of singer or instrumentalist. This leaves us with a very different audio topography, in which a new sonic landscape, one without a central focus, becomes part of the genre's expressive vocabulary.

Representation and simulation

The methodology used to construct figurative spaces in ambient music draws on a combination of elements associated with representational art and simulation. However, the idea that music itself can be representational

22 "Waterloo Sunset" was released as a single in 1967, reaching number 2 in the UK singles chart.

23 Franck Mallet, "Redefining Musical Space: In the Enosphere," *Artpress*, 271, (2001), accessed January 18, 2018, http://music.hyperreal.org/artists/brian_eno/interviews/artpress01.html

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has been contested by various writers. Nelson Goodman[24], Roger Scruton[25] and Richard Kuhns[26] all express widely differing opinions that are heavily mediated by factors such as connotation and denotation. Scruton flatly asserts that:

> Music may be used to express emotion, to heighten a drama, to emphasise the meaning of a ceremony; but it is nevertheless an abstract art, with no power to represent the world. Representation, as I understand it, is a property that does not belong to music.[27]

This is a complex debate which is too involved to be thoroughly explored here. However, regardless of this ongoing debate, ambient music certainly meets some of the conditions that Scruton deems necessary for artworks to be considered representational. For example: the use of compositional titles, clearly indicating the nature of the subject to provide a framework through which listeners are guided in a specific way. *Ambient 4: On Land*, for example, features several pieces whose titles reference specific geographical locations including, "Lantern Marsh", "Leeks Hills", and "Lizard Point". Kendall Walton suggests that "mere titles often suffice to make music patently representational; indeed I cannot imagine music which an appropriate title could not render representational".[28] Many ambient works feature direct representations of the subject. In the case of musician Simon Scott, he included field recordings of the Cambridgeshire Fens which were also the

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

25 Roger Scruton, "Representation in Music," *Philosophy* 51 no.197 (Cambridge: Cambridge University Press, 1976): 273-287.

26 Richard Kuhns, "Music as a Representational Art," *The British Journal of Aesthetics*, 18 no.2, (1978), accessed January 18, 2018, https://doi.org/10.1093/bjaesthetics/18.2.120

27 Scruton, "Representation in Music."

28 Kendall Walton, "Listening with Imagination: Is Music Representational?" *The Journal of Aesthetics and Art Criticism*, vol. 52, no.1, The Philosophy of Music (1994): 47.

subject of his 2012 album *Below Sea Level*.[29]

> I wanted to combine organic recordings and synthetic sounds. I'd go out into the Fens and record with hydrophones underwater and other microphones on or above the surface of the water […] The hard part was to blend actual recordings with digitally processed sounds so that it never becomes too synthetic and loses the character of the Fens.[30]

Scott's music relates to the landscape at all stages of creation:

> I use a portable speaker to mix outside so at that point, when I think a track is almost complete, I go out into my sweet sounding location in The Fens and set up microphones to capture a mix being played out into that environment. It works for my music and I love the collaborative results from doing this.[31]

However, the use of field recordings does not have to be so literal in order to be representational; imitative or even borrowed sounds can be equally effective. While Eno's *On Land* album is ostensibly located in East Anglia, it features sounds collected from other locations. The frogs prominently heard on "Unfamiliar Wind (Leeks Hills)" were actually recorded in Choloma, Honduras. After all, we would not expect a landscape painter to be reliant on materials sourced from the site they were painting.

Intertwined with these aspects of representation, simulation also plays an important role in the way figurative space is manufactured. In 2009 my duo

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29 Simon Scott, *Below Sea Level* (New York: 12K - 12k1071).

30 "Exclusive Interview with Simon Scott," (2013), http://sonicfield.org/2013/10/exclusive-interview-with-simon-scott/

31 In the studio with Simon Scott, 2015, https://reviews.headphonecommute.com/2015/10/22/in-the-studio-with-simon-scott/

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Marconi Union made an album inspired by Tokyo.[32] However, neither of us had ever visited the city. Our only experience of Tokyo was through received images in books, films and television. I would argue that the record we made was an example of simulation which Jean Baudrillard[33] or Umberto Eco[34] might recognise, in which reality is eroded by media. It also demonstrates that authenticity is not a necessary component of figurative space. This strand of constructing fictional, or what I prefer to call 'unexperienced', places, is prevalent in ambient music. There are numerous ambient works exploring science fiction themes such as outer space[35] – environments we can safely assume are unfamiliar to the artists who created them. Yet, despite this, they can still resonate with us as listeners, because the preconceptions on which they are built, whether based on media images (like our album *Tokyo*) or some other source, are shared by both artist and listener. Ultimately, it is possible that we are more likely to recognise the simulation than the reality. As listeners we have developed an extensive repertoire of sonic signifiers. These connote these unexperienced places in a way that is commonly understood by listeners and artists. There are, for instance, lots of sounds that have only existed in science fiction films and television but which are widely recognisable, such as the lightsaber from *Star Wars* or the Dalek's voice from *Doctor Who*.

Simulation occurs both conceptually and also as a sonic component within pieces of music. Anyone who has spent any time listening to ambient records will have heard tracks featuring the sounds of cicadas, birdsong, wind or rain. These sounds, or synthetic approximations of them, can be easily obtained from a sound library, created with a synthesiser or sampler and inserted into a

32 Marconi Union, *Tokyo* (BineMusic BINE 020CD, 2009).

33 Jean Baudrillard, *Simulations*, trans. Paul Foss, Paul Patton and Philip Beitchman (New York: Semiotext(e), 1983).

34 Umberto Eco, *Travels in Hyperreality The fortress of Solitude* (London: Picador, 1987).

35 Many 'ambient' artists such as Brian Eno, The Orb and Biosphere have made music inspired by science fiction themes.

piece of music. Our fluency in decoding them and their connotations makes them extremely effective at simulating locations and environments.

This opens up a number of questions about transmission and reception, and how we interpret records that represent place. Eno writes that the piece "Lantern Marsh", featured on his album *Ambient 4: On Land*, was inspired by seeing the place name on a map, rather than any actual memories of visiting it, although Eno acknowledges that he almost certainly did.

He also contends that, "we feel affinities not only with the past, but also with the futures that didn't materialise, and with the other variations of the present that we suspect run parallel to the one we have agreed to live in".[36] So, how do we understand this piece? First, we have a place constructed by an artist. This place is at a junction of knowledge, temporality and imagination or creativity. Eno is engaged in creating a version of his own past and a geography of a place that may or may not have existed. However, this is a 1982 'version' of "Lantern Marsh". So, are we hearing Eno as an adult, or Eno as a child imagining Lantern Marsh? Is this a place that can be found on a map, or is it imaginary, like Marconi Union's depiction of Tokyo? Does it even exist at all? Is it just a metaphor for memory and loss? Or is it just a name applied to a piece of music in order to give it meaning? It could possibly be all these things, some of them, or none. Even for the composer the meaning of a given title may not be fixed. Perhaps the most important question is: how does this relate to the listener? When they hear this music, what are they engaging with? Is it the depiction of Eno's memory, something they could not possibly have experienced – especially as it is not at all clear that Eno has any such memories with which to engage? Or is the music a vehicle for them to project their own experiences and memories onto as part of their listening space? As we grow up, we all inevitably accumulate our own unrealised futures, dreams and hopes that were not realised. These are our own Lantern Marshes, and they are precisely that, our own. Their personal nature ensures that they remain, for the most

36 Eno, liner notes for *Ambient Music 4: On Land*.

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part, unshareable. We should also consider that the transmission of meaning is a two-way process between the listener and the artist.

It is necessary to sound a note of caution here, due to the fact that every musician has their own approach to making music. While some are keen to engage with the conceptual underpinnings of the area they choose to work in, others prefer to think about music solely in terms of form. Equally, we should bear in mind that not all compositions that appear to be representational are necessarily created with a specific subject in mind. Often, this process works in reverse: rather than making a piece of music that represents a specific object, the artist attaches meaning to an existing piece. They complete a track before deciding on a title that they feel reflects the music. In this situation, the artist occupies two positions: they are both creator and listener, divining meaning and imagery from the music but without the benefit of the titular cues that would normally be present for the listener.

Conclusion

As has been shown from the discussions about listening space and manufactured space, spatiality is innate to all areas of music, regardless of genre. However, ambient music, through its generic conventions and affordances, presents particular ways of creating imagined, embodied and representational space. In the case of *Ambient 4: On Land* (and many other ambient records), this space revolves around temporal disjunction, with the composer using place as a metaphor for memory and loss.

There is one last temporal disjunction overlaying all those previously discussed. *Ambient 4: On Land*, Eno's meditation on lost pasts and futures, is itself receding further into the past, and is now older than Eno was when he first released it. However, over the intervening years the album has informed numerous ambient recordings and even entire sub-genres, such as dark ambient, and its influence, particularly the idea of creating figurative space, is still very much present today.

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5

THE STEADY STATE THEORY: RECALIBRATING THE QUIDDITY OF AMBIENT MUSIC

Simon Cummings

"Plus ça change, plus c'est la même chose." – Jean-Baptiste Alphonse Karr[1]

Introduction

As the superstitions of religious interpretation have given way to the rational rigour of scientific investigation, so our understanding of the nature of the universe has fundamentally shifted. Symbolism, significance, order and limitation have been replaced by meaninglessness, insignificance, randomness and infinity. As we look up at the stars, gazing out and beyond what we think of as home, our perception passes ever further away from the specific to the generalised, an existence characterised by a uniform distribution of elements (*homogeneity*) appearing the same from all vantage points and in all directions (*isotropy*).[2] From this universal perspective everything may be precious, but nothing is privileged.

In tandem with our understanding of how things are, how they came to be has been similarly scrutinised. The twentieth century brought numerous theories regarding such origins (or lack of them), proposing either that the universe had no fixed beginning – Fred Hoyle's 'steady state' model – or that it all began instantaneously in an enormous conflagration, the well-known 'big

1 *Les Guêpes* January 1849 (6th series, 1859), in *Oxford Essential Quotations, Sixth Edition*, ed. Susan Ratcliffe (Oxford University Press, 2018).

2 These twin elements are what constitutes the *cosmological principle*, originally asserted by Isaac Newton.

bang' theory.[3] The latter has become firmly established as the most compatible with contemporary cosmological understanding, though arguments remain and further theories (including attempts to combine the steady state and big bang models)[4] continue to be proposed.[5]

It is perhaps not too fanciful a parallel to say that musical compositions can be regarded as sonic universes. They contain objects arranged and positioned in a particular way, distributed with varying densities, according to the most strict or arbitrary organisational rules and schemes. They surround and envelop us, our role as listeners becoming akin to travellers drifting and exploring their inner worlds. Within and around these worlds we are able to perceive everything from the gigantic to the infinitesimal, events that happen in the blink of an eye or which play out over extended periods of time. And while music is inevitably limited by being temporal, bound to and by time, it can in both its objective behaviour and subjective character suggest and evoke the infinite.

Just as our understanding and interpretation of the universe is by necessity subject to continual scrutiny, challenge and revision, the same is true of music, and particularly true, arguably belatedly so, of ambient music. In the four decades since Brian Eno first coined the term 'ambient' to describe a particular kind of musical outlook and practice, what that term connotes has become increasingly simplified, assumption-laden and formulaic. Greek musician Vangelis has complained that it "gave the opportunity for untalented people

3 For an introduction to the steady state model see F. Hoyle, "A new model for the expanding universe," *Monthly Notices of the Royal Astronomical Society* 108(5) (1948) and H. Bondi, T. Gold, "The Steady-State Theory of the Expanding Universe," *Monthly Notices of the Royal Astronomical Society* 108(3) (1948). A commentary on the origins of the big bang theory can be found in Jean-Pierre Luminet, "Editorial note to: George Lemaître, The beginning of the world from the point of view of quantum theory," *General Relativity and Gravitation*, 43(10) (2011): 2911–2928.

4 The so-called 'steady bang' model; see F. Hoyle, G. Burbidge, J. V. Narlikar, "A Quasi-Steady State Cosmological Model with Creation of Matter," *The Astrophysical Journal* 410 (1993): 437–457.

5 For an excellent overview of the history and arguments, see Helge Kragh, "Cosmology and the origin of the universe: Historical and conceptual perspectives," *arXiv preprint arXiv*:1706.00726 (2017).

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to make very boring music",[6] and indeed, a cursory survey of contemporary examples of music described by its creators as 'ambient' might lead one to conclude that its conception rests upon and revolves around little more than the conjunction of a few very basic, superficial characteristics, which might be summarised as: slow, quiet, relaxing and beautiful.

Admittedly, it is true that several of these epithets could be said to apply to the first album to use the term 'ambient', Brian Eno's 1978 *Ambient 1: Music for Airports*. The album's four movements are very obviously designed to be quietly subdued, a deliberate effort on Eno's part – elaborated in the album's liner notes – to enable the music to "accommodate many levels of listening attention without enforcing one in particular", thereby affording the listener the potential for a uniquely polarised form of engagement, able to regard the music as, by turns, "ignorable" and "interesting".[7] Furthermore, each movement of *Music for Airports* is constructed from a small number of brief, repeating melodic gestures which overlap each other with unpredictable freedom while remaining harmonically fixed, strictly diatonic with regard to an unchanging underlying tonality. It would be easy to assume that the dominant traits of *Music for Airports* – and, therefore, the definition of ambient music itself – emerge from this particular combination of gentle, sedate consonance.

In this chapter I will argue that this assumption is a fallacy, at odds with both the non-specific openness of Eno's own definition of ambient – encapsulated in his 'ignorable'/'interesting' dichotomy – as well as the fundamental musical paradigm that he established in *Music for Airports* in order to directly manifest that dichotomy. In an attempt to recalibrate the history, definition and outlook of ambient music, I will argue that, from the perspectives of both composer and listener, it is this same paradigm that

6 Peter Culshaw, "My Greek odyssey with Alexander," *The Guardian*, January 6, 2005, https://www.telegraph.co.uk/culture/music/3634447/My-Greek-odyssey-with-Alexander.html.

7 Brian Eno, "Ambient Music", liner notes from *Ambient 1: Music for Airports* (PVC 7908 (AMB 001), 1978), accessed March 20, 2019, http://music.hyperreal.org/artists/brian_eno/MFA-txt.html.

constitutes the defining aspect of ambient qua ambient: a generalised modus operandi that I call a *steady state*.

The steady state: definition and antecedents

Hoyle's 'steady state' cosmological model posited a situation in which there was neither a beginning and end to the universe nor any significant overall difference in its nature and composition. As such, the universe existed in a state of equilibrium, in which change occurred on smaller scales of distance, density and time but over larger scales was essentially changeless and static. Another way of putting this is to say that the concept of a steady state indicates not a stasis of *detail* but of *behaviour*; the generalised 'rules' governing the steady state are essentially encoded into an underlying behavioural definition which never alters, yet that definition nonetheless specifies (or, at least, allows) creation, variation and change.

It is not difficult to conceive of a musical equivalent of the steady state model. Indeed, Brian Eno's dichotomy potentially offers just such an equivalence, suggesting a musical environment containing 'ignorable' elements that over the long-term remain static and thereby discourage active listening, and 'interesting' elements that undergo short-term change, inviting listener engagement. As I will show, Eno's *Music for Airports* is an example of precisely this kind of musical steady state in action. Yet while Eno's development of this idea was innovative and new, it owed a debt to numerous antecedents and prototypes of demonstrably similar musical environments and processes.

Discussion about 'proto-ambient' tends without exception to reach to the music of Erik Satie as a precursor. Though very often cited,[8] from the perspective of steady states, Satie's piano work *Vexations* (c. 1893) is an

8 cf. Mark Prendergast, *The Ambient Century* (London: Bloomsbury, 2003), 6; Paul Morley, *Op. cit.*, 33; Alan Licht, "Sound Art: Origins, development and ambiguities," *Organised Sound*, 14(1) (2009), 3–10; Eliot Bates, "Ambient Music" (Masters diss., Wesleyan University, 1997), 152. There are innumerable such examples in the literature; indeed, it would probably be easier to cite cases that do not mention Satie than those that do.

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irrelevant point of reference. This may seem a strange assertion since the piece is so directly concerned with maintaining an unchanging state – the same passage of music performed 840 times – over a consequently extended duration. The key difference, however, is in this very exactitude. A musical steady state requires unpredictability, or at least variability, of its parameters at smaller-scale durations, whereas *Vexations* employs *exact* repetition and thereby creates music that does not exhibit short-term material change.[9] As such, *Vexations* is a piece solely concerned with long-term behaviour that, in ambient parlance, we would characterise as being wholly 'ignorable' (which, considering the work's title, is hardly surprising).

For the same reason, Satie's *musique d'ameublement* ('furnishing' or, more commonly, 'furniture' music) is of minimal relevance with regard to steady states. A collection of five short pieces composed between 1917 and 1923, described by Dylan Trigg as "a type of music that must not individuate itself, must not display any excessive idiosyncrasy, but rather blend seamlessly into the background, surreptitiously enforcing an environment that the listener is unaware of",[10] the concept obviously invites immediate comparisons with ambient. However, these pieces similarly rely upon strict repetition of very short musical phrases, and so are focused again, entirely deliberately, on the creation of 'ignorable' music. Indeed, Satie himself was vehemently adamant that these pieces should in no way be actively listened to, urging the audience, "to take no notice of it and to behave … as if it did not exist. This music … claims to make a contribution to life in the same way as … a painting in a gallery, or the chair on which you may or may not be seated".[11] It is interesting to note that, despite Satie's adjurations, and the forbidding reality of music

9 I do not consider accidental considerations such as minor performance variations caused by performer fatigue or the occasional presence of mistakes as meaningful instances of 'change' in this context.

10 Dylan Trigg, "Furniture music, hotel lobbies, and banality: Can we speak of a disinterested space?," *Space and Culture*, 9(4) (2006): 7.

11 Nicola Bernardini, "Erik Satie's Musique d'Ameublement, some ninety years later," in *Furniture Music* (Venice: Blauerhase), 22.

with "no variations, no extensions, … no evolution" that is consequently "exasperatingly static, and … does not seek to offer any solution nor escape to its staticity",[12] the audience nonetheless listened with rapt attention, to Satie's considerable annoyance.

These works by Satie point more directly towards minimalism, early examples of which include nascent precursors of steady states. Terry Riley's *In C* (1964) uses a process by which 53 individually-numbered bars are repeated an arbitrary number of times by each of the unspecified number of players. Though the work has a notionally linear direction, each player methodically working their way through the sequence of bars, this is undermined and diminished by the nature of Riley's musical material. The bars themselves – in terms of their actual content, plus the fact that they are subject to continuous rapid repetition – are from a listening perspective all relatively innocuous, so attention is theoretically only drawn to them when they first occur in a particular part. Furthermore, depending on the number of players, which could be considerable,[13] not all such occurrences will even be audible. The combined effect of these multiple bars sounding simultaneously thus creates washes of generalised sound that, in the short term, include occasional periods of interest due to individual points of change, while over the long term they present an essentially static environment with only modest shifts in harmonic emphasis, never significantly deviating from the purview of its underlying C-based tonality. This corresponds closely to the small-scale 'interesting' detail and large-scale 'ignorable' stasis of the steady state.

Steve Reich's 'phase' works from the late 1960s illustrate something similar. In *Piano Phase* (1967) the first of the two pianists performs an unchanging 12-semiquaver pattern for the entire duration of the work. The second pianist, performing the same pattern, alternates between sections where their rhythms are aligned with the first pianist (the two players beginning

12 Ibid., 23.

13 In the preface to the score, Riley states the most desirable number of players to be approximately 35.

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synchronised with each other) and episodes where they slowly accelerate until their material falls back into rhythmic alignment, now one extra semiquaver ahead of the first pianist. The piece thereby establishes episodes of stasis when the two players are rhythmically aligned, and temporary periods of transitional change during which rhythmic synchronicity is lost, over the long term creating something similar to a steady state.

Not all precursors of steady states are as highly energetic or rhythmically-driven as these examples by Riley and Reich. Tony Scott's *Music for Zen Meditation* (1964), an early example of New Age music, features a collection of trios combining Scott's clarinet with koto and shakuhachi. These pieces comprise slow streams of improvised melody and counterpoint, the three players intermingling their ideas in an attitude of quiet solemnity. As a consequence, none of the nine tracks is meaningfully different from any of the others, and the album as a whole acts not unlike a steady state, articulating an unchanging behaviour of quiet, randomised, diatonic counterpoint. Likewise, jazz flautist Paul Horn's 1968 album *Inside* features a collection of improvisations recorded in the Taj Mahal, exploring and interacting with the effect of its vast reverberant space. Horn's approach in each piece is essentially the same, the music consisting of short tendrils and gestures (combining both flute and the chanting of a male sentry) interspersed with pauses during which the reverberation, literally, fills the space. This amounts to a behavioural stasis in which individual phrases, and the compositions they nominally create, are all unique in the short term yet overall have no substantive distinction from each other.

It should be noted that in both these cases the music was created to serve a distinct functional end, to act as a suitable medium for the listener to engage in states of meditation.[14] As such, they are in both intention and execution not merely similar but equivalent, with only superficial musical differences:

14 The simple title of Paul Horn's *Inside* can be read as a double meaning, beyond its immediate reference to the Taj Mahal, hinting at a connection to an inner world of contemplation.

Scott meditating on Japanese Buddhist ideas in an intimate space, Horn on Indian Hinduist concepts within a reverberant public space, both articulated via the use of steady states. The capacity of the steady state to function in this way will be explored in more depth later.

Around the same time, the evolution of steady states was aided to a large extent by developments in psychedelic and progressive rock. In particular, several of Pink Floyd's albums from the late 1960s and early 1970s feature examples of quasi-steady states. "Careful With The Axe, Eugene" "Set the Controls for the Heart of the Sun" (*Ummagumma*, 1969), "Echoes" (*Meddle*, 1971), "On The Run"(*Dark Side of the Moon*, 1973) and "Shine On You Crazy Diamond"(*Wish You Were Here*, 1975) all include extended sequences where meandering surface details are placed over behavioural and/or harmonic stases. Though in most cases they ultimately form part of bigger, directionally linear structures – often acting as introductions to or periods of reflection between recognisable verse sections – it is clear that Pink Floyd were seeking to move far beyond the boundaries of conventional song forms and take the listener on larger-scale sonic journeys with much broader scope.

The most compelling instances of quasi-steady states in music from this time can be found in the offshoot of prog rock that came to be known as *kosmische musik*. The term was coined by German musician Edgar Froese, whose group Tangerine Dream, one of the first to harness emerging analogue synthesiser technology, took inspiration from the burgeoning interest in space exploration that came in the wake of the moon landings in 1969. Although their early work is clearly indebted in both style and structure to the Pink Floyd examples referred to above (as well as that group's earlier psychedelic period), Tangerine Dream was not a conventional rock group setting out to compose songs. On the contrary, Alexander Harden has commented on the use of electronics and avoidance of the human voice (in tandem with a much-reduced emphasis on the significance of performers) being means to distance *kosmische musik* from the aesthetic conventions of popular music at that time, employing sounds "that do not appear to originate from acoustical sources, which further contributes to

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the music's surreal or otherworldly character".[15] This freed Tangerine Dream to explore more undefined, non-linear musical structures.

In their 1971 album *Alpha Centauri*, slow-moving environments are established that are either rooted in rotating sequences of chords ("Fly and Collision of Comas Sola") or shimmering collections of drones ("Alpha Centauri"). These two ideas would gradually coalesce on Tangerine Dream's subsequent releases, in the process developing a more patient approach to structure, allowing the rate at which their environments changed to slow considerably. "Origin of Supernatural Probabilities", on the album *Zeit* (1972), is a striking early example of this, progressing from a gentle, dreamy opening into muffled pulsations. These pulsations evoke things organic (akin to a heart pumping) and machine-like, above which arbitrary elements – chord clusters, quiet stings, wind-like sounds – appear and overlap. Not only is this behavioural paradigm allowed to persist for a long time (lasting around nine minutes), but it is noticeably restrained, almost appearing to be taking place somewhere in the middle distance rather than seeking to make a conventionally strong foreground impact.

This ostensible indifference, or at least increased passivity, with regard to traditional notions of musical development and structure, as well as audience engagement, creates music that, invoking Eno's dichotomy, could well be described as 'ignoresting'. *Atem* (1973) and *Phaedra* (1974) continued to explore this approach, with the two albums sharing a four-part structure that progresses from long to short durations. It is therefore primarily in their respective opening tracks, being the longest, that these states are most clearly heard. The title track of *Phaedra*, in particular, which functions clearly as a steady state, established an archetype that would form the basis for much of Tangerine Dream's music until the end of the 1970s. The stasis is articulated via rapid, repeating arpeggiations, usually located in the bass; the pitch content of these

15 Alexander C. Harden, "Kosmische Musik and Its Techno-Social Context," *Journal of the International Association for the Study of Popular Music* Vol. 6, No. 2 (2016): 161–2.

arpeggiations varies from time to time but their tempo and character do not. Change is heard in a plethora of transitory ideas that play out on top of this: percussive gestures, potentially ominous chords, the makings of a melody, or just a simple octave doubling of the bass. The fast cycling arpeggiations give the impression of moving at considerable speed, making them the constant element which any and all other ideas seem to be almost literally rushing past.[16]

By this means, a steady state is created in which these rapid bass arpeggios combine the qualities of a bassline, a ground bass and a texture, becoming an unchanging, underpinning element over which pretty much anything else can happen, however seemingly disconnected, unexpected or ephemeral, and the music still hangs together and sounds unified. They thereby enable, in a more complex but similar way to that of Tony Scott and Paul Horn, meditative, non-developmental, improvisational forms of musical structure. This became the basis for Tangerine Dream's subsequent albums *Rubycon* (1975) and *Stratosfear* (1976), their respective steady states again constructed on a bedrock of drones and/or ostinato arpeggios upon which transient elements unpredictably emerge and recede. These states, especially on *Rubycon*, are sometimes used to create subsections in larger composite structures, a practice not dissimilar to the early albums of French musician Jean-Michel Jarre, *Oxygene* (1976) and *Equinoxe* (1977). With their respective poles of long-term stasis and short-term change, resulting in different forms of 'ignoresting' music, it is not difficult to regard any of these works, at least in part, as being ambient in nature.

Brian Eno and the conception of ambient

Brian Eno's conception and earliest exploration of this balance between interest and ignorability date from this same period in the mid-1970s. Eno's

16 Though aspiring to a very different musical aesthetic, and inspired more by things terrestrial than cosmic, an identical approach can be heard on Kraftwerk's 1974 track 'Autobahn', where varying combinations of repetitive beats and basslines form the firmament (or, in this case, 'highway') over which transient ideas pass by. Their 1977 track 'Trans-Europe Express' is arguably an even more austere version of this same idea.

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move away from the conventions of rock music (he was a founder member of UK glam rock band Roxy Music) had begun to take shape in his 1975 album *Another Green World*. Though the album's title does not necessarily connote the kind of interplanetary imaginings of Tangerine Dream, it can nonetheless be read as an allusion to another, perhaps parallel, 'earthly' reality with different conventions, hinting at an alternate kind of creativity.[17] To that end, Eno experimented with introducing chance into the creative process, as well as using the 'Oblique Strategies' set of cards he had co-created with artist Peter Schmidt, which provide pithy prompts to aid and/or (re-)direct creative thinking. While *Another Green World* exhibits many traits derived from rock, several of its tracks utilise a similar kind of steady state to that of Tangerine Dream. "In Dark Trees" features the combination of a percussion-heavy rhythmic underlay and a cycling four-chord progression as an unchanging foundation for extemporised ideas above, while the title track more gently oscillates between just two chords. Elsewhere, Eno explored even more free-wheeling and meandering ideas: 'Becalmed' lives up to its name, its eight chords, emerging from soft wind, slowly and dreamily repeating with only minor adjustments to timbre and embellishment; while 'Little Fishes' sleepily toys with a wobbling melody in an unchanging, dizzy environment infused with lullaby.

Eno developed these latter ideas into the first iteration of the 'ignoresting' dichotomy on his next album, *Discreet Music* (1975). The catalyst for this development – so often recounted as to have become by now almost legendary – was as much imposed as inspired, arising from the aftermath of an accident that resulted in Eno being uncomfortably confined to his bed. He recounts:

> My friend Judy Nylon visited me and brought me a record of 18th century harp music. After she had gone, and with some considerable difficulty, I put on the record. Having laid down, I realized that the

17 Considering where Eno's ambient musical explorations would subsequently lead, the title's implications of landscape are also noteworthy.

> amplifier was set at an extremely low level, and that one channel of the stereo had failed completely. Since I hadn't the energy to get up and improve matters, the record played on almost inaudibly. This presented what was for me a new way of hearing music - as part of the ambience of the environment just as the colour of the light and the sound of the rain were parts of that ambience. It is for this reason that I suggest listening to the piece at comparatively low levels, even to the extent that it frequently falls below the threshold of audibility.[18]

This in turn led him, in the title track of *Discreet Music*, to seek to replicate something of this peculiarly passive mode of engagement. To that end, passivity was made a fundamental part of the composition process itself, Eno setting up loops of music on a long delay system that, once set running, were not otherwise interfered with apart from "providing … two simply and mutually compatible melodic lines" and "occasionally altering the timbre of the synthesiser's output".[19] This latter involvement plays a similar role to the use of synthesisers in Tangerine Dream's *kosmische musik*; while the nature of Eno's looped materials often evokes or resembles acoustic instruments (particularly woodwind), they remain sufficiently anonymous that any putative identity or connection to real acoustic sounds – or even synthesised sounds, for that matter – is rendered moot.

The music's abiding gentleness – almost defiantly unemphatic, remaining in the middle distance – is an important factor in the soundworld of"Discreet Music", as is its particular use of harmony. Eric Tamm has noted how Eno's use of a G major triad in second inversion, avoiding the root of the chord, aids the long-term continuation of the piece.[20] The effect is like a cadence

18 Brian Eno, liner notes from *Discreet Music* (obscure no. 3, 1975).

19 Ibid.

20 Eric Tamm, *Brian Eno: His Music and the Vertical Colour of Sound* (Boston: Da Capo Press, 1995), 131.

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on the cusp of resolution, caught at a liminal point between movement and rest. Most significant of all though is the work's fundamental behaviour, its process of overlapping, non-synchronised loops. It is this above all else that establishes the music's heightened, timeless, meditative effect, perpetually changing while remaining eternally the same. As such, its 31½-minute duration is an entirely arbitrary decision, providing a window onto a musical landscape that ultimately could, and perhaps should, play on forever. In the same way that Steve Reich spoke of a "compositional process and a sounding music that are one and the same thing",[21] "Discreet Music"is both a proof-of-concept and fully-functioning prototype of a steady state as the sole basis for composition. Furthermore, it is the first unequivocal example in Brian Eno's output of what he and everybody else would soon call ambient music.

A melding of the worlds of *kosmische musik* and proto-ambient came in 1977 with a collaboration between Eno and German group Cluster. A duo comprising Hans-Joachim Roedelius and Dieter Moebius, Cluster's work through the early 1970s had borne a conceptual and technological similarity to Tangerine Dream, embracing new synthesiser technology to create extensive, improvisational soundscapes. Aesthetically, Cluster's earliest music (as heard on their first two albums, *Cluster* (1971) and *Cluster II* (1972)) contrasted sharply with that of Tangerine Dream, directly harnessing drones and noise, the latter to an extent anticipating industrial music. But from the mid-1970s, the duo sought to explore a much gentler amalgam of free-form structures and embryonic electronic pop (using early drum machines, bearing a strong resemblance to Kraftwerk's *Ralf and Florian* (1973)). Much of their 1974 album *Zuckerzeit*, in a smaller-scale but nonetheless extremely similar way to Tangerine Dream, consists of rhythmic patterns and undulating arpeggiations (with unchanging harmony) acting as an underlay for melodic improvisations. Their next album, *Sowiesoso* (1976), was gentler still and draws marked similarities to the non-vocal tracks of Eno's *Another Green*

21 Steve Reich, *Writings on Music, 1965–2000* (Oxford University Press, 2004), 35.

World, its seven tracks either drone-based or built upon languid cycling chord progressions.

Eno had encountered Roedelius and Moebius earlier in the 1970s through the Krautrock group Harmonia, a collaboration with Neu!'s Michael Rother. Eno's appreciation for the group, and particularly for Cluster's album *Zuckerzeit*, was evidently considerable; David Sheppard recounts Eno spontaneously getting involved at a Harmonia concert in 1974:

> During the latter half of the gig Eno clambered on stage in an act of uncharacteristic showmanship and joined in on synthesizer. There was obvious delight from both sides – the mutual joy of discovering fellow travellers. Eno, as Roedelius recalls, wasn't there just to showboat: 'Brian did more than "jam" with us, it wasn't at the encore or anything, it was the whole second part of that concert – we just played some of our tracks and Brian was happy just to play along'.[22]

This mutual appreciation found expression in the 1977 collaboration album *Cluster & Eno*, which in its soundworld is a clear fusion of Eno's "Discreet Music" and Cluster's *Zuckerzeit* and *Sowiesoso*. All of its nine tracks utilise steady states, eight of them founded upon harmonically fixed hovering drones or gently rhythmic ostinatos, over which free melodic ideas meander, with final track 'Für Luise' consisting of a barely-changing repeating progression of eight chords.

The consolidation and proliferation of steady states

In the liner notes to *Discreet Music*, Eno described the listening experience while recuperating from his accident as one where the music became "part of the ambience of the environment". He now made that idea the basis – and the prefix – for his new album, *Ambient 1: Music for Airports*. Eno's intentions were

22 David Sheppard, *On Some Faraway Beach: The Life and Times of Brian Eno* (Chicago Review Press, 2009), 185.

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principally functional, to create an "ambience … defined as an atmosphere, or a surrounding influence: a tint" – yet not only, as its title implies, to be suitable when played within the unique environment of airports, but also, on a more personal level, "to induce calm and a space to think".[23] To this end, like the meditation-inspired albums of Tony Scott and Paul Horn, Eno also utilised steady states as the means to create the album's four compositions, returning to the more emphatically hands-off, quasi-passive compositional approach used to compose "Discreet Music"(and which had not been used on *Cluster & Eno*).

Each of the four movements on *Music for Airports* utilises brief, simple melodic gestures that are looped to create a series of individual elements or strands heard simultaneously. As with "Discreet Music", the length of the gestures and the loops is such that synchronisation is completely coincidental. As such, the elements operate in a manner not dissimilar to the mediaeval practice of isorhythm, in which rhythmic and melodic components (the *talea* and *color* respectively), having different durations, are continually repeated, their asynchronous nature leading to musical patterns that are continually new yet which arise from a fixed and limited range of possibilities. If the relative durations are incommensurate with each other – which is to say their relative durations do not share common factors – these looping elements, once begun, will never again synchronise (or only after an extremely long period of time), resulting in music that never repeats and is literally always new. This was the method taken by Eno, who described the track "2/1" as being,

> […] structurally very, very simple. There are sung notes, sung by three women and myself. One of the notes repeats every 23½ seconds. […] The next lowest loop repeats every $25^{7}/_{8}$ seconds or something like that. The third one every $29^{15}/_{16}$ seconds or something. What I mean is they all repeat in cycles that are called incommensurable

23 Brian Eno, "Ambient Music", liner notes from *Ambient 1: Music for Airports* (PVC 7908 (AMB 001), 1978), accessed March 20, 2019, http://music.hyperreal.org/artists/brian_eno/MFA-txt.html.

> – they are not likely to come back into sync again. […] So as the piece progresses, what you hear are the various clusterings and configurations of these […] basic elements. The basic elements in that particular piece never change. […] But the piece does appear to have quite a lot of variety. […] The thing about pieces like this of course is that they are actually of almost infinite length if the numbers involved are complex enough. They simply don't ever re-configure in the same way again.[24]

Although Eno uses the word "repeat" several times in this description, and the behavioural definition of each movement's steady state is predicated on several elements repeating in this way, the resultant music does not overtly convey repetition at all. Rather, we are conscious of music with a generally isotropic nature – where new ideas closely resemble earlier ones, though we never perceive them to be exactly the same – and which, taken as a whole, clearly displays a well-defined, limited scope of activity. This is partly a consequence of the incommensurate nature of the elements' relative durations, but is also due to their rhythmic content being devoid of any underlying pulse or metric scheme, thereby militating against the notion of being connected at a fundamental level.

The strongest sense of connection comes from the elements' melodic aspect where, in the same way as in "Discreet Music" and throughout *Cluster & Eno*, each movement's pitch content is diatonic in relation to a fixed underlying tonality. In "1/1" the effect is highly dronal, its combination of piano, electric piano and synthesiser never meaningfully deviating from the sense of a persistent D major triad. "2/1" and "1/2" – the latter track essentially a continuation of the former – are closer akin to Eno's (and Cluster's) previous use of chord progressions, conveying a sense of moving between chords I, IV

24 Brian Eno, "Generative Music," *In Motion Magazine*, accessed 27 April, 2019, http://www.inmotionmagazine.com/eno1.html.

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and VI of A^{b} major.[25] The final track, "2/2", takes a slightly different approach, giving the impression of being anchored to a loose ground bass. In its clearest form, this ground would consist of the progression I – III – IV – V in the key of A major, though this is articulated more by implication than by example, and the piece instead presents a nebulous, never-ending oscillation between tension arising from this sense of chordal movement and quasi-cadential rest.

The way in which these fixed underlying harmonies are extended over time can be regarded as a form of Schenkerian *prolongation*, functioning, as music theorist Felix Salzer has described, "as the primordial prolongation of the tonality-indicating fundamental chord". Salzer regarded such prolongation as the "ultimate definition of tonality. […] It is correct to say: *Tonality is synonymous with chord prolongation*".[26] Though the tonal centres in *Music for Airports* are, in some cases, ambiguous – reinforced by Eno's general avoidance of positioning such a 'tonic' in an unequivocal root position – the harmonic limits are not. The diatonic nature of the meandering melody elements in each of the four movements acts to clarify and prolong these limits, over time clearly defining the harmonic palette of each piece.

However, within a steady state the concept of prolongation is extended beyond its function applying solely to harmony. As has already been described, the 'rules' encoded within the behavioural definition of a steady state are fixed and generalised, while allowing for specificity and change at a more superficial, short-term level. As a consequence, over longer-term durations – or across a sequence of separate but behaviourally analogous tracks – a steady state acts to clarify and prolong this limited, underlying range of behavioural activity. This kind of macro-structural *meta-prolongation* thus mirrors our understanding of the universe: specific details are non-teleological, only significant (if at all)

25 I disagree here with Eric Tamm, who claims the tonality to be rooted in a "D^{b} major seventh chord with an added ninth" with "competing 'tonics' of D^{b} and A^{b}" (*Op. cit.*, 133.). To my ear the pitches comprise a type of modified pentatonic scale on Ab (A^{b} – C – D^{b} – E^{b} – F) with the music oscillating between competing 'tonics' of Ab major and F minor.

26 Felix Salzer, *Stuctural Hearing: Tonal coherence in music, Vol. 1* (Courier Corporation, 1962), 232. Salzer's italics.

at smaller-scale, local levels, in contrast to the homogeneous and isotropic nature of musical elements and actions over more extensive time periods. Crucially, therefore, steady states depend upon longer durations in order to be fully appreciated and effective, as I have previously observed:

> This latter aspect, extended time, is vital: both as a compositional approach and a listening experience, [steady states] could be described as 'macrospective'; what happens moment by moment is of secondary importance to its long-term structural dimension. However, what makes 'steady statism' – to coin a phrase – so engaging is the way we as listeners are pulled back and forth between focusing on the short- and long-term actions of the music, ever aware of its essential open-endedness yet nonetheless engaged by the shifting, possibly transient, ways it is manifested on the surface.[27]

In many important respects, Eno's *Music for Airports* broke new ground. It introduced a new term, 'ambient', to the musical lexicon, together with a definition of that term, and provided an exemplar of its modus operandi, formalising the use of steady states as the basis for ambient's unique kind of 'ignoresting' music.[28]

This exemplar was reinforced on the subsequent albums in the 'Ambient' series. Somewhat less so on Eno's collaboration with Harold Budd, *Ambient 2: The Plateaux of Mirror* (1980), which functioned primarily as a vehicle for Budd's noodling piano improvisations within reticent environments (another kind of 'discreet music'?) created by Eno. Some tracks come close

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27 Simon Cummings, "Altered (steady) states", *5:4*, accessed May 1, 2019, http://5against4.com/2017/10/03/altered-steady-states-kenneth-kirschner-september-27-2016november-17-2016-markus-reuter-falling-for-ascension-formuls-entryiseasierthantheexit_exit/

28 While Eno has not directly referred to his compositional systems for ambient music as 'steady states', he has alluded to the idea when describing the attractiveness of slow movements in the music of Haydn and Mozart, which: "didn't produce emotional surprises, [but rather] presented an emotional situation that held steady for quite a long time. In other words, a 'steady-state' kind of music" (Eric Tamm, Op. cit., 35).

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to the action of a steady state, 'First Light' being one of the best examples, largely comprised of an essentially unchanging (save for registral alterations) undulating arpeggio over which melodic ideas are placed, redolent of *Cluster & Eno*. However, across the album there is a more overt sense of linear direction and musical intent, such that very little could be described as 'ignorable'. The album is not, therefore, a convincing representation of Eno's 'ignoresting' dichotomy.

The other two albums in the series are a much more direct and meaningful extension of this fundamental concept of ambient. *Ambient 3: Day of Radiance* (1980), composed by US instrumentalist Laraaji and produced by Eno, utilises steady states throughout. The three sections of "The Dance" are defined by a behaviour in which rapid, regular dulcimer strikes create a generalised, densely arpeggiated, static harmonic field within which, in the latter two parts especially, small discrete ideas – perceived within subtly shifting pitch emphases – can occasionally be perceived. (While "The Dance" bears something of a resemblance to minimalism, the lack of any clear sense of an ongoing, developing process makes this a merely superficial similarity.) The two 'Meditations' with which *Day of Radiance* concludes greatly reduce the pace and impact of Laraaji's dulcimer. Their steady states consist of a similar – if somewhat busier – soundworld to that of *Music for Airports*, with multiple floating strands of dulcimer music intermingling freely in a harmonically fixed environment. "Meditation #2" sounds more hands-on and coordinated, pivoting around a dramatic – and surely deliberate – burst of overlapping runs and arpeggios two-thirds through, while "Meditation #1" is much more plausibly an act of passive creation with minimal interventions being made to adjust timbre, density and dynamic.

Eno returned to the creative helm on *Ambient 4: On Land* (1982). Steady states are again the basis for much of the music, primarily articulated such that the long-term elements are drone-based, deep fundamental tones that underpin almost all of the album's eight tracks. Over these, various transitory ideas appear – strains of melody, gently abrasive noise elements, and forms

of pseudo-animal, bird or insect sounds – the activity of which is generally meandering and unpredictable. Taken together, the music becomes a kind of subdued equivalent of Tangerine Dream's *kosmische musik*, exploring (as its title suggests) planet-based landscapes instead of intergalactic starscapes.

Beyond this, *On Land* is a clear continuation of the thinking that led to *Music for Airports*, though with several key developments. Where the earlier album was conceived by Eno as "an atmosphere, or a surrounding influence: a tint", *On Land* is a vivid attempt to expand this into a collection of immersive worlds which the listener is invited to enter and inhabit. This was no merely figurative kind of immersion: in the liner notes to *On Land* Eno went so far as to devise an "ambient speaker system", enclosing the listener within three speakers (front left/right plus centre rear) thereby enabling his description of the music to become actualised: "I regard this music as environmental: to be experienced from the inside".[29] An integral part of this experience is Eno's shifting away from his hitherto elusive approach to sound and timbre in favour of sounds directly evoking real-life creatures (though remaining abstract and unidentifiable).

As far as its use of steady states is concerned, the long-term dimension is harmonically simplified in *On Land*. It shifts away from the richer, triad-based harmonic palette of *Music for Airports* towards single fundamental drones, the possible harmony of which is only implied through the presence of consonant pitches (which in this more vague context could not really be described as 'diatonic') used in the superimposed melodic elements. Aside from this, though, in all key respects Eno's use of steady states in *On Land* functions in exactly the same way as previously, providing a balance of long-term, 'ignorable' stasis and short-term, 'interesting' detail and variation.

The potential of steady states to be a compelling means to the creation of ambient music over extended durations can be heard in other works created

29 Brian Eno, "An Ambient Speaker System", in liner notes to *Ambient 4: On Land* (Editions EG, EGED 20).

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around the same time as the *Ambient* series. Steve Hillage and Miquette Giraudy's *Rainbow Dome Musick* (1979) uses a steady state in its 23-minute first half, "Garden of Paradise", arranged via a coruscating background harmonic field over which occasional bell strikes, assorted chords and unobtrusive improvised guitar ideas play out.

The 24-minute title track of Robert Rich's *Sūnyatā* (1982) is structured as a meditative steady state in which – book-ended by a prologue and epilogue of quietly croaking frogs – drifting pitches lightly impinge upon, but in no way threaten, an unwavering A^{b} drone. The timbre of the sounds suggests wooden flutes and the human voice, but the reverb with which they are drenched, together with their extremely slow movement, keeps identification out of reach.

All three parts of Steve Roach's 1984 album *Structures from Silence* involve steady states. The latter two, "Quiet Friend" and the title track, set up unchanging behaviours that provide interest through a slight unpredictability in the order (but not the nature) of their chord progressions. The opening track, "Reflections in Suspension", is similar but its steady state features an additional underlying texture of constant glinting arpeggiations that continues throughout its 16-minute duration. Change is introduced via a somewhat arbitrary, slow-moving bassline – which, while it causes no alteration in the arpeggiations, shifts the implied nature of their harmony – and a separate layer of drifting synth chords, both of which sound passive, subject to whim rather than an effort to direct the music.

At the opposite end of duration, Bill Nelson's *Simplex* (1990) comprises a collection of tracks lasting between one and three minutes, each featuring a steady state to create a contemplative sequence of miniature vignettes. Due to their brevity, the distinction between long- and short-term activity in this context is essentially moot.

But by far one of the most compelling, large-scale demonstrations of the use of steady states to create 'ignoresting' ambient is the 1994 album *Selected Ambient Works Volume II* by Aphex Twin, the moniker of UK musician Richard

D. James. At the time, the title may have seemed misleading; James' *Selected Ambient Works 85–92*, released the previous year, had borne little resemblance to ambient, instead exploring examples of what would lead to the house- and techno-fuelled generic offshoots from ambient.[30] By contrast, *Selected Ambient Works Volume II* constitutes an almost wholesale embracing of the steady state model as exemplified by Eno. Its 24 untitled parts, together spanning over two and a half hours, are simple structures built upon small, cycling motifs – usually in the form of short arpeggiations or chord sequences – that are prolonged to form long-term stases, some (echoing parts of *Another Green World*) including relatively gentle beats. Over and around these stases, in the same way as previously discussed, assorted transient elements – in almost all cases, essentially sonically unidentifiable – organically and unpredictably emerge, drift and dissolve.

The steady state: nature and implications

Though it has been already stated, and also implied in the examples explored above, it is worth reiterating at this point that a musical steady state, by definition, consists solely of the kind of polarised long- and short-term behavioural paradigm previously described. In the light of this definition, two important points should be clarified. First, a steady state is not synonymous with an algorithm. While it would hardly be difficult to codify a steady state as an algorithm – indeed, they lend themselves well to generative and computational creative techniques – they can be both *descriptive* and *prescriptive*. As I have illustrated, they can be employed in intuitive, hands-on, improvisational contexts such as those explored in the *kosmische musik* of Tangerine Dream, *Another Green World* or *Rainbow Dome Musick*, and also in strict, hands-off, highly formalised situations such as those heard in "Discreet Music", *Music for Airports* and *Structures from Silence*. Second, the

30 The notable exception being "i", a 77-second ambient track akin to the miniatures on Bill Nelson's *Simplex*.

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definition of a steady state, describing a generalised modus operandi, does not include or imply any notions whatsoever pertaining to specific musical styles or aesthetics. Such considerations are secondary, subjective values that can be applied as desired to the definition of any steady state.

By restating here the true nature of a steady state, particularly its neutrality and adaptability, and asserting its centrality to the conception of ambient as defined by Eno's 'ignoresting' dichotomy, I propose, among other things, to address the question posed by Mark Edward Achtermann:

> One question that ambient music seems to ask is whether it is more fully defined as such by its *quality* or its *organization* […][31]

The 'quality' of not just ambient music but any music is concerned with notions of style and aesthetic, aspects that are personal and idiosyncratic, and therefore sufficiently subjective as to be incompatible with the aim of being definitive, at least in any meaningful way. Indeed, to seek to define ambient via its 'quality' is potentially to risk returning to the fallacy I stated at the outset of this chapter, that ambient music is best or most appropriately defined along the lines of being "slow, quiet, relaxing and beautiful". As Tony Marcus has noted:

> The word 'ambient' comes from the Latin and means 'going about' – from 'iens' going, and 'ambi', about. Which doesn't say 'peaceful' or 'beautiful' or 'relaxing'. It just says 'going about'. Which suggests what? Present? In motion? And sort of 'just there' like a gas or perfume, molecules that diffuse in the air?[32]

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31 Mark Edward Achtermann, "Yes, but is it music? Brian Eno and the definition of ambient music," in *Brian Eno: Oblique Music*, eds. Sean Albiez, David Pattie, (London: Bloomsbury, 2016), 102. Achtermann's italics.

32 Tony Marcus, "The 20 greatest ambient albums ever made," *Fact*, July 19, 2011, https://www.factmag.com/2011/07/19/20-best-ambient/.

It is therefore my contention that ambient is best defined by its organisation. The steady state, encapsulating a behavioural mode of operation devoid of aesthetic considerations, and thereby stylistically neutral, is therefore best placed to be regarded as the *sine qua non*, and perhaps the defining aspect, of the 'ignoresting' compositional methodology of ambient. As such, it can be regarded as the *quiddity* of ambient, objectively transcending any and all boundaries of personal creative whim. Subjective aspects, such as those implied in 'quality', constitute merely the *haecceity* of ambient, the collection of qualitative identifiers pertaining to a specific composition by an individual composer.

Misplaced focus on haecceity rather than quiddity inevitably causes the potentiality of ambient – in terms of both the way it can be explored and articulated, and the breadth and range of its influence – to be misunderstood and very greatly underestimated. For, while one could identify a number of shared characteristics among many of the examples of ambient discussed above – such as the use of conventionally tonal harmonic palettes – as previously shown it is not these that ultimately unites them, but their fundamental behavioural framework.

In this regard, it is interesting to note the palpable aesthetic shift heard on Eno's *On Land*, in which many of the tracks actively avoid aspiring to superficial notions of relaxation or 'attractiveness' in favour of brooding, ominous, even oppressive atmospheres. In conjunction with the role of immersion suggested when listening to that album, this only makes the landscapes of *On Land* all the more disquieting and unsettling. This is echoed on Aphex Twin's *Selected Ambient Works Volume II*, which overall is at some remove from conventions of tonality and peacefulness. Several tracks are highly abstract (1.10 "Tree", 1.12 "White Blur 1")[33] and/or incorporate noise (2.4 "Grey Stripe" , 2.9 "Spots", 2.10 "Tassels") and many actively avoid harmonic certainty or clarity. Instead

33 While all but one of them are untitled, the 24 tracks on *Selected Ambient Works Volume II* are known colloquially by terms derived from images found in the album's accompanying artwork.

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the emphasis is entirely on behaviour, both in terms of the way individual tracks prolong their uniquely-articulated behaviours over time as well as the wider meta-prolongation of the album's overall steady state modus operandi. Occasions when the music overtly projects a gentle, soothing demeanour – the best example being 2.8 "Lichen"– are thus merely coincidental instances within a broader, aesthetically pluralistic and peripatetic exploration of ambient.

That ambient should be regarded as entirely distinct from superficial and qualitative aspects is not surprising. Early hearings of *Music for Airports* had, if anything, the opposite effect of the relaxation with which that album in particular, and ambient in general, tends to be associated. Victor Szabo recounts how,

> […] various listener accounts give reason to question the extent to which Eno's album ameliorates anxiety, and proffers a sense of security, within real airports. When Eno's music was first installed at New York's LaGuardia Airport in 1980, some airport workers and travellers reportedly complained that the music induced unease. As one remarked, 'It sounds like funeral music'. […] And if that weren't enough, in 1984 the music sparked protest from employees at Berlin's Tegel Airport who were annoyed by the acoustic 'interference'.[34]

Furthermore, Szabo suggests the responsibility for ambient not functioning in a soothing way is at least in part a direct consequence of the unique long- and short-term behavioural flux fundamental to the steady state.

> While these tracks promote an overarching sense of stability by constraining the parameters of global, or long-term change, a number of local, or short-term variabilities keep the music from resting on certain ground. Although the sounds used in each recording remain

34 Victor Szabo, "Unsettling Brian Eno's Music for Airports," *Twentieth-Century Music* 14, No. 2 (2017): 311.

> within a single modal pitch collection, the irregular, seemingly unmotivated oscillations between major and minor sonorities within each collection lend the music an emotional mercuriality. And although the non-periodicity of repeated sonic iterations relieves listeners of expecting their metric placement, these sound events also overlap indiscriminately, and dissipate into indefinitely long echoes, creating a bounty of micro-variations in timing and timbre. Within the tracks' overall stable texture, such irregularities generate just enough light turbulence to keep those on board with the music from nodding off. Though seemingly weightless and placid at a distance, the music remains astir and amiss, possibly fostering an uncanny sense that the music's stability is a ruse.[35]

Meta-ambient

Since the quiddity of ambient, defined in the steady state, is concerned solely with behaviour and contains no information regarding style, aesthetic or quality, this has implications on the extent of music that can be regarded as being, at least to some degree, 'ambient'. Indeed, defined in this way the reality of ambient extends to a plethora of diverse aesthetics and contexts, including music not necessarily described or intended by their composers as 'ambient' – what we might term 'meta-ambient'.

A case in point can be found as far back as 1962, in US experimental electronic composer Raymond Scott's three-volume series of albums *Soothing Sounds for Baby*.[36] All three volumes employ steady states in every track, a foundation of repeating patterns and arpeggios over which melodies are placed. Utilising early computer technology, the range of timbres employed by Scott is often harsh, sibilant and piercing, and in some cases (most obviously

35 Ibid.

36 The albums are intended to accompany the first year-and-a-half of the baby's life, one volume for each six-month period.

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"Toy Typewriter" and "Tin Soldier") highly percussive. The music's timbral nature, together with the equally subjective responses to Eno's steady states recounted by Szabo, suggests that Scott's title for this series may perhaps have been somewhat optimistic, yet the music can nonetheless be regarded objectively as an early instance of meta-ambient music.

Further examples of meta-ambient abound in more recent electronic music. Each hour-long part in the so-called "Trilogy in Three Parts" by The Hafler Trio[37] is founded upon a deep, seemingly eternal, fundamental note C, the timbre of which is elusive but evokes both cello and double bass. I have previously noted how,

> [t]his fundamental is powerfully omnipresent; everything else takes place above it, sometimes below it, always in relation to it. The music comes across as a luxuriant paean to the harmonic series – or, rather […], a celebration of all the explicit and implicit harmonic richness contained within that single deep fundamental note.[38]

Against this quasi-static drone, each part in the trilogy introduces episodes focusing on different pitch-class groups: *Cleave: 9 Great Openings* (2002) uses the pitches closest to C in the harmonic series (C, D, E, $F^{\#}$, G, A and $B^{\flat}$); *No Man Put Asunder: 7 Fruitful And Seamless Unions* (2003) does the opposite, using more unrelated, relatively dissonant pitches ($D^{\flat}$, $E^{\flat}$, F, $A^{\flat}$ and B); and *No More Twain, Of One Flesh: 11 Unequivocal Obsecrations* (2003) is the simplest, using only the notes F and G, producing the most 'pure' intervallic relationships with the fundamental. Each individual part of the trilogy, and the trilogy as a whole, thereby comprise the prolongation and meta-prolongation of a steady state behaviour as well as a harmonic prolongation

37 a.k.a UK experimentalist Andrew M. McKenzie.

38 Simon Cummings, "Contemporary Epics: The Hafler Trio – Trilogy in Three Parts," *5:4*, accessed 14 May, 2019, http://5against4.com/2011/10/19/contemporary-epics-the-hafler-trio-trilogy-in-three-parts/.

(in the Schenkerian sense), the pitches introduced in the episodes acting as temporary dissonances ultimately prolonging the underlying 'tonic' C.[39]

Many of the experimental electronic works by US composer Kenneth Kirschner are meta-ambient in nature, most especially the series of indeterminate pieces Kirschner created in 2004 and 2005. The pieces are generative, produced in real-time within a web browser using the Adobe Flash software. Various banks of samples – containing a mix of sounds and silences – arranged in layers, are selected from at random according to very basic rules. In a similar way to the hands-off composition process of *Music for Airports*, Kirschner's involvement in the indeterminate works extends no further than devising the range of sounds and the rate at which each layer is introduced; once set in motion, they continue until a stop button is pressed by the listener. The presence of silences in the sample banks is crucial to preserve clarity in the texture as it grows in complexity, as additional layers are introduced over time. One of the most impressive of these indeterminate works – and, in its use of non-rhythmic, largely unidentifiable sounds, most similar to the examples of ambient previously discussed – is *January 15, 2005*,[40] consisting of "fourteen lengthy fragments of abstract electronics layered five times to produce an intense, heavy, seamless acoustic soundscape that keeps reinventing itself over very long periods of time".[41] Steady states, with varying degrees of strictness and perceptibility, have continued to be a key part of Kirschner's musical language in both his indeterminate and fixed compositions.

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39 This sense of both harmonic and behavioural (meta-)prolongation is reinforced by the fact that the first two parts of the trilogy do not 'end' as such but are abruptly cut off, implying that they are only stopping due to the durational limitations of the CD medium and that the next part should in fact continue seamlessly.

40 *January 15, 2005* can be played at the following URL: http://kennethkirschner.com/011505/011505.html.

41 Simon Cummings, "Determined/Indeterminate: An Exploration of the Music of Kenneth Kirschner," in *Imperfect Forms: The Music of Kenneth Kirschner*, ed. Tobias Fischer (Tokafi, 2014), 19. http://www.tokafi.com/static/tokafi/img/Kenneth%20Kirschner%20Imperfect%20Forms.pdf.

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As might be inferred from the aforementioned antecedents in minimalism, examples of meta-ambient can readily be found in the world of instrumental music. US composer Steve Peters' work *The Webster Cycles* (1981) dates from only three years after *Music for Airports*, and operates in a directly comparable way. Composed for one to five wind instruments, Peters describes the piece as a "found score",[42] comprising all the words in the Webster dictionary containing only the letters A to G, arranged in alphabetical order. In a manner similar to Riley's *In C*, these words are performed as melodic phrases by each player independently (each word to be played within the limits of a single breath), moving from word to word at their own pace. In performance, a steady state is quickly established through the unchanging behaviour of the players steadily articulating the series of words, with the music's surface continually varying according to the harmonic friction and sympathetic resonances arising from its limited but ever-changing pitch content.

The long-form works of German composer Jakob Ullmann, such as *PRAHA: celetná - karlova – maiselova* for voice and ensemble (2004–7) and *Müntzers stern* for solo bassoon (2014–15), draw on steady states that could be characterised as harnessing the passive, pseudo-silent ambience of the performance environment as the long-term aspect (sometimes with the addition of drones or otherwise sustained pitches). Smaller-scale interest and change comes in the form of small, active sounds that are delicately placed or projected into this ambience. Oliver Thurley describes how in Ullmann's music, due largely to its quietness, the liminality of the steady state takes on an extreme fragility, heightening listener's perceptions,

> […] quietness draws the listener's attention into the music, revealing new dimensions, yet the music simultaneously attempts to evade focus through its quietness and static structure. […] The music never makes any sort of expressive gesture; it remains brittle throughout,

42 Steve Peters, *The Webster Cycles* (self-published, 1981).

> presenting the listener with a constant and unrelenting soundscape that balances precariously at the brink of perception: a fragile listening experience. […] For the listener, the music presents itself as sound in constant flux, which although constantly moving, has no clear *telos* and never goes anywhere. This stasis too is a function of the fragility in Ullmann's work as one's ability to listen to the work is made precarious […]; the structural stasis of the pieces accentuates the listener's sensitivity to the most subtle changes in the texture.[43]

That such music can be regarded as meta-ambient is reinforced by Ullmann's indications in the liner notes of his albums, which are essentially identical to Eno's conception of ambient listening:

> To achieve the original sound quality of this live recording it is suggested to listen to this CD at the lowest possible volume.[44] We would like to point out that this piece is extremely quiet. Please choose the volume setting of your sound system so as to just barely mask the ambient sounds of the room.[45]

Aesthetically similar steady states can be found in works by composers associated with the German-based Wandelweiser collective. Structured upon modes of behaviour that tend to remain consistent over extended periods of time (sometimes many hours), the majority of these compositions, like those of Ullmann, incorporate silence as an integral element in the long-term aspect of their respective steady states.[46]

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43 Oliver Thurley, "Disappearing Sounds: Fragility in the Music of Jakob Ullmann," *Tempo* 69, No. 274 (2015): 18–19.

44 Jakob Ullmann, liner notes from *A catalogue of sounds* (ed. RZ 1017, 2005).

45 Jakob Ullmann, liner notes from *voice, books and FIRE 3* (ed. RZ 2005, 2008).

46 For a detailed early account of the history and outlook of Wandelweiser, see Michael Pisaro, "Wandelweiser," *erstwords*, accessed 14 May, 2019, http://erstwords.blogspot.com/2009/09/wandelweiser.html.

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The slow rates of change that typified the earlier electronic work by French composer Éliane Radigue have in recent years found a parallel in her instrumental music. Radigue's ongoing *Occam Ocean* project involves slowly-shifting pitch environments either rooted in fundamental drones or sustained chords that establish long-term behavioural stasis – a generally flat dynamic contour, just one or two modes of articulation – where, again, short-term variation is heard and felt in the way pitches collide against one another, leading to "complex overtones and undertones [forming] ephemeral constellations of musical relationships".[47]

British composer Rebecca Saunders has composed numerous ensemble pieces she describes as 'collages', in which various numbers of 'sound surfaces' are superimposed upon each other. These works, such as *murmurs* (2009), directly employ steady states. Both the nature of each player's material and the way it is are articulated are specific yet vague, with "[a]ll sounds, where possible, surfacing out of, and disappearing into, silence".[48] These individual materials are superimposed to form a vague, nebulous murmuration in which "[e]ach line is fragile and imperfect, and is thread through the collage of changing density".[49] Performed at a level of extreme quietness, *murmurs* quickly displays a meta-ambient behavioural stasis formed from these quasi-arbitrarily juxtaposed 'sound surfaces' that "continually pulls one's focus between attention on solos, pairs and larger groupings, at the same time causing one to question whether sonic events are, in fact, connected".[50] Furthermore, the importance of ambience is directly referenced in the score, Saunders insisting that a "dry acoustic is to be completely avoided!"[51]

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47 Luke Nickel, "Occam Notions: Collaboration and the Performer's Perspective in Éliane Radigue's *Occam Ocean*," *Tempo* 70, No. 275 (2015): 22.

48 Rebecca Saunders, Introductory notes to *murmurs* (Peters Edition, 2009).

49 Ibid.

50 Simon Cummings, "CBSO Centre, Birmingham: BCMG – Murmurs," *5:4*, accessed 16 May 2019, http://5against4.com/2019/03/24/cbso-centre-birmingham-bcmg-murmurs/.

51 Rebecca Saunders, Ibid.

Within the scope of this chapter it is of course not necessary (or possible) to continue with an exhaustive summary of music that might be regarded as meta-ambient. It is left to the reader to consider and question other examples that might fall within the sphere of ambient as defined by the neutral, objective behaviour of steady states. For example, if behaviour is the guiding principle rather than subjective or stylistic elements, does ambient need to be quiet? If the 'ignorability' of ambient implies an act of withdrawing (voluntarily) from the music due to a paucity of engaging elements, might 'repulsability' be its polar equivalent, an act of withdrawing (involuntarily?) from the music due to an overload of engaging elements? And if so, could certain types of Noise music be considered meta-ambient? Apropos the music of Phill Niblock, which has pushed the soundworld of Éliane Radigue to its limits, prompting Robert Ashley to describe works like *Disseminate* as "hardcore drone".[52] Apropos the music of Zbigniew Karkowski, whose music can in part be regarded as an opposite of sorts to Jakob Ullmann: where Ullmann delicately encroaches into a silent space, Karkowski subtly encroaches into a saturated space.[53] As an inversion of the microsound-focused subgenre of ambient named by composer Steve Roden as *lowercase*,[54] might we conceive of these extreme musics as *UPPERCASE*?

Conclusion

I began this chapter looking up at the stars, and by way of drawing to a conclusion, I now return to them – or, at least, to the impulse that causes us to look up. From its inception, through the vagaries of New Age and the voyages of *kosmische musik* to the atmospheres and tints of Eno and beyond, ambient music has always found itself attributed with extra-musical

52 Robert Ashley, liner notes to *Phill Niblock – Disseminate* (mode 131, 2004).

53 Furthermore, Karkowski's *UEXKULL* (1991) draws strong comparisons to The Hafler Trio's 'Trilogy in Three Parts'.

54 See Steve Roden, "On Lowercase Affinities and Forms of Paper," *Line*, accessed 14 May, 2019, http://www.lineimprint.com/wp-content/uploads/2011/10/line_053_essay.pdf.

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connotations pertaining to that which we might loosely call 'beyond'. The proto-ambient of Tony Scott and Paul Horn sought directly to channel their respective faith-based meditative methodologies. This extended to the titles of the tracks – e.g. "A Quivering Leaf, Ask The Winds", "Enlightenment" (Scott), "Mantra I / Meditation", "Vibrations" (Horn) – seeking to evoke and stimulate mystical or spiritual thought and provide a sonic environment within which contemplation could take place. Tangerine Dream sought to tap into something indefinable yet awe-inspiring by allowing their – and our – imaginations to run riot through hypothetical soundscapes of the universe. Eno too sought both to colour existing environments and to create entirely new sonic habitats for the listener to occupy.

The merits (or otherwise) and implications of such extra-musical perceptions, regardless of whether they are applied by their composers or listeners, are beyond the scope of this chapter. Yet the nature of the steady state may well be pivotal to the way in which such perceptions become manifested so readily in ambient (and, potentially, meta-ambient). The role of randomness – whether actual or merely perceived – in steady states is analogous to John Cage's turning to chance procedures in the 1950s, eschewing rigorous procedural methods[55] in favour of a means to overcome higher-level decision-making through an obviation or even sublimation of the self. Furthermore, the endless, potentially timeless, nature of steady states – by definition capable of continuing their 'ignoresting' behaviours forever, transcending notions of beginning or end – indicates a polar opposite to the finitude and decay of the world, and perhaps thereby goes some way to satisfying human inclinations to eternity and the beyond.[56]

That the musical results of steady states can be subjectively perceived as articulating a 'narrative' with which we can emotionally (and spiritually)

55 Methods best exemplified at the time by the integral serialism of Pierre Boulez.

56 That being said, steady states can, of course, be utilised as the vehicle for a musical process of decay. A well-known example of this can be heard in William Basinski's *The Disintegration Loops* (2002–3).

engage is beyond question. In relation to the aforementioned indeterminate works of Kenneth Kirschner, I have previously explored how these pieces,

> […] when heard over extended periods of time […] are indeed narratively null, exhibiting a long-term equilibrium. But reducing one's aural scope – an entirely legitimate thing to do, as the durational and structural aspects of these pieces are undefined and aleatoric, respectively – the music passes over peaks of intensity and through valleys of repose, a process that invites connections to be made between what has passed, what is happening now and what one expects may happen soon. Moreover, the peaks occasionally expand into powerful lengthy plateaux, becoming transfixed, ecstatic even.[57]

Without directly invoking spiritual connotations, Jakob Ullmann's use of steady states nonetheless indirectly functions to establish a uniquely heightened environment that could be said to draw distinct perceptional parallels. Thurley writes of how Ullmann's works "blur the listener's ability to identify what is being heard in a densely fused homogeneous stasis", a process exacerbated by keeping the performers hidden from the audience. This has led to what Thurley calls "a theatre of the invisible", producing "the unnerving effect of an eternal, omnipresent acousmêtre".[58] Indeed, to return to Victor Szabo's remarks about the disquieted early public responses to Eno's *Music for Airports*, it is conceivable that the disturbing "uncanny sense" engendered by the music's use of steady states is perhaps akin to the profound emotional response that German theologian Rudolf Otto conceived as the *numinous*.[59]

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57 Simon Cummings, "Determined/Indeterminate: An Exploration of the Music of Kenneth Kirschner," in *Imperfect Forms: The Music of Kenneth Kirschner*, ed. Tobias Fischer (Tokafi, 2014), 20.

58 Oliver Thurley, Op. Cit., 20. The term 'acousmêtre' – a portmanteau of 'acousmatic' and 'être' – was coined by Michel Chion to describe a voice that "has not yet been visualized […] a special kind of being, a kind of talking and acting shadow […] whom you have never seen". Michel Chion, *The Voice in Cinema* (New York: Columbia University Press, 1999), 21.

59 Rudolf Otto, *The Idea of the Holy*, trans. John W. Harvey (Oxford University Press, 1923), 7.

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In this chapter I have sought to present the steady state as the essential, objective, universal component – the *quiddity* – of ambient music, as encapsulated in Brian Eno's 'ignoresting' dichotomy. In contradistinction to the assumption that ambient is best defined by subjective, superficial qualities, I have shown how this is fallacious, at odds with the non-specific openness of Eno's own definition and practice of ambient, and have argued that it is most appropriately defined by behaviour. As both a compositional approach and listening experience, the 'ignoresting' dichotomy is subtle. Paul Morley has characterised ambient as,

> […] the missing link between dubious muzak and artful minimalism, between the whispering of space and the whispering in space, between form and formlessness, between content and contentment".[60]

Such descriptions emphasise the essential duality of ambient, positioned at a crucial, liminal point between opposite poles with regard to intention, perception and engagement. But that is where its definition, as such, ends; the dichotomy accounts for how ambient should behave, what it should be, but neither states nor suggests anything about what it should be *like*.

As the quiddity of ambient, the steady state likewise says nothing about style, aesthetic or quality, instead describing only the music's underlying organisation. This directly engages with the behavioural paradigm established by Eno in "Discreet Music", *Music for Airports* and *On Land*, in which self-contained, unchanging ideas repeat in proximity to one another in an unpredictable way. This results in non-teleological music in which this fundamental, unchanging behaviour is clarified through meta-prolongation, characterised by a polarised juxtaposition of small-scale, short-term change and large-scale, long-term stasis. It is my assertion that the modus operandi

60 Paul Morley, *Words and Music: A History of Pop in the Shape of a City* (London: Bloomsbury, 2003), 20.

harnessed in the steady state is the most fundamental and compelling means by which to manifest Eno's 'ignoresting' dichotomy. The inevitable tension between its poles of ephemeral change and eternal immobility result in what David Toop has lyrically described as,

> […] drifting or simply existing in stasis rather than developing in any dramatic fashion. Structure emerges slowly, minimally or apparently not at all, encouraging states of reverie and receptivity in the listener that suggest (on the good side of boredom) a very positive rootlessness.[61]

The tension in steady states, mirroring the nature and action of the universe and capable of being perceived and interpreted from both intra- and extra-musical perspectives, is thus a palpable and vivid way to elicit the ambivalent responses of engagement and disinterest in the listener that were, are and always will be the quiddity of ambient music.

61 David Toop, *Ocean of Sound* (London: Serpent's Tail, 2001), ii.

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6

FRAGILITY, NOISE, AND ATMOSPHERE IN AMBIENT MUSIC

Monty Adkins

This chapter will examine how contemporary experimental ambient music engages with notions of fragility, the aesthetics of atmosphere, and the use of noise to engender a more active listening experience than that proposed by Brian Eno in 1978.[1] Although rather at odds with the generally accepted innocuous nature of ambient music – one that "tints" the environment – I propose that, through engaging with these concepts, composers can encourage different ways of listening to and thinking about ambient music, as well as reintroducing the sense of "doubt and uncertainty"[2] that Eno originally ascribed to ambient music. In doing so, I mean to demonstrate that ambient music is far from being a contemporary comfort blanket to block out the perceived problems, or overwhelming influx of information, in society but is a genre that, at its best, can offer a reflection of contemporary culture and thought. In order to do this, I will present a framework for discussing ambient music, drawing on, and developing Nomi Epstein's notions of fragility, Torben Sangild's tripartite consideration of noise and Gernot Böhme's aesthetics of atmosphere.

'Ambient' Music

> An ambience is defined as atmosphere, or a surrounding influence: a tint […] Whereas conventional background music is produced by stripping away all sense of doubt and uncertainty (and thus all

1 See Brian Eno, 'Ambient Music', liner notes from the initial American release of *Ambient 1: Music for Airports* (USA: PVC-7908 AMB001, 1978).

2 Ibid.

> genuine interest) from the music, Ambient Music retains these qualities […] Ambient Music is intended to induce calm and a space to think. Ambient Music must be able to accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting.[3]

Since the writing of this oft-quoted manifesto-like statement by Brian Eno to accompany the release of *Ambient 1: Music for Airports* (1978), ambient music has been developed and expanded from the initial stylistic tenets set out in the quartet of releases *Ambient 1-4* (1978 – 1982). As a genre of music it now encompasses a plethora of influences resulting in music as diverse as the post-industrial dark ambient[4] of Lustmord, the lush synthesiser-driven work of Robert Rich, or the experimental ambient of Taylor Deupree, whose label 12k has "decisively defined and developed its own concept of minimalism in the realms of experimental and ambient music".[5] In a wider musical context, ambient has been used as a prefix to describe a raft of other genres including techno, rock, and house. Daniel Siepmann writes that:

> Ambient music is a genre of music that focuses on coloring the listener's sonic environment while largely disregarding other functional musical traits such as melodicism, harmonic progression, or rhythmic variation. While these qualities are certainly recognizable in the musical texture, they are all yoked towards advancing an unobtrusive, background music – a music that isn't meant to be listened to directly.[6]

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3 Ibid.

4 A term originally coined by Roger Karmanik.

5 See www.12k.com

6 Daniel Siepmann, "A Slight Delay: Agency and Improvisation in, the Ambient Sound World," *Perspectives of New Music* 48(1), (2010): 174.

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The focus on the utilitarian application of such music to engender a state of ecstasy and well-being has ignored the sonic material itself, perceiving it as subservient to its function. Such music may create a certain 'tint' within an environment but considering it as rendering merely a 'functional tint' encourages a state of non-listening - which is not how much of today's ambient music is listened to either in performance or private listening environments.

As the genre and its various offshoots have developed over the intervening 40 years, the original intentions of ambient music, as outlined by Eno in 1978, have also transmogrified. Whilst ambient music has, like any other genre, developed a number of common stylistic or memetic qualities – such as a pervading, generally slow, pacing; often a tonal or modal framework; fragmented melodic lines or shorter 'cells' that imply a sense of non-closure; the use of drones; and a sense of continuity or singular 'atmosphere' – a composer focusing on one or only a few of these qualities can produce widely divergent sonic results. Such albums as Sarah Davachi's *All My Circles Run*[7], Lawrence English's *Cruel Optimism*[8], Tim Hecker's *Harmony in Ultraviolet*[9], Taylor Deupree's *Fallen*[10] and William Basinski's *Watermusic II* [11] are all tagged and categorized as 'ambient' releases. Despite this, there has been little critical reflection on the state of ambient music today. Most critiques still take Eno's original 1978 statement and the body of work encapsulated in *Ambient 1-4* as its starting point of reference. Lawrence English writes:

> I have increasingly found myself problematizing the term [ambient]. I dislike that there is some apriori [sic] reading of the term now. The idea that music becomes fixed and set is something I am very

7 Sarah Davachi, *All My Circles Run* (USA: Students of Decay – SOD-115, 2017).

8 Lawrence English, *Cruel Optimism* (Australia: Room40 – RM470CD, 2017).

9 Tim Hecker, *Harmony in Ultraviolet* (USA: Kranky – Kranky102, 2006).

10 Taylor Deupree, *Fallen* (Japan: Spekk – KK037, 2018).

11 William Basinski, *Watermusic II* (USA: 2062 – 20620302, 2003).

> uninterested in. It goes against the very fibre of music, the evolution of sound in time and the complexity that unfolding brings.[12]

This begs a number of questions. What does ambient music mean today and what kind of listening states does it engender? What critical aesthetical insights that have developed over the past 40 years can be drawn on to inform contemporary ambient music?

The five examples cited above illustrate only some of the breadth of recent ambient music. They are perhaps representative of the more experimental outer-edges of the genre: the edges that start to permeate other genres. Davachi's work, with its slowly evolving textures, whilst reminiscent of the drone-based works of Chihei Hatakeyama[13], has more kinship with the intense listening experience of the music of Eliane Radigue, and the "slow change music" of Laurie Spiegel. Spiegel in her notes for *The Expanding Universe* writes that "slow change music" allows,

> […] the listener to go deeper and deeper inside of a single sustained texture or tone […] The aesthetic aim is to provide sufficiently supportive continuity that the ear can relax its filters […] The violence of sonic disruption, disjunction, discontinuity and sudden change desensitizes the listener and pushes us away so we are no longer open to the subtlest sounds. But with continuity and gentleness, the ear becomes increasingly re-sensitized to more and more subtle auditory phenomena within the sound that immerses us […] we open up our ears more and more to the more minute phenomena that envelop us. This is also not "ambient music", a term that came into use some years later. This is music for concentrated attention, a through-composed musical experience, though of course it also can

12 Lawrence English, email to author, January 21, 2019.

13 See Chihei Hatakeyama, *Above The Desert* (Russia: Dronarivm DR-42, 2016).

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be background.[14]

A music of sustained textures for concentrated attention of a very different kind is Lawrence English's *Cruel Optimism*. The predominantly noise-focused post-shoegaze infused sound world of *Cruel Optimism* is redolent of Rafael Anton Irisarri's *A Fragile Geography* and Fennesz's *Black Sea.* In live performance these works are anything but ambient. The listener is immersed in a sonic continuum of often intense volume that stimulates both emotional and physical/bodily responses. Such work, through both the cover imagery and videos produced to accompany the releases, although not produced under the Slow Music movement banner nevertheless shares much in common with its aims in wanting to engage with, rather than escape from, the everyday world. The Slow Music movement, though not solely aligned with ambient music has,

> […] much in common with other slow movements and fully supports and advocates a cultural shift towards slowing down life's pace and connecting more meaningfully with others, our surroundings and ourselves […] slow music makes people reflect on modern living, not shy away from addressing many of the pressing issues of our times and encourages people to come together to make a positive difference […] Slow music is also about active listening.[15]

This emphasis on active listening and reflection of "modern living" is something Eno himself encourages, writing that, "[…] the message of ambient music for me was that this is a music that should be located in life, not in opposition to life. It shouldn't be something for blanking things out,

14 Laurie Spiegel, liner notes from, *The Expanding Universe* (USA: Unseen Worlds – UW19, 2019).

15 See "What is Slow Music," accessed January 9, 2018, https://www.theslowmusicmovement.org/blog/what-is-slow-music

or for covering things up".[16] Irisarri's *A Fragile Geography*[17] clearly develops from a similar aesthetic standpoint in that,

> […] the record bares the marks of difficult terrains – personal, political, social and cultural. It tips its hat to the complex and unpredictable dynamics of the contemporary world, correlating concerns both macro and micro. Compositionally the music mirrors the tensions of contemporary America, contrasting passages of great beauty and calm with harrowing waves of density and pressure.[18]

William Basinski's *Watermusic II* is a meditative loop-based work that slowly evolves over its extended duration. It engenders a sense of calm through its predominantly mid-frequency focused short melodic cells that gently lull the listener through their repetition. Deupree's *Fallen,* conversely, is far more fragmented, and uses noise in a very different way to that found in English, Irisarri, Fennesz or Hecker. The broken melodies and production techniques – which include a high noise floor - suggest a fragility not found in any of the previously mentioned works.

All of these releases engage listening in different ways, but engage it they do. Often we choose to listen privately, even within social spaces. We construct our own private 'atmosphere' and 'tint'. Our use of ambient music in the creation, augmentation or interruption of spaces, be they private or public, in itself expresses a desire to exercise agency within, or mediate our environment. As Daniel Siepmann writes, "Ambient music operates as a reflection of the self, a self that includes the social and technical world in which one is immersed".[19]

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16 Brian Eno, "Paul Merton's Hour of Silence," (1995) accessed August 20, 2018, http://music.hyperreal.org.org/artists/brian_eno/interviews/ambe2.html

17 Rafael Anton Irisarri, *A Fragile Geography* (Australia: Room40 – RM466, 2015).

18 Rafael Anton Irisarri, liner notes from *A Fragile Geography* (2015) accessed April 17, 2019, https://irisarri.bandcamp.com/album/a-fragile-geography

19 Daniel Siepmann, "A Slight Delay," 193.

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Ambient music is thus a genre that does not merely colour the listener's sonic environment but actively engages with it and in doing so stimulates a greater awareness of it and the self. Whilst ambient music may not rely on traditional functional musical syntax (melody, harmony, and rhythm) it can engender a deep listening experience through slow-moving immersive textures and drones enhanced through the use of noise and fragility to create emergent atmospheres. Lawrence English writes that,

> […] this music is a type of unspoken contract. It is about acknowledging as a matter of primacy, that the experience of the music is an open dialogue between the interiority of our affective listenership and the exteriority of the spaces and places that hold the music as we experience it. Ambient embraces the variables of the situation in which it is encountered, it forgoes any sense of control in favor of prioritizing a discrete subjective perspective […] the music is never wholly owned, but rather it is constantly becoming.[20]

Fragility

Whilst adjectives such as delicate, subtle, or enveloping are commonly used in descriptions of ambient music, 'fragile' is not, as it implies a potential fracturing of the sonic continuity that much of this music displays. Fragility in sound is perceptually complex and paradoxical. Fragility is a state of tension in which the sound's 'failure' is offset by its continued temporal movement forwards. Within this there is a sense of both beauty and danger. The beauty is of something prone to failure that needs attention, and the danger is of it ceasing to function musically. Oliver Thurley writes:

20 Lawrence English, "Ambient Music at 40: Lawrence English examines the future of a drifting genre," *FACT* magazine, February 4, 2018, accessed April 14, 2019, https://www.factmag.com/2018/02/04/ambient-music-at-40-lawrence-english/

> A musical situation may be considered fragile if the normal functionality of a sound – or the means of its production – is somehow destabilised and placed at risk of collapse. Fragility, then, can be understood as a precarious state in which sound is rendered frangible and susceptible to being destroyed or disrupted. To compose a fragile sound or musical event would therefore involve organising a system either a) vulnerable to disruption by some small external force, or b) positioned upon an unstable foundation such that the system collapses under its own weight.[21]

In experimental ambient music, which is mostly consumed as digitally mediated sound, this is a deceit we willingly enter into as listeners. For even though we know that the recorded 'permanent' file will not change from one playing to the next, we nevertheless return to it over and over to re-listen to and re-experience the tension inherent in this fragility. It is therefore a figurative or metaphorical fragility, but one that does not perceptually diminish even after repeated listening. In this situation fragility is "entwined with objecthood, tied up in the notion of the object: there must be an object that is prone to failure for this tension to exist".[22] This 'failure' could be an old instrument (such as a hand-pumped harmonium), record or tape player, or in the case of Stephan Mathieu and Taylor Deupree's *Transcriptions*[23] – 78 rpm records and wax cylinders. Much of the time this fragility is a carefully controlled conceit by the composer. It is only in rare examples, such as in Basinski's *Disintegration Loops,* where the quasi-anthropomorphised magnetic tape actually does 'die' and fail as its surface crumbles through each loop in the transfer process from analogue to digital preservation recording

21 Oliver Thurley, "Disappearing Sounds: Fragility in the music of Jakob Ullmann," *Tempo*, 69 (274) (2015): 6.

22 Daniel Wilson, "Bergson, Mourning and Memory: The Fragility of Time in Klaus Lang's Trauermusik," *Tempo* 71 (281) (2017): 53.

23 Stephan Mathieu and Taylor Deupree, *Transcriptions* (Japan: Spekk – KK019, 2009)

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in real-time. Such decay or metaphorical decay encourages us "to think about those things that become something else when they fall apart".[24] One particularly poignant example is the depiction of dementia through the increasing looping, fragmentation, and processing of old dancehall records in The Caretaker's *Everywhere at the End of Time* [25] – an epic work in six parts spanning some six and a half hours.

In much ambient music, a steady-state dynamic, gestural behaviour, timbral palette and modal/tonal framework are often maintained throughout. Such a stability of continuity is a pervading quality of ambient music, and yet such 'stability' is not without tension – Eno's "doubt and uncertainty". Within this overall sense of stability, a perceptual fragility can occur on a moment-to-moment surface level or at a deeper structural/temporal level. Akin to a tightrope walker, the slow graceful progression across a divide when viewed from a distance betrays the continuous muscle tension and micro adjustments needed to maintain balance. Similarly, sound objects can lack a stable pitch contour or be subject to various types of micro-distortions to suggest the decaying of a sound belying the permanence of the digital sound file. Nomi Epstein writes that, "Fragility, then, offers a sonic experience where both the possibility of stability and the possibility of its obliteration have been demonstrated".[26]

In her article *Musical Fragility: A phenomenological examination*, Epstein identifies ten categories of fragility in contemporary music: 1) performative; 2) material; 3) acoustic; 4) structural; 5) notational; 6) psychological; 7) temporal; 8) tuning; 9) spatial; and 10) multi-dimensional.[27] In our discussion of ambient music not all of these are pertinent, partly due to the recorded

24 Saini Manninen, "The art of Leftovers: Memory, Matter and Decay," *Journal of Media Practice* 12/3: (2011): 246.

25 The Caretaker, *Everywhere at the End of Time*, https://thecaretaker.bandcamp.com/album/everywhere-at-the-end-of-time

26 Nomi Epstein, "Musical Fragility: A phenomenological examination," *Tempo* 71 (281(2017): 40.

27 Ibid.

nature of the genre. However, we can adapt various of Epstein's headings and apply them to ambient music as well as refining and adding to this list. I will consider in detail *material*, *structural* and *temporal* fragility in ambient music as well as two newly proposed concepts: *technological* and *gestalt*.

For Epstein, *material fragility* is damage to the object or instrument used in sound production so it can no longer carry out its normal sonic function. In recorded ambient music, from a Schaefferian perspective, we hear sound objects transmitted via records or other (digital) technology. James J. Gibson's ecological approach to perception maintains that such objects afford certain types of actions.[28] It is the potentiality of such objects' fragility that creates the tension experienced by the listener. This could be in the way a sound object is developed or processed, or in the treatment of the technology used to play the music. Deupree states that:

> I often make my music balance on the edge of fragility, which comes from a specific design of the sounds and the composition. When it's successful you have this very gentle, hushed music that has a lot of tension in it. It's a very strange, but effective contrast. The tension keeps you engaged, in a way fearful that at any minute it's going to fall apart, while the gentle qualities can relax you and ease that tension. It's playing with this dichotomy that I find the most interesting music can live.[29]

Similar tensions can also be found in Philip Jeck's music. In Jeck's work (which is most often constructed by mixing multiple records on old Dansette players) as in Basinski's, there is a local micro-tension produced by a repeating 'loop' yielding a differing sonic outcome through the unpredictable qualities

28 See James J. Gibson, *The Ecological Approach to Visual Perception*, (Boston: Houghton Mifflin Harcourt (HMH), 1979), 127.

29 Infinite Grain 13, Interview with Taylor Deupree, accessed May 7, 2019, http://sonicfield.org/series/infinite-grain/

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of the technology being exploited - resulting in surface distortion or temporal fracturing. Miguel Carvalhais writes:

> From recording and valuing the artist's actions, we come to the development of processes that are exogenous to the artist, and that often may not be totally under their control. Two other artworks allow us to understand the allure of these semi-autonomous processes of erosion and degradation, Andy Warhol's 1978 *Oxidation Paintings*, and William Basinski's *Disintegration Loops* [...] The oxidation in Warhol's paintings was artificially halted by processes of conservation. If that had not happened, the works would have eventually been destroyed by the oxidation. As they are, they freeze a moment in time, a particular stage of the process. Basinski's tapes were transferred to digital, and thus the fully destructive process of *disintegration* was recorded for posterity, becoming central to the compositions and defining their titles.[30]

Material fragility can be linked to *technological fragility* especially where the technological medium as material is brought into focus by the composer. Although such technological fragility has commonly been associated with glitch music[31] its use in ambient music is somewhat different. Technological fragility can be heard in the pitch warping of tape loops, hiss, wow, flutter and dropout of Taylor Deupree & Marcus Fisher's *Twine*[32] and Deupree's *Somi*[33] and *Fallen.* There is also a current trend, employed by both Taylor

30 Miguel Carvalhais, "On Emptiness (or, on finishing with a blank canvas)," Proceedings of xCoAx 2017 Conference, Lisbon, accessed April 15, 2019, http://2017.xcoax.org/pdf/xCoAx2017-Carvalhais.pdf

31 See Kim Cascone, "The Aesthetics of Failure: 'Post-digital tendencies in Contemporary Computer Music," *Computer Music Journal* (2000): 12-18. https://doi.org/10.1162/014892600559489

32 Taylor Deupree and Marcus Fisher, *Twine* (USA: 12k – 12k1086, 2015).

33 Taylor Deupree, *Somi* (USA: 12k – 12k1087, 2017).

Deupree and Ian Hawgood (see 光[34]), amongst others, of mastering with a higher noise floor than usual. In their work, noise, particularly arising from analogue equipment used in the recording process and mastering chain, becomes a timbral or textural constant – a non-space for isolated musical objects to occur – *le bruit de fond*. The high noise floor also provides a sense of sonic continuity. Whilst not dissimilar from the pink or brown noise often used for relaxation, this noise floor provides a faux patina of age – a distancing of the sound from the listener. As such, it not only contributes to the creation of atmosphere but also of temporal distance. In addition, we are invited to listen technologically to the materiality of the medium supporting the auditory signal itself. Tape pitch bends in Deupree and Fisher's *Twine* is a complex example of sonic fragility of the sound heard carried through tape – a technological fragility, yet fixed in a digital and permanent audio file. The destabilisation of the tape recorder's regular functionality, through the spooling of tape too quickly or a loop slipping, renders it fragile, and it becomes precarious. Our attention is actively drawn to such events as the temporal quasi-regularity of the loop is fractured.

What Oliver Thurley writes about Ullmann's scores could equally apply to Taylor Dupree, Marcus Fisher, or Ian Hawgood's recent work:

> At the macroscopic level the structure often seems static, avoiding any formal *telos* or expression; close-up the music is, in fact, in perpetual motion beneath its surface. It is the constant movement of these tiny variables in performance that causes fragile disruptions, as musical events are constantly tampered with and undermined or destabilised. Pitches are never allowed to settle, but instead waver uneasily; dynamics are not even, but shake erratically.[35]

34 Ian Hawgood, 光 (France: Eilean Records – 073, 2018).

35 Oliver Thurley, "Disappearing Sounds," 10.

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It is this tiny movement, often variations of pitch or within a repeated decay tail that is transformed in some way (see Deupree's *Fallen* or Ian Hawgood's *Impermanence*[36]), that demands an acuity of listening in order to comprehend fully the subtlety of the destabilisation of the sonic materials. It is an intentionally composed fragility. It is the transience of the sound to which attention is drawn. The warping of a decay highlights the moment of capturing the embers of a sound. We listen to a composed impermanence, as if to half-remembered memories or some brittle exhumed sonic artefact. As such we listen to crafted 'atmospheres' that suggest decay and ageing (often achieved through the subtle mixing of mono and stereo recordings).

In much ambient music, there is a perception of *temporal fragility* not only evident at the moment-to-moment level in the use of repetition or asynchronous looping techniques, but also through the use of textural materials and drones which result in the suspension of the listener's consciousness of time passing. The form and slow, sometimes almost glacial, pacing of ambient music deliberately sets out to destabilise the listener's perception of time. The extended duration of many ambient works, their structural stasis and often fragmentary pitch content prevent easy recall and separation of distinct sections in the work. This leads to a perceived temporal stasis in which sonic placement is often unpredictable. Thurley's writings about the work of Jakob Ullmann are again applicable more widely here:

> This apparent temporal stasis […] makes it difficult for audiences to pick out moments by which to orientate their fragile listening experience; further obfuscating and distorting the temporal experience.[37]

36 Ian Hawgood, *Impermanence* (UK: Slowcraft Records – SR16, 2019)

37 Oliver Thurley, "Disappearing Sounds," 19.

In discussing this distortion of the "temporal experience" the writings of Edmund Husserl are pertinent. Husserl developed the notion of a subjective time-consciousness that is distinct from objective time. From this, Husserl went on to propose the idea of 'inner time-consciousness', the main focus of this being an individual's 'temporal span'. Husserl maintained that the temporal span comprises three main parts that are inseparable: primal impression, retention, and protention – our anticipation of the moment. In ambient music, particularly long-form, drone-based work, the music is devoid of directionality and curtails the possibility of protention. More realistically (and interestingly) perhaps, ambient music pluralises protention so that there is never just one clear path of continuation as there is so often in tonal music. Fitzell writes that:

> Devoid of substantial directionality, a nonlinear temporal experience permits no protentions of closure, only nondirectional protentions of continuance. Unlike linear music, which features readily apparent and often predictable temporal trajectories, nonlinear music curtails a listener's ability to anticipate conclusion. The effect is one of enduring present awareness.[38]

Siepmann applies the Deleuzian model of the rhizome to ambient music as an example of this "present awareness" and networked openness. He writes:

> […] there are no beginnings from which a linear sequence may emerge, but rather densifications, intensifications, reinforcements, injections, showerings, and other intercalary events […] there must be a distribution of inequalities in the system so that the musical contents shift and flow in attempts to gain stability and equilibrium

38 Gordon Fitzell, *Time-Consciousness and Form in Nonlinear Music* (PhD Thesis, University of British Columbia, 2004), 22.

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in the ambient world.[39]

Even when closure is implied as in the use of 'loops' – in Deupree and Fisher's *Twine* and Basinski's *Disintegration Loops*, the dropout, wow, and flutter, create ever-changing loops that are temporally fragile. This process disrupts the subject's perception of time as a constant linear process.

A further example of such temporal fragility that leads to a sense of structural fragility can be found in the looping patterns of Janek Schaefer's installation *Extended Play*. In this installation the violin, cello and piano parts of a pre-composed piece are recorded separately onto custom vinyl. Three versions of each are presented at different speeds. In addition, the looping records, arranged in groups of three under a suspended red light, can be stopped and started by proximity sensors triggered by those in the gallery. The result is a work in a state of continual flux, whose structural integrity is constantly interrupted and fractured.

An extension of this concept of temporal fragility is what I term gestalt fragility – a quality that is particularly evident at the moment-to-moment surface level of the music. In Deupree's *Somi* and *Fallen*, isolated pitches or fragments of a suggested melody are presented – often isolated across the stereo field and through pitch tessitura separation imply multiple auditory streams progressing simultaneously. The listener is drawn to make connections between these elements. Often temporal connections in one auditory stream are stretched out so a sense of musical line is difficult to perceive. The listener is left with a melodic line in which a quasi-traditional polyphonic melodic syntax is implied but never actually stated. The disconnected melodic elements serve to disorientate the listener further through the negation of expected gestalt principles.

In ambient music the five concepts of fragility discussed encompass specific aesthetic and sonic qualities of ambient music including notions of

39 Daniel Siepmann, "A Slight Delay," 191.

impermanence, disintegration, the emergence and decay of sonic materials, evidence of the corporeal captured in the sound production, studio artefacts, and the temporal transcendental quality of ambient music. All of these qualities invite an acuity of listening to appreciate how they are being used and manipulated, and how they contribute to the creation of atmosphere. One aspect of technological and material fragility touched on in this section is the perception of, and role of noise. The next section discusses this in detail outlining specific approaches to noise in ambient music.

Noise

Noise is as a territorialising form of sound: one that masks, obliterates, is transgressive and overpowers. At a certain level noise, interpreted as volume, becomes a physical sensation rather than auditory signal. Torben Sangild writes that, "Noise can blow your head out. Noise is rage. Noise is ecstatic. Noise is psychedelic. Noise is often on the edge between annoyance and bliss".[40] For Sangild, the "distorted guitar is a metonymy of 'abrasiveness,' of something torn, shattered, and decomposed. Noise expresses physical, emotional and mental instability".[41] Throughout the twentieth and twenty-first century we talk about noise pollution and noise abatement. Since Luigi Russolo's manifesto *The Art of Noise* (1913) and his *intonarumori*, noise has been an increasing part of music, evident in the work of Merzbow, Pharmakon, Tim Hecker, Ben Frost and Maja S. K. Ratkje amongst many others.

Torben Sangild considers noise as "a de-centering [sic] of subjectivity" in sound. To perceive this de-centring involves listening closely to what is at the heart of such a sonic event. Sangild identifies three categories of noise derived from acoustics and information theory:

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40 Torben Sangild, *The Aesthetics of Noise* (2002) accessed April 16, 2019, http://www.ubu.com/papers/noise.html

41 Torben Sangild, "Noise – Three Musical Gestures – Expressionist, Introvert and Minimal Noise," *The Journal of Music and Meaning*, vol. 2 (2004), accessed April 17, 2019, http://www.musicandmeaning.net/issues/pdf/JMMart_2_4.pdf

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1. Acoustic noise - In the field of acoustics the concept of noise is in principle purely physically defined. Noises are sounds that are impure and irregular […]
2. Communicative noise – In communication theory, noise is that which distorts the signal on its way from transmitter to recipient. […] In music noise is often originally a malfunction in the instruments or electronics (a disturbance of the clear signal), which is then reversed into a positive effect. The distortion effect of the electric guitar, for instance, which is now ubiquitous, was originally an overload of the amplifier […] When you reverse a disturbance into a part of the music itself, it is not smoothly integrated but infuses the music with a tension. There is still a play on the formerly negative relation between noise and signal when a noise is legitimated. This tension is an important part of the musical power of noise.
3. Subjective noise – 'Unpleasant sounds' – this is the common and colloquial, but also the most intricate, meaning of noise. And it is obviously a subjective definition […][42]

In our consideration of noise in ambient music, it is the second of these (communicative noise) that is the most pertinent. However, noise does not always have to be perceived as something overpowering or abrasive. One only has to think of the noise generators to assist sleep used to mask 'unwanted' distracting sounds or the countless YouTube sites playing hours of waves crashing on an unidentified beach or just actual noise signals.[43] Christoph Cox writes that the difference between a signal (intended) and noise (unintended) "is *relative* rather than *absolute*",[44] and cultural theorist

42 Torben Sangild, "The Aesthetics of Noise."

43 See "Ten hours of Pink Noise," https://www.youtube.com/watch?v=ZXtimhT-ff4 or "Smoothed Brown Noise," accessed April 16, 2019, https://www.youtube.com/watch?v=FcWgjCDPiP4

44 Christoph Cox, "Sound Art and the Sonic Unconscious," *Organised Sound* 14(1), (2009): 20.

Abraham Moles writes that,

> […] there is *no* absolute structural difference between noise and signal. They are of the same nature. The only difference which can be logically established between them is based exclusively on the concept of intent on the part of the transmitter. *A noise is a signal that the sender does not want to transmit*.[45]

In much dark ambient, as well as the more post-shoegaze noise-infused ambient of composers such as Tim Hecker, Erik Levander, Christian Fennesz and Rafael Anton Irisarri, impure and irregular 'noise' sounds – often derived from the guitar - are a prominent characteristic of their sonic palette. In their work, noise is not the antonym of a pure tone in the acoustic sense. Rather it is the primordial sonic state that suffuses the music with a fragile tension, a tectonic shifting plate, out of which other textural or gestural elements emerge. This 'legitimated' noise arises from the technology these composers use but is also used to fragment, distort and interrupt the signal further, as in "Caecilia" and "Happy Audio" from Fennesz's *Endless Summer* [46] or "Live Room" from Tim Hecker's *Virgins*[47]. The use of noise creates an ecstatic intimacy and musical immateriality – masking an afterglow of musical gesture. Such work can clearly be considered as arising from the second part of Sangild's tripartite model. It also moves beyond the traditional signal/noise dichotomy and clearly uses noise as part of the compositional intent; as a disruption to the musical flow and as a technological artefact. Therefore, in order to discuss this and other ambient music repertoire in more detail I propose a refinement of Sangild's 'communicative noise' into three subsections: 1) noise as intention; 2) noise as interruption; and 3) noise as artefact in experimental ambient music.

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45 Abraham Moles, 1966 *Information Theory and Esthetic Perception*, trans. Joel E. Coen. (Urbana: University of Illinois Press, 1966), 78.

46 Christian Fennesz, *Endless Summer* (Austria: Mego – MEGO-035, 2001).

47 Tim Hecker, *Virgins* (USA: Kranky – KRANK-183, 2013).

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As well as in the Fennesz and Hecker examples above, *noise as intention* can be found in both instrumental and electronic ambient music. The development of Western instruments has for the most part sought to eliminate the noise of its sound production, whereas Japanese instruments like the Biwa or the Shamisen actively seek the inclusion of noise into their sound as an additional expressive quality. These instruments are designed to generate additional buzzing tones and achieve a 'beautiful noise'. The Japanese call this new sound, generated by the sum of the noise and the sound of the instrument itself, *sawari*. Over the past decade ambient/modern classical albums that use the piano, although not specifically intended as sawari, nevertheless make use of additional 'noises' to enhance the expressive quality of the music. In contrast to classical piano recordings in which a clarity of tone is sought that eliminates the mechanical noises of the piano itself, albums such as Deupree's *Fallen*, Jason van Wyk's *Attachment*, Otto Totland's *Pinô*, Olafur Arnalds' *Living Room Songs*, Nils Frahm's *Encores 1* and Joep Beving's *Solipsism* all use extraneous close mic-ed piano noises such as pedal noise and the sound of the hammers and key mechanisms to add to the sonic texture of their work. Such additional sounds create a sense of intimacy, immersion and fragility.

Noise as interruption can be perceived as a sonic signifier commenting on the fragility of structure and sonic materiality through its breaking of musical coherence or perception, as well as sonic aggression. Fennesz and Hecker exemplify the latter. Examples of the former can be found in Taylor Deupree's *Northern*[48], "family tree" from offthesky's *form.creek*[49]and Sogar's "Monohr" from *Apikal.Blend*.[50] In these latter examples, *noise as interruption* is both metaphorical and literal. Glitch artefacts are deliberately-used 'noise' to fracture the sonic continuum, to destabilise melodic and harmonic content

48 Taylor Deupree, *Northern* (USA: 12k – 12k1037, 2006).

49 offthesky, *form.creek*, (2007), https://noise.offthesky.com/track/family-tree

50 Sogar, *Apikal.Blend* (USA: 12k – 12k-1022, 2003).

both temporally and functionally. This glitch can be a click, noise, or other abruptly edited sound that draws attention to the continually shifting sonic surface. Whilst there may well be a steady quasi-tonal framework or a continuity of synthetic or instrumental timbre, the moment-to-moment interruption of this creates a restless surface that draws the listener's attention to these micro-fractures in the temporal continuity. 'Noise' and 'fragility' are perceptually conjoined.

Noise as artefact can be found in more experimental electronic ambient music. Philip Jeck's practice of not using covers on his vinyl exposes the fragility of the medium, allowing it to acquire a 'history' of scratches, dust and other detritus, whilst effacing the original content. In Basinski's *Disintegration Loops*, the very recording of the tape loops actively destroys the material substrate that holds the audio signal. Basinski's pieces were composed in the process of digitising recordings made on magnetic tape that, having aged and degraded, were destroyed by the transfer process. The final 'preserved' work is a simple auditory witnessing of this wilful destruction of the fragile original. Noise is introduced in each loop as the material surface of the tape breaks down with each successive loop. The recording is the "remains and embodied memories within performance"[51] as Basinski recorded them.

Atmosphere

The three different forms of communicative noise I have proposed have a key part to play in the creation of atmospheres in ambient music. Eric Tamm writes that Eno's ambient music is characterised by the maintenance of a single, pervasive atmosphere.[52] Eno himself defined an ambience, "as atmosphere, or a surrounding influence: a tint".[53] This is beautifully suggestive as a description. It is instructive however, to delve a little deeper into the

51 Saini Manninen, "The art of Leftovers," 245.

52 Eric Tamm, *Brian Eno: His Music and the Vertical Color of Sound* (Boston: Da Capo Press, 1995).

53 Brian Eno, "Ambient Music."

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meaning of 'atmosphere', and how atmospheres are formed and perceived. To develop an understanding of atmosphere in ambient music, the writings of Gernot Böhme are useful. The phenomenology of atmospheres is often discussed in relation to reception theory and was first critically discussed by Gernot Böhme.[54] Mikkel Bille writes that by,

> "[…] approaching atmospheres from both a consumption and a production side, Böhme indicates […] how atmospheres may seem […] commonplace and work as a premise for engaging with the world, but there is a production aspect with political potential when atmospheres are staged [or constructed sonically]. That is, atmospheres are active in shaping the world, thus showing the two sides of atmospheres where the environment 'radiates' a quality of mood and the person participates in this mood with his/her own sensitivity.[55]

The aesthetics of atmospheres that Böhme proposes encompass our everyday experiences, our (fragmentary) memories of past events as well as our appreciation of physical spaces and art. Böhme writes that in order to define the character of an atmosphere "one must expose oneself to them, one must experience them in terms of one's own emotional state. Without the sentient subject, they are nothing".[56] This implies an active engagement on the part of the listener. Or, at the very least an active engagement at some point to establish the perception of atmosphere. The music may then be

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54 Gernot Böhme, *Atmosphere as the Fundamental Concept of a New Aesthetics*, trans. David Roberts, Thesis Eleven (36), (Cambridge, MA.: The MIT Press, 1993), 119.

55 Mikkel Bille, "Review of Gernot Böhme, *The Aesthetics of Atmospheres,*" ed. Jean-Paul Thibaud. (London, Routledge, 2017), *International Journal of Sensory Environment, Architecture, and Urban Space*, https://journals.openedition.org/ambiances/1065

56 Gernot Böhme, "The Art of Staging as a paradigm for an Aesthetics of Atmospheres," *Atmospheric Architectures. The Aesthetics of Felt Spaces*, ed. & trans. A. Chr. Engels-Schwarzpaul (London: Bloomsbury, 2017), 159.

background until a change in atmosphere is perceived and is so brought to the fore of the listener's attention again. Atmospheres provoke an emotive and unique response in the recipient. Hermann Schmitz defines such feelings as "unlocalized, poured forth atmospheres […] which visit (haunt) the body which receives them […] affectively, which takes the form of […] emotion".[57] Atmospheres are everywhere and condition our listening experience of ambient music (exterior locus) as well as the atmosphere emanating from the ambient music itself (interior locus). They are indeterminate and intersubjective, occupying an interstitial position between object and subject and so their ontological status is fragile and to some extent re-made anew on each listening. To paraphrase English, they are in a 'constant state of becoming'. Böhme considers atmosphere "an almost objective sensation spilled into space"[58] writing that,

> […] atmospheres are neither something objective, that is, qualities possessed by things, and yet they are something thing-like, belonging to the thing in that things articulate their presence through qualities - conceived as ecstasies. Nor are atmospheres something subjective, for example, determinations of a psychic state, And yet they are subject-like, belong to subjects in that they are sensed in bodily presence by human beings and this sensing is at the same time a bodily state of being of subjects in space.[59]

Böhme's blurring of the object-subject dichotomy, of "objective sensation", renders traditional notions of representation and signification problematic,

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57 Gernot Böhme, *Atmosphere as the Fundamental Concept of a New Aesthetics*, trans. David Roberts, Thesis Eleven (36), (Cambridge, MA.: The MIT Press, 1993), 119.

58 Gernot Böhme, quoted in Simone Broglia, "The Meaning of A Sound Place. G. Bohme, The Aesthetics of The Atmosphere," *DIGICULT* 52, 31-32, accessed August 20, 2018, http://www.digicult.it/digimag/issue-052/the-meaning-of-a-sound-place-g-bohme-the-aesthetics-of-the-atmosphere/

59 Böhme, "Atmosphere as the Fundamental Concept of a New Aesthetics," 122..

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in that for Böhme such considerations or interpretations are subservient to the creation of atmospheres. In the creation of atmospheres in sound we are therefore not primarily concerned with source-sound bonding to generate meaning. This emancipation of identity renders interpretation open, requiring the listener to complete an understanding. It is the individual's phenomenological experience of sound in ambient music that affords an interpretation of atmosphere. In moving beyond a semiotic analysis of sound in ambient music, Christoph Cox's proposition of a "sonic materialism" that goes beyond representation and signification is useful. Cox writes that:

> This materialist theory of sound, then, suggests a way of rethinking the arts in general. Sound is not a world apart, a unique domain of non-signification and non-representation. Rather, sound and the sonic arts are firmly rooted in the material world and the powers, forces, intensities, and becomings of which it is composed. If we proceed from sound, we will be less inclined to think in terms of representation and signification, and to draw distinctions between culture and nature, human and nonhuman, mind and matter, the symbolic and the real, the textual and the physical, the meaningful and the meaningless. Instead, we might begin to treat artistic productions not as complexes of signs or representations but complexes of forces materially inflected by other forces and force-complexes. We might ask of an image or a text not what it *means* or *represents*, but what it *does*, how it *operates*, what changes it effectuates.[60]

Atmospheres are, Böhme writes, "spaces insofar as they are 'tinctured' through the presence of things, of persons or environmental constellations, that is, through their ecstasies".[61] This could almost be an elaboration of

60 Christoph Cox, "Beyond Representation and Signification: Toward a Sonic Materialism," *Journal of Visual Culture*, accessed April 19, 2019, https://journals.sagepub.com/doi/10.1177/1470412911402880

61 Ibid.

Eno's original liner notes to *Music for Airports*. If we carry on this adaption of the aesthetics of atmosphere to ambient music specifically we can state that "the particular quality" of an ambient work "lies in the fact that it not only communicates to us that a certain atmosphere prevailed somewhere else but that it conjures up this atmosphere itself".[62] Furthermore, to paraphrase Böhme, ambient music that depicts a melancholic state of mind, is not merely an exercise in musical semiology but produces this state itself. We can go so far as to state that the logic within an ambient piece of music is not to be found in a meaningful combination of sonic objects but in the creation and communication of atmosphere. Simone Broglia writes that,

> […] compared to the theories of association that have characterized the relationship between music and emotiveness, the theory of atmospheres starts from a given body-sound report that is as basic as essential: sound is the modification of the space investigated by the body, a sound which is able to shape the emotional position of listening in an environment.[63]

and continues that,

> […] the innovative aspect of the aesthetic approach by Gernot Böhme is to try to weave the possibility that the subject has to perceive the environment as an interaction mediated by the same spatial sounds that cross it and characterize it through a primary state of policy-situational context […] it redefines the meaning of music as an experience whose core is listening to a particular

62 Böhme, "Atmosphere as the Fundamental Concept of a New Aesthetics," 124.

63 Simone Broglia, "The Meaning of A Sound Place. G. Bohme, The Aesthetics of The Atmosphere," *DIGICULT* 52, accessed August 20, 2018, http://www.digicult.it/digimag/issue-052/the-meaning-of-a-sound-place-g-bohme-the-aesthetics-of-the-atmosphere/

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acoustic atmosphere.[64]

If we consider Brian Eno's *Thursday Afternoon* in this context, with its isolated piano tones and subtly changing background, atmosphere is created through the individual's identification with the piano as a solitary 'figure' situated within an atemporal, other-worldly sonic frame. An *interior* and *external locus* is present in the music itself as well as between the listener and their environment. The other worldly quality of the synthetic backdrop for the isolated piano tones suggests something ungrounded in its lack of bass frequency content. The music seems to float. In Deupree's *Fallen* the same blueprint gives a very different atmosphere – a high noise floor and emphasis on the idiosyncrasies of the analogue tape technology gives the sense of something aged – not something other-worldly, but fragile and communicated through a vast distance of time, captured and relayed to us in the present. This communicates an atmosphere of nostalgia, the ecstasy of melancholy. Here the background 'noise' attunes the listener to a certain perception of the music. It demonstrates that atmospheres can be designed and quasi-objective, and perceived as a subjective experience. In choosing sounds the composer creates the conditions for a certain atmosphere to become manifest. As Böhme considers atmospheres "conjured" in artworks rather than metaphorically communicated, the sonic content of ambient music is what he terms the "generator" of atmosphere.

Hermann Schmitz refers to a 'technology of presentation' (*Eindruckstechnik*) particularly with reference to theatre works. However, the technology of presentation is equally applicable in a sonic context in ambient music's use of noise and fragility. It is the 'staging' of the sounds – their context, that allows us to listen to them as generating a particular atmosphere. Böhme develops Ludwig Klages' 'eros of distance' which, "unlike the Platonic Eros does not desire closeness and possession but keeps its distance and is fulfilled by

64 Ibid.

contemplative participation in the beautiful".[65] Deupree's use of disembodied melodic cells and tape noise gives this sense of distance. As Demers notes, the use of a tonal framework within such 'noise' provides the 'beauty'.[66]

The interpretation or communication of atmospheres is complex due to the subject-object dichotomy and what I have termed the *interior/exterior locus* of their construction. An individual's reception and construction of atmosphere is of course mediated through their own memory. Christoph Cox writes,

> […] each of our conscious perceptions is grounded in a vast swarm of elements that do not reach conscious thought. Such unconscious perceptions have what Leibniz calls a virtual existence. They determine conscious perception but are not present to it. Leibniz notes that memory, too, has such a virtual existence. Our present experience takes place against the backdrop of a vast reservoir of memory, which for the most part remains unconscious. Yet […] a photograph, a song or a chance encounter can draw a portion of this reservoir into actuality, temporarily illuminating it and offering a glimpse of the totality.[67]

This "glimpse of the totality" is why atmosphere in ambient music is so important and draws listeners back to it over and over. It is not a 'closed' music that is syntactically complete. Rather it is open. Its temporal, structural, and gestalt fragility create an incomplete space which atmosphere fills. It is the listener alone that completes this totality of experience. This is what the fragmentary melodies of Taylor Deupree's *Fallen* and the cyclically haunting

65 Böhme, "Atmosphere as the Fundamental Concept of a New Aesthetics," 118.

66 Joanna Demers, *Listening Through The Noise: The Aesthetics of Experimental Electronic Music* (New York: Oxford University Press, 2010), 103.

67 Christoph Cox, "Sound Art and the Sonic Unconscious," Organised Sound 14(1), (2009): 21. doi:10.1017/S1355771809000041

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cello melody lines of *Faintly Recollected* [68] by Ian Hawgood and Danny Norbury achieve – an open-endedness that, through its gestalt fragility creates an atmosphere of melancholic reflection. In their incomplete 'traditional' musical syntax, they create the impression of something half remembered. It is as if their incomplete presentation presents a portion of our unconscious reservoir of memory brought into actuality, offering a glimpse of the totality that is completed by the listener.

Noise also has its part to play in the creation of atmosphere. Deupree's use of tape noise as a continuum in which to situate foregrounded pitch content on *Somi* is akin to filmmakers' recording room tone noise for "a subconscious sonic field without which dialogue and diegetic sound would seem artificial and unmoored".[69] This sonic field – a sonic continuity which is punctuated by surface features – is the key aspect of ambient music's ability to generate atmospheres. Böhme writes that atmospheres "seem to fill the space with a certain tone of feeling like a haze".[70]

In ambient music we can identify a number of key elements that generate atmosphere many of which are to do with the lack of functional syntax identified by Daniel Siepmann. The use of noise, drones, or slow textural evolution provides a sonic field or haze from which sonic events can emerge and disappear. This continuity creates a singular atmosphere within which ecologies of sound can develop but do not establish an over-riding functional discourse or structural logic of their own – rather they act as surface features of a landscape – creating their own fragile geography. The five aspects of fragility identified (technological, gestalt, material, structural and temporal) also contribute to the creation of atmosphere, often in combination with one another. These approaches to fragility provide a framework for the composer to consider, process, and present their sonic material in a particular way, that

68 Ian Hawgood & Danny Norbury, *Faintly Recollected* (Poland, Home Normal – HN102, 2018).

69 Ibid., 24.

70 Gernot Böhme, "Atmosphere as the Fundamental Concept of a New Aesthetics," 114.

act as 'generators' of atmosphere and elicit in the listener their own memories and hence unique manifestation of atmospheres within any given work.

Conclusion

In drawing attention to fragility, noise and atmosphere in experimental ambient music I have sought to outline a framework or terminology for discussing such work. I have also attempted to refocus discussion away from the *ignorable-as-it-is-listenable* mantra, and more towards concepts of subject agency, and listening. It is my contention that whilst much experimental ambient music possesses many of the qualities originally outlined by Eno, these are works to be actively listened to – few performers aim to present their music at similarly low levels to those that led to Eno's 'epiphany'.[71] Ambient music does not assert an identity for interpretation. Rather, through the creation of atmospheres it manifests an environment from which, through conscious engagement, meaning may emerge – meaning that is both a reflection of the self and the society in which we live.

71 See: Ivan Hewitt, "How Brian Eno created a quiet revolution in music," *The Telegraph*, January 5, 2016, accessed April 23, 2019, https://www.telegraph.co.uk/music/artists/how-brian-eno-created-a-quiet-revolution-in-music/ Eno having been knocked down by a cab was recuperating at home, "to amuse him an old girlfriend took an LP of harp music round to his flat. "[…] After she had gone, and with considerable difficulty, I put on the record," he recalls. "After I had lain down, I realised that the amplifier was set at an extremely low level, and that one channel of the stereo had failed completely. Since I hadn't the energy to get up and improve matters, the record played on almost inaudibly. This presented what was for me a new way of hearing music – as part of the ambience of the environment just as the colour of the light and sound of the rain were parts of the ambience."

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7

CHANNELLING THE ECSTASY OF HILDEGARD VON BINGEN: "O EUCHARI" REMIXED

Lisa Colton

Abbess Hildegard von Bingen (1098–1179) became an unexpected cult figure in the final decades of the twentieth century, when her life and work were used as the stimulus for numerous cultural products, from imagined autobiographies to film. Her adoption as a quasi- featured artist by creators of electronic dance music (EDM) was surprisingly commercially successful, chiming with Michael Embach's view that:

> No other medieval figure has been as subject to transitions that have strayed so profoundly from an authentic impression, moving through myth and legend, and finally into pure fiction.[1]

Hildegard's reception at this time rested on cultural understandings of her as a visionary, a nun whose spirituality had almost magical qualities. Her mysticism, her isolation as a well-documented female composer of the twelfth century, and her melodic style led to Hildegard's association with 'ecstasy' – both in the meanings found to be inherent to her music, and with the interpretation of her works in performance and re-composition. This chapter will examine the ways in which notions of female ecstasy also informed the use of Hildegard's music in ambient house and New Age tracks that sampled the song "O Euchari": The Beloved's "The Sun Rising" (1989), Orbital's "Belfast" (1991), and Richard Souther's "Vision (O Euchari in Leta Via)" (1994).

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1 Michael Embach, "Hildegard of Bingen (1098–1179): A History of Reception," *A Companion to Hildegard of Bingen: Companion to Hildegard of Bingen*, ed. Beverly Kienzle, George Ferzoco, and Debra Stoudt (Leiden: Brill, 2013), 273–304.

Medievalism was threaded through diverse genres of the late 1980s and 1990s, from Viking imagery in heavy metal to the popularity of crossover groups such as the Mediaeval Baebes.[2] This appropriation of ancient culture also drove the reuse of Hildegard's music by those working in dance and ambient genres. The timbral qualities of the voice type fashionable in early music performances were appealing to electronic music composers, whose female-voice samples were similarly pure in tone, and to their listeners. Such presentations of women's vocality in popular and electronic genres were typically ethereal, wordless, and passive in the mix. However, the three examples discussed here were released during a time when a number of prominent women musicians actively challenged stereotypes. The analysis of three songs featuring the "O Euchari" sample will therefore consider the ways in which Hildegard's music is lent different levels of agency and meaning, depending on its manipulation by modern composers and arrangers. As representative of a 'female voice' – both literally and in terms of its performance of Hildegard's historical and creative voice – I am interested to consider the extent to which the Hildegard sample aligns which the presentation of other such voices. I will situate the "O Euchari" songs within the context of female-voice tracks of the 1980s and 1990s, and offer a comparison with the monastic chanting sampled by Enigma, demonstrating the contrasting ways in which signifiers of gender and spirituality functioned in popular music. What can the use of Hildegard's song tell us about electronic music's relationship with music of the past? And, perhaps more controversially, what do such interrelationships reveal about problematic historical stereotypes of female creativity?

Rediscovering Hildegard for the New Age

Hildegard von Bingen was a Benedictine nun, eventually an abbess, whose

2 On medievalism in music and popular culture, see Simon Trafford and Aleks Pluskowski, "Antichrist Superstars: The Vikings in Hard Rock and Heavy Metal," *Mass Market Medieval: Essays on the Middle Ages in Popular Culture*, ed. David W. Marshall, (Jefferson, NC, and London: McFarland & Co), 57–73; Veronica Ortenberg, *In Search of the Holy Grail: The Quest for the Middle Ages* (London: Hambledon Continuum, 2006).

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diverse writings covered almost every available topic of her day, from the political to the spiritual and from aspects of natural philosophy to physiological studies of the human body.[3] A figure of Catholic devotion for centuries, Hildegard's story provided ample evidence of her sanctity, but it took until 2012 for her official canonisation to occur. Hildegard's theology, her interest in the natural world, and her political involvement with religious and secular leaders across Europe has meant that her biography – unlike that of so many other remarkable women – was never entirely erased from historical accounts in her native Germany. She has been venerated in various ways since her death.[4] In the English-speaking world, studies of Hildegard were encouraged by feminists' search for marginalised figures to add to the historical canon. Perhaps surprisingly to musicians familiar with her creative output, Hildegard's compositions did not play a prominent role in the early reception of her influence during the medieval and early modern periods, or even during the nineteenth century. They are far from insubstantial: 77 individual liturgical songs, plus a further collection of songs that form her morality play *Ordo virtutum*.

A catalyst for the wider interest in Hildegard's musical output was the release of *A Feather on the Breath of God* (1982), a full album of her devotional chants, performed in various vocal and instrumental combinations by Gothic Voices (directed by Christopher Page).[5] A second influential 'classical' album of her music, *Canticles of Ecstasy: Hildegard von Bingen*, was released to critical

3 Of the considerable bibliography on Hildegard, Barbara Newman's edited collection of essays remains an excellent, interdisciplinary guide; *Voice of the Living Light: Hildegard of Bingen and her World* (London & Berkeley: University of California Press, 1998). See also Beverly Kienzle, George Ferzoco, and Debra Stoudt eds., *A Companion to Hildegard of Bingen* (Leiden: Brill, 2013).

4 Jennifer Bain, *Hildegard of Bingen and Musical Reception: The Modern Revival of a Medieval Composer* (Cambridge: Cambridge University Press, 2015), 3.

5 *A Feather on the Breath of God: Sequences and Hymns by Abbess Hildegard of Bingen*, Gothic Voices with Emma Kirkby & Emily van Evera, dir. Christopher Page (Hyperion, CA66039 vinyl 1982; CD Hyperion, CDA66039, 1984). Recording Engineer: Tony Faulkner; Recording Producer: Martin Compton.

acclaim by Sequentia in 1994.[6] Both recordings tapped into the idea that Hildegard's music was 'ecstatic', a word that was regularly used in connection with the style of her song and for marketing purposes.[7] The term 'ecstasy' conjured Hildegard's reputation as the 'Sibyl of the Rhine'; it also resonated with aspects of popular culture of the 1980s and 1990s in which trance-like states, not least through the use of the drug MDMA ('ecstasy'), were part of the club scene, and thus served as a meeting point for medieval and modern cultural references. The presence of Hildegard's music in commercially released recordings has grown far beyond the 30 or so releases assessed by Jennifer Bain in her 2008 study of Hildegard's musical 'ecstasy'. Hildegard's songs have formed part of compilations as well as – unusually for a composer of plainchant – many albums entirely dedicated to her music. Even more remarkably, Hildegard's devotional music has reached diverse audiences through its performance and reworking by musicians ranging from enclosed Benedictine nuns to classically-trained professional early musicians, and from performers steeped in world, folk, and New Age traditions to those in electronic dance music.

The recordings by Gothic Voices and Sequentia tapped into a particular trend in the 1980s and 1990s, as popular demand for examples of historical, female-centred spirituality played a role in the New Age movement. New Age's spiritual themes were diffuse, drawing liberally on diverse religious and quasi-spiritual traditions. Particularly attractive to its audience were ritualistic and shamanic practices, since they offered an apparent connection to ancient wisdom, often in unfamiliar linguistic traditions (Latin song, Buddhist chanting, Native American incantation) whose texts were used for sonic meditation more than semantic meaning. Music was an integral part

6 *Canticles of Ecstasy: Hildegard von Bingen*, Sequentia (Deutsche Harmonia Mundi, 05472 77320 2, 1994).

7 Jennifer Bain, "Hooked on Ecstasy: Performance 'Practice' and the Reception of the Music of Hildegard of Bingen," *The Sounds and Sights of Performance in Medieval and Renaissance Music: Essays in Honour of Timothy J. McGee*, ed. Brian Power and Maureen Epp (Farnham, Ashgate: 2009), 253–74.

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of New Age, and commercial recordings brought otherwise niche musical traditions to large Western audiences. Both New Age and rave cultures made use of chant, tapping into perceptions of spiritual song as healing, communal, and liberating.[8] In the 1960s, texts like Kahlil Gibran's *The Prophet* had enjoyed cult status within the counterculture as a result of its timeless, non-denominational appeal; in the 1990s, Gibran's writings were joined by such publications as *Hildegard in a Nutshell*, *The Wisdom of Hildegard von Bingen*, and the scholarly and accessible *Hildegard von Bingen: The Woman of her Age*, each offering a female-centred perspective to a New Age readership.[9] As part of these developments, Hildegard gained the uncommon distinction of being one of the few medieval composers whose reputation had crossed from the ivory towers of academia into public awareness.[10]

Hildegard's chants were not the only medieval songs to be remixed in the 1980s and 1990s. When EDM, ambient house, New Age, and rave culture appropriated the sound world of pre-modern spirituality into new electronic contexts, they frequently drew on monastic chant, which was also experiencing crossover success at this time, whether remixed or sung unaccompanied as a relaxation aid.[11] One of the most popular bands of the period, German group Enigma, achieved commercial success with tracks sampling male-community Gregorian chant ("Sadeness (Part I)", from *MCMXC a.D.*, 1990, which sold 5,000,000 copies), and male-voice Native American chanting

8 For a wider survey of electronic music cultures around 1990, see Simon Reynolds, *Energy Flash: A Journey Through Rave Music and Dance Culture* (London: Faber & Faber, 2013).

9 Kahlil Gibran, *The Prophet* (New York: Alfred A. Knopf, 1923); Robert van de Weyer, *Hildegard in a Nutshell* (London: Hodder and Stoughton, 1997); Fiona Bowie, *The Wisdom of Hildegard von Bingen* (Grand Rapids, MI: Eerdmans, 1997); Fiona Maddocks, *Hildegard von Bingen: The Woman of her Age* (London: Review, 2001).

10 Bain, "Hooked on Ecstasy," 253.

11 A history of the marketing of medieval music as part of New Age would go beyond the central purpose of this chapter; a discussion of the mass marketing of Hildegard and chant recordings can be found in Jennifer Bain, "Hildegard on 34th Street: Chant in the Market Place," *ECHO: A Music-Centred Journal* 6, no. 1 (2004) online at http://www.echo.ucla.edu/Volume6-issue1/bain/bain1.html.

("Return to Innocence", *The Cross of Changes*, 1994).[12] However, the sampling of Hildegard's song had more to do with the typical ways that the female voice had traditionally been presented in electronic musical media as it did with its historical, liturgical roots. The reason for the particular appeal of Hildegard's 'female voice' therefore demands some careful scrutiny, as it arguably had much to do with the marketing and reception of the Gothic Voices recording from which Emily van Evera's performance of "O Euchari" was sampled.

The award-winning *A Feather on the Breath of God* received substantial attention from outside the traditional early music world. Three factors made Hildegard an obvious choice for those seeking a sample of early chant (initially without permission or credit): her chaste, idealised femininity, her mysticism, and the heightened public awareness of her song. What better to feature on an album of New Age or electronic music than the 'voice' of a nun who experienced mystical visions, wrote spiritual/sensual poetry, and who was already at the top of the classical charts? But there was a further factor at play: namely the underlying resonance between Hildegard's chants and the conceptual basis for ambient music more broadly, as neatly articulated by Brian Eno in his album notes for *Music for Airports*. Of the modern genre, Eno wrote that "Ambient Music must be able to accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting".[13] Essentially, then, it was music in which the listener was paramount, but who was also expected to seek sounds that could be engaged with, or not, in equal measure. In Page's notes to *A Feather on the Breath of God*, the director included the following guidance on the ideal manner for plainchant performance:

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12 The Gregorian chant samples on hit singles "Sadeness" and "Mea Culpa" were taken, without permission, from the album *Paschale Mysterium*, performed by Capella Antiqua München (dir. Konrad Ruhland, Sony Classical, B00XZRPKOG, 1977).

13 Brian Eno, 'Ambient Music', liner notes from the initial American release of *Ambient 1: Music for Airports* (PVC 7908 (AMB 001), 1978), accessed February 13, 2018, http://music.hyperreal.org/artists/brian_eno/MFA-txt.html

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> Ideally, [medieval] singers were to allow their activity to absorb the whole spirit and body, inducing a state of meditative calm and so intensifying the quality of devotional life. Distractions […] were therefore to be avoided. Discretion was the basis of the ideal: voices betraying a poised, attentive spirit dwelling upon the inner meaning of the text, sensitive to musical nuances but never seduced by them.[14]

The relationship between the two ostensibly different musical genres is one of common levels of perception within the frame of musical time: rather than anything standing out, distracting the listener's attention, both Gothic Voices' performance of plainchant and Eno's ambient music emphasise meditative practice. Page's words share an affinity with Eno's definition. The listener could, perhaps even should, be only minimally aware or casually stimulated by the sounds of devotional chant. Even the medieval singer performed mainly as a functional aid to calmness of thought, perhaps mindful of St Augustine's advice that one should enjoy the prayerful message of song but fall short of allowing it to incite the body to dancing or other sinful pleasures. It is a trope of medieval religious writing that song might have such effects, and that women were both more susceptible to them and more naturally inclined to seduce others with their siren-like voices.[15] Arguably, then, both the Gothic Voices' recording of Hildegard's music and the electronically manipulated versions of her song held in common their wrestling with the presence of the potentially distracting, even unruly, female voice in the mix. A final irony remains in that the ability of ambient music to make women's voices even more ignorable than usual, in fact facilitated widespread awareness and opportunities to hear Hildegard's song.

The three main areas on which the present discussion will focus all relate to just one of Hildegard's songs, "O Euchari" (Fig. 1). The song – whose four

14 Page, liner notes to *A Feather on the Breath of God*, 5.

15 See Bruce Holsinger, *Music, Body, and Desire in Medieval Culture: Hildegard of Bingen to Chaucer* (Stanford, CA: Stanford University Press, 2001).

double versicles last over five minutes in performance – is a poem in honour of the missionary, St Eucharius, a figure of veneration for the community of Trier (where he served as Bishop) and elsewhere. In Hildegard's chant, the opening melody soars upwards in a manner found elsewhere in her output, from the opening note to an octave above by way of the fifth, emphasising those intervals.[16] The rising opening gesture of "O Euchari" is aurally striking, and helps to situate the remaining, more step-wise melody within the Phrygian frame that is gradually established, and is confirmed by the F natural towards the end of the first phrase. The lyric's distinctive "O" opening recalls the "O" antiphons, medieval devotional chants performed at Vespers in the final part of Advent, each praising attributes of Christ and the Blessed Virgin Mary ("O Sapientia", "O Clavis David", etc.). The text is a joyous praise of Eucharius, and this aspect of celebration is well matched by moments of melisma (more than one note per syllable), which function to emphasise closing syllables of lines and verses in particular.



Fig. 1: Hildegard von Bingen, "O Euchari"

The tracks that sample Hildegard's music all sit within the broad genre of electronic music, but they function quite differently in the particular ways that Hildegard's music is used and transformed, and what cultural meanings are signified. Although there were various recording styles already available to electronic music composers – including performances of Hildegard's

16 On the stylistic features of Hildegard's music that have been marked out as personally distinctive, and the problems with this perception, see Jennifer Bain, "Hildegard, Hermannus, and Late Chant Style," *Journal of Music Theory* 52, no. 1 (2008), 123–49. Bain demonstrates that the gesture as found at the beginning of "O Euchari" is not peculiar to Hildegard's music, but instead is typical of eleventh- and twelfth-century chant composition lying outside of Gregorian repertory; Bain, "Hildegard, Hermannus"; 124, 146.

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songs by nuns, monks, classical singers and diverse instrumentalists – they all selected the Gothic Voices track as the basis for new work. Therefore, I will take Bain's claim that "the style of musical presentation itself […] can shape the image of who Hildegard was for anyone listening", and use it to test what that might mean when all three share the same initial performance material.[17] I am chiefly interested in three areas: the use of Hildegard's song to create a sense of timelessness; the use of "O Euchari" in relation to the idea of 'ecstasy', also fundamental to ambient, house, New Age and rave cultures; and finally in the importance of female-centred spirituality to the three remixes.

Susana Loza has identified various ways in which human voices are manipulated by technology in electronic dance music, and of the five categories she describes, four are particularly relevant to the ways in which the "O Euchari" sample is used in remixes and are worth summarising here.[18] First, although all three employ material that has been excised from the original track, The Beloved's mix can be seen to employ a basic 'cut-up' (Loza's first technique), in which the sample can be heard as more nonsensical than in its original context; this is enhanced by their use of the sample as a 'diva loop' (technique five), in which "the female voice is electronically eroticised and/or the exaggerated peak of one natural(ised) and ultrafeminised orgasmic cry", "sonically spliced and mechanically (re)produced until it surpasses the borders of believability".[19] In both the Beloved and Orbital's mixes, Loza's second technique, the 'Moebius loop', produces "a haunting echo that multiplies until it collapses upon itself in a series of surreal and interconnected ellipses";[20] this effect is also part of the outro material to "Vision" by Richard Souther. Her third technique, which is the use of vocoder, is not part of these remixes,

17 Bain, *Hildegard of Bingen*, 7.

18 Susana Loza, "Sampling (hetero)sexuality: Diva-ness and Discipline in Electronic Dance Music," *Popular Music* 20, no. 3 (2001), 349–57.

19 Loza, "Sampling (hetero)sexuality," 349–50.

20 Loza, "Sampling (hetero)sexuality," 350.

and that in itself reminds us of the central importance of the qualities of the singer's original vocal in creating meaning in subsequent arrangements. Orbital play with the speed of the sample more than the other two artists.

Timelessness and medievalism: Orbital, "Belfast" (1991)

Eight minutes long in its commercial release, Orbital's track "Belfast" places the chosen sample of Hildegard / van Evera in two main sections (Fig. 2).[21] There are only a handful of main elements to the piece: a high-pitched, oscillating melodic motif; a high-pitched percussive element that provides a surface rhythm; a mid-range harmonic wash evoking vocal timbres; low-pitched material that serves as a harmonic underpinning; and the sample itself. In the middle of the track, a version of the high-pitched, oscillating material is developed as a continuous keyboard melody, before a break and re-building of the track, accompanied by a more active bass riff and the re-entry of the sample within the full texture at a slightly reduced tempo.



Fig. 2 Placement of Hildegard samples within the track

A theme of being outside conventional time is common to several Orbital releases, and this is sometimes emphasised through the handling of sampled material. The opening track of the group's first album (untitled, but known as *The Green Album*), "The Moebius", drew sampled speech from *Star Trek: The Next Generation*: "There is the theory of the Moebius: a twist in the fabric of space where time becomes a loop, from which there is no escape […]

21 Although live remixes are typical of club-scene experiences of this track, the success of the commercial release makes it an appropriate reference point; "Belfast" was released on Orbital, *Orbital* (FFRR, 1991).

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When we reach that point, whatever happened *will* happen again".[22] Thus Orbital's tracks play with trance-inducing verbal and sonic repetition and also with speed, especially after the main break, and the use of a sample of looped Hildegard in "Belfast" ties in well with their aesthetic more generally. However, although the Hildegard / van Evera sample is looped, this is not to the extent that the vocal "collapses upon itself" as might be identified by Loza in similar examples. Instead, the sample is reproduced only once each time it appears, with the listener hearing it four times in total.

"Belfast" is informed by an overarching medievalism, achieved not only through the introduction of Hildegard's sequence, but also through further stylistic features. The track opens with material redolent of medieval drones through the use of pitch and timbre, and by open, perfect intervals (Fig. 3); this material provides a contrast with the high pitch of other material, including synthesised sound and van Evera's own voice. A drone on open harmonies is a simple device, but it is a clear early music signifier that conflicts with the synthesised sounds that subsequently enter the track on higher pitch material.

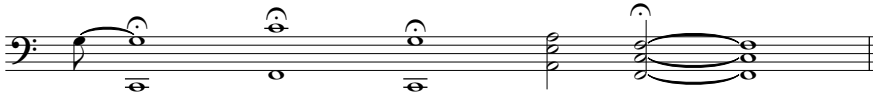


Figure 3: Orbital, "Belfast": opening drones

In both sections featuring Hildegard's music, the medieval song is very low in the mix, giving a sense of historical distance – we hear echoes of her voice as if across time. The sample is heard at the same pitch as in Gothic Voices' original release, but the tempo of the sample is gradually adjusted to match speed changes that take place from the midpoint. The pitch of the sample is slightly dissonant with the harmonic setting established in the track, but there are moments of resolution at the ends of the sample phrases where

22 The same sample is used on "Time Becomes", the opening track on Orbital's second album (1993), also untitled but known as *The Brown Album* on account of its colour.

the drones close on E. Textually, there is some effort to retain a semantically meaningful section of Latin ("O Euchari, in leta via ambulasti ubi cum filio Deo mansisti, illum tangendo"; O Eucharius, you walked in the path of joy when you tarried with the Son of God, touching him), and this clarity is aided by the limited number of loops. The quiet dynamic of the sample within the mix makes the poetry less audible. However, the musical line and shape would have been immediately familiar to either fans of Hildegard or, more widely, to those who had heard The Beloved's "The Sun Rising", released only a year before and still played regularly at similar club venues.

The use of a sample so well known to the audience from The Beloved's reworking appears to tap into a form of cultural nostalgia. But for what period does this track create nostalgic yearning? On the one hand, the use of pre-existent song and signifiers of early music in the new material provokes nostalgia for the sort of idealised medieval past beloved by writers, painters, architects, and musicians since the nineteenth century. Theirs was a romanticised past, a pre-industrial world in which sexually innocent damsels were won through the chivalric acts of manly knights. On the other hand, it was equally, if perhaps not more so, a sort of nostalgia for the very recent past of a young audience who held "The Sun Rising" in shared cultural memory.[23] Finally, we might consider that the imagined experience of rave culture, and of the drug use, all-night dancing, and associated euphoria of that scene, was evoked even for members of Orbital's audience who had not participated directly in those events, but who understood the musical references to it across both tracks and their various remixes.[24] Music as used in clubbing spaces of

23 On the use of sampling in dance music, and its connection to nostalgia, see Morey in Chapter 8, "Ambient House: 'Little Fluffy Clouds' and the Sampler as Time Machine", as well as Justin Morey, "A Study of Sampling Practice in British Dance Music, 1987–2012" (PhD diss., Leeds Beckett University, 2017).

24 On club cultures of the 1990s, see Ben Malbon, *Clubbing: Dancing, Ecstasy and Vitality* (London & New York: Routledge, 1999), where ecstatic experiences are discussed on pp. 105–34. Malbon associates ecstatic experiences directly with drug-taking, but my use of the term is broader, drawing particularly on the sort of mystical and contemporary discourse associated with Hildegard and her music, following Bain, "Hooked on Ecstasy".

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the 1990s held some of its social function with monastic chant, since sound and (in the modern context) dancing served to bind individuals into more collective emotional and ritual experiences, often by blurring musical time through repetition.[25] In this way, timelessness, euphoria, and nostalgia were effectively created for listeners through Orbital's deliberate manipulation of references to time.

Musical ecstasy and female sexual purity: The Beloved, "The Sun Rising"

The Beloved's remix of "O Euchari" is arguably most typical of the more problematic ways in which women's voices have been represented within electronic dance music, exemplifying Loza's descriptions of the dehumanisation of voices through multiple loops, creating amplified peaks that we might read here as 'ecstatic'. The 'ecstatic' female voice has a long and frequently thorny relationship with electronic music genres, in which the ubiquity of women's passive, manipulated voices can be contrasted with the relative historical absence of women from the recording studio.[26] The binary gender split in studio-based music is typically understood as a divide between 'male/techno/wizardry' and male authors' creative manipulation of a 'diva loop'.[27] The gendered discourse surrounding technology has changed little since the early 1980s when it attracted criticism for the relative power imbalance that saw women as users rather than makers of music technologies. As Rebekah Farrugia has articulated, the consensus among feminist scholars across disciplines is that "technology is not inherently masculine, but has been labeled as such as a result of socially constructed narratives, rhetorical

25 Malbon, *Clubbing*, 103.

26 See discussions in Hannah Bosma, *The Electronic Cry: Voice and Gender in Electroacoustic Music* (Amsterdam: University of Amsterdam, 2013).

27 Barbara Bradby and Dave Laing, "Introduction to 'Gender and Sexuality' Special Issue," *Popular Music* 20, no. 3 (2001): 296.

devices and material practices".[28] The tracks discussed here employ rhetorical devices that highlight different aspects of gender, as well as other markers of identity such as age and ethnicity.

Typically, in electronic (and many other) music genres, the female voice comes to signify the passive object of desire; a siren-like presence from the mix. As Dominic Pettman has remarked, the female voice in acousmatic music has an intimate quality: "a voice with no visible source", he writes, "is all the more enchanting and all-enveloping".[29] In many electronic works, the female voice not only remains passive, it lacks any agency other than apparently expressing sensual pleasure, itself a stereotype in the cultural understanding of women's vocality more broadly. When we hear van Evera in the mix, then, she sounds her own desirability. A further layer is the presentation by van Evera of Hildegard's musical and creative body, the voice of a nun; although Hildegard lived to an advanced age, her vow of chastity ensured that she maintained a body free from sexual activity, and from the subsequent markers of women's aging bodies such as childbirth. This archetype of sexual unavailability has made nuns the focus of much insinuation, humour, suspicion and even desire for hundreds of years across diverse media. One might conclude that far from being passive, Hildegard's vows signify her body as virginal, imaginatively untouched by a lover, and thus more sexually heightened for the listener than a non-religious voice might suggest. Hildegard's melody may itself even be considered as siren-like, a form in which verbal articulation is less important than its pleasurable sound of "O". In doing so, it would offer an example of what Adriana Caverero has described as a key role for women's voices in music:

> In her erotic function as seductress, as an object of masculine desire, the woman appears first of all as a body and as an inarticulate voice.

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28 Rebekah Farrugia, *Beyond the Dance Floor: Female DJs, Technology and Electronic Dance Music Culture* (Bristol and Chicago: Intellect, 2012), 20.

29 Dominic Pettman, *Sonic Intimacy: Voice, Species, Technics (Or, how to Listen to the World)* (Redwood City: Stanford University Press, 2017), 18.

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> She must be beautiful, but she must not speak. What she can do, however, is emit pleasing sounds, asemantic vocalizations, moans of pleasure.[30]

Discussions of the common aesthetic preference for sopranos in electronic music typically emphasise the cultural understanding of 'purity' of this voice type – a term attributed to both adult sopranos and to the voices of children.[31] The appeal of 'pure' voices was a feature not only in electronic works of the mid-to-late twentieth century, but also to the parallel early music revival in which Emma Kirkby, for example, was marketed as possessing the voice of an angel: pure, sweet, youthful and by implication virginal.[32] When we hear Hildegard's music presented as a 'diva loop' in these ambient house tracks, the very fact that it is performed using a soprano gives the illusion that we are hearing a voice recorded not ten but 840 years ago: as if we are hearing the voice of Hildegard herself. One well-known story recounts that Hildegard was once seen singing "O virga ac diadema" as she walked round her abbey, a recollection that has remained a stubborn part of her reception, even though it is likely fictive. Although we know nothing of the precise performance situation of Hildegard's music – which may well have been performed communally, by groups of men or women, or as a solo song, in or outside the liturgy, with or without instruments – the use of just one, unaccompanied female voice evokes Hildegard herself.

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30 Adriana Cavarero, *For More than One Voice: Toward a Philosophy of Vocal Expression*, trans. Paul A. Kottman (Palo Alto, CA: Stanford University Press, 2005); quoted in, Pettman, *Sonic Intimacy*, 30.

31 One thinks not only of women, but of the presence of boys' voices in canonic electronic works such as in Karlheinz Stockhausen's *Gesang der Jünglinge* (1955–56, featuring the voice of 12-year-old Josef Protschka), or Jonathan Harvey's *Mortuos Plango, Vivos Voco* (1980, featuring the composer's choirboy son). The preference for boys' voices to denote innocence has a long history across diverse media, not least in the music of Benjamin Britten, but lies beyond the scope of the present discussion.

32 See Melanie L. Marshall, "*Voce Bianca*: Purity and Whiteness in British Early Music Vocality," *Women & Music: A Journal of Gender and Culture* 19 (2015): 36–44.

How do such cultural resonances function in a track like The Beloved's "The Sun Rising", given that in this example we can hear only a tiny fragment (just two words) of Hildegard's music?[33] The song is placed within a detailed musical texture, creating antiphonal contrast in the chorus with the low-pitched, controlled vocal delivery of Jon Marsh (Fig. 4). Hildegard's leaping melodic line – often characterised as a distinctive feature of her compositional style – is made even more striking by the tightness of the loop in terms of its duration, its relentless repetition, the manipulation of the speed of the original, and by the transposition of the sample up a tone. The effect is not so much meditative as urgent; Hildegard / van Evera's voice is trapped in the track in which it is repeated unchanged in quick succession. Marsh's own repeated material is authoritative, and suggests that the sample itself illustrates the rising sun. His rational, masculine presence is set against an 'ecstatic' but contained feminine vocal.

33 "The Sun Rising" (1989), was released on The Beloved, *Happiness* (East West Records (UK) and Atlantic Records (US), 1988). It also featured on their remix album, *Blissed Out* (East West, 1991).

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[Intro; instrumental]
Verse 1
Movement outside,
Silence inside
Restless lovers spread your wings
As the day begins

[Chorus 1]
O Euchari (repeats)
It's just the sun rising
It's just the sun rising
It's shining
It's just the sun rising
It's just the sun rising

[Verse 2]
Learn to love your secret life,
Still calm and gentle life
your resolution comes too fast
Now the night is past

[Chorus 2]
O Euchari (repeats)
It's just the sun rising
It's just the sun rising
It's shining
It's just the sun rising
It's just the sun rising
[instrumental]

[Verse 3]
Smiling, gliding,
Breathless you're riding
Love is just a state of mind
That we leave behind

[Chorus 3]
O Euchari (repeats)
It's just the sun rising
It's just the sun rising
Oh it's shining
It's just the sun rising
It's just the sun rising

[Instrumental]

[Outro]
Let yourself go
O Euchari (repeats)
It's just the sun rising
It's just the sun rising
It's shining
It's just the sun rising
It's just the sun rising
It's shining
It's just the sun rising
It's just the sun rising
It's shining
It's just the sun rising
sun rising
life, love... (repeats to fade)

Fig. 4: Lyrics of The Beloved: "The Sun Rising" (Jon Marsh, Ludovic Navarre, Steve Waddington)

The reduced sample of "O Euchari" used in "The Sun Rising" encourages an analysis that considers the employment of this very short musical extract to build a larger, meditative canvas based on the musical ecstasy so often perceived within the melodic gesture in the notes of the song's opening phrase. The word 'ecstasy' has long been frequently associated with Hildegard's music, so tied up is her musical output with our idea of her as a visionary, even though Hildegard's visions "never occurred in ecstasy [trance], but rather while she was awake".[34] The most obvious example is the naming of Sequentia's recording, *Canticles of Ecstasy*, but it was also an important part of the way in which Gothic Voices' musical director, Christopher Page, framed Hildegard's musical style:

> One of the problems with her is that she is always in ecstasy, as someone once said of her, 'anything will set her off' [...]. The amount of variety she can display in her musical compositions, ranging from very simple and short pieces – where more or less every syllable has a note – to these vast sequences, which are among the most luxuriant compositions of the Middle Ages – the range she shows is really terrific.[35]

In a later interview, though still wedded to her music as ecstatic, Page was less convinced by the variety of Hildegard's style, going as far as to suggest a *lack* of authenticity in the particular part of her creative expression associated with mysticism:

> I'd say if there is a problem with Hildegard today, with all fairness to my many colleagues who have recorded Hildegard, they all sound alike. And that's in part because a lot of Hildegard sounds alike.

34 Bain, "Hooked on Ecstasy", 255.

35 Christopher Page in conversation on BBC Radio 3, *Spirit of the Age* programme (further details unavailable).

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> She's a powerfully voiced but not a flexible or versatile artist. And her mode of enhanced ecstasy can become wearing, even sometimes unconvincing, after a while, as if you wonder whether she really feels as much as her language is laying claim to.[36]

It is difficult to read this change of heart for those wedded to the image of Hildegard promoted in the later twentieth century, that of a fiercely political, even feminist, individual whose music was understood to match her other written expressions. And if "a lot of Hildegard sounds alike", then with what – or with whom – are we assessing this individuality? Again, we find an example of the stereotypical presentation of women's creative voices, which lurch between presenting composers as *too* individual and wayward, or as simply derivative or unexceptional.[37]

Hildegard as New Age icon of female spirituality: *Vision*

In some New Age releases, notably the music of Richard Souther, the original performances by van Evera are used more specifically to represent Hildegard's personal spirituality. Indeed, Souther's work presents Hildegard as co-author, aligning his creative product with the sorts of understandings of Hildegard's religious life that formed part of her popular reception at that time. This is most fully realised in *Vision: The Music of Hildegard von Bingen* (1994), an album that named the medieval author but initially failed to credit the performer. A follow-up album, *Illumination* (1997), tapped into the same market and was advertised as Souther "in collaboration" with the abbess.

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36 Page, interviewed by Bernard D. Sherman, "'Mistaking the Tail for the Comet': An Interview with Christopher Page on Hildegard of Bingen." The interview was initially undertaken for the article "The Hottest 900-year-old On the Charts," *The Los Angeles Times* (Sunday, August 9, 1998). Both articles are available at http://www.bsherman.net/hildegard.html.

37 On the problematic reception of women's creative voices in the twentieth century, see Lisa Colton, "The Female Exotic: Tradition, Innovation and Authenticity in the Reception of Music by Judith Weir," *Recycling and Innovation in Contemporary Music*: *Contemporary Music Review* 29, no. 3 (2010): 277–89.

Souther's practice of acknowledging Hildegard as co-author, rather than simply a featured artist or nameless 'diva loop', recognised her input in a manner that locates his album within the reclaiming of historical women musicians in feminist musicology of the 1980s and 1990s.[38] Under an extension of this model, composers and arrangers like Souther might equally name the performers and recording technicians with whom electronic music composers work. A collaborative understanding of a creative product does more to balance the presence of diverse minds in its final realisation in sound, not least for songs that include sampled material, pre-existent medieval song, and skilled production teams. Since the nineteenth century, however, the composers (here, Souther, Orbital, and The Beloved) have been credited exclusively or disproportionately with the final piece of music as their 'work'. Hannah Bosma has argued that "the different status of composer and performer is not so much related to technology as to socio-cultural structures and ideology".[39] Her claim is exemplified by the lack of any credit being offered initially to van Evera, as was typical of sampling practices of the twentieth century.[40] Indeed, Nicholas Cook has articulated the injustice of crediting practices that exclude performers, without whom composers' works would not enter or be maintained in the repertory at all.[41]

Aspects of production and creative choices combine to connect Hildegard's spirituality to the modern audience in Souther's arrangement; more than Orbital or The Beloved's releases, this version is more like a remix of the twelfth-century song. The title track of *Vision* – "Vision (O Euchari in Leta Via)" – takes substantial parts of the Gothic Voices recording and transforms it structurally into a more conventional dance music / pop format, in which

38 See, for example, Jane Bowers and Judith Tick, *Women Making Music: The Western Art Tradition, 1150–1950* (London, Macmillan, 1986).

39 Bosma, *The Electronic Cry*, 173.

40 Morey, "A Study of Sampling Practice."

41 Nicholas Cook, "Analysing Performance and Performing Analysis," *Rethinking Musicology*, ed. Nicholas Cook and Mark Everist (Oxford: Oxford University Press, 1999), 245.

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the opening phrases are redeployed as a chorus or refrain.[42] Reverberation and other forms of processing are used to emulate the acoustic of a large abbey church. The sound world is initially characterised by van Evera's plaintive, unaccompanied voice, before the introduction of the sort of instrumental textures that were broadly described as 'ethnic' at that time – marimba, bells, percussion, pan pipes, maracas, flutes – as well as an increasing presence of synthesised sound and eventually a wash of choral textures as a backing. This is Hildegard for New Age spiritual meditation, but in many ways it takes the creative voice of the medieval composer more seriously than the others, albeit with Souther's rearrangement of her melody.

The significance of Latin lyric

For many, perhaps even most, modern listeners, the semantic meaning of the Latin poetry in "O Euchari" would have been beyond their comprehension. One might therefore hear the song as part of the commonplace sound of sampled, wordless female voice in electro-acoustic music, or of live female voice with electronics. Bosma has, for example, argued that the proliferation of such scorings – not least in contrast with the relatively smaller number of works for low-voice male singers and electronics – is a cultural trope signalling the disempowerment of women and the feminine in electronic music.[43] Considered in isolation, the opening syllable "O" is the sort of female orgasmic cry that was ubiquitous in dance and soul genres, and which featured iconically, albeit incongruously, in Bodyform sanitary towel commercials in the 1990s in order to signal female empowerment.[44] The vocalized "O"

42 "Vision (O Euchari in Leta Via)", released on *Vision: The Music of Hildegard von Bingen*, Emily van Evera and Sister Germaine Fritz, arr. Richard Souther (Angel, S21-18449, 1994).

43 Hannah Bosma, "Voice or Ear? The Female Voice and the Listener's Position in Paul Lansky's *As it Grew Dark*," in *Sonic Mediations: Body, Sound, Technology*, ed. Carolyn Birdsall and Anthony Enns (Newcastle upon Tyne: Cambridge Scholars Publishing, 2008), 109.

44 The musical semiotics of this advert, which elided orgasmic cries with the 'ecstatic yell' of the vocal to create a sense of female empowerment, are analysed in detail by Philip Tagg, in "What a Scream" (Video recorded 31 December, 2008), accessed at https://vimeo.com/284173398.

that opens Hildegard's song can only be created by an open (here female) mouth, a traditional focus of the male gaze, inviting us to hear the nun's voice as more sexually aware than her chaste vocation might otherwise permit. Arguably, though, the use of Latin-texted, rather than textless, song in the remainder of the samples carries its own cultural associations, even though most of the listening audience would not have been expected to understand the devotional theology of her poetry.

What aspects of religious context survive the reworking of Hildegard's song, and is the sample suggestive of individual or collective prayer? The presence of Latin in remixes of the abridged lyric evokes the devotional origin of the song. Additionally, the originally joyous message of the text is heightened by its expressive rising melody, in ways that chime with the broadly 'spiritual' aspects of much electronic dance music. On repetition within "The Sun Rising", the sonic properties of Hildegard's phrase reduce cumulatively to their component vowels (heard as O-EE-OO-CAH-REE); since only these opening syllables are used, the language is only vaguely suggestive of Latin. In "Vision", and to some extent in "Belfast", the words retain their status as religious lyric; the use of Latin devotional poetry serves to indicate, but not overstate, the (Catholic) religiosity of the sample. It is Souther's arrangement that uses the most extensive poetic text, and although there have been significant cuts to Hildegard's song, much of its evocative nature is preserved in what remains (Fig. 5). In this way, the agency of the sampled voice is greater the longer the textual segment used, since it becomes more obviously poetic and liturgical.

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Lyrics, noting edits made to the poetic text	*Translation*
[Solo voice, refrain] O Euchari in leta via ambulasti	O Eucharius, you trod in the path of joyousness
(Instruments enter: marimba etc)	
[Verse 1] O Euchari in leta via ambulasti ubi cum filio Deo mansisti illum tangendo et miracula eius que fecit vivendo.	O Eucharius, You trod in the path of joyousness when you tarried with the Son of God, touching him, and seeing the miracles that He wrought.
[omitted: tue um perfecte amasti]	[you loved him perfectly]
[Verse 2] Cum sodales tui exterriti erant pro eo quod homines erant nec possibilitatem habebant bona perfecte intueri.	When your fellow travellers[1*] were terrified because they were men and had no chance to see Divine God perfectly.
[omitted: next 18 lines of poetry]	
[Bridge] Sed et ub tua doctrina Ecclesia effecta est racionalis, ita quod supra montes clamavit ut colles et ligna se declinarent ac mamillas illius sugerent.	And in your preaching Ecclesia[2**] is filled with understanding so that she has proclaimed in the high places that the hills and trees should bend and be suckled by her breasts.
[Refrain] O Euchari in leta via ambulasti (plus *ah* backing) O Euchari in leta via ambulasti O Euchari in leta via ambulasti O Euchari in leta via ambulasti	O Eucharius, you trod in the path of joyousness.

* Valerius and Maternus, the missionary companions of Eucharius.

** The Church (feminine gender).

Fig. 5: Richard Souther: Structure and lyrics of "Vision (O Euchari in leta via)"

I would argue that the choice of female solo voice in the "O Euchari" songs seems less overtly sacred than the samples found in Enigma's reworkings of Capella Antiqua München, a male choir. This is for two reasons: first, the (incorrectly) imagined religious song of the Middle Ages is primarily one of male communities at prayer rather than women, who are assumed to have been silent, passive, or musically limited. This misconception has been fuelled by a dominance of male chant over enclosed women's musical voices in diverse media presentations, as well as in the misrepresentation of women musicians in scholarship. Second, Enigma chose to set more liturgically evocative phrases of music ("Kyrie eleison", "Hallelujah"), in which the words were recognisable to modern audiences through their commonplace use in popular media or current language. In "Mea Culpa", the Latin lyric provided a more familiar linguistic phrase than the surrounding French lyrics to English-speaking audiences.[45] The most extensive liturgical sample in Enigma's output was the antiphon "Procedamus in pace. V. Cum angelis" ("Let us proceed in peace"), which appeared in edited but undisguised form as the backbone to "Sadeness (Part I)". The video that accompanied this release set a male dreamer within a vision of a medieval monastery, in which a solitary monk paces the ruins in personal reflection. In "Sadeness (Part I)", the religious context of a male community of voices is emphasised by use of the extensive sample of the antiphon, which is harmonized and given rhythmic shape by the mix, and by the contrast of this aural image with interjections from the female vocalist, speaking in French.[46]

In an interview for Radio 3, Page reflected on the performance context of songs like "O Euchari":

45 Kirsten Yri reads the use of French language vocals, without provision of translations in line notes, as part of the groups' concept of 'enigma'; "Medieval Uncloistered: Uses of Medieval Music in Late Twentieth Century Culture" (Unpublished PhD dissertation, Stony Brook University, 2004), 129.

46 Yri offers a detailed discussion of the album, and emphasizes the peaceful, spiritual and nostalgic aspects of "Sadeness" in "Medieval Uncloistered", 128–48.

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> We don't know that Hildegard's music would ever have been performed chorally, or indeed ever really be performed by anybody except perhaps Hildegard herself as a prayerful exercise. Now I don't wish to suggest that the many records that have been made are in any way – including my own – misconceived, but I think I now feel that there's probably no real reason, and perhaps no real justification, in modern performance, for going beyond that simple fact that we know: one voice, deeply intense, as a form of personal prayer.[47]

In spite of his own recordings of Hildegard's music, which included both male and female ensemble singing, Page asserts the primacy of her music as a repertory for her own solo voice. In this way, as listeners, we are prepared by scholarship, our cultural reference points, and the sound world of the three remixes to interpret the female vocal as a deeply personal song, the subjective voice of Hildegard singing directly, actively, to the male object of her song, Eucharius. It is not as distant as Enigma's chant selections from conventional, heterosexual love song.

Hildegard within popular and early music female voices

It is relatively easy to point out cases of female vocalists and creative artists of the 1980s and 1990s who, far from being marginalised, achieved a prominent position in popular culture. Laurie Anderson's "O Superman", for example, was not only at number 2 in the UK singles chart in 1981, it was subsequently the source of musicological work by eminent feminist Susan McClary.[48] Kate Bush's experiments with technology such as the Yamaha CS80 and the Fairlight CMI underpinned her critical output in the 1980s

47 Christopher Page in conversation, BBC Radio 3, late 1990s (transcribed by the author, further details unavailable).

48 Susan McClary, "This Is Not a Story My People Tell: Musical Time and Space According to Laurie Anderson," *Discourse* 12, no. 1 (1989), 104–28; the article later formed part of Susan McClary, *Feminine Endings: Music, Gender, and Sexuality* (Minneapolis: University of Minnesota Press, 1991), 132–47.

in songs that framed her distinctive vocal timbre.[49] In house music, artists such as Neneh Cherry and Alison Limerick wrote and performed tracks that explored a broad spectrum of female subjectivity, not one only focused on a woman as object of male, heterosexual desire. In dance-based genres such as techno, the success of many songs hinged on the effective vocal hooks of artists from Lady Miss Kier in "Groove is in the Heart" (1990) to Anita Doth's powerful contributions to 2 Unlimited's hit "No Limit" (1993). On the other hand, such cases were still relatively isolated, and were produced in industry spaces dominated by men. These women achieved at least part of their success through marketing strategies (such as the archetypal "diva") focused on performance and image that at least stray into more questionable areas of what empowerment might have meant within the last two decades of the century. There is no doubt that otherwise ground-breaking, award-winning acts like rappers Salt-N-Pepa attracted criticism from men and women who saw their prominence as strong female artists as undermined by their sex-dominated marketing. How do the "O Euchari" tracks analysed fit into this cultural context for popular music featuring women's voices?

In the remixes that have featured Hildegard's song, the use of a female vocal is not as reliant on markers of the diva as in some other electronic musical cultures, not least because of its lack of an actual female performer on stage. However, to assume that the voice is any less connected with sexuality, or is somehow semantically neutral, would be entirely misinformed. Van Evera's voice derives from a group steeped in the *a cappella* early music debate of the later twentieth century.[50] The early music movement of this time was also one that favoured voices exploring a particular sound, in which women's high voices (often framed as substitutes for boy trebles or even castrati) were expected to be 'pure', without sonic markers of their adult bodies such as

49 Ron Moy, *Kate Bush and Hounds of Love* (Aldershot: Ashgate, 2007).

50 See especially Daniel Leech-Wilkinson, *The Modern Invention of Medieval Music: Scholarship, Ideology, Performance* (Cambridge: Cambridge University Press, 2002).

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obvious vibrato; as Marshall has demonstrated, this sound was also one that prioritised archetypes of whiteness within an industry that arguably presented a relatively whitewashed medieval past in its marketing.[51]

The "O Euchari" sample was therefore attractive because it conveyed traditional notions of white women's youthfulness and chastity, not only via an absence of sexuality in a passive sense, but also in an emphasised non-presence of the corporeal. Historically, women's sexual abstinence has been framed as highly contested, frequently under threat, and in some ways therefore the epitome of disempowerment; one need think only of the problematic marketing strategies of Charlotte Church or Britney Spears to see how burgeoning sexual maturity has been used to build media appeal. Even in medieval lyrics, such as the *chanson de nonne* genre, it is clear that the narrative positions expressed in songs written from the point of view of young novices were designed to give the impression that their subjects are willing to be corrupted, to seduce, or are more sinful than they ought to be.[52] Hildegard's historical body was chaste; modern presentation of Hildegard, however, often commented on her apparent sexual frustration, of her suspiciously heightened longing for male saints such as a Eucharius and Disibod, hinted at her strong (lesbian?) relationship with nun Richardis von Stade, and emphasised the erotic turn of several of her lyrics. Van Evera's voice reflected the ideal of sung virginal purity, and the reworked Hildegard that resulted from remixes highlighted the nun's soaring, sensual melodic line in a way that encouraged the listener to hear Hildegard's personal desire escape both through song and through its repeated manipulation in the hands of male musicians. It is significant that live DJ performances turned The Beloved's track into expansive mixes, in which "O Euchari's" opening

51 Marshall, "*Voce bianca*". On the ways in which even female performers exploring different timbres are characterized as 'pure', see Kirsten Yri, "Remaking the Past: Feminist Spirituality in Anonymous 4 and Sequentia's Vox Feminae," *Women & Music: A Journal of Gender and Culture* 12 (2008): 1– 21.

52 Lisa Colton, "The Articulation of Virginity in the Medieval *Chanson de nonne*," *Journal of the Royal Musical Association* 133, no. 2 (2008), 159–88.

phrase was heard dozens of times in succession, not least during all-night events where the track would be used to accompany the actual sunrise.[53] In these performances, Hildegard's voice is launched upwards, an orgasmic voice from the ancient past looped in its ultimate release into the dawn.

Conclusion

There seems little doubt that in sampling van Evera's performance of Hildegard's "O Euchari", electronic music composers were attracted by qualities that were, on the surface, in direct opposition to the canonic classical music of the average concert hall. Unlike the nineteenth-century symphonies by white men that dominated mainstream classical discourse, Hildegard's music held potentially different significations: a distant historical time, an intriguing spiritual context, and an ethereal sound world. On the other hand, signifiers of 'otherness' (against that paradigm) in the sample aligned it with the stereotypical ways in which women's voices have appeared in traditional musical discourse, as sexualised and open to manipulation by predominantly male authors. The Beloved's track is perhaps most representative of that portrayal, limiting Hildegard's utterances to the opening vowel sounds that offer little of their original semantic meaning, and repeating them extensively against the controlled male vocal. This is a portrayal that brings Hildegard's ecstatic voice into sharp relief.

While all three of the tracks discussed here explore Hildegard's music in the spirit of medievalism found across popular genres in the 1980s and 1990s more widely, their common sample has offered opportunities to interpret their different manipulations of sound and meaning. Such image management in production emphasised aspects of Hildegard's song relevant to the creative context of each remix. Some of these, notably the pure, virginal tone of soprano van Evera, connect strongly to both the early music movement of the same decades, and to the ubiquitous high, youthful, 'white' and often female voice

53 I am grateful to Rupert Till for sharing this contextual detail.

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in mainstream electronic music. In spite of her ventriloquism through van Evera's vocal, songs featuring Hildegard lie at various distances from what Bosma would recognise as the powerless utterances of a disembodied female voice. Although in Souther's work, and to some extent Orbital's, Hildegard is the ultimate 'featured artist', all three "O Euchari" songs simultaneously replay problematic, nostalgic fantasies of women's musical bodies and voices.

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8

AMBIENT HOUSE:
'LITTLE FLUFFY CLOUDS' AND THE SAMPLER AS TIME MACHINE

Justin Morey

This chapter presents a case study of perhaps The Orb's best-known release, "Little Fluffy Clouds".[1] Building on Kevin Holm-Hudson's[2] previous work, I argue that the use of multiple copyrighted samples from a range of sources, times and locations, allows the record to function at different levels of listener attention, and, moreover, allows the listener to construct different narratives and connections depending on their personal sociocultural and musicological knowledge and perceptions. With reference to the work of Jean-Jacques Nattiez[3] and Philip Tagg[4] on musical communication I will argue that Brian Eno's original intention for ambient music to create a "sense of doubt and uncertainty"[5] is maintained in "Little Fluffy Clouds" through use of the sampler as a time machine that presents multiple realities simultaneously, and thereby allows multiple levels of symbolic meaning to be created. Some thought is also given to the ability of both ambient music and ambient house to create emotional effects through the power of memory and nostalgia.

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1 The Orb, *Little Fluffy Clouds*, (Vinyl) (UK: Big Life – BLR 33T, 1990).

2 Kevin Holm-Hudson, "Quotation and Context: Sampling and John Oswald's Plunderphonics," *Leonardo Music Journal* (7) (Cambridge, MA.: MIT Press, 1997): 17-25.

3 Jean-Jacques Nattiez, *Music and Discourse: Toward a Semiology of Music* (Princeton: Princeton University Press, 1990).

4 Philip Tagg, *Music's Meanings: a modern musicology for non-musos* (New York: The Mass Media Music Scholars' Press, 2015).

5 Brian Eno, 'Ambient Music', liner notes from *Ambient 1: Music for Airports* (LP) (UK: Editions E.G., AMB 001, 1978).

Background

'Ambient house' is a term coined by the former E.G. Records A&R man, DJ and founder member of The Orb, Alex Paterson, initially to describe the low dynamic 'chill-out' DJ sets performed in the VIP room at Paul Oakenfold's Land of Oz night at the Heaven nightclub in London in 1990, and later to represent The Orb's own records. Although the main room at Land of Oz featured the pounding and repetitive beats of the acid house and techno of the time, Oakenfold was also interested in exploring dance aesthetics at slower tempos, as evidenced by his project Movement 98, which featured recordings that were all around 98 bpm.[6] Paterson recalls that the DJs in the VIP room were given complete freedom by Oakenfold to play whatever they wanted, the only caveat being, "Don't get them to dance".[7] There was a practical as well as aesthetic reasoning for Oakenfold's instruction in that he "wanted to create a space away from the main-room frenzy, a place where people could talk and relax".[8] A sampler, a tape machine, and record decks were used to combine sound effects, and records of weather and nature sounds, with pre-prepared synthesised loops and other sampled textures, but with little or nothing in the way of drums.[9] The lack of a defined rhythm meant that the sounds used did not have to conform to the same tempo and that the music could evolve at a much slower pace in comparison to something intended for the dance floor. E.G. Records had released many records by the pioneers of 1970s ambient music such as Howard Budd and Brian Eno, including the first self-styled ambient release, *Ambient 1: Music for Airports* (1978), and Paterson lays claim to coining the term 'ambient house' because of this influence:

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6 See Chapter 6 of Richard Norris, *Paul Oakenfold: The Authorised Biography* (London: Transworld, 2009).

7 Ibid.

8 Ibid.

9 See David Toop, *Ocean of Sound* (London: Serpent's Tail, 1995), 60-63 and Chapter 6 of Simon Reynolds, *Energy Flash* (London, Faber, 2013) for further details on the range of music and sounds played in the VIP Room at Land of Oz.

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> It was either come up with something to describe what we were doing, or get lumbered with a genre or style name we didn't want […] Coming from working at E.G. Records, where the word 'ambient' was bandied around a lot, I knew it had to be in there in somewhere.[10]

Paterson had two colleagues at the Land of Oz nights. Martin Glover (better known as Youth), a school friend of Paterson, was a bass player, founder member of Killing Joke, subsequently noted record producer and part of the defunct mid-1980s pop band Brilliant. Jimmy Cauty was a guitarist in Brilliant and one half of perhaps the other most notable UK ambient house act, The KLF, whose other member was Brilliant's manager, Bill Drummond. The experiments in the VIP room at Land of Oz led the group to release music as The Orb, with their first single, "A Huge Ever Growing Pulsating Brain That Rules from the Centre of the Ultraworld"[11] being a slowly-evolving 20-minute piece with no drum track, using extensive samples of Minnie Riperton's song "Lovin' You",[12] featuring her distinctive whistle register vocal stylings, replete with its own nature sound effects in the form of birdsong. Cauty left the group after disagreements with Paterson, and the remaining members began to incorporate beats into some of their compositions thereafter.

Little Fluffy Clouds

The first version of "Little Fluffy Clouds" (1990), created by Paterson and Youth and released on Paterson's own label, WAU! Mr Modo, included a

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10 Alex Paterson in Matt Anniss, "Ambient House: The story of Chill Out Music," *Red Bull Music Academy Daily*, Accessed March 3, 2016, http://daily.redbullmusicacademy.com/specials/2016-ambient-house-feature/ 2016).

11 The Orb, *A Huge Ever Growing Pulsating Brain That Rules from the Centre of the Ultraworld* (London: WAU! Mr Modo - MWS 017T, 1989)

12 Minnie Riperton, *Lovin' You* (Los Angeles: Epic - 32561, 1975).

version of the track over eight minutes in duration as well as a mix without drums that was subtitled "Ambient Mk 1". The 1993 re-release, lasting a more radio-friendly 4'28", included a chorus of sorts by repeating the vocal sample that is also the song's title, and using the sampler to retrigger the first part of the word "little" to create a rhythmic stuttering effect, similar to that employed by Paul Hardcastle on his record "19".[13] At 104.5 bpm, the record is considerably slower than the house and techno tracks of the time, and is anchored by a prominent dub-influenced bassline, having a strong electronic kick drum on each beat of the bar, with syncopation provided by a sampled and pitched-down drum loop taken from the Nilsson record "Jump Into The Fire".[14] Perhaps the two most notable samples used are frequently juxtaposed during the track: a vaguely mystical-sounding voiceover (taken from an interview with the singer Rickie Lee Jones talking about her childhood) and three measures of Pat Metheny's guitar performance of Steve Reich's "*Electric Counterpoint* – Fast (Movement 3)".[15] The other recognisable music sample appears in the track's introduction: a harmonica melody taken from Ennio Morricone's "Man with a Harmonica", heard in the soundtrack to Sergio Leone's *Once Upon a Time in* the West (1968)[16]. In his article proposing a typology of sampling, Kevin Holm-Hudson argues that the particular juxtaposition of the samples in "Little Fluffy Clouds", combined with The Orb's original electronic parts, creates a very different meaning from that provided by the original samples in isolation:

> The most prominent sample in the song and the inspiration for its title comes from an interview with American singer Rickie Lee Jones during which she describes in rhapsodic detail the skies of

13 Paul Hardcastle, *19* (UK: Chrysalis - CHS 2860, 1985).

14 Harry Nilsson, *Jump into the Fire* (USA: RCA Victor - 74-0673, 1972).

15 Steve Reich, *Electric Counterpoint* (USA: Elektra Nonesuch - 79176-2, 1989).

16 Ennio Morricone, *Man with a Harmonica* (USA: RCA Victor LSP-4736, 1972).

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> her Arizona childhood home. In the context of the interview, this is fairly innocuous discourse; in the context of the Orb's electronic music and the techno/trance culture of which they are a part, it becomes a psychedelic epiphany. This dialogue is juxtaposed with, among other things, a short sample of harmonica from film composer Ennio Morricone's Once Upon a Time in the West (the title invites a connection with Jones' childhood memories) and a two-chord fragment from Steve Reich's Electric Counterpoint [...] Here, the connection is twofold: first, the normally detached resolve of Reich's music is invested with a psychedelic flavor due to its new context (early minimalism was also regarded by some critics as a by-product of 1960s drug culture); second, the process of studio composition by 'layering different sounds on top of each other' [a vocal sample that also appears on the record]... is itself a kind of 'electric counterpoint'.[17]

As with the analysis of any sample-based track, the particular direction taken by the analyst will depend on their level of knowledge both of the sources of the samples and their cultural significance, relevance and resonance. Holm-Hudson makes well-justified points here, but some of the samples that he does not mention potentially provide additional nuance and/or context. The song is arguably intended as a soundtrack to the post-rave comedown, and so the very first sound heard, that of a sample of a cock crowing, suggests that the "implied listeners",[18] to borrow Nathan Wiseman-Trowse's term, are taking in the dawn because they have yet to go to bed. The next sample to be heard is of Radio 4 announcer John Waite introducing an item for the BBC Radio 4 programme *You and Yours*:

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17 Holm-Hudson, *Quotations and Context*, 18-19.

18 See Nathan Wiseman-Trowse, *Performing Class in British Popular Music* (London: Palgrave Macmillan, 2008) for an argument for the use of this term as a means by which a song may be interpreted by listeners, whether or not they are part of the implied audience.

> Over the past few years, to the traditional sounds of an English summer, the drone of lawnmowers, the smack of leather on willow, has been added a new noise.[19]

Given the musical context that follows, this quotation is clearly intended to refer to the sound of the open air, all-night raves that were occurring in the British countryside from the late 1980s until outlawed by the 1994 Criminal Justice and Public Order Act. John Waite has confirmed[20] that, as far as he can recall, the item concerned was indeed discussing raves, perhaps in response to what had been described as "moral panic"[21] in some sections of the media of the time at the ways in which large numbers of young people were spending their weekends.

The subsequent sample, of a Hawker Hurricane aircraft flying overhead, is significant in that it is synonymous in the British consciousness with World War II, specifically the Battle of Britain that took place in the summer of 1941. During that period, this sound would have been heard above the fields of South East England as British airmen fought the Luftwaffe and witnessed, among many others, by my father[22] as a 10-year-old boy. The outdoor raves of the late 1980s and early 1990s brought their own distinctive sounds and happened under the same Home Counties[23] skies, and in some instances

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19 *You and Yours*, 1990. London: BBC Radio 4.

20 John Waite, email to author, July 7, 2017.

21 See, for example Kenneth Thompson, *Moral Panics (Key Ideas)* 2nd Edition (London: Routledge, 2005), 49-54 for a discussion of the term in relation to club and rave culture.

22 In 2016 I attended an outdoor event with my father that featured a fly-over by a Supermarine Spitfire, one of the two main aircraft used by the British in the Battle of Britain in 1941, and which sounds virtually identical to a Hawker Hurricane because both planes use the same Rolls Royce Merlin engine. On hearing this Spitfire flying overhead, I was struck by how this sound resonated on two levels – both as a signifier of a war that was over long before I was born, and as part of a memorable ambient house track from my youth. This led me to consider the time travelling properties of the sampler.

23 The term 'Home Counties' is generally used in reference to the English counties that surround, but do not necessarily border London, namely Berkshire, Buckinghamshire, Essex, Hertfordshire, Kent, Middlesex, Surrey and Sussex, and is therefore synonymous with Southeast England.

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there were close parallels in geographical location. The Sunrise Midsummer Night's Dream party of 24 June 1989 was held at the former RAF base of White Waltham near Maidenhead, home to the Air Transport Auxiliary in World War II. The event was reportedly attended by 11,000 people and was infiltrated by reporters from *The Sun* newspaper, leading to a borderline hysterical report in the 26 June edition headlined "Ecstasy Airport",[24] in which it was claimed that some partygoers had been sufficiently deranged to bite pigeons' heads off, and that the floor was covered in "ecstasy wrappers"[25], which were actually small pieces of tinfoil from a glitter cannon.

The Hawker Hurricane sample continues over the interviewer's question to Rickie Lee Jones, "what were the skies like when you were young?"; this potentially sets up a triple juxtaposition between the idea of 'out West' provided by the harmonica sample and Rickie Lee Jones's childhood recollections as outlined by Holm-Hudson, the British skies and sounds of 1941, and those of 1990. Considering the multiple layers of potential meaning created by this combination of samples, it is appropriate to consider some theoretical perspectives on how the listener contributes to the meaning of a piece of music.

The beholder's share, codes and competence

Twentieth- and twenty-first century thinking about the communication of ideas has tended to move away from the notion of the audience as largely passive to one where they are explicitly involved in the creation of meaning. Harold Lasswell's societal communication model[26] offers an explanation of the transmission of a message but in a fairly mechanistic way:

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24 Unknown Authors. "Ecstasy Airport," *The Sun*, June 26, 1989.

25 Ibid.

26 Harold D. Lasswell**,** "The structure and function of communication in society." *The communication of ideas* 37 (1948): 215-228.

Who	→	Says What	→	In Which Channel	→	To Whom	→	With What Effect
Communicator		**Message**		**Medium**		**Receiver**		**Effect**

Fig. 1: Lasswell's communication model[27]

The advantage of this model is its simplicity and applicability to a range of different methods of communication, yet it is problematic because its linear structure does not allow for the possibility of feedback from the receiver, and there is no consideration of whether or not the communicator's intended message is accurately represented by the receiver's apprehension of it. In his book *Art and Illusion* E. H. Gombrich describes the receiver's contribution as the "Beholder's Share"[28] – how individual knowledge and personal psychology combine to create meaning. Semiotics concerns itself with signs that create a common understanding between the producer of a message and a receiver, in terms of both the literal meaning of a sign and what it signifies, its *symbolic meaning*. Jean-Jacques Nattiez, with particular reference to music, and expanding on the work of Jean Molino, identifies two distinct stages in realising this: *poiesis*, the creation of a work, and *esthesics*, the reception, with the combination of both processes creating the symbolic meaning or *trace*:

Poietic Process				*Esthesic Process*
"Producer"	→	*Trace*	←	*Receiver*

> A symbolic form (a poem, a film a symphony) is not some "intermediary" in a process of "communication" that transmits the meaning intended by the author to the audience; […] it is instead the result of a complex *process* of creation (the poietic process) that has to do with the form as well as the content of the work; […] it is

27 Adapted by the author from communicationtheory.org, 2015.

28 Ernst H. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* 2nd ed. (Princeton: Princeton University Press, 1961).

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> also the point of departure for a complex process of reception (the esthesic process) that *reconstructs* a "message'.[29]

Unlike Lasswell's model, and as with Gombrich's notion of the Beholder's Share, the apprehender of a work of art contributes to its symbolic meaning. Philip Tagg's communication model acknowledges ideas similar to Lasswell's in terms of the flow of a message, but also emphasises the contribution of the listener in providing reconstruction and potential *feedback*, both to the store of symbols from which the music is derived, and to the sociocultural norms necessary to interpret its context. If the transmitter and receiver do not share the same store of symbols, then the message will not be decoded as intended due to "codal incompetence".[30] If they have differing sociocultural norms, then the full context of the message may not be apprehended as intended, leading to "codal interference".[31]

In describing codal incompetence, Tagg uses the example of Bulgarian harvest songs, which employ a different musical symbolic language from traditional Western forms:

> [Y]ou'll hear a lot of semitone clashes similar to those often used to help create tension, horror or discomfort in Western film music. The Bulgarian women's semitone dyads and clusters may sound harsh and discordant to us Westerners the first time we hear them: that sound will at best come across exciting or exotic. But to the Bulgarian harvest singers themselves […] there's nothing bizarre or exotic about their own music, nothing horrific about their semitones. It would in fact be codally incompetent, from the receiving end, to apply the

29 Jean-Jacques Nattiez, *Music and Discourse: Toward a Semiology of Music* (Princeton: Princeton University Press, 1990), 17.

30 Philip Tagg, *Music's Meanings: a modern musicology for non-musos* (New York: The Mass Media Music Scholars' Press, 2015), 178.

31 Ibid.

> semiotic conventions of semitones in Hollywood film music to the sound of Bulgarian women singing traditional harvest songs.[32]

Tagg is keen, however, to note that codal incompetence and codal interference should not be construed as negative terms:

> Now, *incompetence* and *interference* both sound quite negative but neither term is intended in any pejorative sense. The two words are just shorthand for two types of breakdown in musical communication…Each concept simply highlights a particular set of mechanisms causing the varying degrees of difference that inevitably arise, in semiotic terms, between object and interpretant or, in terms of intentional communication, between intended and interpreted message. Codal incompetence and codal interference are in fact essential to the renegotiation of music's possible meanings and to its survival as a sign system capable of adapting to different functions for different individuals in different populations at different times and in different places.[33]

In other words, codal incompetence and codal interference "are prerequisites for shifts in musical meaning. Signs from one culturally specific store (or vocabulary) can be appropriated into another where they acquire a different meaning or function".[34] These ideas are clearly useful when thinking about sample-based music. By removing a sample from its original context and reframing it in a different musical setting, only part of the source code has been used, meaning much of the original message will be lost. Through the process of codal interference, a new message, arising from a different store of symbols, and often a different set of sociocultural norms, will be created.

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32 Tagg, *Music's Meanings*, 180-181.

33 Ibid., 178.

34 Ibid., 193.

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To an extent, this can be evidenced by some of the differences between Holm-Hudson's interpretation of "Little Fluffy Clouds" and my own. The combination of a musical theme from a spaghetti Western with Rickie Lee Jones' musings about the southwestern state of Arizona perhaps provides Holm-Hudson, an American, with a stronger sense of 'out West' than it does for myself, while events in the English Home Counties in both 1941 and 1990 are probably less likely to be applied to the musical material by Holm-Hudson than by me.

Although gaining insights into a composer's intended meaning is not necessary in order to analyse a piece of music, it can certainly aid understanding, and to that end I was fortunate that Alex Paterson agreed to answer some questions of mine about "Little Fluffy Clouds". Although Paterson has discussed a number of the samples used in the record in previous interviews, I could find no mention of the Hawker Hurricane, so it was interesting to discover, given my considerations about that particular aspect of the track, the intentions behind its inclusion:

> The aeroplane was […] a Hurricane, as my dad flew one in WW2. Sadly he passed on in '63 & I never got to know him & I suppose it was a heads up to him.[35]

There seems, then, to have been some successful transmission of the intended message here, in that for both Paterson as composer and myself as listener, the sample points to the differences between our own experiences and those of our fathers (Paterson's father flying Hurricanes, and my father hearing them overhead during the Battle of Britain, and working on planes from World War II during his National Service with the RAF in the late 1940s). Paterson's own intentions were less aligned to Holm-Hudson's and my own analysis of the John Waite sample, in that while he acknowledged

35 Alex Paterson, email to author, February 8, 2018.

that it came from a radio piece about raves, his main reason for including it was "more to do with cricket & The Orb's love of the sound of leather on wood".[36] My interpretation of this sample, then, perhaps imbues it with more significance than may have been intended by the composers – yet, like the Hawker Hurricane sample, it locates this music as English[37] despite the two most repeated samples in the record being the voice of an American singer-songwriter, and the guitar playing of an American musician (Pat Metheny) performing the work of an American composer (Steve Reich).

Ambient and ambient house – commonality

There are similarities in the compositional and production methods of Alex Paterson and Brian Eno. In his much-quoted lecture, "The Studio As Compositional Tool", Eno explains why studio technology is so essential to his practice:

> I can neither read nor write music, and I can't play any instruments really well, either. You can't imagine a situation prior to this where anyone like me could have been a composer. It couldn't have happened. How could I do it without tape and without technology?[38]

Similarly, for Paterson the advent of digital recording and playback technology was essential for his practice:

> The sampler was like the Rosetta Stone for DJs. With the Akai S700 I could now do all of those things that had been going around in my head […] it was a case of 'Bring all of your favourite records,

36 Ibid.

37 The "sound of leather on wood" refers to cricket, which while being an internationally played sport, is played widely at an amateur level across England in the summer months, and is arguably viewed as a quintessentially English pursuit by the English themselves.

38 Brian Eno, "The Studio as Compositional Tool," *Audio Culture: Readings in Modern Music*, eds. Christopher Cox and David Warner (London: Continuum, 2004), 127-130.

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> Alex, and let's see what we can do.' That's how it all started, to be honest, and I've never been afraid to say it, because predominantly the Orb is not about a vocalist, it's about a DJ being the frontman.[39]

While Eno did not use phonographic samples in *Music for Airports*, aspects of the compositional and production process appear to bear distinct similarities to the sample layering approach of "Little Fluffy Clouds". Eno describes how he encouraged the four musicians with whom he was working to perform improvisations simultaneously without being able to hear each other, which he would record:

> I found this very short section of tape where two pianos, unbeknownst to each other, played melodic lines that interlocked in an interesting way. To make a piece of music out of it, I cut that part out, made a stereo loop on the 24-track, then I discovered I liked it best at half speed, so the instruments sounded very soft, and the whole movement was very slow.[40]

This compositional approach seems very similar to a DJ selecting, cutting, looping and time-stretching samples with a digital sampler, or, as Eno argues, "It puts the composer in the identical position of the painter – he's working directly with a material, working directly onto a substance, and he always retains the options to chop and change, to paint a bit out, add a piece".[41] Even with *Music for Airports*, Eno samples and resamples his own recordings, a practice that he developed further in his work in the 1980s. In the liner notes to *Ambient 4: On Land*, he discusses how he moved away from the use of synthesisers to more "organic" sounds such as field recordings, as well

39 Paterson in Richard Buskin, "The Orb: 'Little Fluffy Clouds'," *Sound on Sound*. (2011), accessed July 5, 2016, http://www.soundonsound.com/people/orb-little-fluffy-clouds

40 Eno, *The Studio As Compositional Tool*.

41 Ibid.

as "the complete body of my own earlier work",[42] with the result being that "some earlier pieces I worked on became digested by later ones, which in turn became digested again", a process that he likens to "composting", in that he is transforming "what would otherwise have been waste into nourishment".[43] A similar process can be heard in "Little Fluffy Clouds"; unlike the sample collage dance hits of the late 1980s and early 1990s, which Simon Reynolds argues were constructed from recognisable "audio quotes" where "listener enjoyment was largely bound up with reference-spotting",[44] the majority of the samples used by The Orb were sufficiently obscure[45] for their origin not to be known to the vast majority of listeners. Although the two main samples, the Rickie Lee Jones interview and the excerpt from *Electric Counterpoint*, are contemporaneous (both issued in 1989), their obscurity comes from their relatively limited audiences[46] rather than being rarities unearthed through the process of 'crate digging', meaning their recycling and repurposing by The Orb to provide 'nourishment' for a fresh audience is achieved without the audience being aware of the source materials.

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42 Brian Eno, liner Notes 1982, revised February 1986, from *Ambient 4: On Land*. (CD) (UK: E.G. - EEGCD 20, 1986).

43 Ibid.

44 Simon Reynolds, *Retromania: Pop Culture's Addiction to its Own Past* (London: Faber, 2012), Kindle Edition, Chapter 10.

45 The most recognisable sample is arguably the solo harmonica from *Once Upon a Time in the West*, given that it is both a motif from a popular film and had also been used on other dance records of the time, such as "Dub be Good to Me" by Beats International (Go Discs, 1990), and "Return to Brixton" by The Clash (CBS, 1990), the latter being a remix by DJ Jeremy Healy of The Clash's record "The Guns of Brixton" (CBS, 1979), released due to the success of "Dub be Good to Me" which had interpolated (copied rather than sampled) the bassline from "The Guns of Brixton".

46 The interview with Rickie Lee Jones was included as a bonus record with promotional copies of her album "Flying Cowboys" (Geffen, 1989) and therefore would only have been known to a relatively small number of journalists, DJs and record collectors. While Reich is an important figure in late twentieth-century minimalism, his work would not have been known at the time by the vast majority of pop and dance fans, and even those familiar with *Electric Counterpoint* may not have recognised the sample, given that it is a mere three measures (lasting eight seconds) from near the end of a 15-minute piece, re-edited to fit within the 4/4 time signature of "Little Fluffy Clouds".

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Ambiguity, uncertainty and the sampler as time machine

In his liner notes for *Music for Airports*, Eno states that "Ambient Music must be able to accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting".[47] "Little Fluffy Clouds" also accommodates different levels of listener attention in that it can be background music to "chill out, drop off and nod to the beat"[48] as Paterson puts it, or to talk over, as was the intended outcome for Paul Oakenfold of The Orb's performances at Land of Oz. However, in the right frame of mind it might encourage dancing, and in a different frame of mind become an immersive or even psychedelic listening experience. In the same liner notes, Eno also argues that while "conventional background music is produced by stripping away all sense of doubt and uncertainty (and thus all genuine interest) from the music, ambient music retains these qualities";[49] the discussion above has provided examples of the different ways in which the samples employed in "Little Fluffy Clouds", both singly and in combination, provoke a range of responses in the listener.

Another area of common ground is that of manipulating time. In running some of his recordings for *Music for Airports* at half speed, Eno is literally playing with time, and as a tool, the sampler not only allows users to speed up, slow down, reverse or extend a moment in time, but it also encourages composers to look forwards by looking backwards: sounds found on many rave, ambient house and techno records of the late 1980s and early 1990s have little connection to any music that came before yet are constructed in part from music of the past. As Kodwo Eshun puts it, "[y]our record collection

47 Brian Eno, 'Ambient Music', liner notes from *Ambient 1: Music for Airports* (LP) (UK: Editions E.G., AMB 001, 1978).

48 Alex Paterson, email to author, February 8, 2018.

49 Eno, *Ambient Music*, 1978.

becomes an immense time machine that builds itself through you";[50] Gerald Simpson (A Guy Called Gerald) echoes this idea: "With a sample you've taken time. It still has the same energy but you can reverse it or prolong it. You can get totally wrapped up in it. You feel like you have turned time around".[51]

Vanessa Chang also employs the "sampler as time machine" metaphor and makes the point that it allows the past to be explored, but without a sense of awe that would not permit modification to purpose:

> The sample is revealed as the space of simultaneous play and rupture, where the past both defines the present and is effaced by it. As such, sampling creates a tradition that involves the past without deferring to its structures and limitations, restoring a revised mode of agency to the practice.[52]

Reynolds echoes the time travel aspect of sampling, describing sample-based compositions as being "[w]oven out of looped moments that are like portals to far-flung times and places, the sample collage creates a musical event that never happened; a mixture or time-travel and séance".[53] The layering of multiple samples from multiple times and places in records such as "Little Fluffy Clouds" creates uncertainty about the intended meaning behind those combinations, and allows the listener to construct a range of meanings based on their personal combination of codal competence and codal interference, as can be evidenced by the differences in apprehension between Holm-Hudson

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50 Kodwo Eshun, *More Brilliant Than The Sun: Adventures In Sonic Fiction* (London: Quartet Books, 1998), 20.

51 Simpson in Kodwo Eshun, *More Brilliant Than The Sun*, 76.

52 Vanessa Chang, "Records that Play: The Present Past in Sampling Practice," *Popular Music* 28(2), (2009), 143.

53 Simon Reynolds, *Retromania: Pop Culture's Addiction to its Own Past* (London: Faber, Kindle Edition, 2012), 313.

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and myself, and indeed one of the composers. Each of us has created our own imaginary landscape, in the broad sense in which Eno employs the term in his liner notes to *Ambient 4: On Land*, to cover "places, times, climates and the moods that they evoke. And of expanded moments of memory too".[54] In the same notes, he also argues that "[w]e feel affinities not only with the past, but also with the futures that didn't materialize, and with the other variations of the present that we suspect run parallel to the one we have agreed to live in".[55] The implication here is that, as listeners, we can be affected by memories that are not our own, or be nostalgic for aspects of the past, or indeed the future, to which we have no direct connection or of which we have no personal experience. Reynolds argues for something similar in popular music when he identifies "that peculiar nostalgia for the glory days of 'living in the now' that you didn't […] actually […] *live* through",[56] citing the music of the Swinging Sixties as affecting nostalgic emotions even among those who were not alive at the time. With "Little Fluffy Clouds", there is some evidence of the influence of nostalgia in creating the audio landscape; Paterson notes that the Nilsson record from which part of the drum track was sampled belonged to his brother, suggesting some shared familial musical memories, and he also admits to a "love for westerns and their soundtracks",[57] which explains the incorporation of the motif from *Once Upon a Time in the West*. The inclusion of the Hawker Hurricane sample provides a sonic gateway to his father's past, which is perhaps all the more affecting for Paterson given that he has few personal memories of him. As a listener, this sample can have a similar nostalgic effect; the Second World War is something most people have only experienced second hand, through family memories, feature films and historical accounts, yet the sound is nonetheless curiously affecting and emotive. Given that nostalgia is necessarily

54 Brian Eno, liner notes from *Ambient 4: On Land*, 1986.

55 Ibid.

56 Reynolds, *Retromania*, Prologue.

57 Alex Paterson, email to author, February 8, 2018.

accompanied by a sense of loss, it could be that the digital sampler, as used in "Little Fluffy Clouds", is helping to create nostalgia for a pre-digital, even pre-jet age, when the sound barrier was yet to be broken and genteel games of cricket were played on the village green.

The two main samples in "Little Fluffy Clouds", by the creators' own admissions, have far less personal associations. In an interview, Paterson's co-composer Youth reveals that these were on a cassette tape sent to him by a fan called Simon who worked in a Birmingham record shop, with "a note saying it would be perfect for The Orb".[58] Paterson confirms this story, adding that he and Youth received "different versions of the same tape" and were unaware both of Reich's music and the Rickie Lee Jones interview at that time, adding that he was drawn to the latter because "RLJ had the sweetest stoned voice ever!".[59] This reveals another connection between Eno's compositional approach and "Little Fluffy Clouds": Eno's *Oblique Strategies*[60] is a series of prompts designed to inject an element of randomness and/or risk into the compositional process when needed, and The Orb also appear to have embraced chance in the creation of their record. However, with its opening implications of idyllic English summers – lawn mowers (the Hurricane sample even briefly segues into one of a lawnmower travelling right to left between 0'32" and 0'35") and cricket on the village green – followed by the double whammy of "once upon a time" and "what were the skies like when you were young?", "Little Fluffy Clouds" as a whole appears to be inviting the listener to explore nostalgia and memory.

Ambient house, originally little more than the live mixing of obscure low-dynamic records, soon developed into a sample-based genre and "Little Fluffy Clouds" is an example where the range of samples used provides a number

58 Dave Simpson, "How we made the Orb's Little Fluffy Clouds." *The Guardian*, January 11, 2018. https://theguardian.com/music/2016/jun/07/how-we-made-the-orb-little-fluffy-clouds-interview.

59 Alex Paterson, email to author, February 8, 2018.

60 See https://www.enoshop.co.uk/product/oblique-strategies.html

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of intertextual readings, which point to the "esthesic process"[61] being part of the symbolic communication taking place. Ambient house also provides good examples of the "revised mode of agency" argued by Chang in that potentially any record could be mined for something suitable as long as the result was less frenetic and more comforting than the sounds emanating from the main room.

I close this chapter with a final and fanciful thought on the sampler as time machine metaphor. Fictional accounts of time travel frequently involve someone (or something) from the future travelling to our own time to ensure that a particular chain of events unfolds for the benefit of future generations. It is intriguing that Simon, the Orb fan from Birmingham, was sufficiently keen for the band to use the Rickie Lee Jones and Steve Reich samples for him to send each member their own version of these recordings on cassette. What if, just like the music of the band Wyld Stallyns in *Bill and Ted's Excellent Adventure*[62], "Little Fluffy Clouds" is more important than we know for the future of mankind, and "Simon from Birmingham" was in fact a time traveller, charged with ensuring that the record got made?

61 Nattiez, *Music and Discourse*, 17.

62 *Bill and Ted's Excellent Adventure.* Directed by Stephen Herek. Hollywood: Interscope Communications/Nelson Entertainment, 1989.

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9

ADAPTIVE GAME SCORING WITH AMBIENT MUSIC

Axel Berndt

Game scoring: music meets interaction

Music is an integral part of video games. Since the minimalistic beeps and bleeps of the earliest games the overwhelming majority come with their own more or less elaborate music. Similar to early film music,[1] early game music served as a replacement for missing sound effects, which was still the case in many video games of the 1990s.[2] For several decades, gaming hardware was hardly able to produce naturalistic sound effects due to technological limitations. Sound synthesis technology for games of this time included standard waveform oscillators (such as square, saw and triangle), limited amplitude and frequency modulation, and basic filters (offered by only few sound chips). The stylized sound effects they produce established a unique aesthetic that continues today as part of our media culture, for instance in the chiptune genre. The uniqueness of these aesthetics becomes salient when experienced in other media contexts where naturalistic sounds are more common, such as in films, e.g. in *The Super Mario Bros. Super Show!*,[3] an animated television show that is based on the eponymous Nintendo games series.[4] These sound effects are closer to musical idents than filmic Foley aesthetics and can still be found today, for instance when games reward

1 Zofia Lissa, *Ästhetik der Filmmusik*. Henschel (Leipzig, Germany, 1965).

2 Nils Dittbrenner, "Soundchip-Musik: Computer- und Videospielmusik von 1977-1994," *Beiträge zur Medienästhetik der Musik* vol. 9, (University of Osnabrück, Osnabrück: epOs-Music, 2007).

3 DIC Entertainment. *The Super Mario Bros. Super Show!* Viacom, Nintendo, DHX Media, Sept. 1989. animated TV show.

4 Nintendo EAD. *Super Mario Bros.* Nintendo, Sept. 1985. music by Koji Kondo.

player achievements. They are often designed such that they integrate well into the background music. The result can sometimes establish a form of live-generated musical collage that reflects the events in the interactive scene.

Such a direct relation between interaction and music on the level of individual sound events (e.g. notes and drum kicks) is a typical feature of music video games,[5] such as *Rez*.[6] In the context of video games in general, music video games are a very specific genre regarding the integration of music as a core element of the games' mechanics. The link between interaction and music is usually established on a more abstract level, often with whole pieces of music that correspond with locations in the diegesis (the virtual world) or states of the narration. Nonetheless, in any case music has to follow the interactive progress of the game and serve various purposes.

Most of the narrative functions of music in video games are directly linked to the heritage of music in films. The music mediates emotions, associations, and descriptions of the setting or of physical activity (e.g., Mickey Mousing), leads the audiences' attention, and affects their sense of time.[7] Music does this either in parallel with the dramaturgy, complementary to it, or expresses a contrary/contrapuntal semantic level.[8] In video games these narrative concepts have to be reconsidered in the context of interaction. While acting within the diegesis, the player also perceives non-diegetic music, i.e. music that plays outside the virtual scene (in the 'off', just like a narrator's voice that is audible only to the audience). A sudden cue of battle music could

5 Axel Berndt, "Diegetic Music: New Interactive Experiences," *Game Sound Technology and Player Interaction: Concepts and Developments*, ed. Mark Grimshaw, (Hershey, PA.: IGI Global, 2011), 60-76.

6 Sega. *Rez*. Sega, 2001.

7 Johnny Wingstedt. *Making Music Mean: On Functions of, and Knowledge about, Narrative Music in Multimedia*, Unpublished PhD thesis (Luleå University of Technology, Department of Music and Media, Luleå, Sweden, August 2008).

8 See Sergej M. Eisenstein, Wsewolod I. Pudowkin, and Grigorij W. Alexandrow, "Manifest zum Ton-Film," (1928) *Texte zur Theorie des Films*, ed. Franz-Josef Albersmeier (Germany: Reclam, 1998), 3rd edition; and Wolfgang Thiel, *Filmmusik in Geschichte und Gegenwart* (Berlin: Henschel Verlag, 1981).

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now warn the player of an upcoming danger that was not yet discernible.[9] Originally non-diegetic music can influence the diegesis through its effect on the player. This situation is unknown to the film medium and unique to interactive media. It motivates Kristine Jørgensen's introduction of the conceptual layer of "trans-diegesis"[10] to video game theory.

This establishes a quasi-dialogue between music and player and leads to new narrative functions of music. It can support the player in playing the game by mediating pacing and quality of upcoming events. The music stages in the platform game *Rayman Legends*[11] are prime examples of this concept. In music video games it even dictates interactions, e.g. in the *Guitar Hero* series.[12] The associative power of music can be utilised to influence decision-making processes. Its kinaestetic energy affects playing behavior and dynamics (e.g., forward-driving or soothing), an effect that is also utilised in movement therapy and endurance training.[13] By evoking certain emotionality in response to player interaction, music can affect the player's self-conception and motivate irony or critical reflection of his or her decisions and actions. Music may also help to clarify consequences that would otherwise be unclear in a complex game through its mechanics and its mere visual presentation.

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9 Axel Berndt, "Im Dialog mit Musik: Zur Rolle der Musik in Computerspielen," *Kieler Beiträge zur Filmmusikforschung*, vol. 9, (March 2013), 293-323.

10 Kristine Jørgensen, "Time for New Terminology? Diegetic and Non-Diegetic Sounds in Computer Games Revisited," *Game Sound Technology and Player Interaction: Concepts and Developments*, ed. Mark Grimshaw (Bolton: IGI Global, 2010).

11 Ubisoft Montpellier. *Rayman Legends*. Ubisoft August 2013.

12 Harmonix. *Guitar Hero* series [Computer games]. Harmonix, Neversoft, Vicarious Visions, Budcat Creations, FreeStyleGames (Developers), RedOctane, Activision (publishers), 2006-2017.

13 See Iris Bräuninger and Elisabeth Blumer, "Tanz- und Bewegungstherapie," *Psychiatrische Rehabilitation*, ed. Wulf Rössler, (Berlin: Springer, Berlin, 2004), 380-387; and Julian Rubisch, Matthias Husinsky, Jakob Doppler, Hannes Raffaseder, Brian Horsak, Beate Ambichl, and Astrid Figl, "A mobile music concept as support for achieving target heart rate in preventive and recreational endurance training," *Audio Mostly 2010: 5th Conference on Interaction with Sound—Sound and Design* (Piteå, Sweden: Interactive Institute/Sonic Studio Piteå, ACM, 2010), 142-145.

Most of these effects work best when the player perceives the music subconsciously.[14] This leads to an often misunderstood claim: background music shall not be heard.[15] This, however, does not describe an acoustic quality but refers to the mode of subconscious perception. It can be achieved by an interplay of several musical characteristics such as a low density of musical events, soft amplitude envelopes of the sounds and a less memorable formal structure. Subtle cues and endings are implemented by slowly fading, starting and ending on very high or low pitches. Cues can be masked by louder sound effects. As such, the aesthetics of the ambient music genre seem custom-fit for this subconscious listening mode. Brian Eno writes:

> Ambient Music must be able to accommodate many levels of listening attention without enforcing one in particular: it must be as ignorable as it is interesting.[16]

Throughout the remainder of this section we will follow this concept further. Ambient music comes with several advantages that prove its worth for adaptive game scoring and explains its frequent occurrence in video games throughout the past decades. Hence, ambient aesthetics will also be the basis of our explorations of generative game music techniques later in this text.

Beyond the perceptual attitude, interaction comes with two further core challenges for musical accompaniment.

1. The progress of an interactive scene and its particular timing are unpredictable. How long does a situation last? Music has to wait for that same period. Endlessly repeating a piece of music might be the

14 Norbert J. Schneider, *Handbuch Filmmusik I: Musikdramaturgie im neuen Deutschen Film* (Munich: Verlag Ölschläger, 1990) 2nd Edition.

15 Theodor W. Adorno and Hanns Eisler, *Composing for the Films* (New York: Oxford University Press, 1947).

16 Bill Milkowski, "Brian Eno: Excursions in the Electronic Environment," *Down Beat: The Contemporary Music Magazine*, (June issue), 1983.

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easiest and most common workaround if the scene is longer than the piece. But, once the player becomes aware of it, it produces a déjà vu-like repetitiveness that usually contradicts the progress of the interactive scene. This can become frustrating and even annoying. "The user may tire of the same musical accompaniment and consider it monotonous or even irritating".[17]

2. Players do not wait for the music. Music has to follow. A certain musical change can be required at any time, long before the currently playing piece is finished. This situation is typically resolved by hard cuts (skip the current piece and start the new one) and soft cuts (quickly fade out the current piece and start the new one). Both are asynchronous to the music, do not even comply with basic musical aesthetics (such as its rhythmic properties, hence, have to be judged unmusical and disruptive.

Generally speaking, linear pieces of music are not as well-suited to follow developments of a nonlinear, interactive narration in a musically coherent fashion.

Thanks to its compositional paradigms, ambient music can maintain a certain atmosphere or character of expression for a surprisingly long time without interest waning. This makes it an ideal model to approach the first challenge. Eno's most famous track "1/1" from his album *Ambient 1: Music for Airports*[18] has a running time of 17 minutes and 21 seconds. The *Skyrim Atmospheres*[19] (part of the *The Elder Scrolls V: Skyrim* soundtrack album) has a running time of 42 minutes and 34 seconds. Other ambient tracks can play for several hours. The underlying paradigms of ambient music are characterized by Thom Holmes as follows:

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17 Todor C. Fay, *A System and Process for Composing Musical Sections*. U.S. Patent No. 5,753,843. May, 1998.

18 Brian Eno, *Ambient 1: Music for Airports* (vinyl) (UK, Polydor Records – AMB001, 1978).

19 Jeremy Soule, *The Elder Scrolls V: Skyrim Original Game Soundtrack* (Bethesda Softworks, 2011).

> If there is a unifying element in all ambient music it appears to be a continuity of energy that enables a suspension of tension. Like minimalism, contemporary ambient music often relies on a persistent rhythm and slowly evolving wash of sound textures.[20]

The "establishment and maintenance of a single pervasive atmosphere" is achieved by "non-developmental forms, regularly or irregularly repeating events or cycles of events, modal pitch-sets, choice of a few limited parameters for each piece, and a pulse that is sometimes uneven, sometimes 'breathing', and sometimes non-existent" as Eric Tamm[21] summarizes his analysis of Eno's ambient music. Many ambient compositions do not even rely on repetition. They constantly vary and wander around, but once a mode of expression is established, it is maintained. These qualities are the essential prerequisites to comply with the need to wait for the player in a video game for an unknown period.

The impression of timelessness in many ambient compositions is reinforced by sonic properties. Three major categories of sounds can be identified.

1. Sounds with bell-like amplitude envelopes such as piano, vibraphone, harp, and bells, (i.e. with a percussive attack, effectively no sustain and a long release phase) seem to fade away endlessly. These often arpeggiate more or less randomly over an underlying pitch-set, chord or scale;
2. Pad and drone sounds such as choir, strings, and synth pads, with smooth attack and release phases serve mostly as chordal instruments and sustained sounds;
3. Atmospheric sounds (nature, urban, synthetic) may occur less frequently in autonomous ambient music productions. In the video

20 Thom Holmes, *Electronic and Experimental Music: Technology, Music, and Culture* (New York: Routledge, 2012), 4th edition.

21 Eric Tamm, *Brian Eno: His Music and the Vertical Color Of Sound* (Boston, MA.: Da Capo Press, 1995).

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> game context, however, they are a regular element that originates from the virtual scene's soundscape, as can be heard in the *Skyrim Atmospheres*. It seems natural to incorporate these sounds to some degree as part of the musical conception.

Monophonic (lead) melodies, such as in Brian Eno and Harold Budd's "Not Yet Remembered"[22], are rare. Most ambient compositions avoid easily recognizable elements and structures for which a melody would be a prime example. Amelodic and often arhythmic sequences of overlapping tones are used instead. Phrases of increasing and decreasing density of musical events resemble slow and deep breathing. Rests of up to 10 seconds can be observed between such phrases. These are not completely silent, though, but filled with the tone releases and long reverberations.

On the compositional level, ambient music is often constructed in a serial or procedural fashion. The whole range of generative music approaches is applicable, such as layered event loops, variation through permutation, fractal structures, and Monte Carlo methods.[23] This, ultimately, paves the way for the claim of short-term reactivity of video game music (the second challenge). The following section provides an introduction to, and classification of, approaches to incorporate nonlinearity in musical playback.

A taxonomy of adaptive music techniques

Music in video games - and in interactive media in general - must be capable of waiting for an unpredictable amount of time while at the same time reacting at short notice when player interaction triggers progress. These opposing claims are commonly accomplished by arrangement techniques in two musical dimensions: sequential and parallel. This section presents a taxonomy of these and further, more elaborate approaches, categorized by

22 Brian Eno and Harold Budd. *Ambient 2: The Plateaux of Mirror* (UK: Editions E.G. – EGAMB002, 1980).

23 Gerhard Nierhaus. *Algorithmic Composition: Paradigms of Automated Music Generation*. (Vienna: Springer Verlag, 2009).

their (increasing) use of generative techniques. It discusses the gain of musical flexibility that they exploit. Figure 1 gives an overview of this taxonomy.

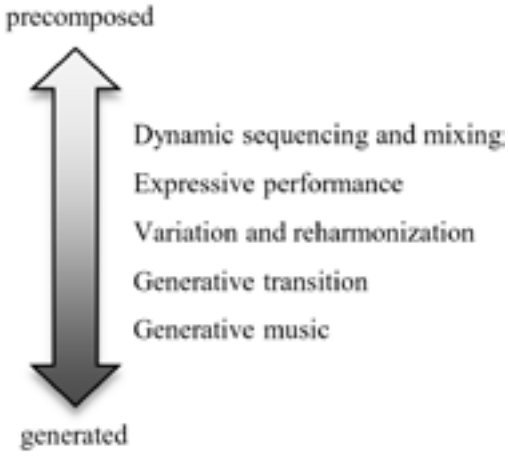


Fig. 1: A taxonomy of approaches to introduce nonlinearity to video game music. The axis indicates the reliance on precomposed and generated musical material.

The concept of sequential arrangement or *dynamic sequencing* reorganizes a sequence of musical segments in real-time according to the interactive context. Its roots lie in classical musical dice games.[24] An example of this technique applied to video games can be found in *Ghost Master*.[25] One of the most well-known implementations of the concept is the *iMuse* interactive music engine[26] that has been used in several LucasArts video games such as

24 See Johann Philipp Kirnberger, *Der allezeit fertige Polonaisen und Menuetten Komponist* (Berlin: George Ludewig Winter, 1767); Wolfgang Amadeus Mozart, *Musikalisches Würfelspiel: Anleitung so viel Walzer oder Schleifer mit zwei Würfeln zu componieren ohne musikalisch zu seyn noch von der Composition etwas zu verstehen* (Köchel Catalog of Mozart's Work KV1 Appendix 294d or KV6 516f, 1787); and Scott Joplin, *Melody Dicer* (New York: Carousel Publications, 1974).

25 Sick Puppies. *Ghost Master*. Empire Interactive, May 2003. Music by Paul Weir.

26 Michael Land and Peter N. McConnell, *Method and apparatus for dynamically composing music and sound effects using a computer entertainment system* (United States Patent No. 5,315,057, May 1994, filed November 1991).

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Monkey Island 2[27] and *X-Wing*.[28] Instead of loose musical segments, *iMuse* uses whole pieces, segmented by jump marks which can be activated to redirect the playback to other pieces and prefabricated transitions in-between. Since the playback of the current segment will not be interrupted, the reactivity of the music depends on the length of its segments. New musical material can only come up with the next segment. Long segments reduce reactivity while short segments tend to make the music 'short of breath' and prevent bigger formal structures such as overarching melodic lines.

Parallel arrangement applies *dynamic mixing* of a multitrack recording. Different combinations of audio tracks are transitioned via fade-ins and fade-outs and present different musical material. A typical example would be: a driving percussion track being added when an action scene starts and fading out when the action is over. The concept of *parallel composing* is a subspecies of dynamic mixing where the playback jumps dynamically between parallel audio tracks.[29] With dynamic mixing the overall playback and musical flow remain unaffected. Fading can be done at any time with no latency which makes the music very reactive while staying coherent. However, to ensure this coherency all parallel tracks have to harmonize and follow the same meter to ensure synchronicity. This limits the amount of change that parallel arrangement offers, i.e. it cannot transition to something fundamentally different. Approaches that combine both

27 LucasArts, *Monkey Island 2: LeChuck's Revenge*, 1991. Music by Michael Land, Peter McConnell, and Clint Bajakian.

28 LucasArts, *Star Wars: X-Wing*, 1993. Music by Michael Land, Peter McConnell, and Clint Bajakian.

29 Tim van Geelen, "Realizing ground-breaking adaptive music," *From Pac-Man to Pop Music: Interactive Audio in Games and New Media*, ed. Karen Collins (Aldershot: Ashgate, 2008), 94-102.

dynamic sequencing and mixing, are capable of overcoming this limitation.[30] Two video games that utilize dynamic mixing as a core method for their musical nonlinearity are Rockstar Games' (2010) *Red Dead Redemption*[31] and Strange Loop Games' (2012) *Vessel*.[32]

Music in today's games is dominated by pre-recorded audio material (often orchestral but also electronic music) that is specifically composed and prepared during the production process to enable the described arrangement techniques. Further, more flexible approaches to nonlinearity require a representation of music that provides more differentiated access and editing. The MIDI standard, for instance, gives access to every single note event allowing for changes of pitch, velocity and duration split-seconds before it is played back by a synthesiser. A synthesiser's parameters can be modulated in real-time by MIDI control and OSC (Open Sound Control) messages. Some Amiga and MS-DOS games used trackers, special types of musical sequencers, for their music which offered the same kind of freedom and editability during playback. Trackers are still in active use today, especially in the chiptune and demoscene. New tracker software releases from recent years (such as SVArTracker, Aodix, Hackey-Trackey, and reViSiT) also integrate the VST standard, run on modern operating systems and feature modern graphical user interfaces - evidences of this technology's up-to-dateness that is also applicable to modern games. This openness paves the way to introduce more flexible concepts to music beyond the possibilities that pre-recorded audio can practically offer.

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30 See Sebastian Aav. *Adaptive Music System for DirectSound*. Unpublished Master's thesis (University of Linköping, Department of Science and Technology, Norrköping, Sweden, December 2005); Axel Berndt, Knut Hartmann, Niklas Röber, and Maic Masuch, "Composition and Arrangement Techniques for Music in Interactive Immersive Environments" *Audio Mostly 2006: A Conference on Sound in Games* (Piteå, Sweden: Interactive Institute/Sonic Studio Piteå, ACM, 2010), 53-59; and Harald Tobler. *CRML - Implementierung eines adaptiven Audiosystems* (Master's thesis, Fachhochschule Hagenberg, Medientechnik und design, Hagenberg, Austria, July 2004).

31 Rockstar Games. *Red Dead Redemption*. Rockstar San Diego, May 2010.

32 Strange Loop Games. *Vessel*. indiePub, March 2012. Music by Jon Hopkins, adaptive music system by Leonard J. Paul.

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A rarely addressed domain for musical nonlinearity is the real-time variation of its expressive performance. Tempo, dynamics and articulation coin its expressive character.[33] Berndt[34] presents computational models to emulate human musicians' performances. These can be used in combination with a mark-up or scripting language such as MPM (Music Performance Markup[35]) to define and render different performances of a piece of music. On this basis, seamless transitions can be computed during performance by simulating the reactions of virtual musicians.[36] The musical material can still be pre-composed which yields a relatively easy integration with established workflows of composers and game music studios. However, the bandwidth of expressions is rather limited by that musical material. The performance can bend it to a certain extent but the compositional substance (melodies, motifs, chords, rhythms etc.) stays the same.[37] Hence, this approach is best suited to short-range narrative processes that take place within a homogeneous scene or section of the game, for example a puzzle that has to be solved in several steps, a platform game where music reflects the progress within a stage, or a multiplayer match that features several phases of gameplay until it is won (e.g. attack, trace, defend).

Considering the limitations of the expressive performance approach, another idea comes to mind immediately: real-time variations of a given

33 Steven R. Livingstone, Ralf Muhlberger, Andrew R. Brown, and William F. Thompson, "Changing Musical Emotion: A Compositional Rule System for Modifying Score and Performance," *Computer Music Journal*. Vol. 34, no. 1, (Cambridge, MA.: The MIT Press, 2010), 41-64.

34 Axel Berndt, "Formalizing Expressive Music Performance Phenomena," *Works in Audio and Music Technology*, ed. Axel Berndt, (Dresden: TUDpress, 2015), 97-128.

35 Axel Berndt and Benjamin W. Bohl, "Music Performance Markup: Formale Beschreibung musikalischer Interpretationen," *International Yearbook of Scholarly Editing*, eds. Rüdiger Nutt-Kofoth and Bodo Plachta, Vol. 32, (Berlin: De Gruyter, 2018) 185-204.

36 Axel Berndt, "Decentralizing Music, Its Performance, and Processing," *Proceedings of the International Computer Music Conference (ICMC)*, eds. Margaret Schedel and Daniel Weymoth, (Stony Brook University, New York: International Computer Music Association (ICMA), 2010), 381-388.

37 The combination of nonlinear expressive performance and dynamic mixing can further increase the bandwidth of expressions beyond the limits of each individual technique.

music on a compositional level. This may start with changing the underlying scale.[38] Transforming a piece from, for example, C major to C harmonic minor can be achieved by replacing each E by an E^b, and each A by an A^b. This tonality variation alone can change the character of expression, especially when combined with a change in its performance. It is further possible to change the whole harmonization by adapting the voice leadings in the polyphonic counterpoint so that different chords are played. A planning approach for effective reharmonizations based on a measure for chord tension is given by Min-Joon Yoo and In-Kwon Lee.[39] Michael Stenzel[40] describes an algorithmic approach to reharmonization. Replacing a chord at a certain position in the music is achieved by shifting every note at that position that does not fit into the new chord to the nearest fitting pitch. For instance, a change from a C major chord to an A minor chord is done by shifting every G two semitones up to A. In real-life situations, though, reharmonization is not as easy as in this simplified example, as Stenzel's experiments revealed. Non-chord tones require a different treatment, differing chord complexities (e.g. a change from a triad to a five-note chord) complicate the mapping, the changed chord progressions may contradict melodic gestures, and adaptations of voice leadings can easily conflict with melodic/motivic structures. Thus, a fully satisfying algorithm for reharmonization must still be considered an open problem.

Real-time algorithmic variation of a given musical piece is not limited to reharmonization, which appears to be relatively rigid due to its various constraints. Further flexibility can be exploited by melodic variation, for example adding ornamentations to a melodic line or replacing it by an

38 Steven R. Livingstone et al., "Changing Musical Emotion."

39 Min-Joon Yoo and In-Kwon Lee, "Musical Tension Curves and its Applications," *Proceedings of the International Computer Music Conference (ICMC)* (New Orleans, Louisiana: International Computer Music Association (ICMA), 2006), 482-486.

40 Michael Stenzel, *Automatische Arrangiertechniken für affektive Sound-Engines von Computerspielen* (Diploma thesis, Otto-von-Guericke University, Magdeburg, Germany, 2005).

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alternative sequence of notes that may be derived from the original, or a free improvisation that introduces new melodic material. Both can be generated algorithmically and on the fly during playback. Melody embellishment is subject to music theory already for several centuries,[41] mostly in form of catalogue-like collections of ornaments. Notated examples from the Baroque era can be found in Georg Philipp Telemann's *12 Methodische Sonaten*.[42] On a note-by-note level, simple melodic embellishment is algorithmically relatively easy to achieve by adding transitioning figures such as non-chord notes from classical counterpoint.[43] These can be further embellished in a fractal fashion to create more elaborate ornaments. Alexander Putman and Robert Keller[44] developed a transformational grammar that implements jazz idioms to generate solo improvisations. Its technical implementation is part of the Impro-Visor[45] software, an educational tool for jazz improvisation. Two artificial neural network-based systems that learn and generate melody variations, *MeloNet* and *JazzNet*, have been presented by Dominik Hörnel and Wolfram Menzel[46] and were demonstrated using the styles of Johann Pachelbel and Charlie Parker. A very successful system for melodic

41 See Günter Altmann, *Musikalische Formenlehre—Ein Handbuch mit Beispielen und Analysen. Für Musiklehrer, Musikstudierende und musikinteressierte Laien* (Mainz: Schott, 2001), 8th revised edition; Joseph Müller-Blattau, ed., *Die Kompositionslehre Heinrich Schützens in der Fassung seines Schülers Christoph Bernhard* (Kassel: Bärenreiter, 1999). 3rd edition; Frederick Neumann, *Ornamentation in Baroque and Post-Baroque Music* (Princeton: Princeton University Press, 1978); and William Bloomfield Pepper, *The Alternate Embellishment in the Slow Movements of Telemann's "Methodical Sonatas"* (Unpublished PhD thesis, University of Iowa, Iowa City, Iowa, July 1973).

42 TWV 41: A3, a2, D3, E2, G4, g3, B5, C3, c3, d2, E5, h3.

43 Alfred Mann, *The Study of Counterpoint from Johann Joseph Fux's Gradus ad Parnassum* (New York: W. W. Norton & Company, Inc., 1971), revised edition.

44 Alexander M. Putman and Robert M. Keller, "A Transformational Grammar Framework for Improvisation," *Proceeding of the International Conference on New Music Concepts* (Treviso: March, 2015)

45 https://www.cs.hmc.edu/~keller/jazz/improvisor/, accessed April 9, 2018.

46 Dominik Hörnel and Wolfram Menzel, "Learning Musical Structure and Style with Neural Networks," *Computer Music Journal*, Vol. 22, no. 4 (Cambridge MA.: The MIT Press, 1999), 44-62.

improvisations is *GenJam*.[47] It runs an evolutionary algorithm to create call-and-response improvisations together with a co-performing human musician.

Reharmonization and variation of voice leadings (not only the melody) may also be utilized in the course of creating modulations and, thereby, seamless transitions to other pieces of music. The challenge is to adapt the currently playing piece so that the changes still conform to its aesthetics, i.e. appear to be pre-composed. As a first experiment in melody transitions, Max Mathews and Lawrence Rosler[48] applied linear interpolation methods using two melodies. The idea has been adopted by René Wooller and Andrew Brown[49] into one of their *Music Morphing* algorithms. Further algorithms are a weighted mixture of fragments from the start and target music using Markov morphing. The latter instantiates two Markov chains, one from the start music, the other from the target music, and applies them in an alternating fashion to generate the transition. While the start music Markov chain gets more time at the beginning of the transition, the ratio shifts in favour of the target music later on. A conceptually similar, evolutionary algorithm-based approach to combine two musical fragments into one is *MusicBlox*.[50] Its fitness function measures the generated candidates' similarity to both input pieces and triggers further recombination and mutation to achieve a desired similarity ratio. So far, these techniques have been applied as creative tools for

47 John Al Biles, "Improvizing with Genetic Algorithms: GenJam," *Evolutionary Computer Music*, eds. Eduardo R. Miranda and John Al Biles, (London: Springer, 2007), 137-169.

48 Max V. Mathews and Lawrence Rosler, "Graphical Language for the Scores of Computer-Generated Sounds," *Perspectives of New Music*, Vol. 6, no. 2 (1968), 92-118.

49 René Wooller and Andrew R. Brown, "Investigating morphing algorithms for generative music," *Third Iteration: Third International Conference on Generative Systems in the Electronic Arts* (Melbourne, Australia, 2005).

50 Andrew Gartland-Jones, "MusicBlox: A Real-Time Algorithmic Composition System Incorporating a Distributed Interactive Genetic Algorithm," *Proceedings of EvoWorkshop/EuroGP2003, 6th European Conference in Genetic Programming* (Berlin: Springer, 2003), 490-501.

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composition and live music making[51] but have barely been tested for transition generation in a gaming or similar context. It is likely that they work very well for certain genres and styles, such as serialism, minimalism and electronic dance music as these often apply similar compositional paradigms. Mathews and Rosler,[52] however, after applying their interpolation approach to two folk melodies, judged the result "nauseating" and "jarring" - hence, this was a stylistic context that seems less compatible with these techniques. Besides these few academic approaches, generative real-time music transitioning is still an open problem.

So far, generative techniques have been introduced in order to perform, vary, adapt, and transition pre-composed music in real-time. The step to a fully generated game score is at hand and comes with a promising new perspective to the problem of nonlinearity. Instead of laborious editing of pre-composed pieces, a real-time music generation algorithm offers 'musical adjustment screws' in terms of its parameters to affect its musical output. These parameters can be modulated by the game engine, resulting in the music dynamically following the progress of the game.

A first instance of live generated game music can be found in the 1984 video game *Ballblazer*.[53] The title theme "Song of the Grid" is generated using Peter Langston's *riffology* technique.[54] A melody is built from a set of riffs (short melodic segments) using random choice and some rules for good melodic connections. Riffs can also be varied by changing the tempo and skipping notes.

---

51 Andrew R. Brown, René W. Wooller and Eduardo R. Miranda, "Interactive Evolutionary Morphing as a Music Composition Strategy," *Music As It Could Be: New Musical Worlds from Artificial Life*, ed. Eduardo R. Miranda (Madison: A&R Editions, 2009).

52 Max V. Mathews and Lawrence Rosler. "Graphical Language for the Scores of Computer-Generated Sounds."

53 David Levine and Peter S. Langston. *Ballblazer*. Lucasfilm Ltd., March 1984.

54 Peter S. Langston, "Six Techniques for Algorithmic Music Composition," *Proceedings of the International Computer Music Conference (ICMC)* (Columbus, Ohio: Ohio State University, 1989), 164-167. Extended version with code examples available at http://peterlangston.com/Papers/amc.pdf, accessed March 17, 2018.

> An endlessly varying melody is generated by riffology and played over an accompaniment consisting of a bass line, drum part, and chords. The accompaniment itself is assembled on the fly from a repertoire of four-bar segments, using a simplified version of the riffology technique.[55]

Langston's riffology technique can be regarded as an extension of the concept of dynamic sequencing but with segments of the length of a single riff. These are much shorter than the musically more sovereign segments that the above concept of dynamic sequencing involves. The riffs are conceptually closer to single notes and their arrangement requires a more compositional logic such as riffology to form a musical idea from them.

The situation is similar with the music of Hello Games' *No Man's Sky*.[56] Its generative music system PULSE integrates into the Wwise audio engine.[57] According to Paul Weir, audio director of *No Man's Sky*, "Pulse, at its heart, is really just a glorified random file player".[58] An instrument is defined by a collection of sounds, which can go down to single tones or notes - so basically a form of sampling. The audio material is a decomposition of original pieces from the band 65daysofstatic. One such instrument holds "variations of a single type of sound" and is associated with a certain "playback logic, such as how often the sound can play, its pitch, pan and volume information".[59] The music system is capable of interpolating between states, thus, creating seamless transitions between different musical soundscapes. In this

55 Ibid.

56 Hello Games, *No Man's Sky*. Aug. 2016. Music composed by 65daysofstatic, music system and logic by Paul Weir.

57 Audiokinetic Inc. *Wwise (Wave Works Interactive Sound Engine)*, https://www.audiokinetic.com/products/wwise/, access: May 7, 2018.

58 Anne-Sophie Mongeau, "Behind the Sound of 'No Man's Sky': A Q&A with Paul Weir on Procedural Audio," *A Sound Effect*. March 2017, https://www.asoundeffect.com/no-mans-sky-sound-procedural-audio/, accessed May 8, 2018.

59 Ibid.

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conceptual framework, 65daysofstatic's original compositions can be regarded as blueprints for the music scripting. The scripts, however, do not merely reproduce them but allow for more variation.

Throughout recent years, game audio engines have become more versatile in terms of real-time sound synthesis and digital signal processing (DSP) capabilities as well as programmability. This facilitates the integration of more advanced procedural music techniques. Unreal Engine 4[60] introduced Blueprints Visual Scripting[61] as a replacement for the former Unreal Script. It is a graphical scripting language similar to MAX and Pure Data. While primarily intended for gameplay scripting it also features some audio and music scripting features and can integrate custom C++ code that may add, for instance, DSP and algorithmic composition functionalities. Since Brinkmann et al.'s introduction of the *libPd* embeddable library,[62] Pure Data,[63] a widely used powerful tool for electronic musicians, has been frequently used in the gaming context on all major hardware platforms and operating systems. A mobile game that utilizes *libPd* for its generative music and real-time sound synthesis is *Sim Cell*.[64] Pure Data's front end is also used by the *heavy audio tools* framework[65] that allows for the creation of plugins for Unity 5, Wwise, Web Audio API and others. Hence, Pure Data became also a regular part of Leonard J. Paul's *School of Video Game Audio*.[66]

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60 Epic Games, *Unreal Engine 4*. https://www.unrealengine.com, accessed May 8, 2018.

61 https://docs.unrealengine.com/en-us/Engine/Blueprints, accessed May 8, 2018.

62 Peter Brinkmann, Peter Kirn, Richard Lawler, Chris McCormick, Martin Roth, and Hans-Christoph Steiner, "Embedding Pure Data with libpd," *Fourth International Pure Data Convention 2011 – A Festival of Programmed Music and Art* (Berlin, August 2011).

63 Miller Puckette, "Pure Data," *Proceedings of the International Computer Music Conference (ICMC)* (Thessaloniki: International Computer Music Association (ICMA), 1997), 224-227.

64 Touch Press Games. *Sim Cell*. iOS app, v1.2.0, 2017. Music by Leonard J. Paul.

65 Enzien Audio Ltd. *heavy audio tools*. First release: January 2016. https://enzienaudio.com/, accessed May 9, 2018.

66 http://videogameaudio.com/, accessed May 9, 2018.

The developers of the video game *Spore*[67] created their own derivative of Pure Data for integration into their game engine, which is called *EApd*.[68] *Spore* incorporates both pre-composed pieces and procedural music. The development of the procedural music system was undertaken by Kent Jolly and Aaron McLeran with Brian Eno acting as consultant. Different scenes in the game (e.g. creature editor, UFO editor, civ editor) have their own Pure Data patches/algorithms. The game dynamically switches between them. Hence, nonlinear musical development basically unfolds within these scenes. Four main design goals led the music system's development:[69]

1. Make the music so that it is not distracting;
2. Music should be non-repetitive and along these lines: "music that is eminently unhummable";
3 Make it playful;
4. Music responds to the user.

Goals two and four are equivalent to the above mentioned two core challenges of music in video games. They reflect the conception of the music algorithm. Rhythmic and melodic patterns are created from random numbers. The seed values of the random number generators are stored and serve as hashes to recall the patterns - effectively motifs - at later occasions. The system can switch back to them by reseeding. Multiple loops of patterns are layered over each other and combined by random crossfades. Instrument switching, varying rhythmic density and reseeding are used to make the music sound more diverse. A melody generator is included that is based on Markov models. A further routine implements a simplified counterpoint based on

67 Maxis. *Spore*. Electronic Arts, September, 2008.

68 Kent Jolly, "Usage of Pd in Spore and Darkspore," *Fourth International Pure Data Convention 2011 – A Festival of Programmed Music and Art* (Berlin, August 2011).

69 Kent Jolly and Aaron McLeran, "Procedural Music in SPORE," *Game Developers Conference: GDC Vault*. 2008. https://www.gdcvault.com/play/323/Procedural-Music-in, accessed May 10, 2018.

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Johann Joseph Fux's treatise *Gradus ad Parnassum*.[70]

Real-time music generation and variation also requires real-time sound synthesis. Music production projects in sound studios often have several synthesisers and DSP effects processors running in parallel to achieve certain sound aesthetics. The required computing resources are far beyond what is typically available in gaming contexts. Leonard J. Paul[71] gives reference values: Audio in games usually gets 10% of CPU and 10% of memory. In comparison to studio production situations this can become quite a limiting factor. However, there is also much room for further optimisation. Many sounds do not have to be synthesised 'from scratch' but can be sampled. Once the procedural music is defined, its polyphony is also known and the sound generators (be it synthesisers or samplers) can be optimised accordingly by limiting their polyphony to what is actually necessary. Even the amount of sample data can be cut down significantly once the pitch range of each voice is known. At the end of the sound design and prototyping phase it is also a good case to incorporate a more or less extensive revision step in the workflow to clean up and replace cluttered, inefficient code by equivalent, more efficient alternatives. This may be more common in engineering than in artistic workflows, but it is worth the effort.

Experiments with generative ambient

Real-time generative music techniques offer various 'adjustment screws' to affect the music during playback and make it more flexible in order to adapt to an interactive context such as the narrative progress of a video game. The type and amount of flexibility will vary depending on the type of musical parameters to be edited and the aesthetic agenda that the music has to comply with. The aim of this section is to explore the bandwidth of

70 Alfred Mann, "The Study of Counterpoint from Johann Joseph Fux's Gradus ad Parnassum."

71 Leonard J. Paul. *Advanced Topics in Video Game Audio*. Invited Talk, Stanford University, CCRMA, May 2015. https://www.youtube.com/watch?v=tvx_QgS7D8Q, accessed, May 10, 2018.

possible interactive parameters further, characterise the musical flexibility more precisely and provide insights on the practical limitations of parameter modulations. Experiments have been undertaken with two conceptually different music engines, the script-based *AmbientMusicBox* and the less deterministic, highly parameterised *AmbientMusicGenerator*.

Ambient music, thanks to its compositional paradigms that often involve concepts of quasi-serial and minimal music, seems a natural fit for these investigations. Its relevance to game scoring has been pointed out previously. Ambient music *is* frequently used in video games today. Hence, the technical, as well as the musical framework, of these experiments should provide insights of practical relevance.

AmbientMusicBox is a real-time script interpreter and synthesiser. Its music is defined via a dedicated XML-based scripting language. The main aim for the definition of the application programming interface (API) was to provide simple, high-level music controls to the game engine and game developer, respectively. Hence, on the application side no in-depth musical knowledge should be necessary to integrate *AmbientMusicBox* into the game mechanics. The set of commands comprises the loading of music scripts into working memory, triggering playback start and stop, channel gain settings, and session recording. Additionally, a synthesiser for wind sounds (with the parameters howl speed and strength) is offered. Audio data can be incorporated which is particularly useful for ambient noises, synthetic as well as naturalistic soundscapes and sound effects.

The scripting language provides dedicated routines for music definition. The following descriptions will focus on its core elements. A more comprehensive technical overview of *AmbientMusicBox* and its scripting language is given by Berndt et al.[72] The structure of the music script is as follows. The root node `<music/>` holds one or more `<voice/>` elements. These represent individual instruments. The structure of a voice element is:

72 Axel Berndt, Simon Waloschek, Aristotelis Hadjakos, and Alexander Leemhuis, "AmbiDice: An Ambient Music Interface for Tabletop Role-Playing Games," *Proceedings of New Interfaces for Musical Expression (NIME) 2017*, (Aalborg University Copenhagen, Denmark, May 2017).

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```
<voice          channelLeft="" channelRight=""
                name="" instrument="" polyphony=""
                fadeSpeed="" relativeMix=""/>
```

Each instrument and DSP effect (specified as child of `voice`) can have a mono or stereo output (specified via `channelLeft` and `channelRight`). The attribute `name` specifies an identifier string that can be used by the application to address the voice, e.g. for dynamic mixing. The attribute `instrument` sets the sound synthesis algorithm to be used for this voice. *AmbientMusicBox* offers a set of prefabricated patches that can be further extended by custom synthesis and effects patches. Attribute `polyphony` specifies the instrument's polyphony, the number of copies to be instantiated to play several notes at the same time. With `fadeSpeed` volume changes are ramped, `relativeMix` sets an initial volume gain (between 0.0 and 1.0). In case of an audio track, audio data is loaded inside the voice. Otherwise, the voice is an actual musical instrument, i.e. it plays notes. Each such instrumental voice specifies one or more sequences to be played, such as the following example.

```
<sequence       loop="inf"
                maxStartDelay.seconds="10">
        <note   pitch.midi="70" velocity="0.4"/>
        <rest   dur.seconds="4"/
        <note   pitch.midi="75" velocity="0.3"/>
        <note   pitch.midi="71" velocity="0.5"
                dur.seconds="25"
                dur.variation="0.025"/>
        <rest   dur.seconds="4"
                dur.variation="0.025"/>
</sequence>
```

In the case that more than one sequence is defined, they are performed simultaneously. The attribute `loop` is set to a nonnegative integer value or `inf` to specify how often the sequence is repeated. The whole concept behind sequences accounts for the typical approach of composing ambient music from (asynchronous) event cycles. With the attribute `maxStartDelay.seconds` the beginning of this sequence can be delayed by a random floating point value (in seconds) up to the given value (10 seconds in this example). The basic building blocks of sequences are `note` and `rest` elements. Their durations are specified in seconds. This seems counter-intuitive in the musical context, but a peculiarity of many ambient compositions is the absence of musical meter in a traditional sense. For this, it is easier to work with absolute timing. Durations can also be subject to random variation which is achieved by the attribute `dur.variation` that defines a maximum variation radius (in both directions, positive and negative). Sequences may contain further sequences that can be played in succession or simultaneously. The fourth possible type of child elements in a sequence is `procedure` in one of the following three forms:

1. `<procedure mode="random choice"/>`

One of its child elements is randomly chosen and performed.

2. `<procedure mode="permutation" numberOfPermutations=""/>`

When the procedure is processed the first time, the first child element is performed. At the second iteration the second child element is performed, and so on. After all children were performed, the specified `numberOfPermutations` is applied to the series and the playback starts anew with the new first child element.

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3. `<procedure **mode**="permutation sequence" **numberOfPermutations**=""/>`

This type of procedure has only one child element of type `sequence`. The first time the procedure is processed the whole sequence is played as is. From then on, the given `numberOfPermutations` is applied to all non-rest children of the sequence before it is performed again.

Procedures are the major means for introducing nondeterminism to the music. They may contain notes, rests, sequences and further procedures. Nesting of sequences and procedures is a powerful tool to build up complex compositions from these rather few musical building blocks.

From the application's perspective *AmbientMusicBox* provides deterministic and nondeterministic music that is capable of playing for a long time without relying on repetition. Channel gain controls offer an effective interface for dynamic mixing. Technically, it is also possible to access the music scripts at runtime and alter the music on the compositional level. This requires the application programmer to have the necessary musical background or a more intimate involvement with the composer during the development process.[73] In this way, reharmonizations can be implemented. However, more drastic alterations to the scripts are rather expensive from both the compositional and algorithmic perspective, hence, impractical. *AmbientMusicBox*'s reliance on predefined compositions (the XML scripts) - even though nonlinear in themselves - and minimalistic API proved detrimental to its musical flexibility. API extensions and the addition of algorithmic tools for more complex transformations and seamless transitioning between scripts are essential to obtain further flexibility.

AmbientMusicGenerator is a real-time algorithmic composition engine. Instead of relying on predefined compositions (such as *AmbientMusicBox*'s scripts) it is interfaced via a series of musical parameters. These are scanned

73 In contrast to this, music production is often subject to outsourcing and takes place at a late stage of game development.

whenever new musical material is generated. Hence every parameter change will immediately result in a change of one or more musical features. The following discussion will focus on these parameters and their modulation. A complete description of *AmbientMusicGenerator*, its algorithmic approach to ambient music and technical implementation is given by Maxim Müller.[74]

First of all, sound synthesis is done in real-time again. It is possible to switch between predefined sounds and modulate basic synthesis parameters such as attack, decay, sustain and release values of the amplitude envelope. This allows for adjusting each tone's articulation. The tuning/transposition of an instrument, a reverb effect and lowpass filter have an effect on its timbre. Each voice also has a volume control for dynamic mixing.

Four polyphonic musical voices are available, each with its own role and corresponding behaviour: an arpeggiator and a chord voice, a bass voice and a melodic phrase generator. They all comply with a given tonality; a defined scale, tonic pitch and main chord. Twenty scales are available, including major, several variants of minor, chromatic, church modes, pentatonic, just pentatonic, and whole tone scale. The main chord comprises up to five inversions. Within this, any position, chord inversion and voicing (close, open) is possible.

Each musical voice's activity is conceived around Eric Tamm's notion of "regularly or irregularly repeating events or cycles of events" and "breathing"[75] in ambient music. This is implemented as phrasing in the following form. Periods of activity (a certain number of sound events played with a certain density and more or less variation in their metric order) are followed by periods of silence (this "sleep time" can also vary by a random amount). The relationship between a voice's play time and sleep time, event density and rhythmic variation determines its pace. Phrases can be long and regular with

74 Maxim Müller, "Interactive Ambient Music Generation," *Works in Audio and Music Technology*, ed. Axel Berndt (Dresden, TUDpress, 2015), 59-95.

75 Eric Tamm, "Brian Eno: His Music and the Vertical Color Of Sound."

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literally no rests in between. Others can be short, dense, and arhythmical. A global tempo parameter can be used to scale the phrasing of all voices at once while keeping their mutual relationship intact.

Each voice (apart from the bass that plays random notes from a given chord) has further individual parameters that relate to its musical role.

- The arpeggiator voice generates an initial random figure and applies permutations to vary it. A parameter can be set to vary the frequency at which this happens;
- The pitch range of the chord voice can be specified. Strictly synchronous note onsets can also be broken up into a looser, more arpeggiated playing technique;
- The melody voice generates its melodies from a Markov model. It can be retrained on the fly by changing the training set (the set of sample melodies) and the order of the model (the length of melodic patterns to learn from these melodies). This causes corresponding changes of melodic features in the music generated from it. Rhythmic features can be included or excluded from training. The melodies that are generated, or more precisely the sequences of pitch intervals,[76] employ only pitches from the underlying scale which can be further limited to pitches only from the main (tonic) chord.

The rhythmic part of the melody voice can be applied to all other voices, too. The other voices will then feature similar rhythmic properties.

Thanks to its highly parameterized algorithm, *AmbientMusicGenerator* offers musical flexibility on several levels: dynamic mixing, expressive performance, reharmonization, and in compositional aspects such as phrasing, melodic gesture, harmonicity, and rhythm. Some parameters may have a subtler effect when modulated, others are clearly audible. Even though all output complies with the ambient-specific conceptualisation that reflects

76 This is a prerequisite for being invariant with transposition and scale.

in the algorithmic approach, *AmbientMusicGenerator* offers more flexibility than all other approaches discussed so far.

When experimenting with on-the-fly parameter changes in *AmbientMusicGenerator*, it becomes immediately apparent that there are essential aesthetic conditions to be considered. Drastic and abrupt parameter changes result in likewise incoherent musical changes. It is advisable to transition these over a certain period of time so that the musical transformation actually becomes a process of musical development. Most numeric parameters can simply be ramped by linear or nonlinear interpolation over time, starting with the initial value and leading to the target value. In the context of sound synthesis and dynamic mixing, this is common practice. But it also applies to phrase length, event density, tempo, frequency of permutation of arpeggio patterns, and pitch ranges - basically all musical aspects that can be abstracted as bipolar numeric ranges.

Other aspects, however, require more dedicated treatment. Melodic transitions can be achieved by piecewise changes of the training set, i.e. adding a few new melodies while removing some that are not in the target training set, then retraining the Markov model and repeating the procedure every few time frames until the training set is in its target state. The main chord can be transitioned via classic harmonic modulation techniques or in a simpler way by changing only one chord position at a time. Timbres might be interpolated if they use the same synthesis patch. Otherwise it is necessary to switch to another timbre which is best achieved during sleep time in-between two phrases and, again, not all voices at once.

A practical limitation comes to light when considering the sheer quantity of the all too specific musical parameters that the API passes through to the application. It requires a musically competent application developer to handle them which is not always a given. It is also relatively intricate to control all of the parameters individually, especially when the aim is to transition from one musical setup to another and not just apply a few

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changes. Hence, it is advisable to introduce some high-level controls as well. *AmbientMusicGenerator* offers three such high-level controls.

1. It is possible to define presets, i.e. predefined parameter settings that the application can trigger with one convenient function call. These presets do not have to be created by the application developer but can be delivered by a composer who would also be responsible for the definition of sounds/timbres;

2. A scripting interface allows for the definition of parameter modulations over time[77] and stores them for reproduction. This is where composers can define musical pieces that do not just rely on static parameters but constitute overarching structural properties from parameter changes (e.g. an A-B-A form where A and B represent different parameter settings). These scripts can also be used to define transitions. The composer would specify how to transform one musical state/preset into another. The application only needs to execute these scripts instead of tweaking the parameters individually (which is nonetheless possible);

3. Keeping a musical state or preset playing for a long time can become monotonous, even if it is not repetitive. The above mentioned scripts might be used to implement some predefined variation. Another way of introducing more overarching variation is offered by stochastic parameter modulations. Starting with a certain preset the application specifies the amount and frequency of parameter changes. *AmbientMusicGenerator* will then choose a parameter at random each time and change its value within the given bounds. In this way an otherwise monotonous music starts to develop over time. The application controls how quickly this performs.

77 e.g. "At time *t* start transitioning parameter *x* to value *y* over the course of *n* seconds."

The fact that *AmbientMusicGenerator*'s parameters are directly accessible to the application opens up a further interesting perspective to couple music and interactive context. It is now possible to use any data stream to modulate one or more parameters automatically. This could be, for instance, the distance between player position and level exit, the number of non-player characters in the scene, the complexity of a puzzle, health meter, mouse cursor movement, or sensor data (e.g. light, accelerometer, microphone). Music now functions as a sonification of this input data, a Musical Auditory Display. Of course, the input data has to be preprocessed to be mapped to a musical parameter, typically by scaling the range, adapting the resolution (quantisation) and removing undesired frequency content (preventing parameter changes that are too abrupt, for example). Such a Musical Auditory Display establishes a much closer relation to player interaction and the game's diegesis. It can help to create an even more personalized player experience.

Conclusion

The omnipresence of music in video games deserves careful consideration not only with regard to its narrative role but also its implementation or, more precisely, technical integration with the games' mechanics. Nonlinear media demand likewise nonlinear music. The bandwidth of possible approaches to such an adaptive, nonlinear musical score reaches from arrangement techniques over on-the-fly alterations of its expressive performance, reharmonization, embellishment, and improvisation to generative transitions and, ultimately, real-time procedural composition.

In today's games, dynamic sequencing and mixing are well established. They can be achieved with static audio data and standard functionality that modern game audio engines typically provide out of the box. They integrate well with the established workflows of composers and game music studios. But the musical flexibility is limited to what this material offers, i.e. what has been composed and produced in advance.

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More flexibility can be attained by altering musical data in a more differentiated way, especially by generative performance, variation and transition techniques. These, however, have to stay true to the aesthetics of the pre-composed material in order to satisfy. Encouraging results have been demonstrated in Baroque and jazz style contexts. But the ideas and their current implementations are still mostly academic, prototypical and far from ready to use in commercial gaming media. Automatic adaptation of pre-composed music is a nontrivial, challenging task that needs more thorough theorisation in the coming years.

Challenging aspects of the aforementioned approaches arise from the fact that they deal with pre-composed music, typically created by human composers. Their aesthetic agenda is usually not fully formalised, if at all, which makes it hard to process their music appropriately. In the world of procedural or generative music things turn out differently. The algorithms behind this kind of music are, in fact, not only full formalisations but at the same time supply various aesthetic parameters to tune their output. Using the example of ambient aesthetics - which is highly relevant to game scoring - it has been discussed how its parameters can be modulated by game mechanics in a musically satisfying way and how its full expressive range is made accessible to game engines.

Such musical flexibility, however, does not come easily. It requires a rethinking on many levels. The composer no longer delivers temporally-fixed pieces but "musical landscapes and mechanisms". Composing and producing these has nothing in common with classical music (record) production but requires different methods and workflows. Just like interactive graphics, nonlinear music arises and develops in the moment of its performance. Hence, in the same way as real-time graphics rendering, real-time sound synthesis must become a common element of game engines, including an appropriate share of memory and processing power. At best, game developers are willing to invest development effort in a music engine capable of creating an overall coherent score and playing experience.

However, not every video game needs such musical flexibility. Game developers should ask themselves which aspects of the game they want the music to reflect and react to, how quickly they want the music to react, how much time their players are going to spend in certain scenes or game states, for how long should the corresponding music play, and ultimately, which musical approach serves their goals best without overcomplicating things.

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