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SOUNDSCAPES OF POSSIBLE MINDS

Meditational Cybernetics in Brian Eno's Ambient Music

ABSTRACT

This article contributes a media ecological approach towards relevant topics within Science and Technology Studies (STS) and Critical AI studies concerning cybernetics, the boundaries of consciousness, neural plasticity, and sensorial awareness, by way of discussing soundscapes produced in the ambient music genre. I will discuss the ways in which the ambient music framework provides potentialities of psychologically entering multimedia realms, (non)physical realms, and realms of altered states of consciousness, which creates creatives spaces of/for increased possibilities of/for the mind(s). I will examine the producer, visual (light) artist, and musician Brian Eno. I will argue that Eno's artistic philosophy and approach to the ambient music genre consists of a generative cybernetic scaffolding, within which he builds his ambient worlds and soundscapes, providing expanded non-physical spatialities that often explore possibilities of sensorial affect and perceptions of the self, increase potentialities for individual neural plasticity, and heighten cybernetic eco-consciousness. I will thus explore the ways in which Eno's ambient audiovisual media, abstract aural architectures or soundscapes, and meditations on cybernetic environmentalism allow for non-narrative psychological emancipation from the formalism imposed on the 'self' in everyday lifestyle and techno-culture. Consequently, Eno's ambient, subconscious awareness confronts viewers with contemporary and future usages and values linked to a) expanded edges and/or boundaries of synaesthesia; b) neural plasticity and notions of 'self;' and c) cybernetic questions concerning the human-machine relationship to collectivity, shared environments, and eco-consciousness.

KEY WORDS: media ecology, ambient music, cybernetics, neural plasticity, synesthesia, Brian Eno

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INTRODUCTION

The term *ambient* derives from the Latin *ambiens* for 'going around,' from *ambīre*, *ambi* + *īre,* meaning 'to go,' 'to seek,' 'surround,' 'encircle,' 'embrace.' Drawing from the Latin derivation, the term *ambient* is inherently spatial and depends on scales of circumference and/or movement within space (i.e., going, round, to go). The common usage of the term *ambient* is defined as 1) "of the surrounding area or environment;"[2] 2) "completely surrounding; encompassing;"[3] 3) "creating a certain reaction or mood, often a subconscious one, by being *where*ver people tend to be;"[4] 4) "pertaining to or noting sounds that create a peaceful and relaxed atmosphere;"[5] and, perhaps one of the more interesting new additions, 5) "pertaining to or noting close and constant social contact and communication fostered by the internet or the use of digital devices" (e.g., *"social media sites that enable intimacy and awareness"*).[6] *Ambient sound,* within media production and sound studies, "is a standard term that denotes the site-specific background sound component providing locational atmospheres and spatial information of public places."[7] *Ambient music* can be regarded as aesthetic reflections "upon their instrumentality through musical techniques, metaphors, and moods."[8] Ambient music thus "serves users as a means of relaxing, regulating mood, and fostering an atmosphere or sense of place."[9] One key contributor to the cultural-artistic usage of 'ambient music' as an emergent and referenced musical genre is the artist Brian Eno.

In *A Year With Swollen Appendices,* Eno defines ambience "as an atmosphere, or a surrounding influence: a tint."[10] He explains that his "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] In *Atmospheres as The Fundamental Concept of the New Aesthetics* (1993), Germot Böhme[12] argues that since the dawn of the age of technological reproducibility, atmospheric artistic philosophy is to be understood as the 'new aesthetics.' "That is, a general theory of aesthetic work understood as the production of *atmospheres.*"[13] Thus it comes as no surprise that ambient music, or

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[2]   Dictionary.com, s.v. "Ambient." https://www.dictionary.com/browse/ambient.
[3]   Dictionary.com, s.v. "Ambient."
[4]   Dictionary.com, s.v. "Ambient," (emphasis added).
[5]   Dictionary.com, s.v. "Ambient."
[6]   Dictionary.com, s.v. "Ambient."
[7]   Budhaditya Chattopadhyay, "Reconstructing atmospheres: Ambient sound in film and media production," *Communication and the Public* 2, no. 4 (2017): 352-62.
[8]   Victor Szabo, *Ambient Music as Popular Genre: Historiography, Interpretation, Critique* (Doctoral thesis, University of Virginia, 2015), iii.
[9]   Szabo, *Ambient Music,* iii.
[10] Brian Eno, *A Year With Swollen Appendices* (London: Faber and Faber Ltd, 1996), 296.
[11] Eno, *A Year With Swollen Appendices,* 296.
[12] Germot Böhme, "Atmosphere as the Fundamental Concept of a New Aesthetics," *Thesis Eleven* 36, no. 1 (1993): 113–26, https://doi.org/10.1177/072551369303600010.
[13] Alec Mapes-Frances, *Reading Machines: Ambient Writing and The Poetics of Atmospheric Media* (BA Thesis, Modern Culture and Media, Brown University, 2017), 11-12.

"music functioning as background, is not new to the second half of the 20th century."[14] Aligned with Böhme's timeline, the historical origins of the genre can be traced back to the early 19th century composer Erik Satie. Satie coined the generic term 'Furniture Music' in order to describe five of his minimalist, repetitive musical pieces. Furniture Music is peripheral background music, intended to be in parallel to pieces of furniture within one's spatial environment. From the 1970s onwards, the conception of background music took on an unprecedented reactionary context. Responding to the overabundance of urban noise, signal-to-noise ratio, consequences of the industrial revolution, and "electric technology in the world at large,"[15] ambient music took on the role of providing listeners a "restorative alternative to the hustle and bustle of public spaces and at the same time allows us to be aware of it, if we should want to."[16]   Within the field of media ecology, scholars have been contributing fruitful insight upon the blurring of spatial, industrial, and technological boundaries coinciding with a new aesthetics of communication. Media ecology is comprised of various angles and approaches, but broadly speaking concerns media as environments,[17] new languages of (cultural) communication,[18] the study of expanded (digital) environments,[19] and the study of the growing prevalence of "filling of our personal and environmental space with new phenomena produced by IT,"[20] multiple media formats and technological devices. As sensorial affect continues where physical spatial realms are emancipated, extended, or split, from concrete material dimensions, traces of collective consciousness are further brought into non-physical environments via dial-up connections of the human sensorium. In doing so, there has accumulatively been residue left of human sensorial affect and consciousness within the code of these non-physical environments. These traces, along with the advances in the evolution of computer-generated imagery, computer vision, unsupervised machine learning and/or deep learning methods, and digital research methods, have engendered a technological culture in which we now share our lived space with the culture of the techno-virtual. With this expansion and proliferation of multimodal technologies, discourse concerning sensorial perceptivity and sensorial affect, the

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14   Böhme, "Atmosphere."

15   R. Murray Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World* (Rochester: Destiny Books, 1997).

16   Lola San Martín Arbide, "Furniture Music for Airports: Erik Satie and Brian Eno reflect on the music that best suits everyday life" (presentation, *Proceedings of the International Conference Beyond the Centres: Musical Avant-Gardes Since 1950*, Thessaloniki, Greece, July 1-2, 2010), http://btc.web.auth.gr/.

17   Neil Postman, "The Reformed English Curriculum," *High School 1980: The Shape of the Future in American Secondary Education*, ed. Alvin C. Eurich, 160-68 (New York: Pitman, 1970).

18   Marshall McLuhan, *Understanding Media* (Cambridge: MIT Press, 1994).

19   James J. Gibson, *The Ecological Approach to Visual Perception* (New York and Hove: Psychology Press, 1986).

20   Tatyana Medvedeva, Galina Kazantseva, Albina Karpukova, Olga Serova and Lolita Bikteeva, "Media Environment as a Zone of Personal and Social Risk," *International Journal of Environmental and Science Education* 11, no. 18 (2016), 11840.

algorithmic-architectural and philosophical boundaries of cultural-logic[21] and the boundaries of consciousness by way of technological audiovisual synthesis[22] arise, including questioning possibilities of merging previously separate, distinct realms or modal objects: e.g., physical realm v. digital realm, conscious realm vs. non-conscious realm[23] and the visual realm vs. sonic realm.[24] This probing of sensorial affect and proliferation of various media inputs and architectural cultural-logic places into question notions of 'the self.' What does it mean to be an individual within/or a collective? A human or a non-human? An organized system of control or a system of chaos? Is the notion of 'self' comprised as natural or artificial, and to what extent does self-agency play a role? Consequently, cybernetics from a developmental and cultural-logical standpoint becomes equally relevant as cybernetics from a control system and/or "control societies"[25] perspective. In other words, how are subsequent generative processes enacted after the birth of cybernetic systems? How can we view the human-like evolutionary generative growth of consciousness in the nonhuman agent? How does the role of sensorial awareness reconfigure realms of (possible) consciousness? Consequently, this becomes a feedback-loop based questioning that concerns notions of how we view consciousness (natural or artificial), and how we view our human selves in non-human spaces, algorithmic-architectures and/or digital habitats–and vice versa.

In this paper, I offer various angles to address some of these questions through examination of the artistic philosophy of the visual artist and musician Brian Eno, a key and prolific contributor to the generic body of ambient music. I aim to outline the ways in which Eno's re-blending of various media formats, states of attention and/or consciousness, and multimedia, generative methods by way of modulation, situates itself within a cybernetic framework. Within this framework, examination of the expansive role of atmospheres, sensorial affect and neural plasticity occurs as a meditational cybernetic feedback loop between spaces of the mind (i.e., consciousness), spaces of the self, and spaces of the environment (real or virtual). I will examine how Eno's music offers minimalist approaches with meditative characteristics and/or the spontaneous, generative nature, which gives way to feedback of new atmospheric aesthetics, expanded spatiality, and expanded

[21]   Luciana Parisi, *Contagious Architecture: Computation, Aesthetics, and Space* (Cambridge: MIT Press, 2013).

[22]   Meera Raghu, "A Study to Explore the Effects of Sound Vibrations on Consciousness," *International Journal of Social Work and Human Services Practice* 6, no. 3 (2018): 75-88, doi: 10.13189/ijrh.2018.060302; Jacquelyn Allen-Collinson, Gareth McNarry and Adam B. Evans, "Sensoriality, Social Interaction, and Doing sensing," *Physical–Cultural Ethnographies. Journal of Contemporary Ethnography* 50, no. 5 (2021) 599–621, https://doi.org/10.1177/08912416211014266.

[23]   Jonathan Weinel, *Inner Sound: Altered States of Consciousness in Electronic Music and Audio-Visual Media* (New York: Oxford University Press, 2018), https://doi.org/10.1093/oso/9780190671181.003.0002.

[24]   Michael Kubovy and Michael Schutz, "Audio-Visual Objects," *Review of Philosophy and Psychology* 1 (2010): 41-61, doi: 10.1007/s13164-009-0004-5.

[25]   Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (1992): 3-7, http://www.jstor.org/stable/778828.

consciousness and consequently plasticity of the mind and cognition. Specifically, this will shed light on how neurological and/or biological cybernetic feedback systems relate to a *new aesthetics of atmospheres* as potentialities to transform prior conceptions of *the self* and human-nonhuman cohabitation and sensorial collectivity.

AURAL ARCHITECTURES AND SYNAESTHETIC SPACE

Brian Eno's collection of generative Ambient Music, e.g., *Discreet Music* (1975), *Ambient 1: Music for Airports* (1978), *Ambient 2: The Plateaux of Mirror* (1980), *Ambient 3: Day of Radiance* (1980), *Ambient 4: On Land* (1982), *Apollo* (1983), *Thursday Afternoon* (1985), *Neroli* (1993), *Mixing Colours* (2020), *The Pearl* (1984), can be considered as an ambient music genre emerging out of what has been termed "music for peripheral attention."[26] For Eno, ambient music is a genre that is minimal yet also "far from passive"[27] listening. Eno states: "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."[28] While many other predecessors and additional alternative histories of minimal, meditative ambient music exist prior to Eno, he stands unique in that he "did so overtly, setting out a manifesto to deliberately write ambient music, and in doing so established a new genre."[29] Eno explains, his explicit "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."[30]

Emerging with this new language of aesthetic communication (i.e., new aesthetics of atmospheres) "is a major paradigm,"[31] that predominantly concerns the role of *synaesthetic audiovisual artworks*. The term *synaesthetics* derives from the Greek *syn* + *aesthesia*. The Greek *syn* means 'together' and *aesthesia* (*aísthēsis*) means 'perception from the senses,' which, due to the "influence exerted by Baumgarten's *Aesthetica* of 1750, came to denote 'sensory knowledge.'"[32] "Synaesthesia is also a medical term to define a neurological condition where a fusing of sensations occurs when one sense is stimulated which automatically and simultaneously causes a

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[26] John Lysaker, "Turning Listening Inside Out: Brian Eno's Ambient 1: Music for Airports," *The Journal of Speculative Philosophy* 31, no. 1 (2017): 155–76, https://doi.org/10.5325/jspecphil.31.1.0155.

[27] Lysaker, 162.

[28] Lysaker, 170.

[29] Rupert Till, "Ambient Music," *Bloomsburg Handbook of Religion and Popular Music,* ed. Christopher Patridge and Marcus Moberg (London and New York: Bloomsbury Publishing, 2017), 323-37.

[30] Eno, *A Year With Swollen Appendices,* 296.

[31] Gene Youngblood, *Expanded Cinema: Fiftieth Anniversary Edition* (New York; Fordham University Press, 2020), 76.

[32] M. Beatrice Fazi, "Digital Aesthetics: The Discrete and the Continuous," *Theory, Culture & Society* 36, no. 1 (2019): 3-26, https://doi.org/10.1177/026327641877024.

stimulation in another of the senses."[33] Synaesthesia is thus taken to be a solely perceptual phenomenon, "such that a sensory stimulus of one modality elicits an additional perception in the same or another modality."[34] Consequently, synaesthetic artworks are typically created to invoke sensorial neurological effects through experimentation with visuals, sounds, and spatiality. However, while they are composed of a wide array of multimedia elements, "it is conceived and edited as one continuous perceptual experience."[35] A synaesthetic audiovisual artwork is thus, in effect, an act of continual transformation: metamorphosis. In *Expanded Cinema* (1970), Gene Youngblood deems this concept as a new means of communication or aesthetic language that consists of a universal rhythmic flow and balance of the cosmic consciousness. Youngblood writes, "it's a process of becoming, man's ongoing historical drive to manifest his consciousness outside of his mind, in front of his eyes."[36] Synaesthetic artworks are, he deems, "a space-time continuum, a mosaic simultaneity," which invokes the continuous perceptual experience of the fusing of various senses and images into one unifying force, a continual process of being a closed 'set' consisting of a multitude of relationships. In turn, all-immersive sensorial experience becomes capable of creating a synaesthetic experience by way of affect and sensory-motor contingencies.[37] Consequently, inducing a primarily sensory-motor affection-image in which perception "is no more in the sensory centres than in the motor centres; it measures the complexity of their relation."[38] This new aesthetic has contributed to blurring concrete borders and sensorial boundaries that are typically affiliated with various differing media formats (visual, audial, haptic, etc.). The spatial expansion of filters, notes, temporalities, levels of synaesthesia and freedom or scales of circumference are the keys to providing increased potential for expanded (psychological) movement. Once one enters these kinds of immersive synaesthetic soundscapes or aural environments, "the division between media and real world has dissolved."[39] Rather than a broken surface of spatiality and objects, these ambient soundscapes build abstract homogenised fields of connecting vaporous energies. In this synaesthetic sense, the use of rhythm, movement, and soundscapes structures serve to provide the setting and space for psychological liberation and sensorial emancipation as well the exploration of the merging of the audio, visual, and nature of spatial movement (i.e., ambient, *ambiēns, ambīre*).

[33]   Josephine Machon, "Defining (Syn)aesthetics," in *(Syn)aesthetics* (London: Palgrave Macmillan, 2009), https:// doi.org/10.1057/9780230236950_2.

[34]   Aleksandra Mroczko-Wąsowicz and Markus Werning, "Synesthesia, sensory-motor contingency, and semantic emulation: how swimming style-color synesthesia challenges the traditional view of synesthesia," *Frontiers in Psychology* 3 (2012), https://doi.org/10.3389/fpsyg.2012.00279.

[35]   Youngblood, 86.

[36]   Youngblood, 81.

[37]   Mroczko-Wąsowicz and Markus Werning, "Synesthesia."

[38]   Gilles Deleuze, *Cinema 1: The Movement-Image* (London and New York, Bloomsbury Press: 2013), 72.

[39]   Tony Oursler, "System for Dramatic Feedback," for exhibition: *Video Spaces: Eight Installations* (New York: The Museum of Modern Art, June 22 - September 12, 1995), https://www.moma.org/ interactives/exhibitions/1995/videospaces/oursler.html.

Eno's approach towards growth and generativeness within abstract soundscapes and structures is an inherently spatial concept. Eno asserts that with concerns to the genre of ambient music, for himself and his collaborators, "immersion was really the point: we were making music to swim in, to float in, to get lost inside."[40] For Eno, the generativeness of synaesthetic ambient music is "a way of searching a musical space that [he] wouldn't do [so by] using just his musical taste, as one's taste tends to propel [one] into the same *area* over and over again."[41] The generative nature of randomness, is a *tool* for Eno to exploit in order to take him somewhere different: "you're taken somewhere you didn't expect to go."[42] While in the studio, Eno claims that his favorite effect to create these immersive soundscapes is the Low Pass Filter, which takes off/out all of the high frequencies. He asserts that this filter has "an amazing psychological effect" for him in that "it creates scale, distance, warmth, and a weird sort of intimacy"[43]–thus perhaps resonating with the most recent addition to the definition of the term 'ambient', i.e., "pertaining to or noting close and constant social contact and communication fostered by the internet or the use of digital devices."[44] In his exploratory framework, concerning the (non)boundaries of space within artistic practice, Eno argues that there are two kinds of artists: the farmer and the cowboy. The farmer "wants to find a piece of territory and fully explore it and exploit it" (e.g., Piet Mondrian), whereas the cowboy "just wants to find somewhere new, the next frontier, the next territory."[45] Eno classifies himself as belonging to the second category, and this becomes crystallised in the collaborative album *Apollo: Atmospheres and Soundtracks* (1983). The soundtrack was made for the 1989 documentary film entitled *For All Mankind* by Al Reinart. The film consists of archived documentation that Reinart stumbled upon within the NASA archives, consisting of over six million feet of footage taken during the Apollo moon landing mission. Reinart ventured on delving through the footage in order to sculpt the film and, in doing so, he reached out to Eno in hopes of a soundtrack collaboration. Eno declares that the soundtrack works specifically well for this film due to the "long periods" of nothingness, but nothingness that is not static but rather in a state of "floating."[46]

In the making of the *Apollo* soundtrack, Eno discovered that the astronauts who took the Apollo flight were able to take one cassette with them each and found that, overall, the majority brought country music: music of the frontiers. Eno explains how this notion surprised yet excited him in the idea that "to do space music that's a really expanded psychedelic version of country and western music."[47] One of the album's most concrete representations of this is the track *Deep Blue Day*. Album

40   Eno, *A Year With Swollen Appendices*, 294.
41   Brian Eno, *Brian Eno: The Innovator*, interview by Rick Rubin (The Broken Record Podcast, Pushkin Industries: Podcast & Audiobook Production Company, 2021) (emphasis added).
42   Eno, *Brian Eno*, 2021.
43   Eno, *Brian Eno*, 2021.
44   Dictionary.com, s.v. "Ambient."
45   Eno, *Brian Eno*, 2021.
46   Brian Eno, "Brian Eno on Apollo," Noisey, September 23, 2019, video, 14:39, https://www.youtube.com/watch?v=WTxkLGBkcO0&ab.
47   Brian Eno, "Brian Eno on Apollo."

collaborator and musician Daniel Lanois explains the track as a sort of "mantra" piano part created by Roger Eno, that is "the constant of the sky."[48] The mantra piano piece was further produced, extended, and temporally elongated via added effects by both Brian Eno and Lanois, creating an extension of depth in time and space. Lanois explains that while the effects of reverb on their own typically aren't so interesting as "you can think of them as a one-dimension, by introducing a voltage control oscillator, dividing octaves, and having repeat echoes, then you start getting into more harmonic collisions."[49] Consequently, Eno's aural atmospheres act as "strange, borderless, unlocalizable 'auras' or 'ambiences,' 'affective powers of feeling 'and 'spatial bearers of moods.' [50]

Associations concerning the in-betweeness of both space and mind can be found within the concept of *liminality* or what anthropologist Victor Turner calls *liminal zones.* Liminal zones are "ambiguous but potent spaces of transformation and threat that lie at the edge of cultural maps" as places where "the self finds itself beyond the limits of its own horizons."[51] The word "liminal" comes from the Latin word *limen,* "which means threshold or doorway, places that are simultaneously both and neither, in the same way that the doorway is part of both rooms and yet is also neither room."[52] In her book *Liminal Dreaming: Exploring Consciousness at the Edges of Sleep* (2019), Jennifer Dumpart furthers the use of this phrase to describe the states that consciousness goes through in hypnogogia and/or hypnopompia. Hypnogogia derives from the Greek words *hypnos* for 'sleep' + *agōgos* for 'leading, to go towards, draw out or forth, move.'[53] While the terminology of hypnagogia clearly has direct relationship to the spatial definition of ambient (i.e., go around, go towards), further parallels prevail. In relation to the etymology of the term 'liminal' as a doorway, Eno expands on the ways in which the genre of ambient music serves as exploration after unlocking the doorway that is part of both rooms and yet is also neither room:

> All the musical experiences that have had an important effect on me have prompted the same feeling, of being faced with this strange connection of familiarity and mystery embodied in the same source, as if a door has unlocked into a whole universe of feeling that exists somewhere deep inside. It's the feeling of being awake, rather than automatic. You get hooked on that feeling, everybody who has once felt it wants it for the rest of their lives.[54]

Thus, thinking of the ambient space, of the in-between, "as not just a phase through

[48]   Daniel Lanois, "Brian Eno on Apollo," Noisey, September 23, 2019, video, 14:39, https://www.youtube.com/watch?v=WTxkLGBkcO0&ab.

[49]   Lanois, "Brian Eno on Apollo".

[50]   Mapes-Frances, *Reading Machines,* 11.

[51]   Erik Davis, *TechGnosis* (Berkley: North Atlantic Books, 2015), 8.

[52]   Jennifer Dumpert, "The Practice of Liminal Dreaming: Consciousness at the Edge of Sleep," *Kosmos Journal for Global Transitions* (2019), https://www.kosmosjournal.org/kj_article/91136/.

[53]   Online Etymology Dictionary, s.v. "Hypnogogia."

[54]   *Imaginary Landscapes,* dir. Gabriella Cardazzo and Duncan Ward (London: Eyeplugin Media Corporation, 1989).

which to travel but as destination of its own offers new ways to see and understand the many liminal zones of the world."[55]

MEDITATIONAL CYBERNETICS, NEURAL PLASTICITY, AND THE SELF

The *Apollo* film soundtrack, simultaneously serving as an ambient soundscape creation that provides expanded spaces for the sensorial mind, can be highly credited to the contribution of Brian Eno's brother, Roger Eno. Roger Eno's career background is in music therapy for a psychiatric ward, meaning that he "was looking at music not purely as entertainment, it was also on a physiological level, basically what it did to moods."[56] This approach to music as therapy for psychological behavior states and/or moods consequently raises questions concerning the relationality between neuroscience[57] and the humanities. Specifically, "human responses to music may be viewed through a neuroscience lens with increasingly sophisticated neuroimaging technology, providing neurological and biomedical measures of psychological states."[58] Ksenia Fedorova[59] asserts that "analytical tools applicable to broader humanistic research"[60] can be found in the ways neural plasticity and cybernetic feedback serve and/or act. Neuroplasticity is defined as the processes with which "the brain, as the source of behavior, adapts its architecture and functions to perform new tasks[.]"[61] Fedorova examines the possibility of relationality, "[t]he initial connections within cybernetics between computational and cognitive sciences [that] have proven their implications for psychology and wider social sciences" alongside "the studies of plasticity within neuroscience [that] have stimulated discussions in the humanities about the political and ethical connotations of the brain's ability to repattern itself."[62] For instance, she explains, "as acknowledged by Catherine Malabou, the adaptive and relational nature of neuronal structures (e.g., Spike-Timing-Dependent Plasticity, or STDP) may be instrumental in the transformation of the conception of the self as a fixed entity towards understanding of it as fluid and plastic, with a potential for

[55]   Dumpert, "The Practice of Liminal Dreaming."

[56]   Roger Eno, "Brian Eno on Apollo," Noisey, September 23, 2019, video, 14:39, https://www.youtube.com/watch?v=WTxkLGBkcO0&ab.

[57]   Michael H. Thaut, Gerard Francisco and Volker Hoemberg, "The Clincal Neuroscience of Music: Evidence Based Approaches and Neurologic: Music Therapy," *Frontiers in Neuroscience* 15 (2021): 1-2, https://doi.org/10.3389/fnins.2021.740329; Michael Thaut, Gerald C. McIntosh and Volker Hoemberg, *Handbook of Neurologic Music Therapy* (Oxford: Oxford University Press, 2014).

[58]   Julian O'Kelly, "Music Therapy and Neuroscience: Opportunities and Challenges," *Voices* 16, no. 2 (2016), https://doi.org/10.15845/voices.v16i2.872.

[59]   Ksenia Fedorova, "Plasticity and Feedback: Schemas of Indetermination in Cybernetics and Art" (presentation, Proceedings of the 22nd International Symposium on Electronic Art ISEA, Hong Kong, 2016).

[60]   Fedorova, "Plasticity and Feedback."

[61]   Alicja M. Olszewska, Maciej Gaca, Aleksandra M. Herman, Katarzyna Jednoróg and Artur Marchewka, "How Music Training Shapes the Adult Brain: Predispositions and Neuroplasticity," *Frontiers in Neuroscience* 15 (2021): 1-2, https://doi.org/10.3389/fnins.2021.740329.

[62]   Fedorova, "Plasticity and Feedback."

creativity and freedom."[63] But then, what exactly does this potential freedom for creativity entail? And in what way can this be linked to audiovisual soundscapes' relation to neural plasticity? Or, "What is the difference between existing in potential and in actuality and how does it matter for thinking about plasticity, self-organization, and the "self"/ "subject" itself?"[64] As musician Clair Boucher (Grimes) argues in a recent interview, exploring new sounds and/or music can potentially increase one's neural plasticity and broadens one's conceptual scope, which is growing in imperativeness within our increasingly complex, automated-driven, technological environment.

A key aspect to the safe exploration of the boundaries of consciousness and openness towards exploration of the liminal, non-narrative mind involves providing a comfortable space for one to *surrender*. Brian Eno explains that ambient music was intended as a radical way to make "comfortable" music, music in which one doesn't have to be on the defensive (e.g., punk, rock and roll, etc.). Namely, allowing one the ability *to surrender* instead of *to defend against*. Eno further explains the context of 'to surrender' being "where we achieve transcendence or ecstasy," letting go of control and surrendering. He argues that in order to produce a tranquil transcendence of surrender, music must be made to allow the expanded safe space for psychological freedom. He argues that "if you make music that doesn't direct people too much as to what to think, it turns out that people have very fertile and creative imaginations."[65] As argued by visual artist Roy Ascott, understanding Eno's work falls into a recognition of his "aesthetic of surrender and meditation" that flows "from a process of removal of the Self from reflection, toward a quiet celebration of uneventfulness."[66] However, while Ascott and Eno both stress the core values of meditation, mantra, and surrender in Eno's ambient-based artistic philosophy, there is yet another component that the two assert: the theory of cybernetics.

Brian Eno's re-blending of various media formats, states of attention and/or consciousness, and multimedia, generative methods by way of modulation, situates itself within a cybernetic framework. Namely, the nature of cybernetics can be explained most simplistically as *cycle interlocking with cycle to create dynamics*. Cybernetician and artist Roy Ascott explains that Eno was the first of his students "to understand that cybernetics is a philosophy, and that philosophy is cybernetics."[67] In his own words, Eno states, "cybernetics is the science of organization. Cybernetics shows you how to organize systems too complex to understand, to deal with a world too complex to understand. The function of art is to create conceptual disorientation. Good art breaks rules. It forces people to either accept disorientation or to retreat. If

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63   Fedorova, "Plasticity and Feedback."
64   Fedorova, "Plasticity and Feedback."
65   Eno, "Brian Eno on Apollo."
66   Roy Ascott, *Brian Eno: Visual Music,* ed. Christopher Scoates and Will Wright (San Francisco: Chronicle Books, LLC, 2013).
67   Ascott, *Brian Eno.*

they retreat from life as they do from art, they eventually come to live in the past."[68] In terms of cybernetic tradition, Eno finds that it was British theorist and cybernetician Anthony Stafford Beer who ignited the systems-thinking flame in his own artistic philosophy. Eno states, "[Beer's work] so fundamentally changed the way that I thought about music that it's very difficult to translate into individual things, it just changed the whole way I work...Stafford [Beer] for me was the doorway into a whole way of thinking."[69] As worded by sociologist, philosopher, and historian of science Andrew Pickering, what Eno "learned from Beer was to make this cybernetic insight explicit and the center of his future musical development."[70] Namely, Eno's ambient music "can be understood as ontological theater and help us to see where a cybernetic ontology might lead us when staged as music."[71]

Inversely, Beer's approach to cybernetics draws significant parallels to the mantra-like piano hook expanded in Eno's *Deep Blue Day* track. However, while meditative and mantra-esque, Beer typically gravitated towards the (mental) imagery rather than sonics. As Pickering explains, "Beer's style of meditation involved visual images. He both meditated upon images–mandalas, otherwise known as mantras– and engaged in visualisation exercises in meditation. In the tantric tradition this is recognized as a way of accessing a subtle realm of body, energy, and spirit."[72] Consequently, Beer developed "a cybernetic rhetoric for smuggling all sorts of positive spiritual knowledge past the ontology of unknowability,"[73] which resulted in applying a reciprocal relationship between meditation and technology. Namely, Pickering explains that Beer used "meditation as a technology of the non-modern self, aimed at exploring regions of the self as an exceedingly complex system and achieving "altered states of consciousness."[74] This principle of external necessity,[75] this "notion of de-centering the self"[76] was to be the psychological, spiritual, and social goal and can be understood as "the model of *interacting* homeostats."[77] The characteristic of *interaction* is naturally also stressed upon by Eno as being a core value to his artistic method:

> I like systems that make use of the brain, the watcher's brain, as a process. The notion they are not being a quality of things, but the name of a type of

[68]   Brian Eno, "Four Conversations with Brian Eno, Interview with Frank Rose," *The Village Voice*, March 28, 1977, https://www.frankrose.com/reporting/four-conversations-with-brian-eno/.
[69]   Andrew Pickering, *The Cybernetic Brain: Sketches of Another Future* (Chicago: University of Chicago Press, 2010), 302.
[70]   Pickering, 306.
[71]   Pickering, 307.
[72]   Pickering, 293-94 (figure details changed).
[73]   Pickering, 291-92.
[74]   Pickering, 293.
[75]   *Principle of external necessity* is an artistic philosophy affiliated with the German Expressionist movement, defined as an aesthetic style intended "to escape from the internal necessities of our individual existence and to create pure art, free from human tragedy, impersonal and universal." Herbert Read, *A Concise History of Modern Painting* (London: Thames and Hudson Ltd, 1974), 194.
[76]   Pickering, 294.
[77]   Pickering, 244 (emphasis added).

interaction between you and something, or you and an event." / "If you start thinking of it as an interaction, it frees you from a lot of aesthetic problems.... You don't have to decide if something *is* or *isn't* art.[78]

Eno's inherent interactivity with(in) 'the event' is reminiscent of Alfred North Whiteheads's[79] conceptual framework of the experiential nature of the universe and that a person is comprised of a continuum of overlapping events and processes of becoming. This notion of the 'event' as key has become a core concept for new media theory in the affective turn or re-emergence of affect.[80] As M. Beatrice Fazi eloquently explains, from this particular affective standpoint, "the digital can be interwoven or associated with its material structure as long as it enters into the composition of relations and distributions of virtual potentials."[81] The affective turn within new media theory thus "focuses on the modes in which this composition is possible and becomes 'lived' in occasions."[82] Interaction and the event within an affect theory framework thus give pointers to the ways ambient atmospheres and cybernetics afford affective mapping and re-mapping that proactively poeticises relationality and potentiality. Or, as Cláudia Martinho phrases it, ambient aural architectures induce creative approaches that tend towards an "ecology of affect."[83] Overall, this discourse consists of analysis of an emerging co-habitation between the non-human yet human agent and/or man-made co-habitation with a humankind. In other words, the ways in which we interact, build, and modulate both human and artificial consciousness must be done so in tandem with critical self-reflection upon the complexity and chaos that these contributions will instigate and/or bring to the events composing the weaved strings and matrices comprising the cybernetic feedback loops.

NETWORKED ANIMISM AND ECO-CONSCIOUSNESS

The framework for thinking of human consciousness vs. artificial consciousness with concerns to perception, *qualia*, and spatial representations is a collective-based cybernetic one. Contemporary discourse surrounding interpretability, interoperability, and politics of hidden layers (or hidden layer maps) in neural

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[78]   Eno, *Imaginary Landscapes.*

[79]   Alfred North Whitehead, *Process and Reality* (New York: The Free Press, 1979); Alfred North Whitehead, *Modes of Thought* (New York: Free Press, 1968).

[80]   Affect theory, see more: Deleuze, *Cinema 1: The Movement-Image*; Erin Manning, "Always More Than One: The Collectivity of *Life*," *Body & Society* 16, no. 1 (2010): 117–127, https://doi.org/10.1177/1357034X09354128; Brian Massumi, *The Politics of Affect* (Cambridge and Malden: Polity Press, 2015); Lauren Berlant, *Cruel Optimism* (Durham and London: Duke University Press, 2011).

[81]   Fazi, "Digital Aesthetics."

[82]   Fazi, "Digital Aesthetics."

[83]   Cláudia Martinho, *Aural Architecture Practice: Creative Approaches for an Ecology of Affect* (Doctoral dissertation, Goldsmiths, University of London, 2018), doi: 10.13140/RG.2.2.27207.96166.

networks, specifically concerning the representation of features,[84] can be seen in equation to the processing steps of cognition, of the 'logistics of perception'[85] for human cognition and memory. Moreover, an accurate representation of features depends on structures and location of features, or rather proximity of features, upon the spatial grid. Consequently, the infrastructure depends on abstract structures, architectures, and proximity within space. Moreover, as neural network machine learning methods primarily work off the management of distributed representations, this comes down to the capabilities of discerning context. This then, is primarily concerned with the question of consciousness in various agents: ability to recognise representations of *states* versus representations of *qualia* is thus a core demarcation of conscious agents. Namely, *qualia* is that which is a sensational quality that emerges as 'perceived sensations' in the viewer, listener, and/or experiencing subject, as opposed to being connected to an object's characteristics.

Eno recognizes the experiential nature of 'perceived sensations' and the systematic method inherent in various mass-scale behaviours of humans. He finds this thought most clearly illustrated within the inner-workings of an (American) metropolitan city. He terms this phenomenon as *Edge Culture,* derived from Joel Garreau's book *Edge City* (1991) which "proposes that the life of cities has shifted from the traditional centres to the edges—so that, instead of a centre from which everything flows and to which everything is related, there are now cities which are actually strings of new, active, local centres disposed around the empty, now-dead old centre."[86] Eno explains that now, we see,

> a broad and dense field of cultural objects connected very, very richly - with lines going every which way depending on who you are and where you stand and what you're looking for anyway. . . . This is the key idea. If you abandon the idea that culture has a single centre, and imagine that there is instead a network of active nodes which may or may not be included in a particular journey across the field, you also abandon the idea that those nodes have absolute value. Their value changes according to which story they're included in, and how prominently.[87]

Eno further declares that this Edge Culture is the closest he can get to explorations of animism. Namely, the initial idea "where ambient music comes from was this idea of making music that had a soft edge that blended into the rest of the world" so that, "the music can invite in more of the rest of the world," "it draws it in and that becomes part of the composition as well."[88] Eno compares the genre of algorithmic, generative

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[84] Omid Bazgir, Ruibo Zhang, Saugato Rahman Dhruba, Raziur Rahman, Sauparno Ghosh and Ranadip Pal, "Representation of features as images with neighborhood dependencies for compatibility with convolutional neural networks," *Nature Communications* 11, no. 4391 (2020), https://doi.org/10.1038/s41467-020-18197-y.

[85] Paul Virilio, *The Vision Machine* (London: BFI Publishing, 1994).

[86] Eno, *A Year With Swollen Appendices,* 327.

[87] Eno, 328.

[88] Eno, *Brian Eno.*

music to placing (or 'planting') "compositional 'seeds' provided by the composer"[89] that are then to be grown generatively. Unsurprisingly, "[f]eedback, communication and control were the central interests of cybernetics; and one of the main goals of comparison of these processes in living organisms, machines and organizations was to reveal the capabilities for learning and self-management."[90] Eno's methods and approach engender the nonhuman, machine, urbanised world, not contained in a little capsule tidied off from the rest of the world, or serving as a kind of sensorial overload, but rather somehow blended into it, into the rest of the world. This networked architecture of nodes, edges, and human-nonhuman philosophies quickly finds parallels to contemporary discourse on new media theory and digital research methods concerning data and media networks, architectures and technologies.[91] The evolution of the communications network alongside the increasing complexity within and throughout various new media technologies is expanded and interfaced within a synthetic, ecological as well as psych-sociological scale. Namely, akin to machine learning methods of distribution representations, data collection, and nodes within data visualizations: findings, genres, generalisations, etc. are purely based in a framework of perception, prior conceptions and circumference of expanded scope rather than necessarily looking at the *actual centre.* In relation to edge culture, connecting the nodes and seeing meaning thus depends on context, on the perceptual parameters: who you are, where you stand, and what you're looking at. Regardless of which context, ecological or technological, this perceptual argument stands as feedback into our environment (natural, artificial, intra-personal), thus finding immense and pressing relevance to contemporary discourse surrounding collectivity, consciousness, identity and ecological awareness.

CONCLUSION

The nature of cybernetics can be explained most simplistically as *cycle interlocking with cycle to create dynamics.* One way in which this can be produced sonically is through Eno's generative approach to ambient music. This interlocking of cycles parallels the notion of networked selves. Networked selves is distinctively the marker that makes the difference between contemporary art consciousness to that of the early modern era: awareness of roots, ethnicities, assemblages, relationality (personal, social, environmental, etc.), and increasingly the notion of hybrid identities. Consequently, feedback that is based on technical interfaces gives back unnatural versions of ourselves that we begin to process, perform, internalise and implant in the notions of the 'self.' Thus, not only is the collective consciousness growing in the context of natural and/or artificial identities but also in relation to the

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[89]   Eno, *A Year With Swollen Appendices*, 331.
[90]   Fedorova, "Plasticity and Feedback," 51.
[91]   Tomasso Venturini, Mathieu Jacomy and Pablo Jensen. "What do we see when we look at networks: Visual network analysis, relational ambiguity, and force-directed layouts," *Big Data & Society* 8, no. 1 (2021), https://doi.org/10.1177/20539517211018488.

overall and/or overarching conceptions of "natural" and "art-ificial." Moreover, ambient music's entering and expanding of the realm of space and mind (e.g., the liminal space) illustrates possibilities for psychological expansion in relation to how electronics, the digital, non-physical, programmability has overarching effects yet also is driven by agential co-existence. By exploring synaesthetic atmospheres as meditational/meditations on cybernetics, the notions of 'self' as well as human-to-human *and/or* human-to-nonhuman collectively arise within listeners, providing a space for sensorial exploration, agency, and possibilities. Eno's generative ambient music genre offers meditations on cybernetic environmentalism, which allows for non-narrative psychological emancipation from the formalism imposed on notions of the 'self' within our hyper-increasing techno-culture. By providing an abstract (mental) space to disassociate from the urban technological and industrial noise, by way of generative forms of electronic music, Eno provides the listener an alternative relationship to technology, the environment, animism, and spatiality of one's own mind.

Within such atmospheres and aural architectures, questions posed include: How can this temporal and medium-based immaterial shift relate to contemporary discourse concerning a technogenetic perspective? How do digitally expanded realities relate to our biological and genetic changes, to perceptual experiences that are linked directly with our biological nervous system and to neuro-bio-feedback systems? And, if the "screen acts a consciousness,"[92] what does this shift infer with concerns to the evolution of the human mind, brain, and consciousness? How do these artistic philosophies and process re-orient the collective "changes in the manner of sense perception,"[93] whereas *and/or*[94] in directly contrasting temporality other than that of the content genres associated with contemporary new media (devices)? In other words, can the typical 'non-slowness' of new media audiovisual content perhaps be seen as contributing to a collective "change in the manner of sense perception" towards a global culture/society of non-reflection and increasing inability to tap into personal, creative, and/or spiritual thinking? Is there thus a desire to go backwards on the technological timeline and subtract, or perhaps simply pause from the never-ending chase to the next new technological advancement? Perhaps now, it becomes increasingly necessary in order to reflect, re-orient, meditate, and transcend on both levels of the personal-creative as well as on technologically-induced changes in the contemporary, global collective-consciousness as the boundaries between signal-to-noise, media formats, technogenetics and artificial consciousness continue to blur. ◙

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[92]   Deleuze, *Cinema 1: The Movement-Image*, 24.

[93]   Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction* (London: Penguin Books, 2008), 8.

[94]   Youngblood, 82.

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