SILICEOUS: SPECULATIVE MIMESIS AND THE GRAIN OF THE DIGITAL AUDIO WORKSTATION

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ABSTRACT

Siliceous is an electronic composition by the author exploring two related practices. Firstly, it explores a sonic practice the author denotes as speculative mimesis, understood as the construction of notional soundscapes. Secondly, it explores the unique material conditions of the digital audio workstation (DAW), a software application ubiquitous in the creation of recorded music but rarely explored in its own right. Taking a hypothetical subterranean ecosystem as the subject of the composition, it was found through rge composition of *Siliceous* that employing techniques from electronic dance music, among other novel techniques, explored both the limitations of speculative mimesis and the material conditions of the DAW simultaneously. These findings refute R. Murray Schafer's concept of the hi-fi soundscape, making clear how constructed and illusory this kind of soundscape is despite its privileged status in the acoustic ecology community.

1. INTRODUCTION

Siliceous[1] is an 8-minute, 26-second electronic work created during an artist residency in Ólafsfjörður, Iceland. It is the final track on my album, *Thru* (2017). It explores two related concepts: a sonic practice I call speculative mimesis, and a framework developed as part of my doctoral thesis (forthcoming) called *the grain of the digital audio workstation*. The former describes the compositional techniques of creating soundscapes inspired by natural ecosystems, with a relatively high degree of realism despite being ultimately fictional and speculative. The latter describes the sonic effects that infer the unique material conditions and practices pertaining to the digital audio workstation (DAW), and thus develops analytical strategies for situating the DAW, DAW-based music and its practitioners within historical and cultural context. These two concepts, as realised in *Siliceous*, are symbiotic. After providing more context and points of reference for the piece, I describe each of these concepts in greater depth, before reflecting on how they were explored through the composition of *Siliceous*.

2. BACKGROUND

Siliceous stemmed from a persistent compositional idea I'd been wanting to explore for several years but didn't have the time or technical skill to achieve until 2016. I was interested in creating a kind of cracked, dry, splintered electronic music derived from soundscape compositions and musical evocations of landscape (Weiss 2008). The musical works that dealt with landscape that I loved, a prime example being Richard Skelton's *Landings* (2009), didn't reflect my own experience of landscape in the occupied Nyoongar nation of south-west Australia. I felt that simply transplanting European evocations of landscape into an Australian context would replicate colonial narratives. The film *Picnic at Hanging Rock* (McElroy and Weir 1975) is a prominent example of such depictions—it utilises the trope of the young white woman lost in an apparently inhospitable Australian landscape, understood by Elspeth Tilley to be "a marker of innocence that signals the settler as *not* savage and, therefore, as entitled to occupy the land" (Tilley 2009, 38). *Picnic* also evokes the notion that the landscape is sentient and supernatural, and this is evoked prominently through sound design. Thick, bassy rumbles accompany sweeping images of Hanging Rock and its surrounds, the implication being that the land is stirring or awakening. The use of bass-heavy noise to denote large or geological entities is a persistent sound design choice in film, games, and theatre, and I was interested in exploring alternative sonic impressions that evoked landscape as a site of multiplicity and heterogeneity rather than one giant, all-encompassing entity.

Between September and October I was involved in an artist residency with five other sound artists at Listhús í Fjallbyggð[2] in Ólafsfjörður, Iceland, as part of the one-off Norðanvindur Sound Art Residency and Festival. Ólafsfjörður, with a population of about 800, is located in the mouth of a fjord and surrounded by imposing hills. Landslides and avalanches occur frequently. I had many discussions with Icelanders about 'the big one,' the overdue eruption of Katla, Iceland's largest volcano. These conversations suggested a hushed reverence for the landscape, often understood as a living entity, part of a folkloric Icelandic tradition of animism. These

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[1] https://michaelterren.bandcamp.com/track/siliceous

[2] http://www.listhus.com/

characteristics affect the lived experience of Icelandic people in palpable, sometimes violent ways. A goal for this piece was thus to make an impressionistic, speculative soundscape of the subterranean, one that evoked these anxieties and tensions arising from human cohabitation with this environment.

Siliceous also stems from observations about current trends in experimental electronic music and electroacoustic music, two stylistic traditions in which I situate my practice. The technical vocabulary of my practice is almost exclusively mediated by the DAW; I spend many hours a day using DAWs in compositional and other professional contexts. Despite its centrality in the practices of many electronic musicians and audio engineers, there is a dearth of work that critically interrogates the DAW's status as a near-ubiquitous mediator of sound and music today. In fact, especially in this decade, there has been a trend towards production techniques that explicitly *hide* the fact that the music was made in a DAW. These techniques include using tape- or vinyl-emulating plug-ins, or using traditionally analogue styles of synthesis, such as subtractive synthesis with classic waveforms.

I wanted to explore compositional techniques that brought the DAW's unique characteristics to the foreground, and in doing so, implicate and problematise DAW-based music production. I will now explore each of these ideas in greater detail, before describing their application in *Siliceous*.

3. SPECULATIVE MIMESIS

Speculative mimesis refers to the creation of 'natural' soundscapes that could plausibly be 'real' but are ultimately fictional. The imitation of 'real' acoustic sounds has been a signifier of virtuosity of electronic instruments for much of the twentieth century, with John Chowning writing in 1973 that "the synthesis of natural sound … is the ultimate test of acoustical theory … [and] an extraordinarily rich point of departure in the domain of timbre" (Chowning 1973). Although this mostly centred around the imitation of acoustic musical instruments, such as Wendy Carlos' *Switched-On Bach* LP (Carlos 1968), imitations of less anthropocentric sources were increasingly common throughout the latter half of the twentieth century. Oskar Sala's evocative imitation of birds using the Mixtur-Trautonium in Alfred Hitchcock's *The Birds* (Hitchcock 1963) is a famous example. Evocations and imitations of nature, according to Jean-Christophe Thomas, have been a central aesthetic of many of the composers associated with the GRM, such as François Bayle, Michel Redolfi, and Denis Dufour (Thomas 2007).

The valorisation of 'natural' sound produced by electronic means continues today, and adjacent frameworks have emerged to understand these practices. Peter Batchelor's *trompe l'oreille* (Batchelor 2007) suggests the "fabrication of aural landscapes" as a way of "directing the reality into which it is incorporated and encouraging deeper environmental listening by the casual observer." Timothy Opie and Andrew R. Brown's *eco-structuralism* (Opie and Brown 2011, Opie 2010) posits a similar framework, using field recordings as data for digital signal processes to afford the "aesthetic appreciation of natural motion". Lindsay Vickery et al (Vickery et al. 2016) suggest that eco-structuralism in the context of chamber music questions "the ideological framework of 'music' and the development of audio technologies that have eroded the distinction between natural/artificial and representational/abstract dichotomies in music".

Perhaps unquestioned in these practices is what forms of 'natural' sound are valorised in these works, and thus, what soundscapes are ignored or erased. Andra McCartney (2010) suggests that the field of acoustic ecology has predominantly favoured what R Murray Schafer calls the "hi-fi soundscape" (1977), soundscapes with minimal broad-band noise, clear spatial definition of sound sources, and capture using state-of-the-art recording equipment. Lo-fi soundscapes by comparison are noisy, inarticulate, and are usually associated with urban soundscapes. "The ideal of hifi," McCartney writes, "seems to be related to ideas of authentic experience, of solitude, and of control of the environment." Jonathan Sterne is more forthcoming in his appraisal of the hi-fi ideal: it demonstrates "a distinctly authoritarian preference for the voice of the one over the noise of the many" (Sterne 2003, 343).

I am interested in speculative mimesis as a way of foregrounding the constructedness of hi-fi soundscapes for the purpose of musical composition, and the ideological implications therein. Its projection of a hypothetical 'nature' can be instructive of the musician's ideologies, inviting questions about what the appropriation of natural forms in electronic composition infers. For Jody Berland, such questions should be understood within a narrative of individual mastery and control over the natural world, and the technology that enables it giving its users "a sense of individual power over vast sound environments. Music producers adapt to these technologies because they are 'efficient': they offer greater control over their work and work environment" (Berland 2008, 31).

Speculative mimesis also necessarily questions the limitations of musical media in making such soundscapes plausibly 'real' enough—in this case, the DAW.

4. THE GRAIN OF THE DAW

The grain of the DAW is a framework devised as part of my doctoral thesis to describe the sonic effects in recorded music that infer the material conditions and practices pertaining to the DAW. It is derived from Roland Barthes' essay "The Grain of the Voice" (1977), which he describes as "the body in the voice as it sings, the hand as it writes, the limb as it performs" and "the very friction between the music and something else" (188).

The term "grain" is also used in other sonic contexts to infer sounds that either invoke the metaphor of touch

and coarseness (Chion 2009, 171), or sonic effects introduced by the recording apparatus that may be perceived as 'outside' of the music itself. The most common understanding of this kind of grain is transductive noise, such as the hiss of electromagnetic tape or the crackle of a vinyl record (Link 2001). In popular and experimental musics, transductive noise is increasingly used as compositional material itself, as Sterne suggests when he writes that "the sound of sound reproduction has become just one more musical colour" (Sterne 2007). Contemporary recordings might include 'artificial' vinyl crackle to invoke particular affects, especially but not limited to nostalgia.

Transductive noise as compositional material hinges on the presumption that digital audio production techniques do not introduce transductive noise. This is essentially true—signal-to-noise ratios in DAWs are much higher than analogue recording equipment—although this doesn't necessarily preclude that DAW-based compositions do not have a 'sound.' To listen for the grain of the DAW requires a shift away from the longstanding conflation of "grain" with "transductive noise," towards new listening strategies. To apprehend the grain of the DAW in a way that doesn't rely on transductive noise, I use Brian Kane's explorations of acousmatic sound. In a study of Luc Ferrari's *Presque rien*, Kane argues that contrary to conventional interpretations, *Presque rien* is not aleatoric or random, but rather a meticulously constructed meditation on the nature of recording. It foregrounds the recording apparatus through its flattening of dynamic range (the crickets are the same volume as the fishing boats, for example), and the careful crossfading between recordings made at different locations and times of day. "*Presque rien*," Kane writes, "points back at itself, articulating its own technical condition by bringing the recorded character of the recording into audibility" (Kane 2014, 132). In other words, *Presque rien* foregrounds the grain of recording by using compositional techniques unique to its technical condition. This provides a context on which an investigation into the compositional techniques that foreground the grain of the DAW can be enacted.

Mimesis is another compositional technique that can foreground the grain of the DAW. Early imitations of organic and acoustic sounds using synthesis or other electronic means reveal their both their limitations and some aspect of their character. A famous example is the ersatz drum sounds of the Roland TR-808 drum machine, which have since become canonical in the electronic music corpus.

Speculative mimesis goes a step further. It implies these supposedly representational sounds emerge from interaction with the tools used to make the sounds, in this case the DAW. In *Siliceous*, I am interested in what ways speculative mimesis can foreground the grain of the DAW.

5. COMPOSING SILICEOUS

The composition of *Siliceous* was an iterative process consisting of three interchangeable phases: sound design, arrangement, and acousmatic listening. Sound design involves the creation of synthesised sounds, arrangement involves the sequencing and mixing of those sounds into a composition, and acousmatic listening involves listening to the composition-in-progress outside of the DAW environment to critically appraise the work and locate areas that require improvement. Each phase enabled different aspects of the two core concepts of the work to emerge, and are discussed here separately.

5.1. Sound design

In the sound design phase, I focused on creating sharp, snappy, and 'dry' sounds that alluded to the properties of sound transmitted geophysically. Using specifically "in the box" methods—software synthesisers and other tools exclusively within the DAW environment—nearly a hundred short and concise sounds were created for the piece. In synthesising these sounds, I developed an interest in bass/kick drum samples, so prominent in electronic dance music, a genre almost exclusively mediated by the DAW, as a middle-ground between subterranean speculative mimesis and conventions of DAW-based compositional practice. Throughout *Siliceous*, bass drum samples are looped, pitch-shifted, and stuttered in short phrases, evoking the cadence of an animal vocalisation. Given their main functions in dance music as a component of rhythm, metre, and/or pulse, they perform similar functions in *Siliceous* as well, albeit in a more drawn-out, yawning fashion, as singular, understated bass drums punctuate the track at intervals of about 30 seconds. The bass drum also evokes the proximity effect, the increase in bass frequency response as a sound source approaches a microphone or ear, as well as the conduction of sound through earth, suggesting a visceral presence in the sonic image.

5.2. Arrangement
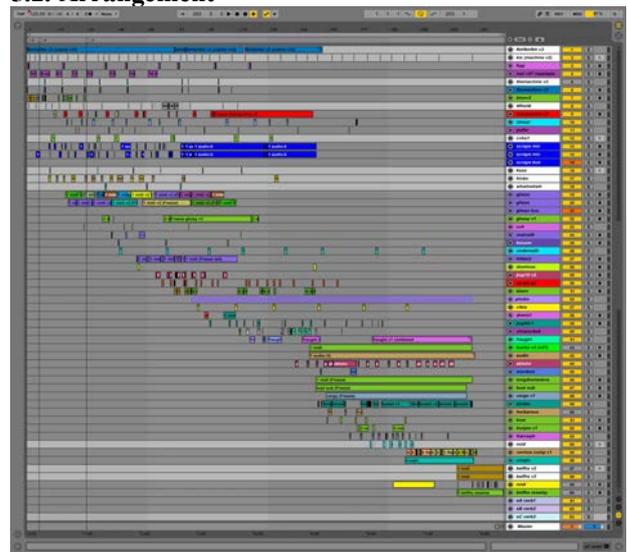
Figure 1. Composite screenshot of the DAW session for *Siliceous*.

The arrangement of *Siliceous* involved carefully situating sounds in the timeline such that it cumulatively evoked a chaotic yet relatively static soundscape. It begins with little fanfare, with the gradual crescendo of drones and background sound effects being the only indicator of narrative or conventional compositional structure. The effect I was trying to achieve was what Claude Schryer called the Sharawadgi effect (Schyrer 1998), a sense of contrived irregularity that may seem banal or random at first glance, but is in fact meticulously ordered to appear as such. A screenshot of the DAW session (Figure 1) visualises the contrived disorderliness of the composition.

The compositional elements which foreground the grain of the DAW are not so easily visualised, involving mixing strategies and attention to articulating the three-dimensional soundstage of the work. The majority of sounds created in the sound design phase occupy the foreground of the sonic image, mixed with presence and low dynamic range to simulate close proximity and the conduction of sound through earth. In the background, consistent drones and reverberant glissandi give a contextual depth to the sonic image, enveloping and overpowering the foreground sounds towards the end. There is a stark contrast between foreground and background, with little in between.

The foreground-background dichotomy occurs in the construction of dance music and the organisation of synthesised sounds. Broadly speaking, synthesised sounds in dance music can be understood in three categories. The 'lead' is typically loud, present, carries the primary melodic lines, and occupies the foreground of the sonic image. The 'pad,' meanwhile, typically provides chordal, harmonic backing for the lead, and occupies the background of the sonic image, providing a metaphorical 'padding' for the lead. Finally, the 'bass' typically plays bass lines, although in certain types of dance music like dubstep, it has a 'lead' function as well. In the case of *Siliceous*, the bass is mostly synonymous with the lead, both occupying the foreground. Incorporating these foreground-background, lead-pad binaries inherited from dance music draws further attention to the soundscape as overtly constructed and mediated by the DAW.

5.3. Acousmatic listening

The acousmatic listening phase involved exporting (bouncing) the work-in-progress, and listening to it in conditions similar to how the end-listener will experience the work. I use the phrase "acousmatic" to allude to Schaeffer's definition of "a sound that one hears without seeing what causes it" (Schaeffer 1966, 91). Listening to a work-in-progress when the DAW is open, active, and in sight, invites a different kind of listening scenario to what the end-listener will experience. During this phase I would make notes of areas of improvement, referring back to them when I commenced work in the arrangement phase. The most consistent changes I needed were small shifts in when sounds occurred in the timeline.

One aspect arose entirely due to carelessness, perhaps from not acousmatically listening *enough*. There is one sound beginning at 2:16 characterised by a noise burst with high-speed panning modulation, evoking a splash or an explosion. This sound, and slight variations on it, occurs eight times between 2:16 and 3:27. All of these sounds are panned hard to the left. This panning is unintentional—I had planned for them to be placed in the centre of the panorama. I believe the problem occurred because the action of offline bouncing, exporting a DAW session to an audio file and not simply recording it all in real-time, sometimes introduces unpredictable anomalies. The sounds are processed with a third-party delay plug-in, and I believe that there was an error that caused only the left channel to be processed. This was an oversight because towards the end of the compositional process of *Siliceous*, I had listened to it so many times that I didn't bother to listen intently on the final version, as this had not been an issue in previous renders. It was only after receiving the masters that I realised the problem was there. At first, I was frustrated by this oversight, but I have come to hear it with some affection, as if it were a small acknowledgement of the fragility and fickleness of the DAW.

5.4. Reflections

The speculative soundscape created in *Siliceous* is consistent with Schafer's notion of the hi-fi soundscape. Sounds are articulate, rarely overlap, and are easily audible as distinct from each other. There is little to no broad noise that masks these sounds, and the 'background' sounds do not interfere with the audition of the foreground sounds. In Schafer's terms, this is the ideal soundscape, an application of compositional technique towards allegedly creating a more liberal-democratic soundscape. Speculative, however, the hi-fi soundscape remains. By emphasising the material conditions and practices of the DAW, *Siliceous* makes clear how constructed and illusory the hi-fi soundscape is in the first place.

Less carefully negotiated, however, are the questions around narratives of mastery and control over nature that are so prominent in the discourse on audio and synthesis (Rodgers 2010). This suggests a quandary in which musicians working with eco-structuralist techniques must deal with: how can one appropriate the sounds and structures of natural ecosystems without replicating these colonial narratives? I don't believe *Siliceous* provides any flattering answers here, but it is a direction that should be interrogated further.

6. CONCLUSION

This paper has suggested techniques for exploring speculative mimesis and the grain of the DAW through electronic music composition. In doing so, it problematises Schafer's hi-fi soundscape by foregrounding its constructedness. Future avenues of exploration may include strategies for meaningful environmental activism in the context of electronic music composition or speculative mimesis, or providing more

thorough interpretative frameworks for understanding what these works say about composers' and listeners' motivations vis-á-vis bringing 'natural' sounds into the concert hall or into your headphones. The limitations of speculative mimesis are not so much technological, I believe, but ideological.

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