

POLYPHONIC PROCESSES FOR BASS AND VOICE

A CRITICAL REFLECTION IN PARTIAL
FULFILLMENT OF THE PHD IN ARTISTIC
RESEARCH AT NTNU, TRONDHEIM, NORWAY

ABSTRACT

'Polyphonic Processes for Bass and Voice' carries dual meaning, referring first to a musical and instrumental methodology at the project's core, while accommodating an unexpected diversification of artistic discipline as the research unfolded. The current exposition traces the project's progression through the lens of five sub-projects at the intersection of music performance, sound design, and text-based arts. An idiosyncratic approach to double bass playing expanded into a sense of one's "instrument" as encompassing one's entire body and environment, which sparked more intentional design of audience perceptual flow and a re-voicing of solo performance presence. In many cases, 'Polyphonic Processes' has answered initial research inquiries not through resolution but evolution, augmentation and a willingness to reorient the question itself.

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BACKGROUND & INTRODUCTION

The Practice

I work with the dyadic power of bowed bass, combining its low "stopped" notes with natural harmonics, and incorporating my singing voice as a third layer. This core triadic sound—one bass note, one harmonic note, and one vocal note—forms the foundation of the project. Improvising and composing at the instrument, I explore variations in timbre and voicing searching for an acoustic presence that transcends the sum of three parts. In contrast to the traditional roles of melodic voice and accompanimental bass, I blend the voice into bowed bass, often matching the register and timbre of its harmonics. The result is a fused sound that blurs the distinction between bass and voice and brings forth something singular or "wholly other", emulating the blended timbres and composite presence of a pipe organ.

To identify this sonic phenomenon, I borrow the term **organum**. According to musicologist and organ scholar Peter Williams, this fluid term has evolved for a millennium alongside the pipe organ, encompassing everything from the physical instrument to ensemble music to vocal and liturgical works. Modern historians define organum as an early form of vocal counterpoint (Williams 1993, 8). However, at the dawn of non-unison ensemble music (circa 900) it captured a spirit of "harmonious difference," describing a sound that is "neither unison nor solo but ensemble, expressing unity in diversity, whether vocal, instrumental, or both" with "many separate elements working toward one common cause" (Williams 1993, 85).

In the current reflection, organum encapsulates the plurality of solo playing as it compiles into **one sound**. The resulting blur of kindred timbres is the foundational aesthetic of my music – three layers melted together by friction and sustain, producing an emergent property greater than the raw sum of its voices.

The Original Project

Within organum, the original PhD project aimed to enhance the musical polyphony of tripartite **bass and voice**, polyphony as the denomination of several distinct lines developing together in designed interrelation. Homophony was already in use as a compositional technique, through the synchronous motion of bowed dyads augmented with a vocal note. The new challenge was to play three independent lines at once, particularly by peeling apart the two bass notes to achieve increased independence between the harmonic and low "stopped" or fundamental registers. This depended on operating concurrent pitch layers on the bass in a technically

idiomatic way to fold more notes into one efficient movement, like an organ sounding more than one pipe per key.

Another primary goal was to expand the bass-voice organum by layering new instrumentations and ensembles around it, without compromising its merged quality. This involved aggrandizing tripartite bass and voice by gathering compatible layers of sound around it, whether electronic or acoustic, and working toward precision in voicing, timbre, and orchestration to augment rather than alter the existing organum. To this end the project, newly situated in Norway, relied on anticipated collaborations within local and national music communities.

Polyphonic organum defined the project's primary artistic motion. All subsequent research questions were designed to support its development, investigating compositional form and improvisation, technology and amplification, technical research on bass and voice, and customized notation. These questions were articulated as follows:

1. Orchestration: Given the delicate blend of tripartite bass and voice, how could I orchestrate outward from solo writing and playing, to augment rather than interfere with the timbral organum of the solo instrumentation?
2. Amplification: Bowed bass is difficult sound to amplify because of its enormous frequency spectrum and resonance. Chordal or polyphonic bowed bass in close proximity to a vocal sound source is exponentially more challenging. Many pickups on the market are simply not designed for a treatment of bass beyond its traditional ensemble role. How could I design and enact an amplified solo setup for my unique solo instrumentation and its acoustic complexities?
3. Technology: Coming from an entirely acoustic background, the fundamental principles, possible uses, and performative haptics of music technology presented a significant yet alluring learning curve. However, Bert Turketsky once described the sound of bowed chordal bass as having a "fused, almost electronic" quality (Turketsky 137), positioning electronic sound as a promising orchestrational layer in the project. How could I develop a creative and performative relationship to music technology relevant to the practicalities and aesthetic values of the acoustic practice?
4. Expanding form: Prior to the PhD period, my primary compositional unit was song form; a craft which I sought to continue cultivating, yet which posed expressive limitations. What compositional forms could give my work longer expression? How could I create more immersive and durational pieces for performance?

5. Improvisation in performance: Although active as a free improviser, in my solo practice I only improvised as a precursory mode of exploration, rarely improvising alone on stage. How could I navigate the continuum between composed and improvised material in solo performance? What could be identified as an idiomatic, improvised solo language, not just as a tool for private practice, but on stage?
6. Mapping and Notation: As the basis for increasingly polyphonic solo playing, how could I visualize and map the concurrent pitch systems on the fingerboard of the double bass? Could such a mapping develop beyond a reference tool, becoming a technological interface or automated aid to the compositional process? How could I subsequently practice the newly mapped information, as well as develop custom notation for it? Such notation need not serve for publication or dissemination of finished pieces, but rather be personally operative to accelerate the project's musical output.

The project had a clear timeline. Year one for solo research and composition, year two for solo with electronics, and year three for solo with electronics and ensemble, all while expanding the concept of polyphonic organum into larger formations. The original research questions were geared toward producing music. All work processes focused on sound's musical function, with regular public performance a primary methodology. I planned to expand concentrically from my existing practice on the double bass, aligned with a progress narrative inherited from western classical music equating musical advancement with increased complexity.

At its core, the proposed project relied on engaging within new professional circles in the Norwegian experimental music scene. In fact, as viewed from the USA prior to immigration, many Norwegian musicians demonstrated influences and interests complementary to my practice, and their collective creative output was a motivating factor to apply for the PhD position. The original project held the long-term goal of initiating musical collaborations both locally and nationally toward the eventual formation of an ensemble. I looked forward to new connections as an essential counterbalance to the solo nature of my work, envisioning that the continuum between solo and ensemble playing would form the project's most productive and grounding processes.

Work began in January 2020 with 3-dimensional pitch visualization, designed to illuminate dyadic pitch relationships and open up a new kind of "sight" of the left hand. Produced for the International Conference for Live Interfaces (ICLI 2020), this mapping was not yet operative (ie. populated with functional metadata such as pitch name, class, frequency, sounding interval, etc), meant only for the time being to communicate to myself and to a new research community the project's main trajectory and the internal dimensionality of the acoustic practice. I had imagined that, as the mapping developed, it would be one of the primary tools in every

subsequent work phase – in fact, becoming the main interface for the solo practice, translating the complexities of the instrument's intervallic relationships outward and inward, whether working solo, in dialogue with electronics, or with other instrumentalists.

Rupture

Two external factors derailed these plans. First, the pandemic, which hit two months after my immigration to Norway, greatly undermined my ability to build working connections within a new creative, cultural, and professional community. Second, a restriction tied to my non-EU status prohibited all paid performance activities for the duration of my university employment. This led to approximately 1.5 years of personal isolation and 4 years of professional restriction and disempowerment.

Lived circumstances became integral to the artistic core of the PhD, shaping not necessarily the project as proposed, but as produced. The concept of a musical and performative project became thoroughly atypical, its practice unsituated and intent dispersed. The original purpose – to make and perform music – was suddenly irrelevant. Sustained dislocation from social meaning and professional identity had profound creative consequences, forming a pivot point around which the original research questions hollowed, and others took root.

New inquiries surfaced to redirect creative processes, focused on resituating, recontextualizing, and localizing available threads of creative energy. From within social and sensory void I looked for its antidote, attempting to counteract pandemic conditions of flattening, silencing, occluding, splintering and distancing with creative fixations on presence, environment, text and speech, the sense of sight, and the holistic 3-dimensional aspects of both sound and tactile practice. Planned working methods began to transpose and transform in unexpected ways, donning new mediums and modes of expression.

The first major shift was the transposition of the vocal role through the addition of spoken text as performance material. Across physical distances, words created a more direct social connection than music. Text and language soon became a primary aesthetic tool in the project, with an emphasis on the literary technique of extended metaphor, imbuing familiar words with long-term creative and polyphonic affect.

Next, the role of sound itself began to morph, seeming to lose its operative purpose as music, and newly perceived as an autonomous, environmental force. During lockdown in an unfamiliar climate, sensorial grounding became an urgent task. Sound became sheer presence; good company; an external and autonomous agency, especially when chorused. Noticing, capturing and collaging with the sounds of the immediate environment represented a hunt for closeness, a

way to localize and affirm real space and time amidst the normalization of 2D digital presence during lockdown. Indeed, the aesthetic sustenance and fresh process of play with environmental sound completely overshadowed any previous relationship to music.

Finally, the concept of “sight” took on new meaning and importance in the project. The word itself came to symbolize a nexus of intersecting research threads, stemming from the prolonged experience of social invisibility. It was impossible to anticipate the spectacular physiological and psychological changes brought on by isolation. Sensory faculties did not seem to function as they did before, at once heightened and blurred – vision with hearing, hearing with touch, touch with vision. A perceived sense of “sight” soon extended beyond external or internal visualization, bypassing the eye entirely in favor of the body's combined proprioceptive, kinetic, auditory, and tactile faculties. By overlaying a heightened sense of body upon the lived sound field, “sight” pointed to a mode of spatial awareness both sonic and physical, as a way of “seeing” and affirming oneself *without the need for mirrors*. For a performer, such extreme transformations in sensory perception raised enormous questions which could not be answered alone at the bass.

Reorientation

Musical polyphony on a delimited instrument had given way to a polyphony of medium, method, and concept. Moving forward, the artistic process drew sustenance from a chorus of research questions, rather than a single dominant thread centered on the double bass. The resulting field of association provided an endless conceptual puzzle with proliferous entry points, intriguing intersections, and much intrinsic fuel. At the fulcrum of the PhD period, and as the pandemic cleared, emergent themes called for internal clarification.

In 2021, two subprojects centering the role of spoken text served to grasp the project's moving targets. First, in April 2021, a filmed solo performance entitled *The Word of the Year* staged an autoethnographic conversation around five solo pieces using structural techniques of live theater. Two months later, I was able to return home to New York for the first time post-pandemic. Re-grounded culturally, socially and sensorially, in October 2021 I wrote the piece *4.57 am*, a durational text meant for unembellished live reading, wherein many of the project's emergent themes were explored and defined through the continuous flow of abstract prose.

The text of *4.57 am* replaced the 3D pitch mapping as the main interface or mapping of the project – the web of concepts and their interrelation through which all further movement would be mediated. This text marked an attempt to defy the linearity of language and speech, “to make use of it in a concrete and spatial sense, combining it with everything in the theater that is spatial and significant in the concrete domain;—to manipulate it like a solid object, one which overturns and disturbs things” (Artaud, 72). *4.57 am* presents itself as a POLYPHONIC text,

countering the sequential narrative of the original project with a multidimensional field of association, which cycles through an experiential epistemic network concerning topics of speech, dimensionality, communion with environment, performance presence, visibility or “sight”, organum, and polyphony and its embodiment. A close reading reveals each topic handled as if a point or surface on the exterior of a translucent prism, turned slowly in the hand to view one through the lens of another, and in this way illuminating the “intervals” between concepts as sites for generative contemplation.

Only with considerable hindsight can I now adopt the voice of artistic research, delineating and articulating these research threads as the following questions:

1. Text and its setting: From the first months of the PhD, I held that communication of artistic research could and *should* also be an aesthetic act. Incorporating live text in a performance was originally a strategy to reflect upon the work process *from within the work itself*. John Cage expressed this strategy as stemming from a desire to “permit the listener to experience what I had to say rather than just hear about it” (Cage, *Silence*, ix). But this new textual role raised issues in the project, wherein performed text had previously manifested only as sung lyric. To incorporate *spoken* text called for a more critical look at the role of the vocal mechanism in a solo practice, which seemed to operate as one of two polarities: either musical instrument or means of verbal communication, but not both. Setting spoken text adjacent to singing weakened the voice’s power. **How should the cognitive and practical dissonance between speaking and singing be navigated? Were these roles compatible along a spectrum, or were they mutually exclusive? What was the most aesthetically salient way to inhabit the spoken voice – what timbre, pacing, form, etc?**
2. Metaphor: Metaphor may be the most polyphonic technique present in the project, unlocking layers of meanings and motions latent within one sound: the word. With larger and more concept-driven investigations, metaphor became the interdisciplinary lifeblood of the project; a tool to absorb the theoretical or technical frameworks of diverse disciplines, and to re-contextualize and revitalize my instrumental practice. A key ingredient in my writing, it also underpins the entire instrumental practice, for ex. the metaphor of bowed bass as the organ of the string family. **Extended metaphor as a generative tool was already a natural way of working. How could I use it more structurally, as an interlocking agent in a larger composition across mediums?**
3. Performance presence: Time off stage brought the opportunity to reassess how solo presence is “voiced” or “placed” in performance, the term *presence* referring to the extra-sonic, social element at the baseline of live performance. Presence differs from the performer’s subjectivity – it is a natural yet intensified and malleable act of “being-

with". Both physical and ephemeral, it operates on a subconscious level between performer and audience. Presence in the current project remains the richest and most elusive line of inquiry, best formulated through fragmentation. **If one's solitary presence constitutes the 'work of art' how does one place oneself? Relate oneself? To instrument? Self? Audience? How do you occupy the space you have created? How do you "voice" yourself in the room? How near or distant, how veiled or exposed, how narrative or abstract? What extra-musical elements – staging, posture, pacing, visuality, aura – yield these effects? And though the flow of performative energy is traditionally viewed on a unidirectional axis from performer to audience, can their combined roles summon a level of presence which transcends both?**

4. Designing environments: Starting from moments of encounter rather than calculated composition or synthesis, I began to source and work with environmental sound as a layered building material. Audio technology was new to me, but the principles of collaging or crafting with audio were surprisingly intuitive, a process closer to craftsmanship than performance. **Soon I was building and designing with sound more than I was playing or performing with it – how could these two processes be reconciled in a piece? What constituted a sound environment, and how did organum and polyphony function within soundscape, whether encountered or designed?**

5. Dimensionality/Spatiality: The spatial or 3-dimensional characteristics of sound took center stage. I began to value sound's localizing function, the ability of sound to both map a space and to place the listener within it. I came to view the concept of "instrument" as encompassing not just the immediate sounding object, but the entire vessel or container of the sound – the room. Playing that space required basic inroads into working with spatial audio, not to reproduce sound fields but to animate newly imagined ones. Such focus on sound's dimensionality highlighted not only the surrounding environment, but the dimensionality my body as producing and receiving sound, raising questions of their interrelation in a future performance. **How could I work with spatial audio in effective balance with a non-negotiable focal point in the room, the acoustic performing presence?**

6. Sight and its subversion: On the surface, sight can refer to the practitioner's "mind's eye" guiding their movements in practice. More deeply, it points to a state of "seeing" or "imaging" compiled from a series of non-ocular, non-visual processes, activated by aural or tactile stimuli – a state alluded to by theorist Marshall McLuhan as the "rumbles of aural-tactility, the power of the spoken word." (McLuhan 72). "Sight" also conveys a superficial layer of perception in live performance, one that favors the visual channel over the sonic. Visual consumption of the performer, especially if that performer is female, is a mediating factor in both the delivery and reception of live music. **What does**

sight mean, both for the audience and for the solo performer on display? What does visibility, invisibility, exposure or occlusion mean, to the musician, to the observer, or community member? Is "sight" something extra-visual? Something auditory or kinetic, based upon physical touch and the kinetic feedback of the body as a whole? And is sight, even in the sound-based arts, synonymous with legitimization, as the primary and most accepted carrier of knowledge and truth – or can that hierarchy be inverted?

Deepening

By year two, the primary creative goal was to construct complete environments that contained **yet transcended music**. It became evident that the target was not necessarily moving, but deepening, and that enacting double bass as type of bowed organ was not “reducible to passive, inner mimesis” (Barthes 162) but was the first point of contact with the foundations of the practice.

In continuing to trace these questions down, beyond bass and organ, I landed amongst the **social and sensory setting of organ**, amongst the influence of the innumerable church services of my youth. These were weekly community gatherings using spoken text, movement, staging, storytelling, social greetings, spiritual objects, group recitation, readings, singing, lighting, and pockets of designed silence. Today, while the theological tenets have been abandoned in my work, the organ and its ritual environment persist, constituting the project’s deeply interdisciplinary roots.

To work with **spiritual and ritualistic memories** called for their re-examination, provoking a consideration of the underlying intent behind the sequential arrangement of music, sound, text, and staging within religious service. Here, amongst the interaction of extra-musical elements, the project relied on thought processes from the field of design, handling materials first in terms of their usefulness, rather than their raw aesthetic qualities. Original questions of extended compositional form were now viewed through the lens of social and perceptual function in performance. In other words, composition in the project now carried a social purpose, prompting me to reverse engineer remembered religious service to understand its relationship to my current goals.

A church service is an episodic composition. Prelude, greeting, hymn, reading, recitation, interlude, reading, hymn, sermon – each element deployed one at a time in a familiar pattern for maximum clarity and focus, compartmentalizing point and counterpoint (of sound, optics, semantics) to consolidate and systematize attention. All symbolic energies are funneled through the sieve of church doctrine, with alternating polarities of text and organ as the main focal points

in a monolithic narrative; every week's theme neatly opened, explained, and concluded by a central spiritual authority.

Polyphonic organum, however, is an irreducible multiplicity, a tissue of sound without neat conclusions or fixed definitions. Its interdisciplinary manifestation denotes the simultaneous, continuous flow of multiple sensory threads toward a kind of synesthesia (organum), accommodating interdependent motions and truths (polyphony) which work in concert through the counterpoint of their agencies. As a heterogeneous space, its unity occurs at the point of its reception and perception, not its point of origin. The value system behind *polyphonic organum* thus posed a significant design challenge when transposed for an interdisciplinary composition.

Diversification and Reorganization

In the final year, the project began to grapple with an interdisciplinary approach to polyphonic organum, searching for counterpoint of method and medium around the original kernel of sound, triadic bass and voice. Though orchestrating outward from the instrument, this relied on decentralizing the role of the instrument in the creative process. One friend in the visual arts aptly observed this shift as "playing the bass, without the bass" – a phenomenon which sound artist Francisco Lopez might call a departure from "the protagonism of 'The Instrument' be it real or conceptual" (Lopez 267).

Decentralization also applied to the instrument's role in the imagined final work. Though I planned to perform solo in the artistic result, I became increasingly certain that neither my own nor the double bass's physical or visual presence should be the persistent focal point. This position was supported by readings on the design philosophy of Anni Albers, who writes: "Standing between the actual and that which may be, the conscientious de-signer, as I see it, seeks to forego his own identity in order to be able more impartially to interpret the potential" (Albers 60). I was, in effect, looking for ways to decentralize the performer's subjectivity, to forego the performer's identity in order to better cultivate a heightened presence that may support the audience's encounter with the work.

In orchestrating many new and disparate elements, Albers also identifies the reason for one practitioner to handle them directly within a single artwork, claiming that the division of labor amongst many specialists too often precludes this "miraculous event that is changed from addition to sum – the fusion of parts into one whole" (Albers 37). Here Albers describes, from her perspective as a designer and weaver, the phenomenon that I identify in sound as *organum*.

In order to preserve this type of fusion or *organum* across mediums, I became an amateur again in a myriad of new disciplines at once, de-skilling to interface directly with materials and

methods beyond my musical specialization: field recording, sampling, sound design, electro-acoustic set-ups, writing poetry, prose, and scripts, conducting interviews, experimenting with live readings, lighting and staging, and playing with other sonic objects like sewing machines, organ pedals, and dismembered parts of the bass. Some endeavors caught on; others were dead ends, followed by prolonged periods of reassessment and reflection. These false starts, especially within the subproject *The Word of the Year*, were the site of much productive research. Hitting creative walls revealed the size and shape of the results to come.

Collaborations on external projects with visual artists helped to shape the practice as it transitioned. In the second half of the PhD period, I took on two sound design projects for fellow PhDs working with audio, soundscape, and electronic composition in film (*Sisterless*) and VR (*Pending Xenophora*). Creative challenges in primarily visual fields addressed loose ends in my own project, allowing me to practice the delicate balance of sound, sight, concept and their temporalities in contexts external to acoustic musical practice. Both collaborators allowed me to work and rework sound's interaction with the visual, spatial, and textual layers of their projects, and offered venues for exhibition, an outlet that infused the PhD as a whole with new purpose at crucial intervals.

Returning to the instrument

Though fueled by an unexpected diversification, the project returned periodically to manual work at the double bass as a point of departure and return, each time seen anew through the lens of other mediums. These phases of instrument-centric work included creating the 3D mapping, keeping practice logs, writing sketches, etudes and studies, composing new songs, assembling a dual pickup system, building and testing tablature notation, and generating new material in dialogue with electronic orchestration processes or narrative texts. But in the wake of the pandemic, rarely was there a persistent push toward greater musical polyphony in solo composition.

Instead, over time, the solo practice became more polyphonic as a byproduct of processes *beyond* the instrument, which multiplied channels of perception and creation *at* the instrument. For example, I had been thinking of polyphony primarily as a problem for the left hand, released to its full potential through isolated technical study of a delimited space, when in fact polyphony was a whole-body proposition – particularly in the activation of the legs and feet as vital players, in addition to the left hand, right hand, and throat. This multi-limbed relationship to polyphony (embedded in the text of 4.57 am as the reoccurring image of the tree frog, or climber) has precedent in the long tradition of organ playing, the organist all but enclosed in a landscape of manuals, pedals and keys for the hands and feet. But in my practice it took shape slowly, its

potential and implementation gradually revealed through reading, trial and error, time on a rock climbing wall, and the chance appearance in my studio of a set of midi organ pedals.

The intention of whole-body polyphony precipitated the shape of the final concert and brought the project full circle to the instrument, double bass and voice, as well as the meta instrument, organ. Organ provided the key to synthesize and activate all research questions into a performative artistic work, along with a curious new insight into the origins of the modern double bass, as symbiotically *linked* to the pipe organ at a key point in its historical development.

Artistic Outcome

The final artistic result took the form of two interconnected performances on the evening of June 4th, 2023, presented at separate venues in Trondheim. The first event, a production of 4.57 am for the Trondheim Planetarium, reactivated the text as framing for the second event, a solo performance piece for bowed bass, voice, midi organ pedal, light, and spatialized sound entitled *This Fascinating Weather*. Those these events contained music, their overarching conception and structure was interdisciplinary, consistent with the evolution of the project. I part ways with the PhD process with a new artistic practice in hand, one which encompasses not only music, but the design of its performative environment, its raw materials (sound itself), and its conceptual framework.

The Shifting Artistic Field

Prior to the PhD project, my practice was situated within the progression of modern experimental bass playing, and resonated most directly with those musical contemporaries who both sing and play an instrument. My understanding of “the field” has since grown to include those who consider and enact performance environments as a *totality*. Musician and writer Laurie Anderson and organist Anna von Hausswolff are two such artists, whose work I experienced live during the PhD period for the explicit purpose of research. Engaging with their *liveness* was paramount, for I was most concerned with their use of spatiality and presence – in other words, the *tactility* of their work, defined in this context by philosopher Byung-Chul Han as “the multidimensionality and multilayeredness of human perception, which involves both the visual field and other senses” (Han 22).

Beyond performing artists, the field may also be reframed to include theorists, designers, musicologists, writers, poets, visual artists and craftsmen. The research process drew heavily from an interdisciplinary cast of writers, among them theorist Roland Barthes, designer Anni Albers, organist and historian David Yearsley, philosopher Byung-Chul Han, and author Bruce

Chatwin (whose body of work, though not referenced in the current reflection, was nonetheless formative in its vast network of symbolic interconnection.) I further benefited from close collaborations and engagement within the visual arts community in Trondheim, recasting my practice against diverse artistic backdrops to nourish evolving work processes both at and away from the bass. In understanding artistic practice across disciplines, such macro-metaphors can act as teaching tools, borrowing and lending perspectives and vocabulary to define and communicate the diversifying practice.

Finally, and perhaps most surprisingly, I shifted away from identification with the modern or avant-garde bass player, and toward string practices of the 16th and 17th centuries. Though the project does not claim historical scholarship nor engage with historically-informed performance practice, it has communed creatively with a much deeper lineage and timeline of instrumental music, evidenced in the development of new tablature (a traditionally Baroque notation strategy) and the reanimation of a 16th century pipe organ in the culminating concert.

Overview of Contents

The following reflection is divided into six sections, beginning with the text of 4.57 am as the backbone of the project. The reader is invited to listen to the recording of the text while reading – a link can be found on page 64 in the section “Media Links”.

Next, two main phases of instrumental research on the double bass are outlined and discussed, along with their implications to the field and ongoing practice, covering the creation of a 3D pitch mapping and custom tablature notation.

Three important subprojects follow, their exposition and analysis undertaken through the lens of the project’s emergent questions. The first is a filmed concert-length solo piece in the form of multimedia theater, entitled *The Word of the Year*, a project which left many research questions unresolved. Two collaborations within the visual arts served to reflect upon lingering inquiries: *Pending Xenophora*, a VR exhibition, and *Sisterless*, a documentary film.

Finally, the artistic result is reflected upon, in its working methods, goals, and outcomes. This includes the performance piece for bass, voice, organ pedal and electronics, *This Fascinating Weather*, as well as its antecedent, the Planetarium setting of *4.57 am*. The reflection concludes with a short summary of the project’s epistemic gains in “Polyphony: Four Conclusions.”

A choice was made to separate supporting images and media into the document’s concluding sections, rather than embed them in-line with the text, to preserve the clarity and flow of reading.

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On reanimation

A curious repetition has occurred throughout the project, in the persistent theme of resurrection or reanimation of something dead, absent, distant, or ancient. There's something to be said for the roles you don't plan for, that nonetheless stitch together a stretch of work and reveal the direction of one's resonance or intonation. Soon it will be a decade since the organ of my childhood was dismantled and sold, and the church building closed. A kind of primordial organ and its spiritual community had been lost, though I did not understand it at the time. Since then I've been on a journey to re-inhabit its sounds and affect, the sense of belonging and mystery embedded in the presence of the organ, which I am not ready to live without.

(END OF BACKGROUND AND INTRODUCTION)

4.57 AM

4:57 am a very strange hour for me to be up, to wake up but here it is. Very quiet on the street, charged with a quiet since it is so seldom so.

I've fallen asleep on the yellow couch here two nights in a row watching baseball with the time difference, Boston in the post season and wake or snooze way way in, with memories and visions of the tree frog outside on the basement door window. It had soft tacky fingers, bigger than its eyes, that I studied through the glass and thrilled over a few hours before I was again down in the basement on the couch in a vaccine delirium with dad watching over me and baseball on the TV. Opening paragraphs of a Musica Practica and some flickering of the lights, some poetics of space of the beautiful dark basement, down and down, some relationship to sight, inner sight in a darkness, inner sight which is imagination which is fear which is the mind and body seeing, not the eyes, which is another sense hovering over the forehead in a fever which is the full awareness of the heat and yet it can't burn you, only intrigue you.

Attempting to pull together the longest loosest threads of ideas, spending money on little string instruments since I came back from the US, all of them warped and out of wack, instruments that don't work, yet contain the entire symphony if someone has the patience or curiosity to hold or sound them in new ways and I always wonder at these constant signs of scattered avoidance, at some meta purpose or are these just signs of life? Everybody relax.

Am tired actually, need a shower. Want coffee. Want Alice Notley, the poet, my new favorite witch, new alchemy in English, not real if reality is dull and makes grey sense. But here is charged always, charged with something cool and electric, jump started by glimpses usually alone usually frozen even if moving, a form of solitude even when eye to eye with another.

Handwriting tight and scratchy. Passive lately so passive even when active, passive to my own inner movements but baking birthday cakes when called upon. Passive and reading, floating. Passivity of the seated, of the standing, of the playing. Amazing how a screen blocks sight, a plane of light blocks sight.

How does it do this? By over-activation. Stimulation of the faculty or the instrument til frayed, til produced. Just as a virtuoso has the power to block music, or the havoc of decibel limits to block hearing, the habit of desire to block love, thinking to block listening, or a wide vocabulary to block meaning. In fact sight, is based on limitations. Pinholes or fields of vision strapped to the movement of one spine or the synapses of one stretch of skin. Discrete strings

of these smooth tissues are not others, sight as something generated assembled by skin muscles movement underneath the habitual search, sight as that charge generated by fear and imagination, inner inner image.

Back to the vaccine fever, back to the couch in the basement in New York and the tree frog. Back to Dad taking notes for me in my delirium of my delirious thoughts in a wide-ruled notebook. What is fatherhood then after all this, 30 years of fatherhood then. What does it boil down to some sort of shared scare and healing, some kind of solidarity. Some simple being here, not trying to solve anything, just looking up breathing techniques of navy seals on the internet. Simple gesture of sitting there and smoothing the hair after years of discord and shared terror and sorting it out. A simple equation of still-there plus leaving space. Watching grown men make millions a piece running in dirty diamonds, ghost of college baseball dugouts wraps us in safety anonymity humidity in a summer darkness while these waves of fever swell up and break at me who feels quite afraid, but in this low place where the water goes we will never be swallowed by LEDs or the big screen, can retain our rightful sight, the kind that studies amphibians free through the glass, the kind that can watch the leaves change from a bedroom window or wake at five to transcribe useless voices, the muffled crack of leather on leather at 97 mph over roars of a crowd no louder than a second hand on a red plastic clock, battery powered.

Sight is analogue. Sight is muscular. Occipital. Sight is sticky. When Christian talks about a score or graphic being "glued to the eyes" we (all musicians) know exactly what he means, the tendency of the symbol to supersede the sound. Constantly mistaking memo for meaning. Can we transfer it? What chance does the eye-popped millennial like myself then have, scribbling and illustrating books and comics while watching the dimensions come to life on the dress form in the attic, child raised in America by a metastasizing screen. Not even the curves have remained unless you pay extra. What chance do I have then? Can sight be transferred.

The route, the trick here has something do with dimension. A whole body sight. The X Y of trunk and yolk of collarbone floating shoulder blades that are unattached, the carpenter's level with the bubble of air slipping back and forth against the earth's pull through a feet, the depth of the pop of the torso from rib cage to breasts and from lower spine to gut, buttock to sharp hip bone that balances the bass, calf to shin, heel to toe. In hot July time Kathy teaches Alexander Technique downtown, puts her hand coolly to the base of my skull to the top of my neck in the back and suddenly sight floats, XYZ, sight fills in through all the lower bones. XYZ or as she puts it, up, wide and forward. And then she asks, when you play, are you making a sound with these same dimensions? Do you hear it ? Do you see it?

A teaching that bypasses symbols. Teaching by direct experience, creating conditions of encounter for another. Yes teaching part and parcel with research, teaching, without which

research or knowledge remains yet another fetish, scratched itch, shiny object to possess to collect to wave or to trade. I like it to pass through. Teaching then, not about instruction or information transfer but simple guidance or presence, condition creation. The clearing of space. An internal collective tuning. A sort of obligation to honesty, bareness, or, a pointing to experience, a direction of attention and saying, "this. This was it." Teaching in fact, oneself, how to remain in oneself. How to stay put when the darkness comes.

For sight, or as they say in baseball being "locked in", is in fact a deeply private state, solitary, edgy, and so is the way to it. That's why there's only one man at the plate. Something hinting to me here, of the "etude" or "study" in music, I meant to write some. This most vulnerable of forms, designed to lay bare its intentions and pitfalls, a state of learning, a clearing of ego and space. To every day, set out to do what you know, as of yesterday, you could not. And yet in the traditions of training, where etude or sketch or study becomes a replication to achieve, a result to confirm just as in the lab - but I lost the train. I will not play spaghetti in a dress. So is the end goal an accumulation, or is the state itself enough, the state and the welcoming in, run by the dual pumps of fear and inner image until there comes a blankness, something clear and engulfing and luminous like when we black out the last light; rather than something "achieved" then, we come into the space of a real perception, the moment when the bus passes your person too fast and too close.

Here I have many seeds, in this sight state. Seeds of song, or maybe of other selves. I have not arrived. There will be no achievement. Only seeds. It is a slippery place, this sight, and so precious.. and until it becomes a tactile sensibility, a native domain that unfolds in your sleep, you cannot go home to it yet and you can by no means purport to teach it. Even the masters must live in study. Live on a steady diet of silence and clearing space, of dropping needs expectations and ideals at the doorway of a dark room, for sight cannot be published achieved or claimed but only inhabited, only encountered, held in the body, stepped in, and out of, and the threshold is slippery.

Here what we call research is, for me, the cyclical practice of the step. And the preparatory clearing of space, sometimes after my own orgy of intellectual connections. A simple process of elimination, of limitation. Cycles of cluttering and then sweeping the surface again clean of symbols objects tools, bobbles and bangles, all useful partners in progress but progress is linear and sight is not. Sight is cyclical. Sight is a suspension, a reversal. Sight is just a space where we can be. Probably it is terrifying.

To have a musician ramble on around visual terms belies how visual our medium truly is and we forget it, but I'm speaking of a vision almost blurred, as inextricably fused with balance and familiarity, as a half dome radiating from ear to ear across the face and tied together in the back with a razor, as the ripple and return of air molecules from the slap of your bare feet on

the warm or cold floor of your apartment that allow the feet to also walk upon the wall and ceiling, as the tingle or weight of something on your fingertips and flutter of air again across forehead, neck, shoulder; cold wind through the pant-leg. This all is sight, this too is sight.

I like to toss out words, maybe we like to splinter off into knowledge taxonomy, terminology, a new one I learned recently is proprioception. There are at least ten more and perhaps I should look them up. Perhaps though, such a wealth of words does nothing in search of what they stand for. Perhaps we even need to skip over the level of semantic into metaphors, an equation or a bridge, something strangely direct, in metaphor – is it a symbol of a symbol? I know nothing of this discourse, except in my gut. Metaphors where we tether one experience in the body to another, stitch them together with or without the aid of words, as in the early days of practice, the early days of apprenticeship with my Franco-syrian maestro in his 80's who would take my bow arm and bow wrist in his hand, the point of bow-string contact in his other hand so as to share a responsibility, and loosening the many small bones of my bow wrist utter the incantation "rock-rock-pull" training the crucial moment of bow-change - imparting a sight to my right wrist with this wedding of direct experience and incantation, week after week, and would allow me to move no further in my training until the sight had grown up like a vine through my arm. These words point to infancy, "rock-rock-pull", the most rubbery-boned era that your skeleton and ligaments still remember and are eager to relive, sometimes you will wake up feeling it – a rubbery easeful weight of your brand new body on the chest or knee of the protector, rock-rock, and the first time you thrilled to throw your whole weight into a tug of war maybe with a forbidden kitchen cabinet or a sock, or flash forward to a neighborhood game with a scratchy rope. Rock rock, pull. Words full of ease, flexibility, full of weight, sculpting the quality of contact between hair and string via wrist, via weight of the arm. Meaning nothing to sight unless planted within their indications as experienced. Meaning nothing if unaccompanied by the directness of their meaning.

Now, I am grown. Now, to scale a sheer vertical wall un-endowed with the rubber bones and the adhesive fingertips I so admired is nothing short of miraculous yet I ask my left hand to do so every time I come to the bass. And after half my lifetime of methods, drills, etudes and shows, fits of research and visualizations, silent reveries or frustrations, experiments expos and contemplations public or private I cannot tell you for sure what it is I am climbing. I have, as of yet, no incantation, to teach myself or to reveal to you the practice you came here to learn about.

Geometrical or geographical language may fluff up vague collective understandings between us such as the notion of length of the fingerboard, width of the fingerboard, and the oft overlooked element of height from the fingerboard, wherein my work operates on two levels only, but often simultaneously, across two strings. Level 1, a note delineated by pressing the string fully down into the board, changing the length and thus the pitch; a deep note,

recognizable as bass; or level 2, a note expressed by lightly touching the string, coaxing it to vibrate in simple fractions - a flute note, a sine wave or air tone. Numerical terms may also convey something, namely that the division of the string into fractions creates theoretically infinite activation points, which filter into the practical world on the level of 3 - 5 activation points under the left hand at any given location the entire length of each string, radiating outward from the halfway point of the string in self similarity, in mirror image, and catalogued in terms of their division number, or partial number.

Then we could congregate around musical terms concerned with organization, homophonic or polyphonic cooperation of two systems of pitch on one seemingly monophonic or linear instrument with a range rivaling that of a piano, language of physics such as hertz frequency and the clear tracking of these within a systemic duality, or of my field's historical and textural nomenclature such as an almost baroque obsession with the friction and resonance of concurrent voices, of blend and rub, of the chemical reaction of sound produced with sound enclosed, sound held, which equals sound reproduced or resounded, or "resonance", of the epic occupying force of these elements when wound up in wind and breath via the pipe organ or, on a miniature scale my pipes, the chords in my throat that may sing, when comes something austere and greater than, a one plus one equals two but one more does not equal three it equals a greater- than-the-sum that burrows into an ear and becomes a fermenting imprint : a kind of inner sound that will not leave you, will never leave me.

Neither do buzzwords from the pedagogical cannon of this instrument reach deep enough now; not for this. A shift, a position a pivot a double stop, hand position or fingering. Useful to direct the technique, the replication, but not the sense, not the sight of the hand. None multiply themselves the way the left hand must multiply itself. None may balance all points of contact, in the hand or otherwise. None is an incantation. None is a beta. Beta, what is that, can I find the definition.

At the wall, between rock climbers, beta is language, lingo, anything from a hint to a full string of instructions shouted from the pad or mimed out in conversation, a funny and sometimes fantastical song sung about the route yet still all technique, all the time. No actually – there are infusions of psychology too. Home finally in the States, in the greenery of New York summer but I can't get out of bed, I bail three times on my brother until he finally comes to pick me up and take my sorry ass straight to the climbing gym. He wants to show me his new hobby. Day 1 of notes, finger joints sore, shoes slimy and too tight. Day 2 this is interesting....Day 3, in the car on the way to the gym, I am driving and eagerly describing all the parallels I see between climbing and LH bass technique, right down to the friction-maker of chalk on fingertips or rosin on the bow, and my brother is the passenger, he shrugs and wiggles his hands in the air and says "I don't know. I'm just like, ooga booga. Strong man. Climb wall. To top." And it catches me. Day 7, beginning to feel the different kinds of holds in my hand from the ground, when

gazing at a route, or even when not. The imprint is there. Day 8, hard fall. Face first. Smash my glasses. Am fine, in fact to my brother it is a badge of honor. Day 10, weight balance and counterbalance, dynamic movement, stamina, to flash a route, or being "too pumped" - to match the feet, crimps and pinches, slab, lift with the legs and rest the arms and don't look down, you are roped up, it is ok, your flesh and blood has got the rope. It's ok. Day something, can't do shit, weak and uninspired, a failure of a day I say and Austin tilts his head to look at me the way he did as a toddler and asks why do I say that. Failure. Maybe he's never heard me use that word before. Day 17 at a different gym now in Manhattan alone enthralled with new routes shapes and colors, they look like the maps I drew last January, new holds I never tried before, put them in the bank of my hands and fingertips, get tired. Day 20 center of gravity, where is it. Stay close, close to the wall. Day 21 Took a class. Wrist hold verses grip contact. Cup the hand in the air and imagine. Day 22 new friends a group conversation about goats that scale the inside of a giant dam with their tiny hooves, and I conquer the problem that threw me. Are the two hemispheres of my body designed for two different jobs? Zen and the art of archery, archers are messed up, grip strength and lopsidedness. Day sometime my own pair of shoes and its like flying around, sticking to everything I lay eyes on, the muscles change quickly now, the routes light up and I forgot if I played music. Did I have a technical tangle in some other practice?

No I cannot intonate this sight on a surface, this sheer plane of actual doing, of climbing the bare board except perhaps through the joyful memories of climbing itself. Except by tethering one physicality to another and furthermore, a physicality that was entirely new to me four months ago and hurt all my finger joints the very first attempt, climbing, that magic amateur state, clumsy and in its infancy, where I cannot trip over my own training or esotericism. The wall stirred up a beginner's mind again, that essential and tender state where all research learning or teaching, outward or inward, takes root.

Here is a state we want to be in, we love to be in, where we know not what we know not – released from the burden of our body of knowledge a baggage we may set aside for the moment and spend time with just ourselves and gradually come to the understanding that herein lies the real instrument. The real plane of inquiry. The seat of sight.

Now bicycles clatter past, and at least they are not cars, reading the same strung-out clarity by Roland Barthes 4 5 6 times and still don't understand its finer points but how it sinks in. Two kinds of music, the music one hears and the music one plays, the second being the arena of the amateur which stirs up desire in the listener, the desire to act, the desire to produce the same sound, to hold those same keys or strings in the hand and engage. Dealing then with music and knowledge in this position, professionalism and the unknowns and the unpolished – I feel here two kinds of knowing, the knowledge one collects, distributes, makes explicit, and – perhaps especially for the performer – the knowledge one becomes. I've heard

once that there are no trade secrets in artistic research, which brings us to an ethical dilemma at the engineered collision of art and research, research being a modus apparatus, an accumulation of the scientific sort, of knowledge for reproduction confirmation and canonization which has given us a wealth of comfort and movement and possibilities but wherein secrets hold no formal role except maybe as a choke-hold on a market. Then the slick fish of art for both creator and encounterer, which rests on the phenomena of secret as a source or a soil for the experience. Yes there are trade secrets here unless we deem it acceptable to remove art from the equation, and especially when one's own body is the instrument at play, secret being the safe pump of energy from body to body from string to ear or canvas to eye, from the link of two languages and the grain of two corpora there comes a sort of explosion, secret as the low-pressure front that draws the air of the soul in a direction, sparks dis-understanding, curiosity and movement, a sacred psychological state between us that contains more potential energy than the casting aside of the curtain. In effect there is no art without the breathless obscurity, not one drawn from disinterest or dis-inquiry but an unknowing which we guard with intention, choosing to leave place for fear, imagination, for others, and for other versions of our self. For the past and future rejections of one's own manifesto today. Now into the shower where the words flash upriver en masse like breeding fish deprived of the tools to write which is where they jump the highest.

Secret is in fact a chosen mode, a methodology if you will, in its most crucial form as a secret kept from oneself, for if you can articulate too much do you become dangerous to your own process? The state is too precarious for globs of knowledge, and you may very well be screwed, trip over from explorer or inquirer to conquerer which in a word positions you as lost. Yes draw the map, you need the map, but more so the gut. Perhaps arrested state of possession excludes the deepest states of becoming. Why else would He entreat you to leave aside your belongings and become as a little child?

An honest life span ago – my first two months in Norway produced a topography of the fingerboard, which is a place traversed by many before and after me. An intensive phase of work which synthesized existing knowledge in a visual manner and theoretically thorough toward a personal mixture of interests on this instrument, illuminating relationships between pitch layers which are the raw materials of my writing. To have-more and be-more I wanted to chart them all in the thousands, because there are thousands of such intervals in this system, shapes created in the hand between simultaneous points of finger-pad contact with an anchoring thumb and hip, four points condensed, like four limbs with hands and feet reaching, splayed on the wall desperate for contact and desperate to stick. But at some point in my topographical sketching I lost appetite for the theory of it, for the cataloguing of it, perhaps it was during the theoretical lived existence of a shutdown crossed with a tenure of expatriation. Either way, the appetite for possession fell through, less interested in knowing and more interested in knowing how, maybe, becoming how. From this early map there are three

dimensions now living in the inner eye, blurry and incomplete and vaguely sketched on a body in motion, no flag or name planted on every single point but do I need to? After a summer finally home finally hearing the same sounds in the night, sounds I can understand, after this summer learning to climb, later standing alone and naked in the full length mirror of my mother's attic studio, and writing a bunch of crappy poetry on my iPhone sometimes with the steering wheel in hand – and I call this my research. To study myself in the glass. But there was a new skin growing on skin that demanded observation, I needed to watch my muscles and tendons reorganize themselves on the frame because all along I mistook the bass for my instrument. It is an instrument, but it is not mine, only on loan, I'm a visitor caretaker operator pulling strings behind the curtain and eliciting sounds but where I breathe and contract is the real home and the real vessel, the immediate translator of the original impulse, that so sacred dishonorable volatile vulnerable scarred and sensitive instrument to tune and protect, where some kind of "research" becomes sound for you, a sound that will never be replaced or reproduced though somebody may acquire my exact double bass and my exact beta.

A voice in my head now that speaks on and on and I can't hardly catch up. Sight rests in this instrument never rehearsed, only growing year by year, its a flash of stillness under a veil, or a glance below at the long way you may fall as the holds get finer and finer barely caught with a thumb and forefinger the entire weight of your fragile life on display, a voice that guides you there, incantations in thinning air saying ok you're ok, you're ok, look up, only up. Here at the top of the route things break down to their simplest elements, here you must remove yourself from yourself, be so present as to disappear, for the full picture is irrelevant, the full data once amassed already obsolete, here is where you must keep secrets from yourself. Here, as in a nordic autumn, everything comes down to a point – then to blank points, and the simplest movements between them. Simplest thoughts or no thoughts, a stripping away to scrape at something underneath that is more terrifying and more rewarding than we all could imagine, made only of being there, sight as in an irrevocable illumination of every point and empty of the eye. Here where my theories end and practice begins, here whereby exposition I may destroy the depths I most endeavored to show, a route only ascended as a collective, that is to say, alone together, collective solitude and collective sight with one some who may tune a presence, that is research and that is a role, and a reason for being; with all questions of technique and tangibles, deliverables, compositions and communicables in the end subverted and subsumed back into the darkness where a raw life lives, spilling the juice of dead fish all over the kitchen like the barbarian that I am and wiping my hands on the strings after a deep sweat in the basement, vaccine breaks off the wall and we're all together again swapping betas in a kind of afterlife, incantations to manage the fear, to poke at the fire, and what was it I found in the wide-ruled notebook in the light of day in my father's handwriting, it was an incantation three lines, it was a note to self. Tree frogs - seldom seen - always heard.

INSTRUMENTAL RESEARCH

The PhD years witnessed a radical expansion of what I considered “the instrument” – even moving beyond the concept of instrument entirely in favor of a direct “tête-à-tête with the still amorphous” (Albers 60) through meditations on sight and corporality.

Still, considering the instrument as something externalized, as systems or environments of sound-producing materials, any approach toward instrumentality in this project is mediated by a two decades long “tête-à-tête” with the double bass. It is the most enduring and productive site of research, particularly in its characteristic *resistance* to being researched.

According to Aden Evens, “a musical instrument is no mere means: it does not disappear in its use. The musical instrument remains opaque and one does not know how it will respond to a given gesture.” (Evens 83). To this we may add Cathy van Eck’s concept of ‘resonance’ or cooperation between player and instrument, as the inverse of a characteristic ‘resistance’ – meaning that it is not in endlessness possibilities but rather their finiteness which make an instrument a true partner in the creation of music (Van Eck, 50).

In the current project, the aspect of instrumental ‘resistance’ proved deeply generative, more so than previously anticipated. In my endeavor to illuminate and map pitch relationships, I soon discovered that illumination is not synonymous with transparency, nor would transparency be desirable. The instrument’s opacity or secretiveness was in fact the “low-pressure front” which drew music into existence and should somehow remain undisturbed. Unchecked transparency and control would undermine the generative dynamic between player and instrument and demotivate the searching *tactile* process, the physical, subliminal *give and take* fueling my basic compositional impulse.

This deference to the mystery of practice, combined with the rupturing effects of the pandemic, created a faster departure from the mapping than would have otherwise occurred. Not only did the practice scatter and diversify in the interdisciplinary sense, but at the bass itself. In leaving the mapping, I chose instead to keep practice logs, write sketches, etudes, studies, and songs, assemble a dual pickup system, build and test a custom tablature notation, and experiment with new musical modes on the instrument responding to other creative modes, such as writing.

Within multifaceted instrumental research, this reflection focus on an interesting dynamic between its two most formalized processes – the creation and evolution of the mapping, and the development of a corresponding tablature, as a custom solution to notational deficiencies in the field.

Abstraction: The 3-Dimensional Mapping or “Modeling” of the Pitch Space

My initial fervor to map or model the bass’s pitch fields came from a genuine sense of wonder, which Bertram Turetzky, writing in 1989, summarizes in *The Contemporary Contrabass*:

“One seldom-used technique with extensive potential is the double-stop combination of natural harmonics and stopped notes. The sound is unique, often not having primarily the character of two notes, but rather something fused, almost “electronic”(…) the technique releases the contrabass from being merely a “one line” instrument. There are somewhere between one and three hundred such possible combinations, depending on the size of the performer’s left hand and the extent of his or her proficiency with higher partials.” (Turetzky 137)

These two concurrent layers of pitch function as one integrated machine. In a single left-hand position, dozens of double-stop combinations occur between layers and across strings, with sounding intervals as wide as 3 octaves and a fifth, or as close as a half-step. This incredible intervallic variety across a vast fundamental frequency range (approx. 41hz – 784 hz) means that bass harmonics are more than an added color or cadenza showpiece. They’re an independent plane of pitch, which can be used simultaneously with more traditional modes of playing to form an augmented approach to the instrument.

Harmonics propel our collectively modernizing approach to double bass, and are extensively studied, catalogued and utilized in contemporary music. Their critical and imaginative use permeates the music of many modern bass players, particularly that of Mark Dresser, and the late Stefano Scodanibbio. Håkon Thelin even considered that “the full potential of harmonic sounds on the double bass (..) may very well be the final step in the development of the historical double bass.” (Thelin, *A Folk Music*, 2). However, most bassists view harmonics as an isolated phenomenon, an “extended technique” rather than a ubiquitous, fundamental layer of the instrument. Even as perspectives change, the enduring tendency is to use harmonics and stopped notes independently, as if shifting gears on a car, releasing one to engage the other.

Two factors contribute to the compartmentalization of harmonics. First, bassists and composers alike cling to the instrument’s traditional role as monophonic accompaniment, producing one linear musical line at a time. Second, contemporary music as a genre maintains a fixation on timbre as the most salient musical parameter. Harmonics and harmonic systems have been thought of as releasing the double bass’s expressive range of timbre (Thelin, *A Folk Music*, 2) rather than as a pitch system, operating like a second manual on the organ compass which hovers above the first.

We needn’t stop at viewing harmonics as timbral expression, or as linearities forming melodic fragments. They are the flip side of the pitch coin, the omnipresent parallel universe, the arm

outstretched from bass to organ. They make the bass larger than the sum of its parts, and their role in the duality and simultaneity of pitch and place is one of the instrument's least explored yet most natural potentials. Nonetheless, to play simultaneous lines makes great technical demands on the player, already stretched in the technique of dyadic, homophonic playing.

I originally viewed the complex role of the left hand as the sole key to achieve increased independence between pitch layers and advance toward producing two independent lines at once. A 3-dimensional pitch mapping (Fig. 1) was created to explore, study, organize, notate and map the relationships between the harmonic and stopped-note pitch systems of the bass, its primary purpose as an aid in developing more comprehensive, polyphonic left-hand technique.

Most maps of the fingerboard are 2-dimensional. Such a 3-dimensional “modeling” was a novel, although intuitive, approach to visualizing pitch on the bass. It represented the *real space* traversed by the left hand, exaggerating elements of length, width and height to externalize and communicate the three-dimensional plane of action, which contained theoretically infinite permutations and combinations. The original goal was, using the mapping, to develop a comprehensive theory and praxis of the harmonic-stopped note dyad, able to track its intervallic content in any given hand position on the fingerboard. In this way the mapping was planned as the primary interface between my core technique and later project phases of orchestration outward from the instrument.

The 3D mapping was first presented for the International Conference on Live Interfaces in March 2020, and later published in paper format (see “Media Links” – ICLI Conference). At the time of publication it was an exercise in visualization, not yet an operative tool to manipulate pitch relationships away from the bass. In later iterations, the mapping would include filterable layers of pitch metadata, embedding the pitch name, class, frequency content, and partial number of each point in preparation for an analytical approach to electro-acoustic orchestration. I envisioned that pitch structures could even be transposed according to alternate tunings of the open strings.

After the project's rupture, I became less interested in these imagined functions – in other words, less interested in exercising the mappings control and transparency – and more motivated to develop a sense of *internal vision* to orient its use. The more fixated on the mapping I had become, the more I tracked the left hand's activity with the eyes; a common tendency in bass playing, but particularly detrimental for me, as it drew the neck, torso and throat out of alignment for singing.

This was the first impulse to “liberate” sight, or to subsume emerging knowledge back into the hand, translating “sight” or visualization into a form of tactility. Anni Albers might identify this as

the “tactile sensibility” of harmonics and their interrelations. She provides another useful thinking point relating tactile perception to the properties of materials, in both their surface texture *and* their inner structures, or modes of resistance (Albers 72). The texture and resistance of the dyads acted as rich *pools* rather than *points* of information, sites of research localized in both hands (pads of left-hand fingers, angles and postures of left-hand finger bones, feedback of pressure and movement from the bow in the right hand) revealing the internal topographies of my instrument in ways which confounded the stark points and geometric grids of the mapping.

The need to “liberate” sight applied not only to the left-hand, but the entire body. A new and holistic ergonomics of playing grew in response to the increasingly complex webs of pitch, movement, and tactile and spatial information perceived at the double bass. For this reason, the continued abstraction of spatial information seemed unnecessary. Once the arena was animated in the mind’s eye, it was more valuable as tactile planes in motion than as additive, digitally constructed information. The map was now “living in the inner eye, blurry and incomplete and vaguely sketched on a body in motion, no flag or name planted on every single point” – but did I need to? Or did I need to simply work with the polyphony of physical pressure points and produced sound, with the double bass in all its unmediated resistance?

Balancing multiple channels of activity on a traditionally monophonic instrument remains a physical, technical and intellectual puzzle. Musical polyphony in this project developed in sometimes fragmented ways in response to a collection of processes, some abstracted as with the mapping, some directly physical, and some based in the instrument’s absence – the cyclical periods away from the instrument, considering how polyphony may manifest across mediums and elements. The result of these modes combined was a deeper knowledge of how polyphony may inhabit the body as a whole, or spill out over the borders of one instrument into another, as it did from bass to organ pedal in the final artistic result.

Tactility: The 2-Dimensional “Patterning” of Tablature Notation

The process of mapping had another unexpected consequence, eventually facilitating a tool that *was* fully operational in practice. From the abstraction or overview of the pitch field in its entirety, I zoomed in on isolated tableaux of possible left-hand action, which eventually took the form of a tablature; a functional mode of musical inscription, workable in real time.

In January 2023 – three years after the mapping was published – the weight and tension of typewriter keys struck me as very similar to the experience of the left hand while playing double bass. This sparked the idea of a typeable tablature notation, a kind of shorthand which could capture chords and polyphonies in a few keystrokes as they took shape.

Each symbol was like a small slice of the “sight” of the hand, illuminating only the intervals within that specific hand shape and position on the instrument. At the location (or “node”) of every note as traditionally pressed or played on the fingerboard, a harmonic lies waiting to be sounded. The territory of the fingerboard harbors multiple sounding realities at each and every point, and quickly becomes dense with information in an attempt to chart or map it.

The complexity carries over into staff notation. To represent chordal and polyphonic playing on the bass, traditional staff notation must usually compromise between showing playing position and exact sounding pitches, neither which are successfully conveyed without extensive annotation, further playing instructions or extra staves. In response, I sometimes needed to produce two correlated versions of staff notation – one which communicates how to play it, and the other which communicates its actual sounding pitch content, as shown on the following page (notice on the left margin, the brackets labeled “PLAYING” and “SOUNDING”):

PLAYING

SOUNDING

F C¹/_E F^m7 E¹/_{F#}7 B^m/_D C¹#7 B^m7 A⁷

Here is the same progression of material (9 chords total) in tablature form:

9	8	
7	7	7
6	9	7
8	8	8
7	8	7
8	8	8

In this system, the eye reads in columns, only receiving information about the left hand's points of finger contact with the string (marked within a 6-pointed grid) and position along the fingerboard (numbers to the left). It is designed only for the player's use while writing at the instrument, not for external analysis, eliminating the need to convey sounding pitch.

All possible shapes were found and mapped to the computer keyboard for quick capture, which means the tablature is also a font. Its shapes are mapped to the keyboard (American English) according to the spatial logic of practice, closely correlated to how they occur on the fingerboard and in "the wild" of the hand. Designed for use while *writing together with the instrument*, it performs one basic function most efficiently: idea-capture. Its setting as a font takes the physicality of composition into account, which often occurs holding the neck of the bass in the left hand, leaving only the right hand free. Even with the bow in the right hand, the player can use the ring finger or thumb to tap a series of keys, visualizing whole strings of complex shapes and layers in a few gentle movements.

I hadn't realized just how much drag the lack of a notational language had created in practice. The tablature allowed me to streamline the process of writing, editing and learning material on the bass, so much so that I was able to write and polish a cadenza for *This Fascinating Weather* in three days' time – an unprecedented turnaround for a woman whose usual delay between composition and performance is closer to 6 months. In that sense, the tablature answered the project's need for a notational language, not for the purposes of polishing and disseminating scores, but to facilitate compositional flow.

Moving from 2D space (the fingerboard as conceived by most double bass pedagogy) to 3D space (the integrative pitch mapping) and back to 2D (the tablature) created an iterative design process which, for me, mimicked modes of dimensionalizing and patterning in clothing construction. To arrive at a tablature was like taking a piece of fabric, draped over the contours of a dress form, and flattening it once again on the cutting table, slicing it into segmented shapes that together form a garment.

The development of tablature also belied an interesting transgression. I had moved from a somewhat futuristic, STEM approach to imaging pitch space, toward a visual practice that was four centuries old, belonging more to the Baroque era. Tablature as musical inscription came to prominence during the fifteenth century, "when instrumental music began to gain independence" (Stone 176). Its rise was to accommodate the faster capture and communication of specifically chordal, polyphonic instruments, specifically lute and organ. Most tablature notations faded again in the seventeenth century and today it occurs mostly as the guitar symbols used in popular music. Its spontaneous development in my practice revealed a curious resonance with musicians of centuries past, and foreshadowed a similar affinity in the final artistic result.

SUBPROJECT 1: THE WORD OF THE YEAR

Description and Process

The Word of the Year was the first large-scale artistic work produced during the PhD period: an auto-ethnographic theater piece, performed solo with bass, voice (both sung melodies and scripted speaking), sewing machine (operated live on-stage), and audio playback (controlled offstage via MaxMSP) (Fig. 2). The audio tracks contained collaged soundscapes, interspersed with recorded fragments of an interview with my mother. All sounds were cemented within the track and timed exactly to coincide with scripted live elements. This created the appearance of spontaneous interplay between performer and audio, when in reality each sequence was through-composed and heavily choreographed.

Thematically, the piece dealt very directly with isolation and displacement, mainly by staging an intentional distance between my live speaking voice and my mother's lo-fi, pre-recorded speaking voice, which had been captured over the phone. Our reconstructed conversations were gathered around a several thematic centers and organized into scenes, reflecting in turn on childhood memories, family stories, Christian theology, intergenerational relationships to craft, and the similar durational psychic states produced by driving and sewing.

Begun in the autumn of 2020, the piece was developed and workshopped across three performance opportunities coordinated through NTNU. It was then video recorded at Dokkhuset Scene in the spring of 2021, during another period of lockdown and social distancing in Trondheim. The video had been commissioned for a digital screening in the United States via Experimental Sound Studio Chicago's Quarantine Concert Series.

The Word of the Year opened new creative strategies for me at a vulnerable moment in the project, as the pandemic approached its functional conclusion. As a work, it primarily addressed **how to use text for critical reflection from within the work itself**, which it accomplished through intermittent conversation with a disembodied voice. The writing and scripting process relied on collage and resynthesis, recycling and resetting ideas until a **narrative thread** emerged, which guided the development of **longer form, compiling narrative sequences alternately with musical sequences**, a compositional structure resembling the episodic unfolding of a religious service.

Limitations and Lessons

The full video was never permanently released. After the initial rush of composing, producing, filming, and editing, I was dismayed to find that the flattening and digitizing effect of video compromised the presence I had worked so hard to develop and dimensionalize onstage. I had unconsciously believed that escaping isolation meant *being seen* via whatever means were most practical. I was wrong. The mechanical capture and reproduction of presence caused significant tension, anxiety and disappointment – perhaps a situation not unfamiliar to the modern performer. To some extent, we have all faced the necessities and customs of industry documentation in a digital age. However, due to the totality of my presence offered within this project, the sense of exile and exposure was also total.

Walter Benjamin offers an interesting assessment of this phenomenon by donning the lens of the earliest film actors, who had gone from being a living person in communication with a living audience, to a source of affect for mechanical extraction:

“What matters is that the part is acted not for an audience but for a mechanical contrivance ... “The film actor,” wrote Pirandello, “feels as if in exile – exiled not only from the stage but also from himself.” (...) This situation might also be characterized as follows: for the first time – and this is the effect of the film – man has to operate with his whole living person, yet foregoing its aura. **For aura is tied to his presence; there can be no replica of it**” (Benjamin 10).

Interestingly, I had engineered the extraction of affect from myself – not just in the project’s final documentation via film, but in the very structure of the piece. I was visually and emotionally consumable from start to finish in every means of expression available. Furthermore, the **performed or acted nature of the text**, and its **direct juxtaposition with the melodic and musical role** of the voice, seemed to cross a line which I had not been previously registered.

A long creative pause followed the completion of *The Word of the Year*. I was confounded by the **problem of presence** (its digital and optical outsourcing) and the full-stop intuited between music and text. I was also **disenchanted with the narrative style** and began to seek alternatives in my writing. Questions of how to create longer form had not been satisfied, though the full performance approached 40 minutes in duration.

There were several positive takeaways which, through the lens of later projects, are possible to identify. One significant process gained was that of **‘setting the stage with sound’** a phrasing which I borrow from a friend’s observations on the piece. As a professional in the field of stage art, she noticed sound’s use to illustrate and animate a sense of place, replacing props or visual cues. This strategy carried over into later projects, where I worked repeatedly with archival audio, the ambience of natural environments, and collaged sound fields to *create place*.

The Word of the Year also offered the **first glimpses of polyphony as a multi-limbed activity**, opening up the use of the right foot while playing, in simultaneous operation of the sewing machine. Furthermore, in navigating the dynamic between active performance and static audio tracks, I learned the **strengths and limitations of composing with fixed progressions of electronic sound**. In future performances, I would seek a dynamic and flexible relationship with audio, also to move more fluidly between composed and improvised material.

Finally, the piece offered a unique success in boiling complex metaphors down a single word or phrase – a technique I would later repeat with the closing incantation of *4.57 am*. In the case of *The Word of the Year*, the word revealed was “pivot” – a technical term shared by both sewing and bass playing, which expresses a way of grounding or fixing oneself in space to facilitate a drastic change of direction. The “pivot” technique was folded into the performance, in a concluding sequence where I sewed, with the hands, at the machine, which yielding a small piece of criss-crossed fabric with many pivot points – the piece summarized in a single tactile object (Fig. 3).

The Word of the Year was the only subproject which benefited from performance as a methodology rather than result. However, many of the puzzles that it opened – particularly those concerned with sight, presence, and the role of text – could not be solved by continuing to perform. The piece was retired, and its questions lie dormant until provided new creative contexts to explore their deeper meaning.

SUBPROJECTS 2 & 3: COLLABORATIONS WITH VISUAL ARTISTS

Between November 2021 and March 2023, I composed music and designed sound for two external projects in film and VR. The artists, Yäniyā Mikhālina (*Sisterless*) and Mari Bastashevski (*Pending Xenophora*) were also PhD candidates at NTNU, fellow internationals employed at Kunstakademiet i Trondheim (KiT). Each collaboration grew slowly from friendship and artistic dialogue before later developing into a defined work process.

My contributions to *Sisterless* and *Pending Xenophora* may be the most surprising and welcome developments of the PhD period. Their collaborative work modes and clear external targets trained an essential aesthetic discernment at the intersection of sound and vision; a discernment previously dormant, and which performance-as-process, from its embodied and ephemeral basis, could not fully engage.

This transition from performance to sound design was refreshing. The inherent subjectivity of performance presents a constant and slippery negotiation for the musician. Visual artists have the luxury of producing an autonomous arena or object, which can exist independently of their physical presence or fluctuating ability to produce and re-produce. Here, in the visual arts, the negotiation of subjectivity became more possible.

In retrospect, it is remarkable how these projects allowed me to tangle with many of my own research questions. Indeed, the sensibilities and skills developed in *Sisterless* and *Pending Xenophora* (and I would argue, the "deskilling") made the bipartite final result possible to conceptualize and achieve. Their workflows highlighted the spectrum or interaction between text, sound and music and pinpointed inroads to long-form, polyphonic composition. They dealt with questions of presence, encounter, and the ethics of representation, which I later brought back inward to the solo practice. More questions arose which seemed cut from the same cloth as existing ones, questions on simultaneity and channels of perception, social and sensory function, and how to listen deeply to the material – to give the material a chance to design itself.

Not least, these projects sparked a pivotal learning curve when working with audio production and live electronics. Their tasks proved to be creatively stimulating, but called for huge swaths of know-how I did not yet have, providing the impetus to develop personalized strategies and workflows within music technology and audio-as-material. It is not obvious, as an acoustically trained instrumentalist, how to build an operative knowledge base in those worlds. To avoid discouragement and disengagement, I seem to need two clear things: an intriguing design puzzle, and a deadline.

Luckily there was no lack of intrigue, design puzzles, or deadlines. Both projects found their premieres abroad in prototype form: *Sisterless* at the Lumbung cinema program for documenta15 in Kassel, Germany, and *Pending Xenophora* at the Brotfabrik Bühne Bonn theater for the 'Digital Ecologies' conference in Bonn, Germany. After revisions and additions, each was then presented again: *Pending Xenophora* at Mediamatic in Amsterdam, NL and *Sisterless* as the central work of an exhibition by the same name at Trondheim Kunstmuseum.

In the case of *Sisterless*, there was a long hiatus in production between the two versions, due in large part to the Russian invasion of Ukraine. The work is a documentary and feminist film, almost entirely text-based, compiled from a series of phone conversations between the filmmaker and the protagonist, Albina, which was later set as voiceover monologue to footage of Albina, her family, and her environment. My job was to subtly push and pull the narrative, mostly without music, and to design (often to literally re-construct) the sound space of the visible and psychological environment. The work process took time; including time to exist quietly with the reality and magnitude of Albina's life, interiority, and death.

Pending Xenophora, in contrast, involved speculative and imaginative research processes to enact a kind of world-building. The result was a multiverse in exhibition form, which the artist created in collaboration with a rout of garden snails. At the center of the exhibition space stood an empty and ethereal inflatable structure: the soft, enveloping site of individual visits to the VR world. My task was to compose the voices of the snails encountered there, as well as an ambient music for the exhibition space. All must be wordless; an accessible abstraction, but, like *Sisterless*, based in the framing of encounter – with character, mortality, and alternate modes of perceiving and synthesizing one's world.

Production occurred in several rounds for both projects, building a much-needed creative momentum in the second half of the PhD. Even within the framework of a long-term artistic research project, it is good and necessary to *work for others*.

The success of these collaborations highlight, in a positive way, the topic of immigration status and candidate labor within the ecosystem of the Norwegian Artistic Research Program. They also offer a starting point for discussing the ethics of reciprocity verses monetary compensation, or the unclear lines between the salaried position of a researcher and their participation in the primarily freelance economy of the arts, which is in fact crucial to the activity of "research through art" and impossible to scrub of its economics.

If afforded the legal basis to freelance as musician during my PhD candidacy, my creative communities would have developed much differently, and produced a much different artistic result. As is, I cherish the results of the legal constraint and the reorientation of energies it

produced. It cleared the space for a new creative identity, for the work modes of sound designer and instrumental performer diverge significantly.

My urge to engage within a Norwegian music scene was originally framed as a research question about collaboration and orchestration. These topics found their answer in a totally different field where I did not yet have a professional status or role, and precisely due to that fact. It should be clear from the life of this project, that no artistic PhD process is self-contained, nor purely academic or institutional, and that the candidate's work status will undoubtedly determine who they work with, what processes they can undertake, and what is ultimately produced. Culture is a social product; producing it, a social process. We crave this engagement with other creatives over our collective work. Otherwise the well runs dry.

SISTERLESS

Description and Process

Sisterless is a documentary film by Yäniyā Mikhalina which “attempts to present a psychic reality of Albina, a young Tatar woman in Russia who dreamed to become a psychoanalyst. Instead, she went through several episodes of psychosis and psychiatric hospitalizations herself, following the psychosis of her sister Almira. [...] Sisterless is an unsentimental attempt to analyze the work of grief, a feminist commentary on the connection between sickness, the contemporary political condition, and the consequences of the Post-Soviet displacement. The narration is based on conversations accumulated over 1.5 years and provides a sex- and class-conscious take on the psychiatric system in Russia, inter-generational traumas, embodied capitalism, and female ethics” (Mikhalina 2024).

For the filmmaker, recorded conversations with Albina began during the 2020 pandemic, followed by a round of collaborative filming and production in Russia in the summer of 2021. My first contributions came in November 2021 as basic design of sound and atmosphere, after which the film was considered in a semi-completed state, and the project went on a long hiatus.

During this pause, Russia invaded Ukraine and the film's protagonist committed suicide. The exhibition catalogue explains succinctly that “Albina had a delirious experience of guilt for major political events that returned after the completion of the film: several months after the beginning of the full-scale Russian invasion of Ukraine, Albina herself committed suicide.”

After losing Albina, for Yäniyā to re-open and finish the project took great strength, sensitivity, and a critical intonation to the ethics of her medium and its use. Though Albina was absent,

there was something of her power and direction in all corners of the work, pervading the film's final stages of production – a presence I experienced in profound and repeated closeness while building the sound of the film around the continuous flow of her private thoughts.

In trying to understand our delicate task going forward, Yäniyā and I anchored ourselves on a passage from Kaja Silverman's *The acoustic mirror: the female voice in psychoanalysis and cinema*:

"To permit a female character to be seen without being heard would be to activate the hermeneutic and cultural codes which define woman as "enigma," inaccessible to definitive male interpretation. To allow her to be heard without being seen would be even more dangerous, since it would disrupt the specular regime upon which dominant cinema relies; it would put her beyond the reach of the male gaze (which stands in here for the cultural "camera") and release her voice from the signifying obligations which that gaze enforces. It would liberate the female subject from the interrogation about her place, her time, and her desires which constantly resecures her. Finally, to disembody the female voice in this way would be to challenge every conception by means of which we have previously known woman within Hollywood film, since it is precisely as body that she is constructed there..." (Silverman 173)

"It is not surprising, then, that a number of feminist filmmakers have pursued a vocal itinerary which is the obverse. Rather than forging closer connections between the female voice and the female body [they have] experimented boldly with the female voice-off and voice-over, jettisoning synchronization, symmetry, and simultaneity in favor of dissonance and dislocation." (Silverman 174)

In *Sisterless*, this dislocation of voice from image (through the exclusive voice-over setting of all dialogue) releases the protagonist's uncanny power of presence by staging a major disruption in narrative chronology. Blending footage from childhood home videos, on-site film shoots, and a diversity of medias and temporalities, the film rejects monolithic or narrative conclusions, a work that simply allows relationships to take place through polyphony of presence and absence (Fig. 4).

Sound Contributions and Takeaways

Much of the film's sound seems documentary – it is only deceptively so. My role was to totally reconstruct the ambient sound of each new environment, with deference to the protagonist's voice as the main sonic focal point. This was no small undertaking, and every minute of the film called for some form of sonic treatment, and only fragmented camera audio existed for most

scenes. In that sense, designing and building the sound for *Sisterless* was **an exercise in the sonic animation, or *reanimation*, of space as visually represented.**

As elucidated in *Soundscape in the Arts*, “in film, there is a huge emphasis on sound’s ability to create place and perspective, oscillating between realism and an emphasis of the artistic undercurrents of the images.” (Rudi 181). The oscillation was a responsibility entirely new to me, further complicated by the constant presence of voiceover. In other words, **I actually needed animate two spaces, one environmental and one psychological**, in order to facilitate the viewer’s experience of a dual encounter: Albina’s **image as separate from yet mediated by her voice.**

Sound thus primarily functioned as **setting or staging for a disembodied female voice**, and I must carefully balance channels of perception across layers of sound and optics to create a sense of fusion between them. I focused on coordinating a detailed counterpoint between instances of change – visual cuts, entrances and exits of the voiceover, small musical phrases or optical gestures, and evolutions in sonic ambience. It seemed as though the combined eye and ear could only process three channels at once, and one instance of change between them. I increasingly employed the orchestration of **slow, imperceptible change** to synthesize layers of visuals and sound into one impression, leaving the voice its own uninterrupted channel at the consistent temporality of human speech.

Working with Albina’s image and voice also helped approach personal difficulties with **optical representation** and presence within performance. The **dislocation between voice and image** seemed an unlikely tool, yet in *Sisterless* it had the effect of amplifying presence, while shielding from the overexposure or alienation of the camera – at least as perceived from the outside. This meditation on the complex, irreducible nature of Albina gradually permeated my own sense of presence, prompting a reflection on which perceptual channels it was most attuned to – for to allow the performer “to be heard without being seen would be even more dangerous.”

PENDING XENOPHORA

Description and Process

To complete the multiverse that is Pending Xenophora, artist Mari Bastashevski asked me to produce two things, which were actually 71 things: an ambient track for the exhibition space, as well as 70 distinct voices for 70 individual snails that a visitor may encounter upon stepping into the VR world.

Such a music is defined by the element of possibility or chance. Once the visitor donned the headset and entered the VR world, their experience, including which sounds they heard or how many, was out of my hands. What Mari had requested, in effect, was **an enormously polyphonic and modular piece**, wherein any voice might be paired with any other at any given moment: a design puzzle, as much as a musical prompt.

The snail voices required an other-than-human sense of pacing or rhythm – which as a human, I struggled at first to find. Mari pointed to the slow movements of expansion and contraction which set a snail's whole body in motion against a surface; their sense of grip and contact, a **tactility** which engages their entire undercarriage. It appears slow to our eye, yet proceeds steadily and securely, rippling with the complex fluctuations of biomechanics, to which any imagined sound or voice must adhere.

Snails do make sound. Their cries are miniscule but unmistakably there, tender and variegated, not unlike running one's finger over the rhythmic textures of a fossil smoothed by age. Mari kept a family of garden snails in a terrarium and sent me a faint voice memo of their vocalizing. I tinkered with it and brought it back for her thoughts. To her ears, it was too active or rhythmic; too "fast". She attempted to describe the intended effect of the VR world, a description which I happened to record. In the early weeks of composing, I listened back to her voice many times:

"It's about the middle part of the book as a way of not focusing on how things end, but on an ephemeral kind of life-cycle. Touch of sadness there... **not purely functional sound, but a beautiful kind of light**, it has that slightly fading mood and color. If I had to pick one keyword it would be ...sunset. Sunrise, sunset. Which is a **very slow movement**. Another way to describe it is white night, which is a type of internal sunset."

In other words, she did not want to mimic or foley a snail's natural voice, and was instead after something otherworldly, suspended and in-process, smeared across colossal time scales that surpass human pacing. Within these **expanded temporalities**, I nonetheless found the need for a

patterned activity encased in statis – or perceived statis. For light is never static; it merely moves beyond the range of our conscious perception, like the day-long gestures of plants, or the wings of a hummingbird which appear as one form in the air.

From our early conversations, I could also intuit something about death and re-animation; a ghostliness. Although the exhibition included live garden snails, the characters inhabiting the VR world (Fig. 5) were based on the artist's perusals of the fossil archives of London's Natural History Museum:

"The term [Pending Xenophora] comes from a category used to label unorderable and unclassifiable organisms [...] and a genus of medium-sized to large sea snails. Xenophora are quintessentially unclassifiable; the ideal speculative being to engage in this work. They are collectors that sort through and then cement other shells onto their bodies. Since no two Xenophora are the same, the Xenophora is always pending, always in the process of knowing, unknowing, learning, unlearning, collecting, and computing." (Bastashevski, Digital Ecologies)

In musical terms, *Pending Xenophora* thus seemed to be calling for a chorus of collected or "found" sounds, reimaged through permutations in timbre and density. And furthermore, though each snail needed a distinct, identifying vocal personality, all must be timbrally linked, like the voices of different family members, in order to accommodate unforeseen groupings.

These families took shape in a single burst of composition, using whatever I could grab at home in one 16-hour day. I recorded the live-processing of violin, voice, or a broken 12-string mandolin; kneaded samples from my archive, slow-bowed brass bells, melodious water babble, crickets, or the crunch of snow; scraped my finger along the paper lungs of an accordion; thrashed around in Synplant, a software synth with a predisposition toward complex, almost plasmic sound; and sampled the smack of my own saliva.

Once a new sound was formed, I could then extrapolate into families, changing a few parameters of its processing to produce themes and variations and hit my impossibly high numbers. 70 snail voices were broken down into 14 parent sounds, each birthing 5 new variations. With a new parent sound, I looked for overtone spectrums I did not fully understand, which could fix my attention long enough for the next generation to be born.

The first time I introduced Mari to her snail voices, she lulled into a focused and quiet state. When she awoke, without skipping a beat, she began to name each family. Snail Carousels. Gastronauts Landing. Chem snails. Puking Snail. Godmother Snail. She seemed to know intuitively the kind of personality each contained. By June 2022 these voices had been programmed into the VR world.

In the same Ableton session, I then built the ambient track, 20 minutes, loopable. Its purpose was to create and sustain atmosphere in the exhibit. Its opening and ending minutes contained natural pauses between phrases, seamlessly concealing the track's restart. At the center of the track, the music swelled into a sustained and layered environment – "sunset, sunrise" – with enough hidden alcoves to delight (or at least avoid irritating) the ear, even after the 1000th listen.

In the continuum between the snail voices and ambient track, I periodically checked in and paired sounds up at random. Could these four voices all sing together? Could this voice distinguish itself against that point in the ambient track? Without losing their individuality, could these 7 voices merge into one fused lump of activity? In these moments I would grab a midi controller with some faders and "play" the exhibit – a way of prototyping of the visitor's experience. I loved the live orchestration of these voices, designed to occupy different phrasings and frequency spectrums yet intimately linked in affect.

The exhibition was produced in Amsterdam at Mediamatic throughout the summer of 2022. I was invited to create a live performance for the exhibition's finissage in early September. So, off to Amsterdam I went – twice. First to understand the exhibit, the space, and its abilities and limitations for a live performance, and the second to produce the show.

As an exhibition, *Pending Xenophora* was set throughout the entire barn space of Mediamatic. A giant diamond-shaped bubble, made of thin plastic and inflated with air, bobbed gently in the center of the room. Entering this translucent vessel from a zippered diagonal slit in the corner, unmistakably vaginal, was like entering the pink womb of prehistory, which the VR headset revealed to be dusted with light and crawling with enormous gastropods.

Performance and Takeaways

Visiting the exhibition highlighted an important question: What could a musical performance accomplish for this project, that the exhibit did not? I was surprised to discover that, when it came to the exhibit's sound world, **the practical reality was less polyphonic than the prompt**. The VR world had only one headset, so visitors must experience it one at a time. Furthermore, their individual entrance would release *only one snail* to sing within the VR landscape. I decided that the performance could offer an alternate and more communal encounter between groups of visitors and groups of snails, based on their sonic animation in huge choruses in the room.

To stage a thematic performance within a visual art exhibition, three things seemed important. First, that **the performance be non-visual**, activating the world of *Pending Xenophora* only through sound. Second, that **my own visual presence as a performer be minimized**, so as not to

interfere with the imagined presence of snails as constructed through sound. And third, the **sound must envelop the audience**. This marked my first attempt at working with spatialized audio, however rudimentary. Using four speakers in the corners of the barn, I was able to saturate the space with snail presence. I could then automate the panning of each snail voice, as if they were entering the room in slow droves and encircling the audience, their autonomous presences **activating the full dimensions of the exhibition through sound and sound alone**.

The performance took place on September 4th, 2022, to an audience of around 30 people. We invited them to gather inside the inflatable VR bubble, to sit or lay down, rest the eyes and be visited by choruses of disembodied snail voices circling in the exhibition space.

The act of performing mainly entailed orchestrating groups of snails to sound together, triggering them via Ableton scenes, and sculpting their arrivals and departures with careful and deliberate manual fades. Again, the most effective tool to create continuity of form seemed to be **extremely gradual and deliberate changes** in the balance of the total sound field. Those snail voices which I could reproduce live, I did, processing voice and violin and incorporating a disembodied bass bridge with pickup, played only with the friction of the hand. Except for two volume spikes, it went as I had hoped, and was a thrilling milestone – the first time performing with electronics, and significantly without the bass; first time working with spatial audio; and the first attempt to subvert my own visuality in solo performance.

The project as a whole yielded many insights, beginning with a lesson in **orchestration** as the design of sound and groups of sounds, revealing, in a completely separate context from the bass, which qualities combined create a singular pairing – that “wholly other” or “organum” effect. I found that if the voices were **timbrally linked**, emanating from **the same “family” of sound**, it was easier to approach this type of blend and fusion. Furthermore, through working with both sampled audio and electronically generated sound, I found that sampled audio was infinitely better suited for my purposes. It handled like a more organic and malleable material, motivating the continued expansion of my personal sound library.

As time scales continued to expand and rates of change become slower than I was accustomed to, **temporality** became an increasingly central consideration in my own work. This proved a key element in **creating longer forms** to moved away from episodic organization toward polyphonic organum, a sonic state which relies on overlapping sustain. **The centrality of ambience** and the **complete absence of text and its signifiers**, in contrast with *Sisterless*, was another important factor, allowing me to refocus solely on **sound’s environmental and animistic function**.

Spatial audio and the **dimensionality of sound** were explored as basic inroads to creating an *encounter beyond the screen*, in the full dimensions of a room. **Polyphony** manifested anew as

the counterpoint of voices electronically generated and operated. This was a revelation, showing that, even as polyphony began to grow outward from left hand to body, it need not be confined to what I could play on a single instrument in real time. Finally, the **continuum between sound design and musical performance** was successfully engaged, by first building and then performing a sound world – significantly without a bass. Now, all that was left was to return to the instrument, to activate the same continuum with the double bass in hand.

MAIN PROJECT: ARTISTIC RESULT CONCERTS

For the believer, an instrument of liturgy and an instrument of music had a common aim.

Peter Williams, *The King of Instruments*, pg. 56

And yet, the real joy of the senses, including sight, is a matter of inefficiency. It means casting a gaze that lingers among the things of this world without preying on them.

Byung-Chul Han, *In the Swarm*, pg. 43

The final artistic result unfolded on the evening of June 4th, 2023, in two distinct segments at separate venues in Trondheim. First, the text of *4.57 am* was presented at the Trondheim Planetarium, its pre-recorded reading set within an ambient soundscape. The room was darkened, and the screen served as a light source, displaying a shrinking circle to entrain the visitor's sense of sight toward the interior visuality of the text. The piece concluded in total blackout. The second part, a live solo performance at Dokkhuset Scene, pick up the thread through an opening state of darkness. Over 30 minutes, the light gradually intensified, illuminating the performer engaged in bass playing, singing, and operating an organ foot pedal.

Both segments employed spatialized audio to craft sonic environments within a performance structure, "setting the stage with sound" and then occupying it, whether figuratively, through the presence of a disembodied speaking voice, or as a live instrumentalist. The goal was to enact interdisciplinary polyphonic organum, creating deliberate counterpoint and sensorial fusion among light, text, sound, music, staging, dimensionality, and presence, and orchestrating outward from triadic bass and voice using electronic processes.

Expanding temporality served as a primary strategy. The goal was to create counterpoint on a larger time scale, building change incrementally with slow, controlled pacing throughout the duration of each piece. Transitions were meant to occur almost imperceptibly between "areas" or "planes" of activity rather than among melodic lines. While these planes contained music, they transcended the typical temporality of music, where polyphony depends on the development of melodic lines over shorter time scales, such as seconds, minutes, or beats. Working with polyphony of planes rather than lines allowed for longer form, characterized by the graduated evolution of multiple concurrent sensory elements—a type of counterpoint more influenced by my recent experiences in sound design than traditional musical composition.

Separating text and music by piece and venue solved a recurring structural issue in the project, accommodating the apparent mutually exclusive dynamic between vocal roles—speaking and

singing—while still facilitating reflection on the work from within the work itself. The text was intentionally presented before the performance, to both reflect on the journey of the PhD and prompt, foil, or frame the upcoming music. Though starkly separated, both liturgy and music had a common aim – to trace the expansion of polyphony from left hand to whole body, and then further from performative body to its activation across interdisciplinary planes.

Light was the explicit connective tissue between the two events. The slow tapering of light in both directions operated in mirror image, providing a macro-structure that alluded to the self-similarity of the double bass's system of harmonics. Practically, it was also designed to highlight an expression of performance presence that transcended specular, visual representation, and was animated only through sound – a strategy I had come to over the course of the three preceding subprojects.

The slow occlusion and illumination of the two pieces was also meant to evoke the seasonal shifts of Trondheim, Norway, a city located at 63° N — the farthest north I have ever lived. These higher latitudes witness dramatic shifts in daylight throughout the year, and daily life in both its social and interior rhythms is greatly affected. In addition to the formative experiences of the pandemic, these cyclical and sensorial changes had psychologically mediated all phases of the PhD period, having the effect of blurring or fusing time. By mimicking these seasonal changes with lighting, I was trying to communicate the temporal organum at the root of life in Trondheim, as well as pay homage to the three years of PhD process situated there—a period marked by significant challenges and growth.

Musically, the second piece create organum by gathering and pairing sounds which came from the same "family", as I had done in *Pending Xenophora*. Six months prior to the concerts, this strategy took a surprising turn when I was confronted with a possible link in the timbral evolution of double bass and pipe organ, dating back to the close of the 16th century. This speculative line of research proposed a fascinating relationship between the two instruments, in which the modern bowed bass was originally developed to articulate the thin bass register of the Baroque Italian organ. To creatively explore this connection, a midi organ pedal was equipped with samples from a 400-year old Brescian organ. Its timbres fused remarkably well with those of bowed dyadic bass and voice, and their interplay became primary source of orchestration and composition for *This Fascinating Weather*.

In essence, all research threads both old and new converged in this renewed contemplation of the pipe organ. Pipe organ's symbolic significance had influenced the project at each stage, present even when it seemed dormant. Now, the project's lessons and goals were brought back into artistic production through a direct encounter between bass and organ, embracing the orchestration of surprises and pluralisms, and designed to foster a communal polyphony of sensory understanding for a Trondheim audience.

PLANETARIUM SETTING OF 4.57 AM

The light took my face. That's all I want to think about. I only want these moments between me
and the elements. If I couldn't see, I would still see, I just know it.

– Alice Notley

I WENT DOWN THERE

Certain Magical Acts, pg. 14

Origins of the Text

Although *4.57 am* was produced as one half of the final result in June 2023, the text itself was written between October 17-19th, 2021. I normally work late, but on those days I awoke naturally and repeatedly around 4:30 am and fell into a current of words. In this way, and more than any other previous text-based work, the writing process was a type of performance, flowing unencumbered from that lucid mental state unique to early morning.

Written by hand, the text was quickly compiled into a file on the iOS Notes app and read the next day to an audience at Cinemateket Trondheim for the Norwegian Artistic Research Program's autumn forum. While I read, a white circle on a black cinema screen was programmed to shrink imperceptibly, disappearing by the 30-minute mark. The chance premiere of the text in a cinema space was significant, allowing me to emphasize, through the use of a minimalistic and durational visual, the text's visuality – the slow transmutations of its cyclical imagery.

The results were a turning point in the project. Previous attempts to work with live text in *The Word of the Year* had left a hollow feeling – in part due to its unshielded delivery to a camera, but also due to its scripted nature, bare and raw subject matter, and staging as theater. *4.57 am* took an entirely different approach. That of reading or simple re-transmission, not acting; continuous, uninterrupted language rather than episodic sectioning or scenes; internal rather than external dialogue; and most significantly, replacing linear narrative with a field of association, a web of interconnected themes, stories, and ideas, constellations for the listener to string together in their own way. In this way *4.57 am* activated the spectrum between prose and poetry – which called for a deft approach to its recorded reading.

To inform the reading process, I looked not to other performative writers, but to American poet Alice Notley, whose live readings contain a blankness and sharpness. Though the text must be inhabited fully, there was something unaffected about presence, as a process of building down

or *not performing* the text, alluded to in 4.57 am as “an obligation to honesty, bareness – simple guidance or presence, condition creation.”

However, this blank state was a struggle to capture in recording. After many failed attempts in studio, I was finally only able to record the text under the same conditions where it was written: in one take at 5 am, sitting on the edge of the bed, still cloaked in the clarity of sleep. This process revealed the responsive aspect of presence – not conjurable autonomously, at will, but arising in unwavering communion with something *other*, whether it be a person, place, set of conditions, or body of material. Presence in fact relies on a blank state of play.

Roland Barthes observes that “The Text decants the work from its consumption and gathers it up as play, activity, production, practice. This means that The Text requires that one try to abolish the distance between writing and reading (..) ‘Playing must be understood here in all its polysemy: the text itself *plays* and the reader plays twice over, playing the Text as one plays a game, looking for a practice which re-produces it” (Barthes 162).

It was through this necessity to record the text as *play* that I came to appreciate its true nature as Text, which, according to Barthes, operates “according to a serial movement of disconnections, overlapping, variations. The logic regulating The Text is not comprehensive (define ‘what the work means’) but metonymic; the activity of associations, continuities, carryings-over coincides with a liberation of symbolic energy (...) The Text is radically symbolic: a work conceived, perceived and received in its integrally symbolic nature is a text” (Barthes 158-9).

Images and themes

4.57 am thus liberated a dense array of symbolisms in the project, including multi-limbed polyphony, dimensionality, chorused environmental sound, presence, and sight. All themes are framed by the opening and closing symbol of a treefrog – more specifically, the spring peeper (*Pseudacris crucifer*), a small creature widespread in the eastern United States. Working closely with its image (and later its naturally chorused sound) provided a fixed external point to consider the elusive concept of presence, or aura, which Walter Benjamin defines as “the unique phenomenon of a distance, no matter how close” (Benjamin 5).

Distance, as it concerns the treefrog in the final artistic works, can be approached in three ways. Firstly, as a visual distance. Despite the treefrog’s sound pervading my childhood environment in upstate New York, I have seen it only once, just two hours before experiencing a severe immune reaction to a Covid vaccine in the summer of 2021. (This timing elevated the encounter to the status of a personal myth.) Secondly, the treefrog articulates sonic distance: the multiplied voice of the treefrog in the canopy above, surrounding the listener, images the intervals and

dimensions of outdoor space. Lastly, from the perspective of displacement, the treefrog offers a form of memorial distance. Not only was the sound of the treefrog beyond my reach in Norway, but the fundamental conditions for its song don't exist there. Warmth and darkness never coincide; darkness is exclusive to the colder months, and warmth is solely a product of direct sunlight. In Norway, to experience the phenomenon of the treefrog, or any chorused and continuous nocturnal sound, was naturally impossible.

As the project unfolded and text aged, the sustained distance of the treefrog began to enhance its presence or aura in my work. It became a conduit for the consideration of sight and presence, ultimately rendered actionable through the fever-induced composition of an incantation ("tree frogs, seldom seen, always heard"). I came to understand my intended presence as primarily sonic: a sustained and dimensional sound enveloping the audience in the dark, prompting the intentional subversion of sight in performance.

As a creature who relies on the tactility of its sticky limbs to move through the world, the treefrog also symbolized a growing sense of four-limbed polyphony, further developed through a critical, active and reflective relationship to rock climbing. In *4.57 am*, climbing is referenced in detail, primarily in its use of "beta" or field-specific incantations, but also as an extremely polyphonic physicality. Climbing served to "multiply the left-hand" in the project, a motion which would eventually spill over into an activation of "four points condensed, like four limbs with hands and feet reaching, splayed on the wall, desperate for contact and desperate to stick."

Roland Barthes, in essay *Musica Practica*, underlines the that "the body strives to be total (...)" with respect to this music, one must put oneself in the position or, better, in the activity of the operator, who knows how to displace, assemble, combine, fit together; in a word, who knows how to structure." While Barthes here refers to the watershed phenomenon of Beethoven's music (considered as having reoriented the "mimetic impulse" from the singularity of the melody to the totality of the orchestra) he further observes that "to compose, at least by propensity, is to give to do (...)" The modern location for music is not the concert hall, but the stage on which the musicians pass, in what is often a dazzling display, from one source of sound to another" (Barthes 153). *4.57 am* acknowledges this transfiguration using a series of extended and interwoven metaphors which "tether one experience in the body to another" positing that at its heart, art is a shrouded and mysterious conversion of energy, illuminating the intervals between diverse practices, instruments, stages and physicalities.

Planetarium setting

At the time of the artistic result concerts, the text of *4.57 am* was 1.5 years old. The choice to produce it anew, this time as a spatialized audio-visual piece, was largely in response to a resonance I felt in the Trondheim Planetarium, which is a 360-degree digital cinema with a screen that fills the entire field of vision (Planetarium, Vitensenteret.com, 2024). It's delimited yet dimensional space seemed well-equipped to focus and coordinate three perceptual threads in the envisioned production: text, ambience, and visuals.

Ambience was created by chorusing tonal clusters of notes from a "family" of sound extrapolated from a single sampled bell, previously used as an absent character's leitmotiv in *Sisterless*. The sample was stretched through granular synthesis, transposed and layered in chance harmonies which evolved slowly and imperceptibly around the recorded text of *4.57 am*, which spans 32 minutes. The slow and staggered entrance and exit of each new transposition expressed polyphony as *expanded*, moving on the time scale of the full piece, and constructing, through its pockets of sustain, a polyphony of planes rather than melodic lines. Major changes were meant occur below the rate of direct observation, leaving perceptual room for the continuous flow of text – a technique learned and practiced in the sound design of *Sisterless*.

The visual of a shrinking circle came from the text itself, located in a passage which describes the slowly compressing sensation of a Nordic autumn: "Everything comes down to a point – then to blank points and the finest movements between them." The point in question is the winter solstice, but also refers to the points at the intersection of lines and planes in a 3-dimensional environment, or the points of contact on a climbing wall. To make contact with a point actually produces a state of visual occlusion, a "sight" in the darkness as "an irrevocable illumination of every point and empty of the eye". Thus, even at its brightest, the shrinking circle was occluded or eclipsed (**Fig. 6**) achieved by simply turning off one half of the Planetarium's hemispherical screen.

Within the concluding state of blackout in the Planetarium, the chorused presence of the treefrog seemed essential to recreate and sustain in response to the text's final incantation ("tree frogs, seldom seen, always heard"). The audio used was an archival recording from upstate New York provided by field recordist Lang Elliot, documenting spring peepers singing in their typical activity and density – a "keynote sound," used to localize the listener within a specific and, in this case, distant biotope (Rudi 187). This audio was introduced separately and suddenly, as an exclusive sonic state. That is because the treefrog's acoustic niche within its natural soundscape is all-encompassing – as a chorus they command an enormous frequency spectrum, spread throughout all corners of the night as a singular yet multiplied, measureless presence. In its exclusivity the dense chorus of the treefrog provides a static fixation; a "pivot point" around which the two interconnected pieces in all their polyphonies could convene.

In setting these concepts sonically, I had to engage with the formidable technical capabilities of the Trondheim Planetarium (Fig. 7) which offers a sound system “the first of its kind in Norway” and “one of only six in existence worldwide, consisting of 38 speakers distributed in three circles at three height levels” (Vitensenteret, 2024). My only previous experience working with spatialized audio was in very basic, DIY set-ups, mainly quadrophonic. Setting *4.57 am* within a hyper-dimensional auditory space posed a daunting learning curve.

It is here, at the fringes of my limited technical knowledge, where I felt it finally necessary to involve an expert. I was fortunate to find Frank Ekeberg, a Trondheim-based transdisciplinary artist and excellent teacher with intimate working knowledge of both the unique Planetarium space and the ambisonic processes it required. Frank was able to communicate ambisonic principles from an introductory level, guiding me to the IEM Plug-in Suite, an open source set of plug-ins designed to work with ambisonics up to the 7th order. IEM’s StereoDecoder and AllRAEncoder were set up with a speaker preset specific to the Trondheim Planetarium (Fig. 8) operated through Reaper and routed in the space via Dante. We then worked implicitly with concurrent audio channels, *carving* the piece out of the rampant possibilities of the space through raw experiments with sound’s placement and movement, searching for the “acoustic ecology” of the piece, “where the interdependence of all sonic elements comes into focus” (Rudi, 190). The slow emergence of this quality from the Planetarium space recalled the first thrill of combining voice and dyadic bass toward a “fused, almost electronic” sound – this time, the effect was shared with another person across sonic disciplines.

It is also here, from my roots in acoustic music, where I note the unique resistance of digital technologies as ‘instrument’. Unlike the physical musical instrument, their resistance operates more as overwhelm or effacement. Digital technology presents a network of knowledge and information which so enormously transcends any one person’s ability to train and master it, that to come head-to-head with it as either instrument or material can easily scramble the mind. Contrary to the isolation and narcissism observed by Byung-Chul Han as outcomes of digital communication technologies, this unbelievable world of creative technological possibilities may in fact stoke an increasing need to build cooperative and interdependent human relationships, countering the cumulative and additive qualities of information with the truth-bearing negativity, interiority, and exclusivity of collective in-person work processes.

THIS FASCINATING WEATHER

“By moving sound from its original location to a new location ... and by combining associations from both environments, a new sense of place is created in the listener.”

Soundscape in the Arts, 180-181

This Fascinating Weather was a solo performance for bowed bass, voice, midi organ pedal, spatialized sound design, and the slow illumination of the room from an initial blackout state, designed to transpose the textual themes of the *4.57 am* into musical and spatial form. For the majority of the piece, the voice sang wordlessly, as if from within a choir, forgoing lyrics in order to leave space for the lingering semantic imagery of the preceding text. Only in the final sequence was a *song sung*, mainly to underscore in lyrics the piece's alternate role as a tribute to the climate, sound environment and drastic seasonal shifts of Trondheim.

A single key insight triggered the composition of *This Fascinating Weather* – one which reframed the project's connection to the pipe organ from imitative and metaphorical to active and integrative, originating in conversation with my luthier Bram de Man seven months before the scheduled premiere.

Origins of the Instrumentation: Intersecting Lineage of Bass and Pipe Organ

For years I have described the double bass as “the pipe organ of the string family.” The metaphor prepares the audience, who so often listens first with their eyes, to hear polyphony and homophony from the bass and to receive bass and voice as one fused sound. In other words, infusing the bass with the *idea* of organ creates a new opening in the ear.

In December 2022, it came to my attention that there may be more to this than metaphor. It is well documented that the historical double bass was frequently found in churches during the Renaissance and Baroque eras and filled various functions in religious service on both sides of the Atlantic. In addition to sharing spaces and duties with the organ, the bowed bass may be symbiotically *related* to the pipe organ, built to work with and *from within* its sound.

My hypothesis is based on an interview with Belgian luthier Bram De Man, a master craftsman equipped to interpret details of build, function, and lineage at an almost forensic level. During our conversation in December 2022, De Man elucidated the work of baroque master luthier Gasparo da Salò (1540-1609) to make a case for pipe organ as *the catalyst* of the modern

double bass – that is, the double bass as we know it today, the low end of the violin family, distinct from the bass violone and widely considered to have been Gasparo da Salò's enduring contribution to organography.

In our discussion at his Brussels atelier, De Man focused his analysis on a particular plate drawing from Michael Praetorius' *Organographia* (1620) – a title that literally translates to “a written text around everything that makes sound”. The image in question depicted a Da Salò double bass. De Man interpreted information of scaling and build – such as the detail of the lowest, thickest string as needing to attach under and beyond the tailpiece – as evidence of the instrument's enormous size. With the gut strings technology of the era, such a behemoth would have been purpose-built to play a few powerful low notes at the expense of everything else, likely costing Da Salò over half a year's labor. Why would the luthier go to all that trouble, posited De Man, unless such instruments served a specific and essential function?

Bram ultimately deduces that this instrument was built to reinforce the low register of the 16th century Italian organ. Gasparo da Salò lived and worked in the town of Brescia, Italy, and was very likely to have rubbed elbows and swapped innovations with master organ builder Costanzo Antegnati, also an active church organist concerned with expanding his instrument's register. Costanzo belonged to a proliferous family of organ builders active in northern Italy from the 15th to 17th century, whose organs are still the *typus* of the Italian organ building school (Sonus Paradisi, 2024).

In Antegnati's day, “Italian pedalboards were small both in the size of the keys and in the compass, typically of an octave” (Yearsley 7). Furthermore, “there were no independent stops, but rather “pull-downs” permanently coupling the pedal to the manual” (Yearsley 9). Today, we consider earth-rumbling bass notes and active pedal work to be among the organ's defining characteristics, but these were German innovations which became the standard across western Europe only by the second half of the 19th century. For Costanzo Antegnati, they were not part of the landscape. In addition to a limited bass register, the typical Italian organ was characterized as having “a mild tone, round rich and singing,” with low air pressure and the absence of reed stops (Williams 1988, 87) meant to “speak with an age-old breathy tone that has a variable edge to it (...) perennially useful for Italian vocal (but not German instrumental) counterpoint” (Williams 1988, 212).

The first strength of the bowed double bass is its power of articulation – in one motion, the bow expertly and simultaneously carves from the instrument both its lowest reverberations and the definition of its higher frequencies. Could it be that exchange between Antegnati and De Salò gave rise to a new breed of bass instrument, bigger, louder, lower, and punchier than a viol, for the express purpose of articulating the soft-spoken and limited bass register of the Italian organ?

Ultimately, De Man approaches the topic of lineage with diplomacy, pointing to a window of a half-century after Da Salò where both luthier and player put up with such behemoths. Then at some point, the bass of the violin family and viol family started to merge. This hybrid instrument is what we play today. Its roots reach down in two directions, which is why our modern double bass has such a variable expression of form, style and sound. In other words, the bass is just too big. It was impractical to standardize it, to constrain it to one 'family' or another. It has always needed fluidity of build and function. Historically, and to this day, we are dealing with a shapeshifter by design.

In this speculative line of research, my aim is not to establish and support a new historical claim. The exact lineage of the modern double bass is hotly contested, and the current PhD does not seek to enter the debate. Instead, to reimagine the bass's lineage and origins serves a primarily creative function, renewing curiosity and compositional direction for the instrument in its fifth century as a form. I submit the preceding discovery on its own merit, as artistic fuel within artistic research.

Creation process

Two events transformed this new revelation into artistic process, the first being my sudden acquisition of a set of MIDI organ pedals, loaned by a generous American colleague at NTNU. The second was the chance discovery of an audio sample pack, containing the full set of pipes and sounds from a 16th century Antegnati organ in Brescia. The sample pack was created by the Sonus Paradisi project, who states as their mission "to archive and conserve the sounds of important and historically significant pipe organs" and "to offer playable models of the organ via specialized computer software and MIDI technology" (Sonus Paradisi, 2024). With both the pedal and the Antegnati organ suddenly in hand, work could proceed on the final artistic result.

Sounds and programs: The pedal's MIDI expression was controlled via Ableton and then routed to Hauptwerk, a powerful organ modeling software housing the Brescia sample pack. Hauptwerk's output was then routed back through Ableton, where the sounds of the organ could be augmented with layers of custom sound design. I sought to reimagine rather than simply reproduce the Brescia organ, pairing each set of pipes with processed audio from my own sound library (including sounds used in *Sisterless*, *Pending Xenophora* and the Planetarium setting of *4.57 am.*) I also paired non-pitched sounds from the organ sample pack (mechanical clicking of keys, wind noise from the bellows) with ambient non-pitched sound; treefrogs, bowed cowbells, water etc. At a certain point, catching myself programming tree frogs into an organ pedal, I realized I had reached the truest spirit of "organographia": trying to place at my feet a collection of every conceivable sound, and to fold *that* into a 400-year-old collection, trying to reanimate the Brescian organ across centuries and distances as larger-than-life.

Spatialization: Organ and bass were set up to speak more locally, through a speaker arrangement clustered around my location in the room. Embedding speakers into the performance set-up as equal partners was a live blending strategy borrowed from the Christian Wallumrød Ensemble, literally placing electronic and acoustic sound in as close proximity as possible. The elements of sound design beyond bass and organ, or *augmentation sounds*, were routed in a crossed stereo pattern in the venue's quadrophonic speaker setup to permeate the entire space from all directions and build sonic environment. By placing myself on the floor rather than the stage, I was able to be more connected to this environment while performing, while minimizing specular and spatial hierarchies between audience and performer and balancing a performative focal point in the room with the immersive, multi-centric experience of spatialized audio.

Blend between bass and organ: De Man's proposed role of bass was as a true bass instrument, fleshing out registers the organ pedal could not. By contrast, my instrumentation seemed like an inversion, using the organ's pedal to underscore the harmonic spectrum of the bass. In actuality, the foot pedal was programmed to access the entire range of the Brescia sample pack with sounding pitches from C1 to C8, commensurate with the wildly expanded register of the bowed bass that harmonic playing allows. This presented a wealth of orchestration options – which stops or combination of stops in the organ paired with which registers and timbres in dyadic bass? Finding the most interesting blends guided compositional decisions, navigated technically navigated by automating changes in the organ's register and registration according to Ableton scenes. Though bass and the Brescia organ had a natural timbral affinity, their blend in the room relied on another technical process, a dual pick-up system which set bowed bass into the amplified space as unaffected as possible. The two pitch layers on the bass, harmonic and stopped note, required their own pickup and signal path, to be recombined later in the final mix. This allowed for more precise EQ and mixing in the live amplified sound field.

Ergonomics: With a vast pitch field to operate in both the feet and hands, I was limited in my writing by daunting new ergonomic considerations. Organists play pedals in a seated position, with both legs free from the hips to create melodic lines. I must play the organ pedal standing, balancing the bass against my left hip. Any activity in the feet must occur within outstanding physical negotiations of shifting, bowing, changing strings, and singing. It became necessary to build a platform around the pedal (**Fig. 9**) to raise myself up by 7 centimeters, bringing my feet flush with the edge of the pedal so as to dip down *into* the pedal with the foot, rather than lift the leg from the hip to play it, which disturbed my center of gravity. I had learned from climbing to heed these signals, to keep the powerful legs working for rather than against the body's alignment. Even with the platform, I could not play running lines as an organist would, but carefully chose individual notes and chords, including cluster chords played with an angled foot, to augment the double bass material. The sole exception was an opening melody, the introduction of the organ sound, which I played with my hands by feel, kneeling over the pedal

in the dark. The deliberate ergonomics of the piece marked a significant mode of engagement with the dimensional, proprioceptive meditations of *4.57 am*.

Orchestration: The sample pack of the Brescian organ included 12 ranks, set as individual stops on the console within Hauptwerk (Fig. 10). Orchestration began by exploring their timbres and pairings, internally and with the sound of bowed bass. These combinations were then further augmented using samples from my own library, processed via granular synthesis, bringing together the age-old art of organ registration and a modern approach to sound design. The signal of a successful pairing came, surprisingly, from the seemingly autonomous emergence of a melody. Melodies and harmonies *emerged naturally from the composite timbre of organum*. This was an essential research finding, a variation on the ability of the composer-performer to “let the instrument write the music” – a phrasing articulated by my fellow bassist and researcher in Belgium, Nils Vermuelen. I had previously taken this idea to mean the idiomatic movements of the left hand as filter for melodies and polyphonies from the bass. This time, melodies shaped themselves *first* around the character of timbral fusion, only secondarily influenced by the ergonomics of playing.

Temporality: An early compositional idea for the piece was to start from timbral distance and move slowly and imperceptibly toward a state of timbral fusion, thereby interacting clearly with to the slowly accumulation of light. Partly due to the constraints of time and ergonomics, the composition was less durational than intended, instead built from a series of scenes or phases. Still, the interconnection of these scenes relied on deliberate, slow transformations and long cross fades, working toward a “tunnel” effect in the music through the overlay of multiple concurrent sonic layers or states. This turned out to be just as interesting to work with and recalled the experience of building and integrating sonic space within film.

Composition and Improvisation: When Derek Bailey asks organist Jean Langlois about the enduring facet of improvisation in organ playing, even when it has disappeared from other areas of European classical music, Langlois reminds the reader that for the organist, improvisation is obligatory, saying “I don’t think it is possible to be an organist if you are not also an improvisor” (Bailey 37). Bailey reveals the fundamentally practical motivation of organ improvisation, a reflexivity to accommodate the unpredictable durations of other elements which make up a religious service. Within *This Fascinating Weather*, improvisation also worked as a practical necessity to move along the structure of the piece as a whole. Much of the composed material was so new that, like the church organist, I was obliged to improvise, in a functional act of connecting and synthesizing fresh music through spontaneous layers. I could knit together planes, one receding and one emerging, through a common sonic texture, or by setting up “rooms” of organ sound to improvise within on the bass. Improvisation also involved the pairing and layering of textures and timbres, a live manifestation of the orchestrational process, which

relied on setting up a dynamic relationship between acoustic and electronic sound production, rather than the fixed audio tableaux from previous projects.

Sight hierarchies: The performance's staging and lighting challenged traditional sight lines, calling into question the primarily visual way that a visitor experiences live music. Positioning myself on the floor within the audience, using diagonal seating angles, and transitioning from total darkness to a full wash of light was meant to counter the position of the performer as a central, visually consumable object. This experimentation drew from reflections on the organist's station, distinct from that of the pastor or priest, in the loft. As a figure, they disappear into the expanses of their instrument, enacting ritual through sound alone. Together with lighting designer Martin Myrvold, I explored various options in staging and lighting arrangements (Fig 11) connected to this idea of absorption. We ultimately decided to conceal and reveal the performer through the gradual transformation of extremes, starting with blackout lighting conditions intended to redirect the audience's primary perception from eye to body and ear, and concluding with white-out conditions which could overwhelm the visual faculty, thereby subverting it anew.

Results and reflections

This Fascinating Weather functioned as an essentially integrative piece, bringing together the personalities of my actual and conceptual instruments, the roles of sound designer, composer, performer, and improviser, and sound environments as experienced on two continents. On a personal note, the juxtaposition of environmental sound from my place of origin (treefrogs) with my place of actuality in Trondheim (frozen water, wind) yielded a curious new sense of place, setting a chimeric stage that drew from both environments and yet was neither.

Extreme lighting conditions and effective floor staging were difficult to achieve at Dokkhuset. In retrospect, the piece may have benefitted from the surround speakers and visual clarity of a black box theater. However, premiering the work at Dokkhuset represented a personal triumph. Dokkhuset was the production site of *The Word of the Year*. To return there with the lessons of years and produce a new large-scale work closed a process loop for me. Dokkhuset also forms a primary site of intellectual and musical community in Trondheim. As a creative and social home base, it was an honor to present the work there, which was titled *This Fascinating Weather* in affectionate acceptance of Trondheim's intense climate and weather patterns. Such weather patterns were in fact a significant source of company and contemplation for me in the deepest recesses of the pandemic, watching the clouds break over mountain, fjord and city from the window of my bare apartment.

POLYPHONY: FOUR CONCLUSIONS

1. Polyphony as multi-limbed: The solo activation of polyphony changed from a localized problem for the left hand into a multi-limbed, whole-body endeavor, with musical simultaneity requiring the active participation of all limbs coordinated through the proprioceptive sense. I first began to consider this essential *tactility of counterpoint* away from the bass, on the climbing wall, and later came to understand it through the lens of organist and musicologist David Yearsley, who draws connections between the historical development of polyphony, the organ pedal, and the traditions and knowledge of leading historical organists, many of whom were blind.

Yearsley notes that “the blind know the shape of things through touch” arguing that “musical touch is also a way of seeing sound with the body, but not just for the blind. The manuals and pedals made it possible for the organist literally to grasp intangible music – especially abstract counterpoint – with his limbs. The organ allowed the organist, blind or sighted, to hold polyphony in his body, so that he could see it with his “inner eye.”

“Articulating these abstract structures with feet and hands [allowed the organist] to make sense of polyphonic space: [enacting] the movement of the individual voices with independent limbs” (104) which “made the art of multilimbed performance (...) one of measuring the progress of still more voices on fingertips, toes and heels; feeling the trajectory of individual lines and the ever-shifting distances between them became an essential mode of musical knowledge.” (Yearsley 105)

Yearsley concludes that “the organist’s art, practiced at its most demanding in large polyphonic works, is fundamentally an epistemology of the body. To execute such rich polyphonic structures – four parts in continuous motion – is to know how counterpoint feels,” (Yearsley 106) even suggesting that polyphony developed *as a result* of the spatial framework provided by pedaled organ, allowing the blind organist to physically “conceptualize complicated contrapuntal structures in ways impossible at other instruments.” (Yearsley 101)

The absence of sight, whether lost or subverted, heightens synapses and spatial logics for navigating polyphonic organ music’s intricate textures. In this project, the intentional subversion of sight, originally designed to cultivate an alternative mode of performance presence, also became a means of embodying polyphony fully. I frequently practiced in the dark, trying to listen more closely to the coordinated knowledge of my limbs. While the music I have produced is nowhere near as polyphonic as most organ pieces, it marks a beginning, not a conclusion, for the art of multi-limbed, whole-body polyphony could extend for several lifetimes—and has.

2. Polyphony of planes: The project moved from a counterpoint of lines to that of surfaces or planes, which releases an expanded temporality of musical polyphonic composition while providing the conditions to develop organum, in the sustained overlapping or chorusing of sound. Here I borrow from the thinking of visual artist Paul Klee, himself a trained musician whose paintings translated the notion of polyphony from musical to visual form. In *Klee og Musikken*, Ole Morten Moe writes that Klee's drawings and paintings "discern between linear and plane polyphony. Klee uses [the term polyphony] several times in his Bauhaus lectures and visualizes it by lines running together and across each other" (Fig. 12) even noting in a 1917 diary that "Polyphonic painting is superior to music in that, here, the time element becomes a spatial element. The notion of simultaneity stands out even more richly" (Moe, 268-269). From the interplay of specific lines, Klee's work moves toward "plane polyphony" by letting "tonal or color planes "sound" together, placing a translucent layer on top of the other (Fig. 13), so that the lower planes "sound" through the upper ones (Moe, 269).

The idea of a polyphony of planes addressed a persistent tension in the project, located in the original bass-specific conception of polyphony between independently active voices, which are perceived more in their distinction than in their unity, and the fusion or merging of those voices; essentially the conflict between the needs of polyphony and organum. A solution is hard to achieve between three parts alone. By multiplying voices, choosing timbres from a relational "family" of timbres, and focusing on sustained overlay or closeness between entire surfaces or planes, polyphony could be developed while preserving the conditions necessary for the organum, or fusion, of voices.

3. Polyphony beyond musical temporality: An expanded sense of time in the music was helped by taking the concept to its extreme. In a mundane moment, sitting on the heated bathroom floor to pick the lint off a pair of socks, I began to envision a type of counterpoint which transcended the span of a single human life, which occurred on colossal scale as if centuries were articulated in layers rather than in a single linear progression. The interconnecting and multidimensional soundings of many generations spoke in simultaneity, each with their own varied expression of an instrument, a vocal role, a concept, or type of movement, and each with something to offer, punctum and contrapunctum, backwards and forwards, to each other.

Is polyphony a very active thing, or may it take place uncompressed and across millenia? We think of it as something on the time scale of music, seconds or beats, but its choreography may also occur on the scale of hours, days, years, and centuries, beyond our quotidian ability to hold and perceive it.

In translating huge swaths of time into a type of frozen space, we may again draw insight from Paul Klee, who regards the equation of space and time as such: "Movement is at the base of the origin of everything (...) there is made a great fuzz on the difference between the arts in time

and space. On closer observation it is all learned nonsense. Because also space is a time concept. When a point is made to move and becomes a line, it demands time. The same when a line is moved and becomes a plane. And the same again when a plane is moved and becomes three-dimensional space” (Moe, from Klee’s essay “Graphik”, 269).

In the same way that a visual may exist as a series of movements in time, a series of movements in time may exist cyclically, dimensionally, and spatially, their qualities of simultaneity standing out all the more richly – as with the imaged chorused sound from a cross section of discontinuous years, or the intervallic relationships of the double bass crystallized in 3-dimensional space. After such calisthenics of the imagination, it was a small step between the polyphony of line and plane on the scale of a long-form musical piece.

4. Polyphony of the senses: To manifest polyphonic organum across mediums in this project, freeing it from the confines of bass and voice, a new intonation to the senses and their interaction was required. This relied on rebalancing existing sensory hierarchies toward an equal polyphony of the senses. Imbalances were exacerbated and made painfully obvious by the pandemic, but theorist Marshall McLuhan considers this a normative condition of the modern Western world, stating that “for several thousand years, man’s sensorium, or his seat of perceptive balance, has been out of plumb” (McLuhan 69) tilted toward a flattened and ocular engagement with one’s environment at the expense of the sonic, tactile, kinetic and dimensional. Referring to Antiquity, McLuhan puts forth *Census communes* as the Latin definition of man in a healthy natural state “when physical and psychic energy were constant and distributed in a balanced way to all sense areas”, a state where “seeing hearing tasting smelling and touch, were translated equally into each other” (McLuhan, 69).

Census communes, in effect the *polyphonic organum* of the senses, was the higher intention of this project for both artist and audience. It was approached mainly through the subversion of sight (in both practice and production) and the deliberate elevation of the sonic faculty by focusing on the dimensionality, or “sight” of sound. This was a healing and, in many ways, anti-theological act, embracing the orchestration of pluralisms to create a space that was decentralized and deconstructive, immersive and abstracted, divested of linear narrative and designed toward a communal polyphony of attention and understanding.

Musicologist John Sheperd highlights the unique abilities of sound, which in contrast with both vision and touch, “is a medium that, in bringing the world to us, stresses the integrative and relational. It tells us that there is a world of depth surrounding us, approaching us simultaneously from all directions, totally fluid in its evanescence, a world which is active and continually prodding us for a reaction (Sheperd 157-158). Sheperd’s observation is rediscovered first-hand by the author John Hull, a professor of theology who gradually lost his vision. In *Notes on Blindness*, he details the integrative and liberating effect of opening the front door to falling rain,

which brought out the contours of the invisible world through a continuous patterned sound field: "I feel that the rain is gracious, that it has granted a gift to me, the gift of the world. *I am no longer isolated*. I am presented with a totality, a world which speaks to me" (Hull 18).

For a project marked so thoroughly by isolation, sound's ability to reconstitute a person as a body *in the world* cannot be overstated. This is, for me, the essential gravitation of the double bass, the organ, or the natural sound field filled with chorused, living voices – their power to immerse, to create place, and in doing so, animate the combined dimensions of the world and the body *as embedded and enveloped within it*, provoking the translation of sight to sound and sound to movement. "XYZ, sight fills in through all the lower bones." And then she asks, "When you play, are you making a sound with these same dimensions? Do you hear it? Do you see it?"

IMAGES

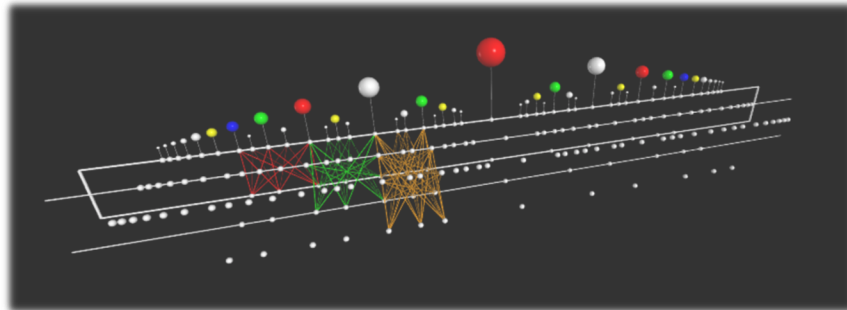


Figure 1: 3D Mapping for ICLI Conference

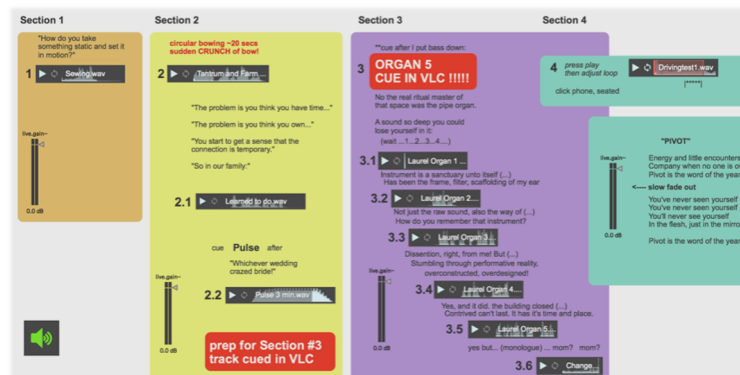


Figure 2: MaxMSP in *The Word of the Year*



Figure 3: Pivots stitched during *The Word of the Year*



Figure 4: A series of stills from *Sisterless*
© Yäniyā Mikhailina

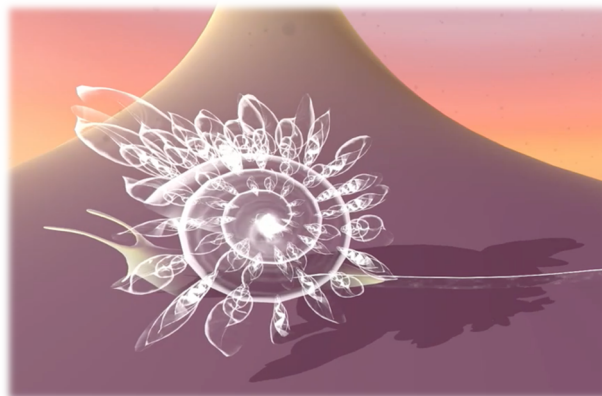


Figure 5: Snail within the VR world of *Pending Xenophora*
© Mari Bastashevski



Figure 6: "Sight" of 4.57 am



Figure 7: Exterior of the Trondheim Planetarium

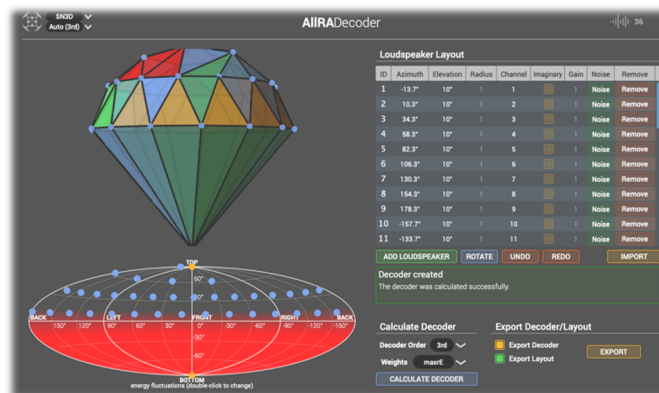


Figure 8: IEM's Decoder with the Trondheim Planetarium's preset



Figure 9: Pedal and platform of *This Fascinating Weather*



Figure 10: The Brescia organ console within Hauptwerk

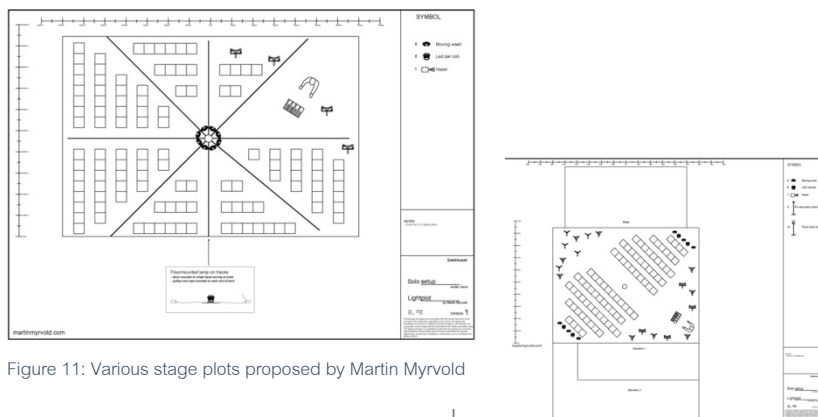


Figure 11: Various stage plots proposed by Martin Myrvold

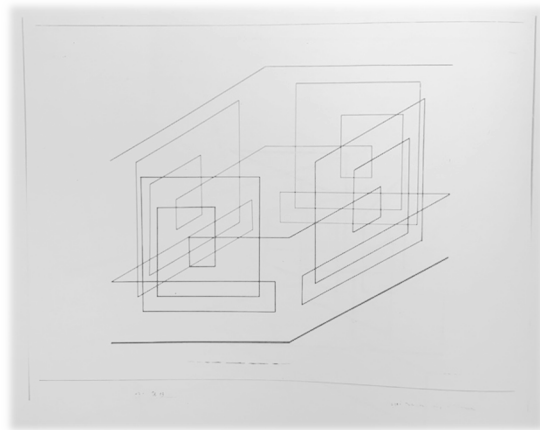


Figure 12: Paul Klee – *Spiegelkanon (auf vier Ebenen)* 1931

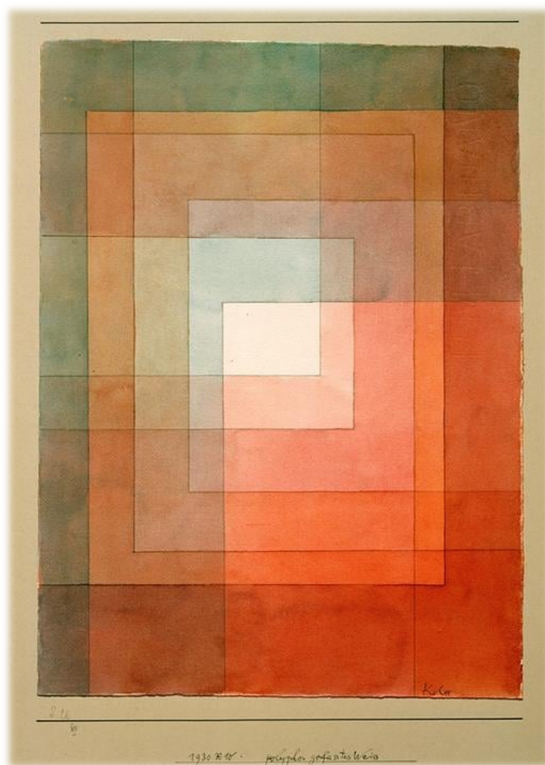


Figure 13: Paul Klee – *Polyphon gefasstes Weiss* 1930

MEDIA LINKS

4.57 am (text only, no musical ambience) <https://on.soundcloud.com/mMqma>

ICLI Conference (Performance Paper) <https://www.researchcatalogue.net/view/908792/908793>

The Word of the Year (video, 36") <https://www.youtube.com/watch?v=UGineNFtR3M>

Sisterless (film, 59") <https://vimeo.com/614514184> password: Zarina Albina Svetlana

Pending Xenophora (audio collection) <https://on.soundcloud.com/NssGQ>

This Fascinating Weather (performance video) <https://youtu.be/zN5qyb0FAV4>

This Fascinating Weather (clips from pre-production) <https://youtu.be/8jRaJlg3QfU>

BIBLIOGRAPHY

Albers, Anni. *Anni Albers: Selected Writings on Design*. University Press of New England, 2000.

Artaud, Antonin. *The Theatre and Its Double*. New edition., Alma Classics, 2013.

Bailey, Derek. *Improvisation: Its Nature and Practice in Music*. [2nd ed.], The British Library, National Sound Archive, 1992.

Barthes, Roland. *Image, Music, Text*. Fontana Press, 1977.

Bastashevski, Mari. "Mari Bastashevski, Digital Ecologies." *Digital Ecologies*, <http://www.digicologies.com/mari-bastashevski/>. Accessed 12 Jan. 2024.

Benjamin, Walter. *The Work of Art in the Age of Mechanical Reproduction*. In *Illuminations*. Arendt, Hannah (editor) Zohn, Harry (translator), from the 1935 essay. Schocken Books, 1969.

Cage, John. *Silence: Lectures and Writings*. M.I.T. Press, 1966.

De Man, Bram. Personal Interview. 03 December 2022.

Evens, Aden. *Sound Ideas: Music, Machines, and Experience*. University of Minnesota Press, 2005.

Han, Byung-Chul. *In the Swarm: Digital Prospects*. MIT Press, 2017.

Hull, John. *Notes on Blindness: A Journey Through the Dark*. Profile Books, 2017.

Moe, Ole Henrik. Introduction. In *Klee og musikken*. Henie-Onstad Kunstsenter, Høvikodden, 23.6.-15.9. 1985: Centre Georges Pompidou, Paris, 8.10.85-8.1.86. Sonja Henies og Niels Onstads Stiftelser, 1985.

Sheperd, John. Music and Male Hegemony. Leppert, Richard, and Susan McClary. *Music and Society: The Politics of Composition, Performance and Reception*. Cambridge University Press, 1989.

Lopez, Francisco. Wine and Dust: Purposeless memory Scraps [and some of their consequences] – from a passionate drifter. In Rudi, Jøran (ed.) *Soundscape i kunsten*. (pp. 263-268). NOTAM, 2011.

McLuhan, Marshall. *Visual and Acoustic Space*. In Warner, Daniel, and Christoph Cox (eds). *Audio Culture: Readings in Modern Music*. Continuum, 2004.

Mikhalina, Yäniyā. *Sisterless - Trondheim Kunstmuseum*. <https://trondheimkunstmuseum.no/en/yaniya-mikhalina-sisterless>. Accessed 16 Jan. 2024.

Notley, Alice. *Certain Magical Acts*. Penguin, 2016.

Planetarium / The Science Center in Trondheim. <https://www.vitensenteret.com/nb/planetarium>. Accessed 10 Jan. 2024.

Silverman, Kaja. *The Acoustic Mirror: The Female Voice in Psychoanalysis and Cinema*. Indiana University Press, 1988.

Sonus Paradisi Brescia, St. Carlo - Italy, Slovenia - Organs.
<https://www.sonusparadisi.cz/en/organs/italy/brescia-st-carlo.html>. Accessed 10 Jan. 2024.

Stone, Kurt. *Music Notation in the Twentieth Century: A Practical Guidebook*. W. W. Norton, 1980.

Thelin, Håkon. A Folk Music of the Double Bass. *New Techniques – New Works*. Norwegian Academy of Music, 2011.

Turetzky, Bertram. *The Contemporary Contrabass*. University of California Press, 1988.

Williams, Peter. *The Organ*. MacMillan, 1988.

Williams, Peter. *The King of Instruments: How Churches Came to Have Organs*. SPCK, 1993.

Yearsley, David. *Bach's Feet: The Organ Pedals in European Culture*. University Press, 2012.