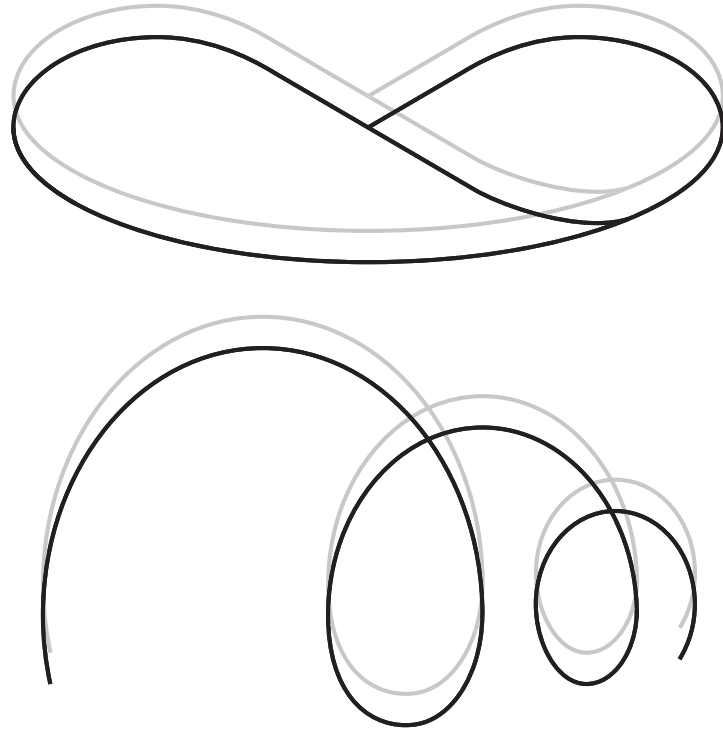


DEAF EXPERIENCE
AND THE TRANSFORMATION OF HEARING

Tarek Atoui, WITHIN (2012, ongoing)



Infinite Ear, an exhibition by Council

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INTRODUCTION

Instead of joining in the chorus of those who lament our era's alleged hearing loss only the better to dismiss the modern project all told, what is required is a more dynamic elaboration of the concept of modernity through hearing
— Veit Erlmann

The shell operates at once as mouth, damp and resonant grotto, and doppelgänger ear—an eerie object becoming (never entirely) a disenchanting scientific thing. — Stefan Helmreich

Grégory Castéra
THE COCHLEAR VERTIGO

YOU ARE IN SENTRALBADET, a swimming pool long frequented by the city of Bergen's residents and visitors. You jump in the pool. When you float in the water your body is caught in its undulations. You feel the variation of these movements and your ears perceive sound trajectories in a different manner. Listening has long been an enigma and certain sages believed the ear housed an ocean. The ocean in your ear moves at the pace of your stride, your red blood cells vibrate at very high-pitched frequencies, your skeleton can conduct vibrations in each part of the body and if a hundred of you were to walk on a bridge at a particular speed you could make it collapse. Water enters your ears and it stays there when you leave the pool. The spiral of the cochlear that transforms air compressions into electric impulsion and enables us to perceive sound is obstructed by the water. You gradually lose your hearing. You feel off kilter and have difficulty making out speech. You search your memory for sonic events. You strain to concentrate. Your attention is focused on the vibrations your whole body perceives, then you understand that the movement around you gives some indication about the sound you can no longer perceive. You see the trajectories of the people around you, you see spaces and groups as sonic forms, sometimes harmonious, sometimes oppressive. You invent a corporeal language that expresses the timbre of your voice which you can no longer hear. You are suddenly more attentive to these sensations despite their having always been there. They alter the way you see and communicate. This leads you to realize that hearing is connected to the other senses and that the relationship between these senses changes from person to person. You use equipment that amplifies and indicates the presence of sound around you. They say a sonic world exists beyond perception, in black holes, photosynthesis, the decomposition of fungi, and that there is no such thing as silence. Now you negotiate all of these sensations to create a music beyond hearing, that undulates like water on the body and on the surface of buildings. Welcome to the *Infinite Ear*.

Since 2013, Tarek Atoui and Council have worked in collaboration with Deaf and differently hearing persons to create a space to experiment with, understand and represent the diversity of the hearing experience. Combining the scientific history of hearing with the history of the sonic arts and of Deaf communities, this site seeks to renew the way we relate to sound perception.

On Hearing Knowledges

During the seventeenth century, the science of otology (the study of the ear) developed in parallel with early modern philosophical conceptions of the ear as an "episteme," or site for knowledge production and selfhood. In *Reason and Resonance*, musicologist Veit Erlmann traces how "[René] Descartes' philosophy enacts an uneasy truce between *entendre*, hearing, and *entendre*, understanding." It is not surprising, then, to note that the word "dumb" also has two meanings: mute and stupid.

Part of the five senses canon, hearing, auditory perception, or audition, is usually understood as the ability to perceive sound by detecting mechanical waves — known as vibrations — through an organ such as the ear, which are then transduced into nerve impulses processed by the brain. (In this way, sound can be understood as a biological imaginary.) Human hearing range encompasses frequencies of 2 Hz to 20 kHz, whereas dogs, cats and dolphins can perceive ultrasound up to 45.65 and 500 kHz. The World Health Organization considers that 5% of the world's population has "mild" deafness (i.e., difficulty listening to a conversation). Indeed, this register of hearing distributes beings hierarchically, according to a scale of ability, and consequently, "profoundly" deaf people, who supposedly hear no sound at all, are located at the edges of this hierarchy.

Begun in 2013 as a research project about deaf persons' perception of sound, *Infinite Ear* approaches profound deafness — a hearing condition ostracized by modern conceptions of hearing — as both an ability (or even expertise) and a starting point from which an alternative to the phonocentric natural history of hearing might be established. To what extent do we hear? What can Hearing and Deaf people learn

from each other's "differently-abled" auditory abilities? Beyond human beings, how might practices in para-hearing — whether biological or technical entities — proffer more complex formulations of listening and hearing, extending these notions beyond audition? In what ways can such knowledge improve political representation of the diversity of hearing?

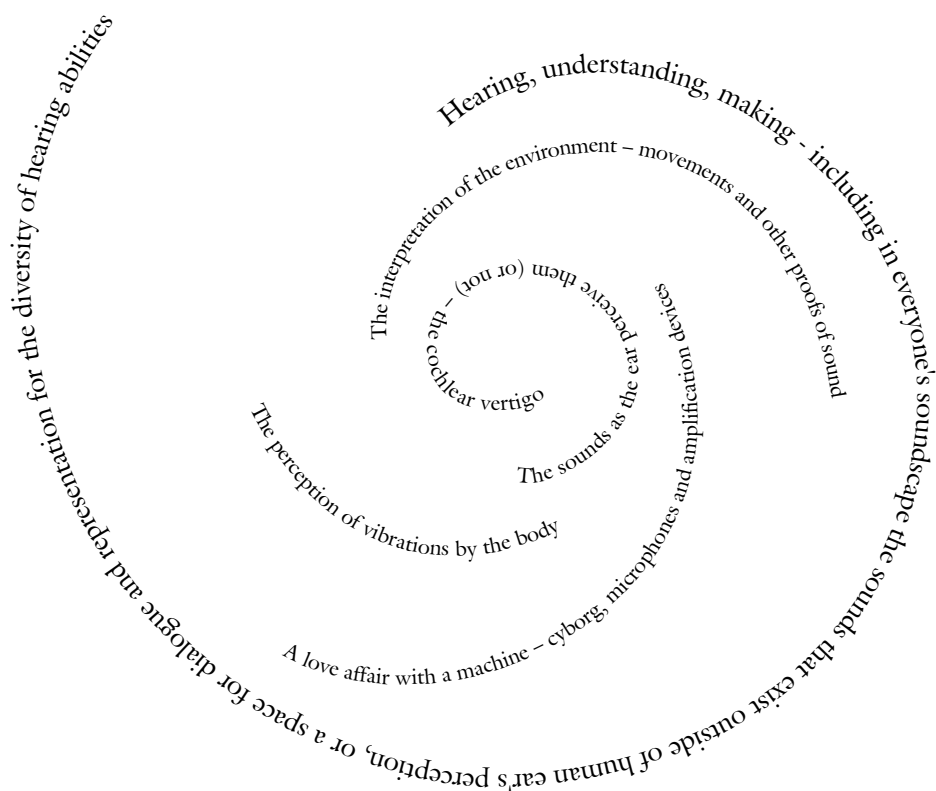
Transformation in Modern Hearing

Infinite Ear considers practices of un- or para-hearing entities, both biological and technical, that exceed, extend or modulate the modern conception of hearing. This follows from Stefan Helmreich and Michele Friedner's essay on disciplinary intersections seeking to "prompt scholars in Sound studies and Deaf studies into new conversation," in order to investigate how sound is inferred in deaf (and Deaf) practice; how seismic communication (sound perceived in the register of low-frequency and vibration) can upend deaf/hearing dichotomies; how the anticipation of sound creates a form of environmental awareness; how "deaf futurists" champion cyborg sound; how space could be rearranged from a deaf perspective; how paracusia (a form of hallucination that involves perceiving sounds without auditory stimulus) is experienced beyond the hierarchy of hearing abilities; and how non-speech-based communicative practices, like signing and active listening, might unwind phonocentric models of speech and thereby move us away from exclusively speech-oriented communities.

These investigations offer new insights into the traditional separation of the senses, and their boundaries, by revealing specific articulations within sensory ecosystems that imbricate more than the five senses. In oscillating between solitary to social operations of the mind, these perspectives on hearing might draw different registers of selfhood, as well as heightened awareness of the sonic environment.

These perspectives may be contradictory. Rather than seeking a single description of hearing, *Infinite Ear* creates a space in which these different perspectives can coexist — a space of composition but also of conflict is a necessary condition for experimenting the common.

The seven chapters of the booklet are a series of collections that will grow, sharpen and shift as the project progresses. Rather than an exhibition marking the end of a research project, *Infinite Ear* should be apprehended as the possibility of a future institution devoted to the diversity of listening.



Tarek Atoui in conversation with
Sandra Terdjman
WHEN WE MET

ST: When we met, we had a different understanding of hearing, now informed by four years of intertwined research and experimentation.

Back in 2012, we shared a common question: What place does sound occupy in deaf culture? As often with Council's projects, we started by organizing a discussion, this time bringing together designers Desiree Heiss and Ines Kaag (BLESS) and a Paris-based organization for Deaf education called Signes de Sens. With Bless, we wanted to imagine a design that could renew the representation of Deaf culture and be a useful tool. Exploring how Deaf and hard of hearing persons perceive and feel sound was the starting point of our research. Different observations ultimately led you to formulate the same question.

*TA: In 2010, I wanted to create a performance that articulated my work on body, sound and composition in a different way. I called it *Below 160*, a performance that mainly used bass and sub-bass frequencies under 160 Hz, and focused on the physical quality of sound. Using sound as medium, I saw this as an attempt to equate my body as a performer and the collective body of an audience. The first time I presented *Below 160* in 2011, the performance took place in front of a hearing audience. What I learned from this performance is how much our ears condition our perception of sound and that we tend to neglect its physical and tactile manifestations.*

I therefore decided to share the same performance with Deaf and hard of hearing audiences, curious about their understanding of a such piece. I was still in residency at the Sharjah Art Foundation and I asked the Foundation to put me in touch with the Al Amal School for the Deaf.

*When I played *Below 160* for the students of Al Amal, I set up my stage and electronics in the middle of a public square in Sharjah's heritage area, and asked the students to experience the sound by moving around. 20 minutes into the performance, several students came on stage wanting to join and play with me. It was a meaningful moment in which the conventional distinctions between audience, stage, space, and musician collapsed.*

A few days later, a workshop presentation we did took 2 hours instead of the typical 45-minute format. The students played sound in a concentrated

and serene way that focused on actions and intentions, disregarding their length and duration.

*After this experience, *Below 160* was transformed, and I left Sharjah with the will to return and keep on learning from the Al Amal school.*

ST: We realized the extent of our ignorance on Deaf culture when we began studying the history of Deaf and hard of hearing education. I remember attending a play at the International Visual theatre in Paris. Everyone was signing around us. We felt excluded and yet curious about the role this language would play in the project.

The physical quality of sound was our first approach of the subject. Other modes of perception came into play later on: the tactile (what is felt through the hands, the bones, teeth) and the visual (sonic information that comes from visual stimuli and sound represented through gesture and sign language).

*Bringing this last element into the project remained a challenge, and we learnt a great deal from the deaf community. You mention how duration and time were altered in *Below 160* and this reminds me of a text entitled *Space, Time and Gesture by Deaf architect Jeffrey Mansfield*. He states that sign language, like music, operates as a space of resistance to an immediate quest for meaning. Sign language has a strong emotional resonance; it involves mood and sensation. These words resonate with your work now.*

*When you started *WITHIN* at the Sharjah Biennial in 2013 and invited us to the Al Amal school, we were able to give our research a context. Together we went to Sharjah several times and worked with a large group of students from 8 to 22 years of age.*

*The most vivid memory I have of our intertwined collaboration took place during the opening days. *WITHIN* had started with a series of performances by 10 drummers playing around the city. We had also organized an afternoon session during which the drummers performed for the students. This performance was both your work and fieldwork. We saw it as a situation to deepen our understanding of the students' relationship to sound. After the performances, students and drummers met for a feedback session. What we thought was a unique experience for the students turned out to be a unique experience for the drummers as well.*

TA: Indeed. What personally caught my attention as a composer was that polyphonic drummers who simultaneously play several elements of their drum kit in sophisticated ways had a sound and body language that was hard to read for the students. On the other hand, drummers with a monophonic style who play loudly were more expressive and articulate. This un-

usual meeting helped me find new ideas for working with the drummers and for engaging with the public spaces of Sharjah.

ST: When we showed the recording of this exchange to Jeffrey Mansfield and conversational analyst Nicolas Rollet, Jeffrey pointed out that the gestures the students used to describe their sensations pertain to the sound description vocabulary used by hearing persons. He described this as one of the reasons why Deaf persons have difficulty expressing their perception of sound. A few months later, Jeffrey set up a workshop in Sharjah exploring how we might create gestures and establish vocabulary to describe sound from a deaf perspective. This is how sign language was introduced into the project.

Convening a pluridisciplinary group of researchers was the basis of Council's methodology. We came back to Sharjah for a 3-day project (then called Tac-et) involving academic exchange in the mornings and practice-based workshops with the Al Amal students in the afternoons. The group included educator Bassem Abdel Ghaffar, designer Desiree Heiss (BLESS), artist Wendy Jacob, sound researcher Inigo Wilkins, joined by sound artist Hasan Hujairi, Jeffrey Mansfield, sign language interpreter Helsa Borinstein and architect Hansel Bauman (via Skype). We wanted to set up a context bearing on our respective areas of specialization but which would also challenge each of our practices. Individual or collective research could then lead to the production of an art project. In your case, your interest in the physicality of noise and sound was informed by the architectural notion of "Deaf space."

TA: I was sensitive to Jeffrey's work on signs and sounds, to Bassem's work on mirror neurons and to Wendy's gesture of giving sound recorders to the students of Al Amal to record the city. Listening to Hansel Bauman was a true inspiration. While I expected a Deaf-friendly architecture to disregard sound and focus on the visual, his work on DeafSpace used sound and vibration as no other architecture did. Then reading the DeafSpace manifesto, the volumes and spaces of this architecture and its use of wood to propagate vibration, evoked huge resonance cases of non-existing instruments. Its modular, configurable walls and its systems of light propagation also reminded me of the software modules and algorithms I use in my computer programming and instrument making. This is when I had the idea of translating the principles of DeafSpace into principles of instrument making. This was the beginning of a new chapter in WITHIN.

ST: In April 2014 we met Hansel Bauman in Washington at Gallaudet University where he teaches and applies his principles of DeafSpace to the university's buildings. His attention to the body (or the body-that-is-deaf) within a given space has also fuelled the exhibition you invited us to curate in Bergen. In a Deafspace, there aren't any elements such as columns or opaque surfaces that might obscure people who are signing from one another. The body-that-is-deaf should always see and be seen. For Sentralbadet, we then asked Jeffrey Mansfield to translate the Deafspace principles into a scenographic proposal.

TA: In my case, DeafSpace was a starting point. But I'm not an architect, and rather than carrying out a theoretical translation of architectural principles into instrumental principles, I returned to "learning by doing."

I started to reflect on an instrument that could be perceived and played by both a Deaf and a hearing person, and then shared this question with different individuals and institutions.

For example, I asked Berkeley University and the Renselear Polytechnic Institute, companies working on speakers and sound systems such as Meyer Sound, music studios developing electronic instruments and computer software such as the Electronic Music Studio of Stockholm (EMS). I also invited sound artists, educators and composers working with and teaching Deaf audiences, including Thierry Madiot.

Several sketches, maquettes and prototypes were proposed and underwent experimentation and redesign in collaboration with Deaf and hearing impaired audiences. Thierry Madiot's percussion tables were redesigned by students from the Nordhal Grieg high school in Bergen, the instruments made by Espen Sommer Eide and EMS were also tested and developed in discussion with individuals of different hearing abilities.

ST: Can you expand on how your experience at ZKM influenced the project in Bergen?

TA: Since 2015, WITHIN's instruments have been developed and shown at the Berkeley Art Museum, EMPAC and ZKM. In each place, the instruments were performed by both Deaf and hearing amateurs and professionals, At ZKM, my participation in the *New Sensorium* exhibition curated by Yuko Hasegawa contributed to finding new ways and techniques of playing some of the instruments. For example, Agatha Gonsior who is profoundly deaf,

played a drum with hundreds of glass marbles, and instead of hearing the sound, she could “see” it through the marbles’ movement. Another example is the feedback the participants gave me on keeping the instruments at a distance from one another in order to keep their sounds distinct. This also brought up new ideas on how to set up the instruments at Sentralbadet, in terms of space, audience and amplification.

ST: When you look at it retrospectively, WITHIN and Infinite Ear have involved more than a hundred participants. Academics and scientists working in various disciplines, musicians, artists, instrument makers, writers and students, from primary school to university. We implemented the idea that each of us holds a form of expertise that can be fruitful to the project. It was never intended to be a “community art” project, targeting a specific community. While it started as an inquiry into Deaf culture, it gradually became an exploration of what hearing is, aside from the aural: hearing in our dreams, hearing voices or the dead, listening to birds or recording unexpected and imperceptible sound. Beyond the hearing and non-hearing binary, it brought together expertise that does not generally meet, therefore challenging a set of preconceived ideas.

The exhibition is far from complete, there are ideas yet to be explored and more works to show — but it is certainly a resulting form. One can trace how the curating of Sentralbadet is informed by different modes of hearing (the tactile, the visual, the signed) that cohabit and feed one another. As for authorship, the distinction between your work and Council’s becomes immaterial. I guess what I’m trying to say is that the exhibition WITHIN and Infinite Ear is hopefully a coherent form yet composed of autonomous projects.

TA: I don’t see Bergen as WITHIN’s final chapter. At Sentralbadet, we will learn to play the instruments individually and as an ensemble. By composing pieces and creating multiple performance situations the project will develop further. My aim is to see these instruments and their repertoire enter a music school or an educational institution that intends to set up a music program for Deaf and hearing people. The work we do in Bergen will be laying important foundations for establishing something along those lines.



WITHIN performance,
Sharjah Biennial 11, March 2013
(c) Sharjah Art Foundation



TACET workshop with Jeffrey Mansfield,
Sharjah Biennial 11, April 2014
(c) Sharjah Art Foundation



WITHIN workshop with Agatha Gonsior, *New Sensorium*
exhibition, Center for Art and Media Karlsruhe (ZKM),
March 2016. (c) Harald Voel

INSTRUMENTS AND PERFORMANCES

You are not censors but sensors, not aesthetes but kinaesthetes. — Kodwo Eshun

As he listened, he became conscious of a curious sensation, a feeling that his ears were stretching out away from his head, that each ear was connected to his head by a thin stiff wire, like a tentacle, and that the wires were lengthening, that the ears were going up and up towards a secret and forbidden territory, a dangerous ultrasonic region where ears had never been before and had no right to be.
— Roald Dahl

WITHIN is a collaborative project investigating how deafness can influence the way we understand sound performance, its space and instrumentation.

For the Bergen Assembly, WITHIN culminates in a new chapter for which Tarek Atoui has developed nine new instruments that expand notions of listening beyond the aural. The design of these instruments and their playability are the result of workshops and collaborations between the artist, instrument makers, deaf and non-deaf students and volunteers. These instruments were made progressively, as the result of exhibitions and residencies that Tarek Atoui initiated in several institutions in the United States, France and Germany, where he met acoustic instrument makers, speaker designers, software engineers and musicians — all contributors to the making of this ensemble.

In September 2016, the instruments will be brought together for the first time in Sentralbadet where composers and performers will be invited to experiment with them in different ways, playing them separately or as an ensemble.

Each week, a guest composer will be commissioned to conduct public rehearsals and to present a final concert.

WITHIN CALENDAR

Friday 2.9.2016 | 8PM

WITHIN I – Performances by Pauline Oliveros, Mats Lindström, Espen Sommer Eide, BIT20, and guests

Friday 9.9.2016 | 8PM

WITHIN II – Performances by Thierry Madiot, Alwynne Pritchard, Kari Telstad Sundet, and guests

Wednesday 21.9.2016 | 11AM-5PM

WITHIN – Workshops and open rehearsals with Gerhard Stäbler and BIT20

Friday 23.9.2016

12.30PM-2.30PM

WITHIN III – School performances by Gerhard Stäbler, BIT20, and guests

3.30PM-4.30PM

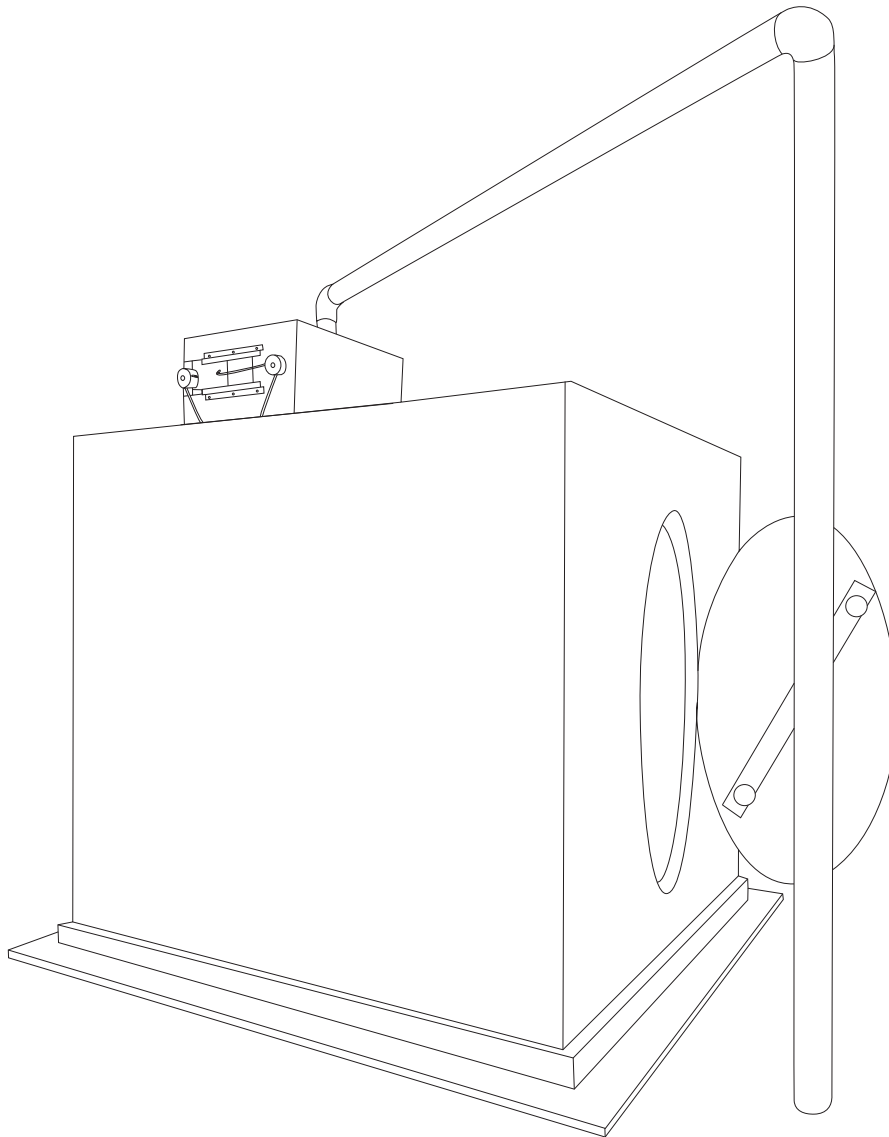
Very Open Rehearsal with Gerhard Stäbler, BIT20, and guests

Sunday 25.9.2016 | 3PM-4.30PM

WITHIN IV – Performances by Gerhard Stäbler, BIT20, and guests

Friday 30.9.2016 | 8PM

WITHIN V – Electronic night with performances by Tarek Atoui, André Bakken, DJ Jade, and guests

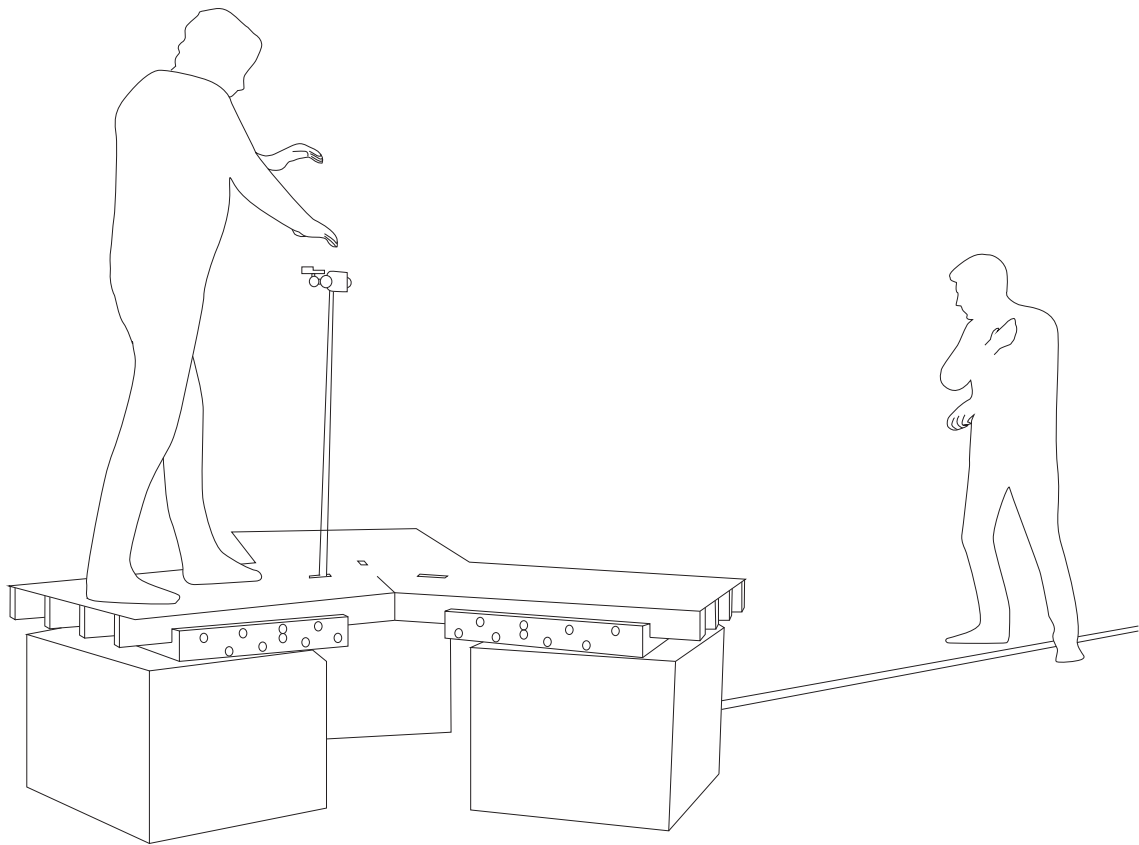


THE SUBBASS PROTOTONE Johannes Goebel

The SubBass Prototone is a 2 x 2 x 2 m organ pipe that one can enter and play from inside. Designed by Johannes Goebel in the 1980s, it is a giant a Helmholtz resonator and the frequency range of this analog wind machine is at the bottom end of hearing, where one can only experience sound by feeling it with the hands or the body.

Helmholtz resonance is the phenomenon of air resonance in a cavity, such as when one blows across the top of an empty bottle. The name comes from a device created in the 1850s by Hermann von Helmholtz, the *Helmholtz resonator*, which he used to identify the various frequencies or musical pitches present in music and other complex sounds.

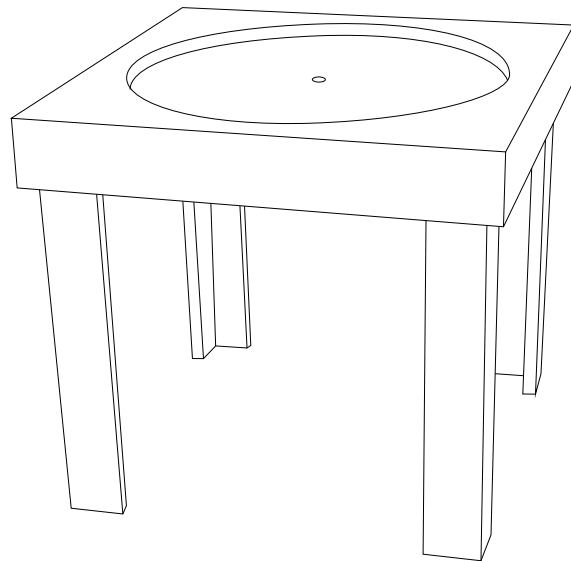
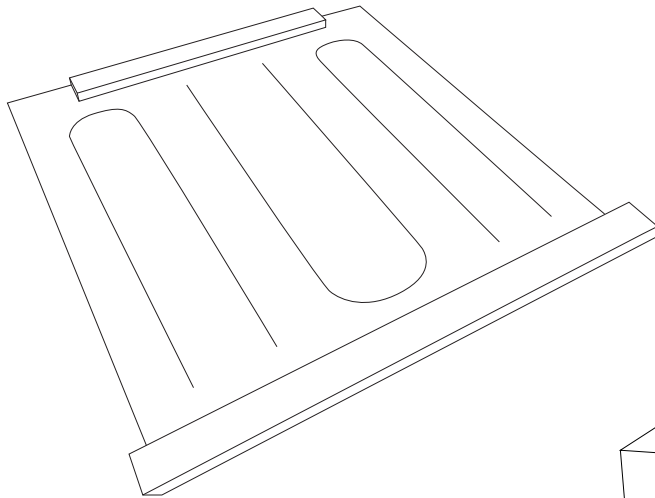
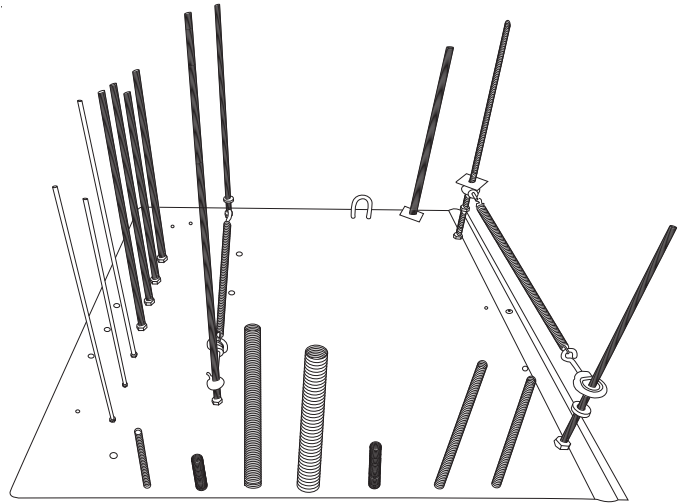
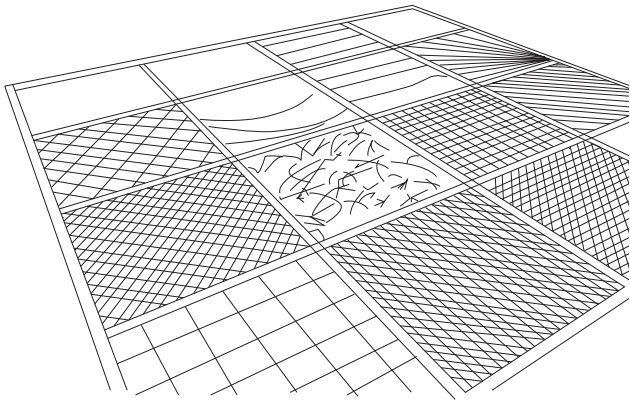
The Subbass Prototone is co-produced by ZKM - Karlsruhe where it was recreated for the *New Sensorium* exhibition curated by Yuko Hasegawa.



THE 0.9 Tarek Atoui, Greg Niemeyer, Perrin Meyer, Jeff Lubow

The 0.9 is a networked group of nine Meyer subwoofers speakers encased by 3 platforms on which performers stand. It has a gestural interface inspired by sign language and is similar to a Theremin. Through specific hands and finger movements, the player produces ultra-low-frequency sounds that are physically felt, perhaps even before they are heard. The instrument allows to play with resonance frequencies of the space where it's being performed. The space and its architecture therefore become conductors of sound, and the audience can perceive the instrument through them.

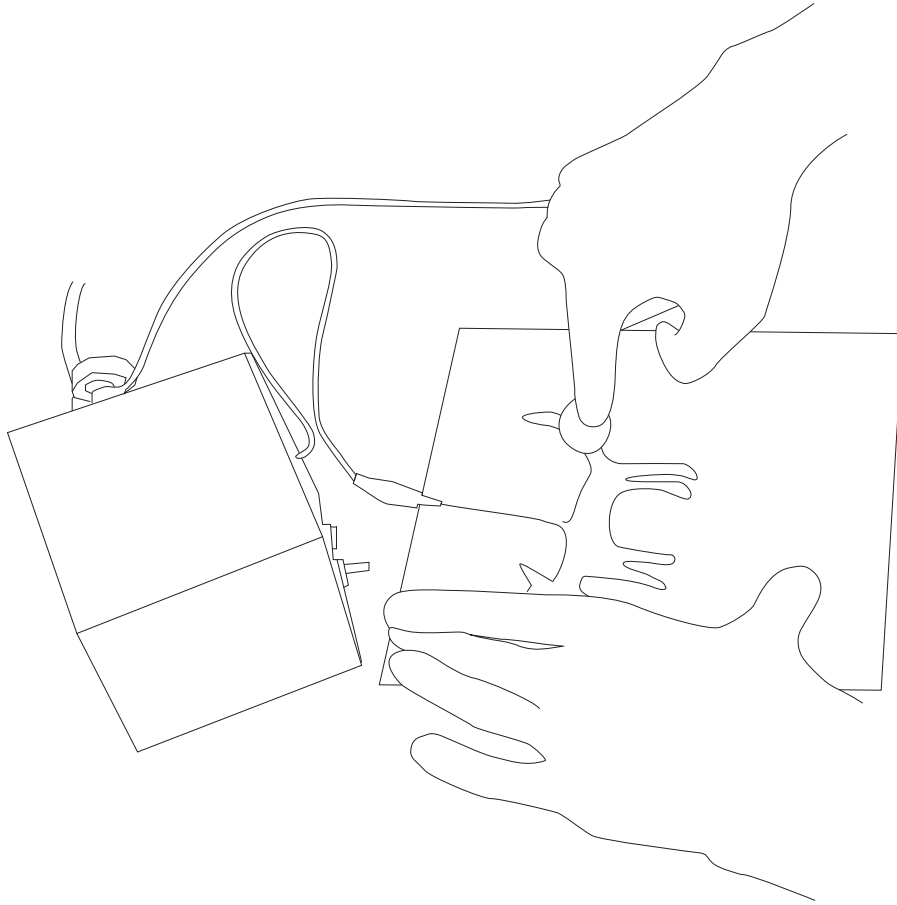
The 0.9 is co-produced by Meyer Sound and the Berkley Art Museum on the Matrix series curated by Apsara DiQuinzio.



4 ITERATIONS ON DRUMS Thierry Madiot

4 Iterations on Drums, is a set of percussion tables that focus on conducting sound through solid materials such as metal and wood rather than air. This way, the sound they produce is felt in the hands of the player before reaching the ears. Initially imagined by Thierry Madiot, the design of these tables was enhanced by students at the Nordahl Grieg high-school in Bergen. Madiot then took the students designs and finalized the instrument at Lutheries Urbaines in Paris.

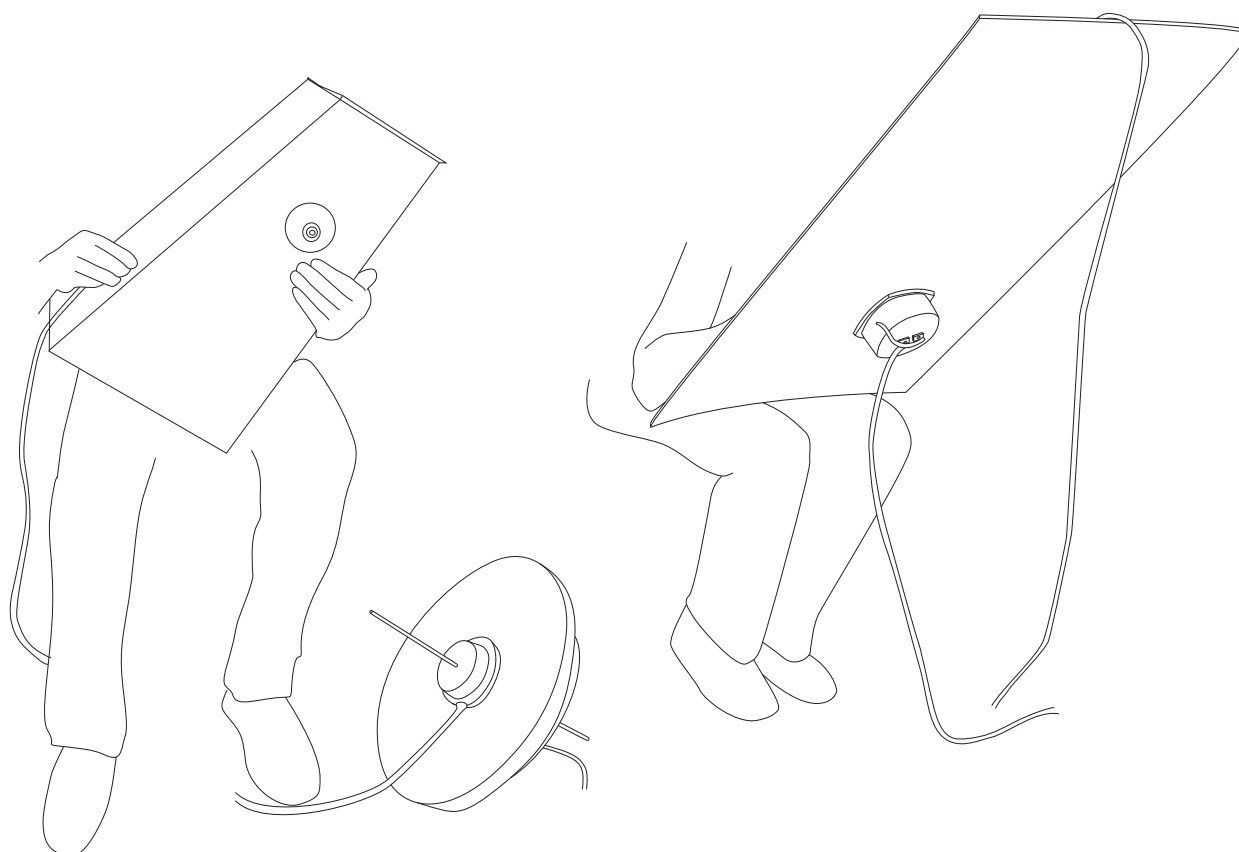
4 Iterations on Drums is co-produced by the Chantal Crousel Gallery - Paris.



THE SUB-INK Julia Alsarraf

The Sub-ink is a set of four units with a single subwoofer each on which the performer sits in contact with the sound. By touching an ink drawing the musician previously prepares, he / she plays a basic synthesizer in rhythmic or melodic ways. The Sub-Ink is a modular instrument that can be used to control other device such as computers and synthesizers, and to connect and synchronize musicians with different hearing abilities.

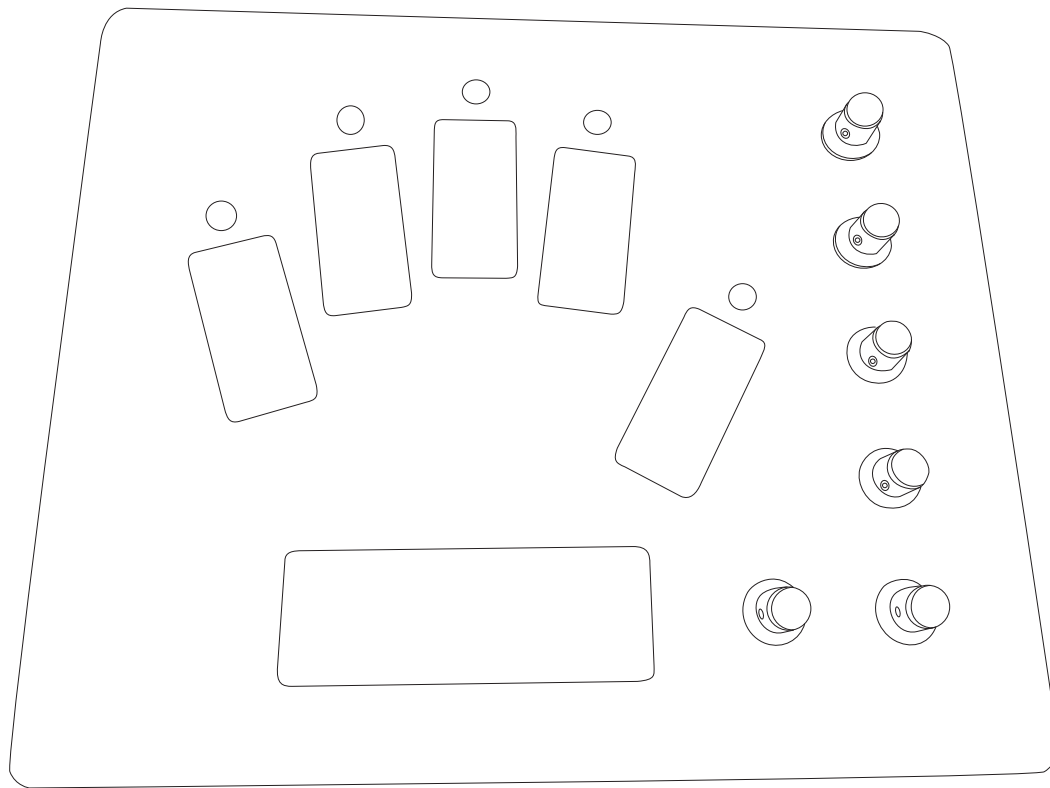
The Sub-Ink is co-produced by the Experimental Music and Performing Arts Centre (EMPAC) - NY with curator Victoria Brooks.



THE TRUE LAPTOP Quartet Mats Lindström

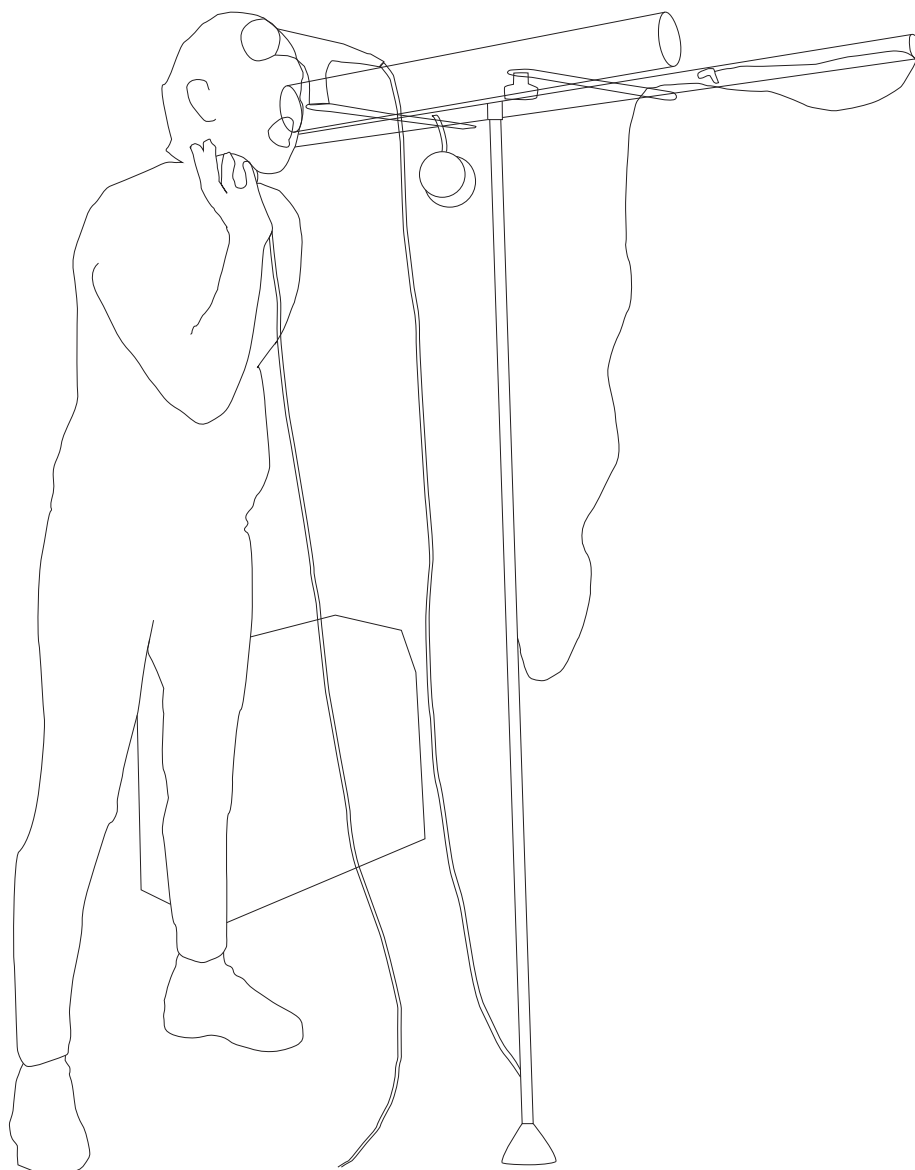
The True Laptop Quartet is a set of four tactile instruments that use metallic found objects, transducer speakers and old microphones to create feedback sounds. These objects are placed onto the lap of the performer who feels the sound in his/her hands or body through the vibrations of metal.

A transducer speaker is a speaker that mounts directly not surfaces like wood, glass or steel making them vibrate and conduct sound.



THE T1 Daniel Araya

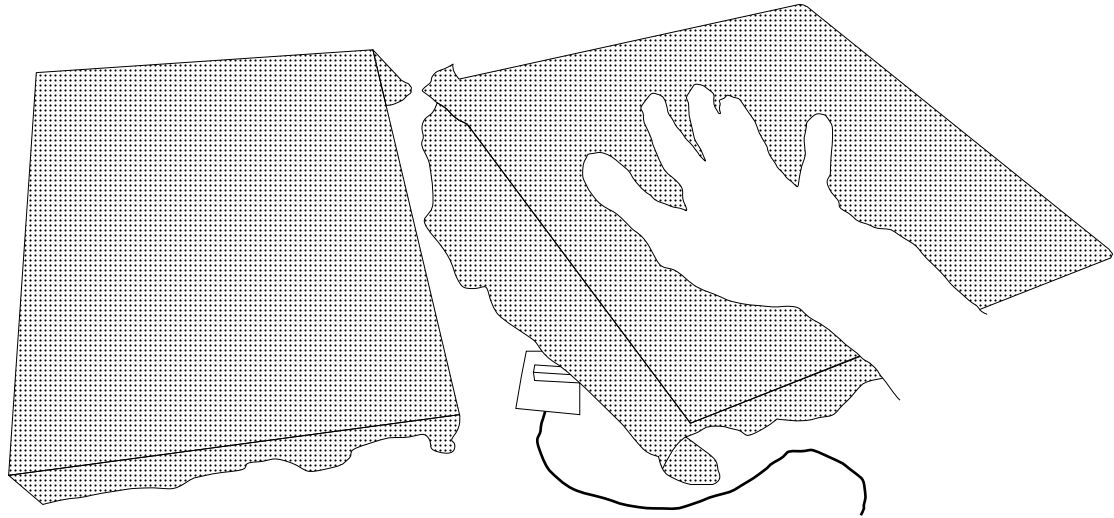
The T1 is a MIDI keyboard which sounds can be heard in a tactile way. This controller easily connects to any type of musical software to play and process sounds the player chooses. It can also be used as a speaker that allows to perceive up to 5 sounds in the fingers and the palm of the hand.



THE OUROBOROS Espen Sommer Eide

The Ouroboros is an instrument where sound is formed inside the mouth of the player. Conceived by Espen Sommer Eide, it is developed in discussion with persons of different hearing abilities. The player places a speaker on the throat and is therefore in direct contact with the sound of the instrument. He / she then stands in front of a set of microphones. By closing and opening the mouth, and without emitting sound, the player modulates and controls resonance and feedback frequencies between the speaker and the microphone.

The Ouroboros is co-produced by BEK – Bergen Center for Electronic Arts.

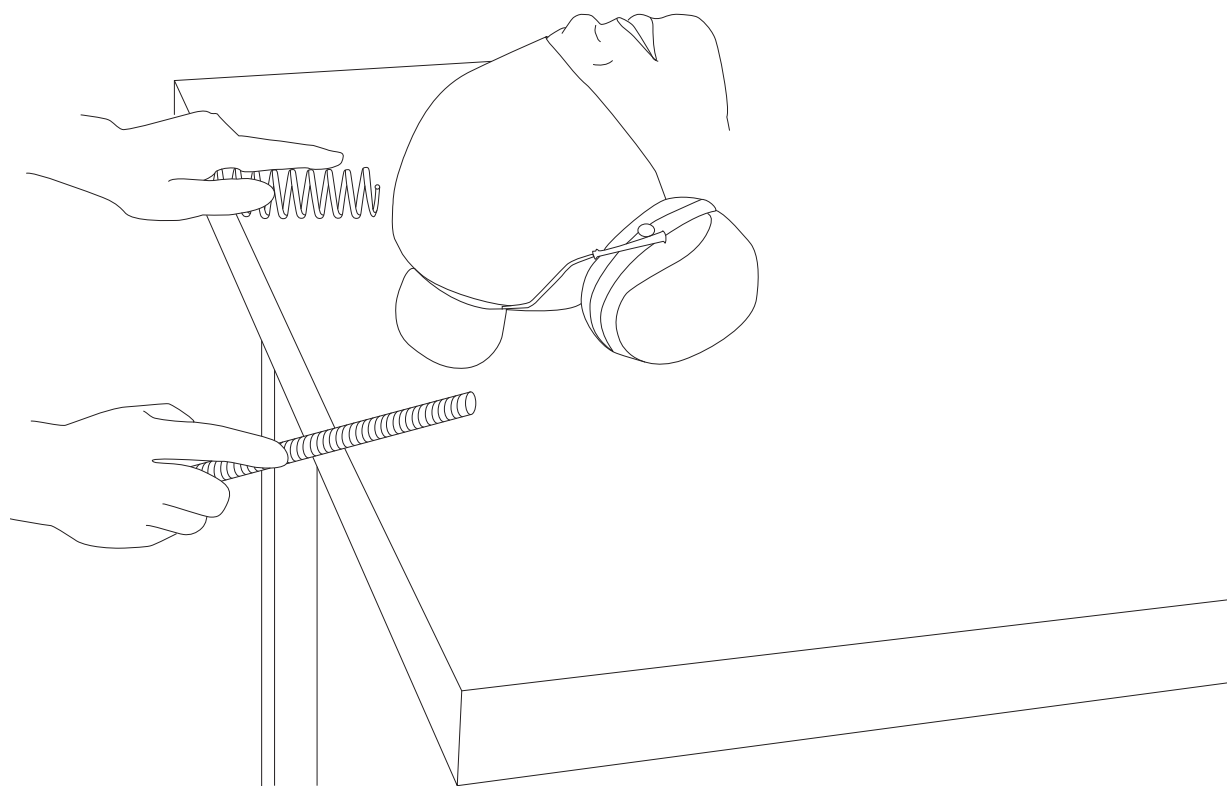


33 SOFT CELLS Kvadrat and Tarek Atoui

33 Soft Cells is a touch sampler made out 33 touch sensitive textile panels. Each panel has a distinctive texture or pattern. The instrument can be connected to different computer software and types of sound, and playing it relies on the sense of touch rather than auditory or visual stimuli.

With the support of BEK, composer Kari Telstad Sundet will create a specific software for the instrument. Throughout the summer of 2016, Sundet will be collecting the sounds of her software on recording sessions with individuals of different ages and hearing abilities from Bergen.

33 Soft Cells is co-produced by Kvadrat. Note from Kvadrat: On 33 Soft Cells, Kvadrat's panels will incorporate electronics between their front textile and acoustic absorbent layer, to become one of Atoui's instruments. Committed to pushing the boundaries, Kvadrat collaborates with visionary talents, who work with art, music, sound design and acoustics. Kvadrat Soft Cells are dedicated to enhancing the sound quality of interior spaces and to enabling architects to realize their acoustic and aesthetic visions.



THE SOUND MASSAGE KIT Thierry Madiot

This kit is a synthesis of Madiot's 16 years of work with sound massage - techniques and practices to expand our experience of sound, through the ears or through the body. This kit is more than an instrument. It can be used therapeutically, recreationally, artistically and/ or pedagogically, and functions as a device where several persons play for one listener laying on a special table.

The Sound Massage kit is co-produced by the Chantal Crousel Gallery - Paris

BIOGRAPHIES

JULIA ALSARRAF is a Troy-based artist. She graduated from Rensselaer in 2012.

DANIEL ARAYA Daniel Araya was born in Sweden in 1976 and is a musician, inventor and instrument builder that specializes in analog synthesizers and multi channel sound installations. He works as the studio engineer at EMS studios in Stockholm, plays improvised electronic music and has a big interest in mechanics, optics and electronics.

Araya has built instruments and installations in collaboration with different artists such as Mark Fell, Kim Hedås and Halldór Úlfarsson as well as custom synthesizers for himself.

During the last few years he has experimented with different materials and techniques using CNC-machines, computer controlled mills, that gives the possibility of almost industrial precision in one off objects as well as very fast prototyping times for new ideas.

BIT20 ENSEMBLE is one of the leading contemporary music ensembles in the Nordic countries. It performs a broad repertoire of contemporary music in a great variety of arenas; the ensemble is a conveyor of the musical traditions of recent decades. They continually instigate of new works and new projects.

BIT20 aims to bring contemporary music to audiences of all ages from any background. The ensemble is open to a great diversity of artistic trends and collaborates regularly with other art institutions, organizations and festivals, as well as with individual artists. The ensemble has commissioned more than hundred works and contributed on twenty-five recordings. In addition the ensemble has an extensive programme aimed at children.

BIT20 has a flexible number of members with the sinfonietta at the core. Several of the members hold principal or assistant principal positions in Bergen Philharmonic Orchestra.

ANDRÉ BRATTEN is a Norwegian electronica musician, composer and producer. He had his album debut with "Be A Man You Ant" in 2013, and he was awarded *Spellemannsprisen* (the Norwegian "Grammy Award") for his 2015 album "Gode". He has toured Europe extensively, and new compositions have been commissioned by the Ultima Festival in Oslo and Ekko Festival in Bergen.

JOHANNES GOEBEL is the founding director of the Curtis R. Priem Experimental Media and Performing Arts Center (EMPAC) at Rensselaer Polytechnic Institute, USA, since 2002. EMPAC is a unique building and program designed specifically at the intersection of artistic productions, scientific research, digital technology and our human realm of experience. Between 1990 and 2002, Johannes Goebel was the founding director of the Institute for Musik and Acoustics at the Zentrum für Kunst und Medientechnologie (ZKM) in Karlsruhe, Germany. A center for art and media, the ZKM is an international forum for experimental productions, research and exhibitions in the fields of art, science, and technology. In both institutions, Johannes Goebel was deeply involved with the architecture, infrastructure and artistic programming. He worked internationally as composer, curator, music educator, instrument builder, researcher and lecturer on the aesthetic implications of digital technology in the arts.

MATS LINDSTRÖM works as a composer and a musician, often with strains of live-electronics and with live performance, intermedia, scenic elements and visual arts as a complement to the music. He has worked both with music for theatre, opera, radio-art and dance and with sound installations. Formerly an engineer in the electronics industry he has designed and constructed a number of unique electronic musical instruments and

apparatuses. He has worked with children and amateurs as performers in several projects. Since 2004 he is the artistic director of EMS, Elektronmusikstudion in Stockholm.

TROND LOSSIUS is a sound and installation artist based in Bergen, Norway. His projects investigate sound, place and space, using sound spatialisation and multichannel audio as an invisible and temporal sculptural medium in works engaging with the site. He often collaborates with other artists on cross-disciplinary projects, in particular sound installations and works for stage.

He holds a master degree in geophysics, studied music at The Grieg Academy, and has been a research fellow in the arts at Bergen National Academy of the Arts. He is research and development coordinator at BEK – Bergen Center for Electronic Arts.

JEFFREY M. LUBOW is an interdisciplinary artist and researcher concerned with the space between body and technology. His influences are spread amongst a number of mentors and colleagues and collaborators the likes of David Wessel, Adrian Freed, Leslie Stuck, John Bischoff, Pauline Oliveros, and Patrick Clancy. Jeffrey studied conceptual art at KCAI, and electronic music practice at Mills College in Oakland, California. Since, he has occupied positions in research and development with various organizations the likes of Cycling '74, Starkey Hearing Research Center, and the Hafter Auditory Perception Lab (HAPL). In 2008, Jeffrey commenced a research position at The Center for New Music and Audio Technologies (CNMAT) at UC Berkeley, focusing on instrument building, music technology, pedagogy, and computer science.

THIERRY MADIOT See biography in THERAPIES page 31.

PERRIN MEYER is a graduate of Berkeley High, Columbia College, and the Courant Institute at NYU, where he studied physics and math. He works for the family business, Meyer Sound Laboratories, where he designs digital audio signal processing algorithms. He also performs research in computational acoustics in collaboration with research groups including CNMAT at UC Berkeley, the Courant Mathematics and Computing Lab at NYU, and The Program for the Human Environment at The Rockefeller University.

GREG NIEMEYER studied Classics and Photography. He started working with new media when he arrived in the San Francisco Bay Area in 1992. He received his MFA from Stanford University in New Media in 1997. At the same time, he founded the Stanford University Digital Art Center. In 2001 was appointed at UC Berkeley as a Professor for New Media. He is involved in the Center for New Media, focusing on the critical analysis of the impact of new media on human experiences. His creative work focuses on the mediation between individuals, communities and environments. Selected projects include Gravity (Cooper Union, NYC, 1997), PING (SFMO-MA, 2001), Oxygen Flute (SJMA, 2002), Ping 2.0 (Paris, La Villette Numerique, 2004), Organum Playtest (BAMPFA 2005), Good Morning Flowers (SFIFF 2006, Townhouse Gallery, Cairo, Egypt, 2006), Maldives Pavillion (Venice Biennale, 2013), gnosion (CCD Mexico City, 2015) blackcloud.org, sevenairs.org, polartide.org, gifcollider.com and tsarbell.com.

PAULINE OLIVEIROS AND IONE See biographies in THERAPIES page 30.

ALWYNNE PRITCHARD is an artist, performer and composer. She studied at the Royal Academy of Music in London and has a PhD

from the University of Bristol. Her compositions and performances have been heard across Europe, America and Indonesia and she has worked with leading musicians and ensembles across the globe. In 2015 she formed the music-theatre company Neither Nor with her partner Thorolf Thuestad. From 2008 and until March 2014, Alwynne was Artistic Director of the Borealis festival in Bergen and from 2001 until 2008, she taught composition at Trinity College of Music in London. Alwynne also worked for many years as a freelance writer and presenter for BBC Radio 3. In January 2016, she took up the position of Artistic Director of the BIT20 Ensemble.

ESPEN SOMMER EIDE is a musician and artist from Tromsø, currently based in Bergen. With the projects *Alog* and *Phonophani* he became a prominent representative of experimental electronic music from Norway, with a string of releases on the label Rune Grammofon. He has also produced a series of site-specific pieces and artworks. These projects include a multi-channel composition for the 50-year anniversary of the completion of the chapel of Notre Dame du Haut in Ronchamp, France, and a special 'Building Instruments' performance at the 2008 Manifesta Biennial. He has had solo exhibitions Dead Language Poetry at Bergen Kunsthall 2013 and The Weed Archive at Nikolaj Kunsthal 2015. Eide has also been involved in a series of art projects associated with topics relating to the Barents and Arctic regions of Northern Norway and Russia, including commissions for the Neiden museum ('Language Memory') and the University of Tromsø ('Material Vision – Silent Reading'), Dark Ecology (Sonic Acts) and the ongoing experiments of the 'Rural Reading Room' events in the area.

In addition to making music and art, Eide has also been directing the Trollofon electronic music festival in Bergen (2001-2006), and worked as artistic developer at BEK (Bergen Center of Electronic Arts). He is a member of theatre-collective Verdensteatret with works performed at the Shanghai Biennial, Exit festival Paris, BAM New York and more.

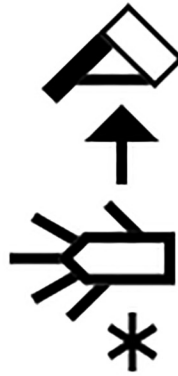
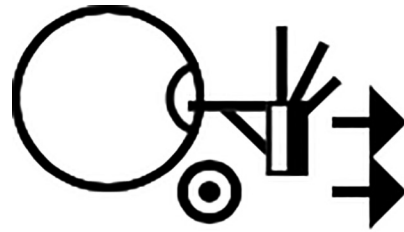
GERHARD STÄBLER Since the 1980s, Gerhard Stäbler he has initiated and directed festivals for contemporary music in the Ruhr area, and large scale projects in public spaces and industrial environments (e.g. in New York, Porto, Chicago, Trier, Düsseldorf, Kiev, Vilnius and Würzburg). He was artistic director of the 1995 World Music Days of the ISCM, held in the Ruhr. His works has been commissioned by orchestras, choirs, ensembles and soloists, by broadcasters and theatres around the world. He has been composer in residence and visiting professor at many institutions in North and South America, in Australia, as well as in the Middle and Far East. A series of awards, prizes and scholarships (e.g. Cornelius-Cardew Memorial-Prize, The Japan Foundation scholarship, Duisburger Musikpreis 2003). In 2015 the first English language book on the compositional work of Gerhard Stäbler was published by the American musicologist Paul Attinello. In Bergen Assembly 2016, the new commission "Dancing Senses" will be premiered by Gerhard Stäbler and the BIT20 ensemble.

KARI TELSTAD SUNDET is a composer from Averøya in Western Norway. She has her BA and MA in composition from the Grieg Academy, University in Bergen. She spent one year of her studies at the Chopin Academy in Warsaw. The recent years she has been focusing on what happens in the intersection between electronics and acoustic instruments, and on the visual nature of sound through the creation of sonic landscapes and images.

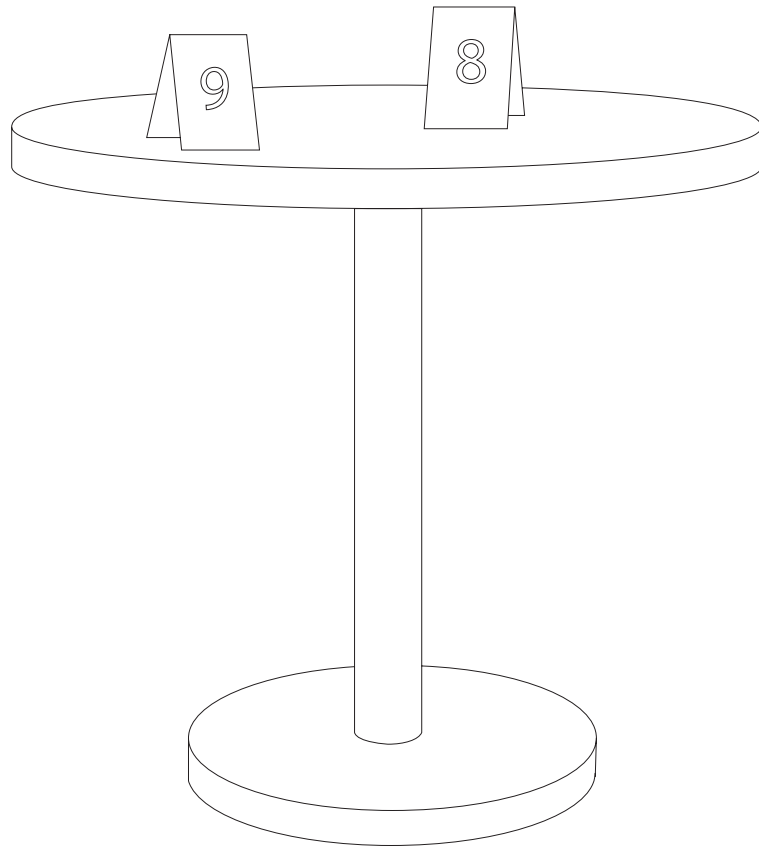
WHITE CAT

Ismael sat quietly in the pews, meeting no one's eyes, snatching onto the gesture every time he saw it and swallowing it deep. Like the sight of the group of deaf people, the gesticulation pushed Ismael further away from the edge and reminded him of the border between his frail husk and the unknowable world that housed him. He tried to paint the knowledge permanently onto the walls of his mind.

— Louise Stern



DRINKS AND SOUNDS



PLEASE ORDER AT THE BAR

White Cat proposes a selection of drinks and of sounds recordings of inaudible phenomena. Please go to the bar to order. The table indicates the numbers of the current and the future tracks you are listening to.

..... 1

COMPOST, Thomas Tilly

What we hear in this recording are the movements of insects, worms and probably a circulation of gas generated by the bioturbation process, which is a process where sedimentary deposits are moved or disturbed by insects and plants. In the external background, one can discern the road and planes flying by. The recording was conducted near a village in the West of France, and a couple of hydrophones were pushed into the compost. Hydrophones are types of microphones used for underwater recording or for listening to underwater sounds

..... 2

INSIDE AN OLIVE TREE OF ELEUSIS,
Tarek Atoui and Chris Watson

This olive tree is close to Demeter's temple. Chris Watson placed a contact microphone under the bark of the tree. This was done in Elefsina as part of Tarek Atoui's ongoing project I/E in May 2015.

A Short Note on Eleusis (Elefsina - 15 km of Athens), Tarek Atoui and Chris Watson. The settlement of Eleusis was founded in 2000 B.C. From as early as 600 BC up until the fourth century AD, Eleusis was the site of the Eleusinian Mysteries or the Mysteries of Demeter and Kore. These Mysteries revolved around a belief that there was a hope for life after death for those who were initiated. The central myth of the Mysteries was Demeter's quest for her lost daughter Persephone who had been abducted by Hades.

..... 3

MONA MINAS GOLD MINE IN COLOMBI,
Carl Michael von Hausswolff, 2012

The Mona Minas gold mine is located in the town of Remedios, north of Medellin, which is famous for its gold and silver mines as well as cattle production. Access was permitted by the owner. Carl Michael von Hausswolff used emission spectroscopy for this recording, which is "a technique that examines the wavelengths of photons emitted by atoms or molecules." Each element (carbon, gold, lithium,...) emits a unique set of discrete wavelengths imperceptible to the human ear. Spectroscopic techniques make them audible, and the sound is used to study the elemental composition of matter.

..... 4

PLANT DECOMPOSITION (EXCERPT, 15),
Matthieu Saladin, 2016

Recorded with a Zoom H4n and two contact microphones, the sounds capture a compost head at Pen-bé, Assérac, France, on June 5th 2016.

..... 5

EVAPORATING PUDDLE (EXCERPT, 15),
Matthieu Saladin, 2016

Using a sound device 702 and two waterproof contact microphones, the artist recorded the sounds of an evaporating puddle at Pen-bé, Assérac, France, on June 5th 2016.

..... 6

EROSION OF A ROCK (EXCERPT, 15),
Matthieu Saladin, 2016

Recorded with a Zoom H4n and two contact microphones at low tide. Pen-bé, Assérac, France, on 5 June 2016.

..... 7

BASEVUOVDI
Morten Norbye Halvorsen

The recording was done on an alluvial gold field located in the north of Norway in Basevuovdi. The geologic term alluvium is described as an "unconsolidated terrestrial sediment composed of sorted or unsorted sand, gravel, and clay that has been deposited by water." The site is also a holy Sami site the artist stayed in over the years. The Sami "are an indigenous Finno-Ugric people inhabiting the Arctic area of Sápmi, and are the only indigenous people of Scandinavia recognized and protected under the international conventions of indigenous peoples, and are hence the northernmost indigenous people of Europe."

Dictionary of Geologic Terms, <http://web.archive.org/web/20110501155938/http://www.geotech.org/survey/geotech/dictiona.html>

..... 8

CEMENTERIO DEL NORTE,
MONTEVIDEO, URUGUAY
Carl Michael von Hausswolff

This cemetery is where sailors from the German cruiser Graf Spee are buried. The Graf Spee had been involved in commerce raiding in the Atlantic once WWII broke out and was later involved in the first naval battle of WWII called the Battle of the River Plate. The Graf Spee was hunted down by the British Admiralty in December 1939 and was badly damaged when it came ashore Montevideo in Uruguay.

..... 9

IN THE CALLICHORON WELL —
 BUILT IN THE FIRST HALF OF THE
 FIFTH CENTURY B.C.
 Tarek Atoui and Chris Watson

Demeter came to this well and rested. The four daughters of the local king Keleos found her and took her to their palace where she taught their brother Triptolemus, the art of agriculture. Then, from him, the rest of Greece learned to plant and reaped crops. Ever since and until WWII, this well remained in use and kept on providing water to Elefsina. This was recorded by Chris Watson with omnidirectional microphones in Elefsina as part of Tarek Atoui’s ongoing project I/E in May 2015.

..... 10

INSIDE A STONE OF DEMETER’S TEMPLE
 BUILT IN 650 B.C.
 Tarek Atoui and Chris Watson

Keleos, king of Eleusis, was one of the original priests of Demeter and one of the first people to learn the secret rites and mysteries of Demeter’s cult. He ordered his citizens to build a rich shrine to Demeter in Eleusis. Chris Watson placed a contact microphone beneath a stone of the temple and recorded the sound. This recording was made in Elefsina as part of Tarek Atoui’s ongoing project I/E in May 2015.

..... 11

LLYN CWM LLWCH
 Morten Norbye Halvorsen, 2015

Llyn Cwm Llwh is the best preserved glacial lake in the South of Wales and sits at the head of the Cwm Llwh valley — part of the Brecon Beacons Site of Special Scientific Interest (SSSI) and a Geological Conservation Review (GCR) site. There are many legends surrounding this lake and the fairies that live on an invisible island on top of it. The recording was made with a hydrophone.

..... 12

THE TUNNEL TO THE UNDERWORLD
 Tarek Atoui and Chris Watson

Persephone was gathering flowers with friends when she was seized by Hades, god of death and the underworld, who took her to his kingdom. Demeter searched for her daughter and in an effort

to coerce Zeus to allow her return, she caused a terrible drought in which the people suffered and starved. This deprived the gods of sacrifice and worship, and Zeus relented, allowing Persephone to return to her mother.

Every year, for four months during the dry Greek summer, Persephone remained with Hades — a period during which plants were threatened with drought. At the beginning of autumn when the seeds are planted, Persephone followed a tunnel that brought her back from the underworld to her mother and the cycle of growth began anew. This recording was made inside the tunnel of Hades by Chris Watson with omnidirectional microphones. This recording was made in Elefsina as part of Tarek Atoui’s ongoing project I/E in May 2015.

..... 13

AQUATIC INSECT
 Thomas Tilly

This was recorded inside the moat of an old castle located in a protected area in Sanzay, a village in the West of France. The type of aquatic insect could not be identified from its sound — only a few have been identified so far and work has just begun on a scientific program investigating these sounds. What is certain, however, regarding the role of light in the recording, is that the frequency varied when the sun were appeared or disappeared. The sound gets higher when the sun shines on the water surface and drops when clouds obscure the area.

..... 14

FLUX OF WORKER BEES
 Eric La Casa

In this recording bees enter and leave the entrance of the beehive. Lacan was arguing that what the bees produce are messages or codes, a form of communication that uses dance and body movement. Recorded in Saint-Denis, near Paris, France and at the beehives of Olivier Darné. See Hearing Matters, item (18).

..... 15

LIMPETS, LE FRIOUL, MARSEILLE
 Gareth Lee Paterson, April 2010

The recording captures the distant snapping sounds of pistol shrimps and in the foreground, the rasping sounds of limpets as they graze for algae using their radula — a tooth-lined tongue. Limpets are

aquatic snails that are covered with conical shells. Gareth Lee Paterson's self-made hydrophones were also used for this recording. In this case, recording took place on the limestone surfaces of a small tidal pool at the end of a creek on the island of *Ratonneau*, Le Frioul, Marseille. This was recorded during the production of sound installation, *Bouillion de sons Frioulais*, for Festival MIMI.

..... 16

MICRONECTA AND RAIN, AGDEN RESIDENCE, S. YORKSHIRE
Gareth Lee Paterson, Summer 2009

Using Gareth Lee Paterson's self-made hydrophones, the track records the dry crackling of rain fall upon a water surface and the calls of a species of micronecta, a small aquatic insect, similar to water boatmen. They are species "belonging to the genus *Micronecta* (*Corixidae*, *Micronectinae*) [and] are known to use sound for pair formation. Only males produce species-specific sounds that attract females for mating [as] males can synchronize their calls generating a chorus." Fish and a barking dog are also occasionally heard in this recording. It was recorded during a walk with Keith Rowe (former AMM member and English free improvisation tabletop guitarist and painter) prior to a recording session in the afternoon.

..... 17

PANAPONERA
Thomas Tilly

The high sounds heard in this recording are alarm calls produced by Panaponeras, also known as bullet ants. Living mainly in rainforests, they are a large species of ants notorious for their highly venomous and painful sting (the most painful among all insect bites). The Sateré-Mawé people of Brazil use intentional bullet ant stings as part of their initiation rites to become a warrior. What one hears in the background sounds like footsteps but is in fact the sound of rain. To record these, professional cardioid microphones were used. By getting closer to the ants (though not too close) one can hear their dialogues and calls.

..... 18

PISTOL SHRIMPS
Chris Chafe and Greg Niemeyer,
11 September 2001

These snapping shrimps were captured by recordist Michael Gurevich with hydrophones at Monterey Bay in California. These shrimps are known as *Alpheus heterochaelis*, or pistol shrimps. Research has come to discover that the sounds they produce originate from the collapse of a cavitation bubble that the shrimps create to stun and hunt plankton and sea creatures; "during the rapid snapper claw closure a high-velocity water jet is emitted from the claw with a speed exceeding cavitation conditions." Pistol Shrimps, Chris Chafe and Greg Niemeyer, 11 September 2001. The snapping shrimp competes with much larger animals such as the sperm whale and beluga whale for the title of loudest animal in the sea.

..... 19

TADPOLES, KING'S WOOD, KENT
Gareth Lee Paterson, Spring 2010

This is another recording of rasping sounds of many tiny mouths as tadpoles chew upon and around Gareth Lee Paterson's hydrophones. Tadpoles are the larval stages in the life cycle of amphibians such as frogs and toads. They are "able to make the calls as early as three days after hatching and can do so both in the water and out of the water." Using self-made hydrophones, Gareth Lee Paterson recorded the tadpoles during a residency with Stour Valley Arts, King's Wood, Challock, near Ashford, Kent and formed a part of the installation titled *Elemental Fields*.

..... 20

TROPICAL BATS
Thomas Tilly

The sounds of bats typically range between 30 000 and 45 000 Hz (ultrasounds that the human ear cannot perceive). Thomas Tilly used an ultrasonic detector that shifts these inaudible frequencies to a hearing range, and captured the sounds of the bats' sonar and their system of echolocation.

Unidentified Insect, River Cocker, Gareth Lee Paterson.

In this recording, we can discern a variety of regular and irregular ticking sounds produced by aquatic plants in a river, accompanied by a series

of short glissandi-like calls. It is not entirely clear what is producing these calls but they are likely to be produced by an aquatic insect amongst the plants. Gareth Lee Paterson used self-made hydrophones to record in a freshwater river called The Cocker, located on the outskirts of the town of Cockermouth in Cumbria, UK. Close to the youth hostel at Double Mills, there is a bend where the river turns 130 degrees to the South East. There is a deep pool and shallows in which small thickets of aquatic plants grow.

..... 21
 VIBRATING BODIES

Eric La Casa

Recorded in Saint-Denis, near Paris, France, this recording captures the vibrating sounds of bees inside the beehives of Olivier Darné. With his hands inside the beehive, Eric La Casa let himself be guided by sensing the vibrations of the bees in his fingers in order to record the sound.

..... 22
 THE COLLISION OF TWO BLACK HOLES
 (20 milliseconds looped over 3min)
 LIGO

Physicists have recently announced the discovery of gravitational waves, ripples in the fabric of space-time that were first anticipated by Albert Einstein a century ago. On 14 September 2015, after 25 years of perfecting a set of highly sensitive instruments (LIGO - Laser Interferometer Gravitational-Wave Observatory) the phenomenon detected was the collision of two black holes. Using the world's most sophisticated detector, scientists Kip Thorne and Ronald Drever at CalTech and MIT listened for 20 thousandths of a second as the two giant black holes, one 35 times the mass of the sun, the other slightly smaller, circled around each other. The analysis of the sound's pitch and amplitude informed them how the black holes collided by circling each other 30 times a second. By the end of the 20 millisecond snatch of data, they had accelerated to 250 times a second before the final collision and a dark, violent merger. Through converting wave patterns into sound, gravitational wave astronomy, an emerging branch of observational astronomy, is now listening to the universe and opening new ways in our understanding of space.

..... 23
 UNIDENTIFIED PHENOMENON IN LONG
 WIRE, TIMBLE INGS N. YORKSHIRE

Gareth Lee Paterson

This is a recording of a cluster of metallic rustlings and scrapings accompanied by a series of rising and falling call-like sounds. Contact microphones were used to make this recording because of their ability to record audio vibrations through contact with solid objects. The long wire was the top part of a fence around rough pasture at a Timble Ings plantation in North Yorkshire, UK. There was no visible cause for the sound but it is possible the wire was acting as a radio aerial receiver for very low frequency radio signals, in which case the source for the radio could have been almost anywhere in the atmosphere. This was conducted on a recording trip with Coryn R.R. Smethurst.

..... 24
 SPHERICS

Jacob Kirkegaard, 2016

Spherics is a Very Low Frequency (VLF) recording of the Aurora Borealis or Northern Lights, also called natural radio. Natural radio is a term coined by California researcher Michael Mideke in the 1980s. It “describes naturally occurring electromagnetic (radio) signals emanating from lightning storms, aurora (The Northern and Southern Lights), and Earth’s magnetic-field (the magnetosphere) [...] Unlike sound waves which are vibrations of air molecules that our ears are sensitive to, natural radio waves are vibrations of electric and magnetic energy (radio waves). Although they occur at the same frequencies as sound, they cannot be listened to without a fairly simple radio receiver to convert the natural radio signals directly into sound.” Done in the dark and cold landscape of Northern Iceland, this recording captures the electromagnetic activity from the solar winds. Kirkegaard used a home-built electromagnetic receiver that was used for a sound installation at the Museum of Contemporary Art in Denmark.

..... 25
 SUN with DIRECTION: 16h24 (short)

Minoru Sato

This recording captures the light conditions on the surface of water using digital video technology and a “solar cell camera.” The sound is excerpted from Sato’s project titled FACT of RECORDING FACT.

..... 26

SUN with REFLECTION: 10h22,
Minoru Sato

This recording captures the light conditions on the surface of water using digital video technology and a “solar cell camera”. The sound is excerpted from Sato’s project titled FACT of RECORDING FACT.

..... 27

BUØY HARBOR
Morten Norbye Halvorsen , 2015

This was recorded using a hydrophone at the harbor in Buøy, an island in the borough of Hundvåg in the city of Stavanger in Norway. The track contains sounds produced during the building of the Hundvåg tunnel located between 60 to 90 meters below the seabed, and what we hear includes sounds of drilling, dumper trucks, and one of the hourly blasts.

..... 28

EURIPUS STRAIT
Jacob Kirkegaard , 2016

This is an underwater recording of the world’s narrowest strait between the mainland in Boeotia (central Greece) and the Greek island Euboea in the Aegean Sea. The principal port in this area is Chalcis and is located at the strait’s narrowest point. The current in the strait is extremely strong and turns the opposite direction a few times a day. It is estimated that the flow can go up to 12 km/h. Using a hydrophone, the artist recorded this sound as part of an artist residency in Greece called Sonic Topographies.

..... 29

FUKUSHIMA
Jacob Kirkegaard, 2016

This recording captures the vast and empty landscape in Fukushima, Japan. Surrounded by mountains and a dark pine forest, the landscape was cold and steeped in dense snow at the time of the recording. An acoustic omnidirectional microphone was used to record this for an audio-visual work titled *Stigma*, created for the Mori Art Museum in Japan.

..... 30

INTERIOR RESPIRATION
Eric La Casa

The sounds one hears in this recording were cap-

tured by a tiny omnidirectional microphone, which was protected by a latex condom and inserted in the throat of a man in the middle of the anechoic chamber of the IRCAM (Institute for Research and Coordination of Acoustic Music) in Paris, France. An anechoic chamber is a space conceived to completely absorb reflections of either sound or electromagnetic waves.

..... 31

STROMBOLI
Morten Norbye Halvorsen, 2012

This is a recording of a single volcanic eruption on Stromboli island, which contains one of the three active volcanoes in Italy. The island is located off the north coast of Sicily in the Tyrrhenian Sea and the artist employed a tape recorder from a helipad near the town of Sciara in Sicily to record the eruption.

..... 32

THE TSAR BELL
Chris Chafe and Greg Niemeyer, 10 April 2016

The Russian Tsar Bell is the largest confirmed bell ever cast at over 200 tons. But in 1732, before it was ever struck, this Goliath of bells broke. Its parts have been on display in the Kremlin ever since. With computer simulations, a team of University of California, Berkeley, Stanford, and University of Michigan researchers (Greg Niemeyer, John Granzow, Romain Michon, and Chris Chafe) created a virtual model of the bell and had it ring for the very first time.

..... 33

THE TUV BULLROARER
circa 2800 cal. BC.

The Tuv bullroarer is a Stone Age sound instrument, a 6,4cm long propeller-blade-shaped artefact of polished slate recovered in 1991, at a site from the Younger Stone Age close to Saltstraumen near Bodø in Northern Norway. It is the oldest known sound instrument from Norway. Bullroarers have been used as musical instruments, but are frequently applied in rituals, often as important instruments in the communication with supernatural worlds. The sound is produced by vibrations as the blade rotates in the air.

BIOGRAPHIES

Professor HEIN B. BJERCK is head of the Norwegian University of Science and Technology (NTNU) study program in archaeology. Besides contemporary archaeology, his is main academic focus is Stone Age studies - ranging from lithic traditions, phenomenological perspectives on cave paintings to international studies of early human-sea relation and colonization processes in seascapes. He is the leader of "Marine Ventures" - a comparative study of marine foragers in the seascapes of Scandinavia and Argentinean Patagonia.

CHRIS CHAFE is a composer, improviser, and cellist, developing much of his music alongside computer-based research. He is Director of Stanford University's Center for Computer Research in Music and Acoustics (CCRMA). At IRCAM (Paris) and The Banff Centre (Alberta), he pursued methods for digital synthesis, music performance and real-time internet collaboration. CCRMA's SoundWIRE project involves live concerting with musicians the world over. Online collaboration software including jacktrip and research into latency factors continue to evolve. An active performer either on the net or physically present, his music reaches audiences in dozens of countries and sometimes at novel venues. Chafe's works are available from Centaur Records and various online media. Gallery and museum music installations are into their second decade with "musifications" resulting from collaborations with artists, scientists and MD's.

JACOB KIRKEGAARD is an artist and composer who works in carefully selected environments to generate recordings that are used in compositions, or combined with video imagery in visual, spatial installations. His works reveal unheard sonic phenomena and present listening as a means of experiencing the world. Kirkegaard has recorded sonic environments as different as subterranean geyser vibrations, empty rooms in Chernobyl, Arctic calving glaciers and tones generated by the human inner ear itself. Based in Copenhagen Kirkegaard has presented his works at galleries, museums and concert spaces throughout the world, including MoMA in New York, LOUISIANA in Denmark, KW in Berlin, The Menil Collection & at the Rothko Chapel in Houston, Aichi Triennale in Nagoya, the Mori Art Museum in Tokyo, Japan. His sound works are released on the TOUCH (UK), Important Records (USA), mAtter (JAP), VON Archives (FR) & Posh Isolation (DK) labels. His work is represented in the permanent collection of LOUISIANA - Museum of Modern Art in Denmark. In 2016 Jacob Kirkegaard is the sound-artist-in-residency at Oxford University, U.K.

ERIC LA CASA is a sound artist living and working in Paris. For 20 years, while listening to the environment, he has been questioning the perception of reality and has expanded the notion of what's musical today. Through his aesthetic of capturing sound, his work fits

equally into the fields of sound art and music. As a result of his in-situ listening processes, he creates forms (of attention) that creep into the venues, slowly infuse there, and become other possible spaces. In the same way that the letter stimulates a country's reading, the in situ aesthetic object renews our relationship to space and landscape.

GARETH LEE PATTERSON By using sound recording as a form of training for the ears, Patterson attempts to understand his surroundings and culture through the act of listening. Such investigations lead him to perform live with a selection of amplified devices and processes, from rock chalk to springs, from burning nuts to vibrating metal, he plays with objects otherwise considered mute. His collaborations have seen him work with some of the most respected experimental musicians active today. His works have featured on UK TV, BBC Radios 3, 4 and 6, Resonance FM and on radio stations worldwide. He lives and works in Prestwich, Manchester, UK.

CARL MICHAEL VON HAUSSWOLFF was born in 1956 in Linköping, Sweden. He lives and works in Stockholm. Since the end of the 1970s, Hausswolff has worked as a composer using the audio recorders as his main instruments and as a conceptual visual artist working with performance art, light- and sound installations, film and photography.

He showed his work at documenta in Kassel and at the biennials in Venice, Istanbul, Moscow, Liverpool and Pusan. He is the curator of the sound project *freq_out* showed in Vienna, Mar-rakech, Paris, Berlin and Stockholm.

MORTEN NORBYE HALVORSEN is an artist and composer living and working in Berlin, whose work incorporates sound, sculpture, film, and performance. Stories and scenes are guided by music, props, websites, photographs, scripted sound recordings, and concert appearances in an ongoing exploration of collaboration, music and performance.

He has been included in group and solo exhibitions including: *Ain Vapor Rise*, Gaudel de Stampa, Paris (2016); All the Instruments Agree, Hammer Museum, Los Angeles (2015); The Companion, Liverpool Biennial, (2014); Pan Exciter, NoPlace, Oslo; *Alluvium*, Objectif Exhibitions, Antwerpen; and *oO*, The Lithuanian/Cyprus Pavilion, 55th Venice Biennale (all 2013) among many more.

MATTHIEU SALADIN is an artist and musician. He lives and works in Paris. His practice takes a conceptual approach and often uses sound. He is interested in the production of spaces, the history of artistic forms and creative process, and in the relationships between art and society from a political and economic point of view. It takes the form of sound installations and performances as well as publications (books, records), videos and software. He is associate professor in sound art at University

Paris 8, member of TEAMeD in the laboratory Arts des images et art contemporain (AI-AC). His research is on aesthetics of experimental music and sound art. He is editor in chief of TACET and works in Volume! and Revue & Corrigée.

MINORU SATO was born in 1963 and lives and works in Japan. He is interested in the relationship between the description of nature and artistic representation, creating artworks as physical phenomena presented with various concepts. His creative activities emerge in the form of installations, multiples, performances, and texts. He ran the label WrK from 1994 until 2006. He produces music as a solo artist, in a collaboration project with ASUNA, and in the band IL GRANDE SILENZIO. Alongside these activities, he curates contemporary art exhibitions and events. Recent exhibitions and presentations of his work include: 2016 Live Arts Week, Bologna; 2016 CONTINUOUS DRIFT, Dublin; 2015 FON festival / yo no bi tour#1, Barrow in Furness UK; 2015 Audiograft, Oxford UK.

THOMAS TILLY uses a microphone and speaker as his primary creative instruments. His work revolves around the study of sound environments and their confrontation with the spaces in which they exist, drawing equally on both experimental and scientific music research. In his approach, listening is central, to the detriment of all other forms of representation. What occurs in the eld must be interpreted and then transmitted to the listener under conditions of total immersion. The subjectivity of this reconstruction is rooted more in the sensible than in a complex technological contrivance. Relations with natural spaces, architecture or urbanism have become his preferred lines of research. Thomas Tilly has presented his work in more than fifteen countries and at numerous international festivals dedicated to experimental and improvised music. Since 2001 he has run the label ssür, and he occasionally writes articles on phonography and its practice.

CHRIS WATSON is a founding member of the influential Sheffield based experimental group Cabaret Voltaire, started his sound recording career in 1981 when he joined Tynes Tees Television. Since then Chris Watson has developed a particular and passionate interest in recording the wildlife sounds of animals, habitats and atmospheres from around the world. As a freelance composer and recordist for film, tv & radio, Watson specialized in natural history and documentary location sound together with sound design in postproduction. Most recently Watson has been exploring aspects of spatial sound through ambisonic installations in collaboration with galleries around the world such as in the Louvre, RMIT Melbourne, Krakow Botanical Gardens, The Millenium Gallery Sheffield, Opera North in Leeds and the Royal Opera House in London's Covent Garden.

THERAPIES

Attending to different degrees, kinds, genres, and articulations of perceiving sound... can open up new ways of "hearing with" and "being with."
— Michele Friedner and Stefan Helmreich

Can you imagine that you are sound? — Pauline Oliveros

WEEK 1 : September 1st – 4th 2016

DEEP LISTENING

Pauline Oliveros and Ione

Pauline Oliveros is the founder of Deep Listening, which comes from her childhood fascination with sounds and from her work in concert music involving composition, improvisation and electro-acoustics. Pauline Oliveros describes Deep Listening as “a way of listening in every possible way, to everything possible to hear, no matter what you are doing.” Such intense listening includes the sounds of daily life, of nature, of one's own thoughts as well as musical sounds. “Deep Listening is my life practice,” she explains, simply.

For *Within/Infinite Ear*, Pauline Oliveros is accompanied by playwright and sound artist Ione. Together they are proposing a Deep Listening session which will specifically explore the relation between sounds and dreams, based on Ione's book *Listening in Dreams* (2005). These sessions, will inform Pauline Oliveros' composition presented for the Bergen Assembly opening weekend.

Deep Listening session — please book here: deeplisting@bergenassembly.no



Deep Listening, Pauline Oliveros,
4th Anyang Public Art project, January 2014
(c) Aimee Friberg

PAULINE OLIVEROS is a composer, performer, humanitarian and senior figure in contemporary American music, whose work with improvisation, meditation, electronic music, myth and ritual has profoundly influenced experimentation in music from the 1960s onward. Awarded the John Cage Award in 2012 from the Foundation of Contemporary Arts, Pauline is Distinguished Research Professor of Music at Rensselaer Polytechnic Institute, Troy, NY, and Darius Milhaud Artist-in-Residence at Mills College. She is the founder of “Deep Listening,” also her life practice. In 1989, John Cage remarked: “Through Pauline Oliveros and Deep Listening, I finally know what harmony is... It's about the pleasure of making music.”

IONE is an author, playwright, director and an improvising word/sound artist. She is also a psychotherapist, specializing in myth and heritage, dream phenomena and women's issues. Her works include the critically acclaimed memoir: *Pride of Family: Four Generations of American Women of Color and This is a Dream! A handbook for Deep Dreamers*. She is playwright and director of *Njinga the Queen King*, the dance opera *Io and Her* and the *Trouble with Him* and the experimental narrative film *Dreams of the Jungfrau*. All feature music and sound design by Pauline Oliveros. Ione is the Founding Director of the Ministry of Maât, Inc (MoM, Inc) and Former Artistic Director of Deep Listening Institute, Ltd.

WEEK 2 : September 6th – 11th

SOUND MESSAGE

Thierry Madiot

Thierry Madiot has been developing the practice of sound massage since 2001. Sound massage involves techniques and practices that expand our corporeal experience of sound. These techniques can be used therapeutically, recreationally, artistically and/or pedagogically. Thierry Madiot was invited to conduct a workshop in April 2016 in Bergen, offering initial training in sonic massage with an emphasis on vibration and non-aural techniques that address both deaf and hearing audiences.

For *Within/Infinite Ear*, Thierry Madiot proposes one-on-one sound massage sessions to the audience.

Sound massage — please book here: soundmassage@bergenassembly.no



Sound massage workshop with Thierry Madiot,
Bergen, April 2016
(c) Bergen Assembly

THIERRY MADIOT is a French sound artist, born 1963 and living in Paris. He is an inventor of instruments and collector of accessories, trombonist, performer of contemporary music and improviser. He has also developed several acoustic installations. As a musician he has led and participated in a number of concerts, ensembles, festivals and recordings. Artistic Director of “Lutherie Urbaine” in Paris since 2013. He has been a part of the “Instants Chavirés” team since the beginning in 1991, organizing concerts, performances and festivals. He established the “Sound Massages” in 2001, and has developed a wide range of techniques and practices that expand our corporeal experience of sound.

WEEK 3 : September 13th – 18th

LA PISCINE

Myriam Lefkowitz and Valentina Desideri

La Piscine is a collective project that questions our usual modes of attention. As a swimming pool contains and mixes water, La Piscine gathers different artistic practices, mixes them together and transforms them. A series of sessions are offered, which draw on a number of practices developed by the artists. Each encounter is a unique experience addressed to a single visitor.

The first edition of *La Piscine* was presented at the municipal swimming pool in Pantin, near Paris, in October 2015 and organized by Les Laboratoires d'Aubervilliers. There, seven artists (Jean Philippe Derail, Valentina Desideri, Ben Evans, Géraldine Longueville Geffriaud, Alkis Hadjiandreou, Julie Laporte, Myriam Lefkowitz) learned certain practices from each other and experimented with mixing them.

Over five days, 100 encounters took place, combining the following practices:

POLITICAL THERAPY addresses a political problem (expressed by the visitor) through discussion, healing and mapping. HOW CAN ONE KNOW IN SUCH DARKNESS is the experience of a motionless body plunged into darkness. The device relies on the sense of touch and on the sound-space that spreads out around and with the body. THE IGNORANT TOUR GUIDES is an audio guide composed of a series of questions, accompanied by a visual guide composed of a series of images. Participants experience The Ignorant Tour Guides while walking about freely in the space. WALKS, HANDS, EYES (A CITY) is a silent walk that weaves a specific relation between walking, seeing and touching. COCKTAILS offers a variety of waters, opening a possible dialogue between taste and our other senses. FAKE THERAPY is a practice that allows anyone to heal anyone else without knowing how, through the use of a set of instruction cards.

Sessions are personal and last 90min. Please book an appointment here: la.piscine@bergenassembly.no

Political Therapy and *Fake Therapy* are conceived by Valentina Desideri. *How can one know in such darkness* is conceived by Myriam Lefkowitz, Julie Laporte et Jean Philippe Derail. *The Ignorant Tour Guides* is conceived by Ben Evans and Alkis Hadjiandreou, *Walks, Hands, Eyes (A City)* is conceived by Myriam Lefkowitz, *Cocktails* are conceived by Géraldine Longueville.

VALENTINA DESIDERI is an Amsterdam-based artist. She trained in contemporary dance at the Laban Centre in London (2003–2006) and went on to do a Master in Fine Arts at the Sandberg Institute in Amsterdam (2011–2013). She practices Fake Therapy and Political Therapy, co-organizes the Performing Arts Forum in France, speculates in writing with Prof. Stefano Harney, she engages in Poethical Readings with Prof. Denise Ferreira da Silva, she reads and writes.

MYRIAM LEFKOWITZ is a Paris-based performance artist. Since 2010, her research has been focused on questions of attention and perception — research which she has been developing through different immersive devices involving one spectator and one performer. Her work has been presented at The Venice Biennial, at Le Centre Pompidou (Paris), at Le Mouvement (Biel), for Situations (Bristol), The Center for Contemporary Art (Vilnius), for MED15 (Medellin), Les Laboratoires d'Aubervilliers (Greater Paris) among other venues. Teaching has become an important part of her practice. She took part, as both student and tutor, in the Master of Experimentation in Art and Politics program (SPEAR, Science Po Paris) founded by Bruno Latour.

HEARING MATTERS

But enough of the contemporary musical scene; it is well known. More important is to determine what are the problems confronting the contemporary mushroom. To begin with, I propose that it should be determined which sounds further the growth of which mushrooms; whether these latter, indeed, make sounds of their own; whether the gills of certain mushrooms are employed by appropriately small-winged insects for the production of pizzicati and the tubes of the Boletii are extraordinarily various, and in number countless, do not on dropping to the earth produce gamelan-like sonorities; and finally, whether all this enterprising activity which I suspect delicately exists, could not, through technological means, be brought, amplified and magnified, into our theatres with the net result of making our entertainments more interesting. What a boom it would be for the recording industry (now part of America's sixth largest) if it could be shown that the performance, while at table, of an LP of Beethoven's *Quartet Opus Such-and-Such* so alters the chemical nature of *Amanita muscaria* as to render it both digestible and delicious!

— (John Cage, *Paris Review*, 1954)

IN THE WHITE CAT



(1)

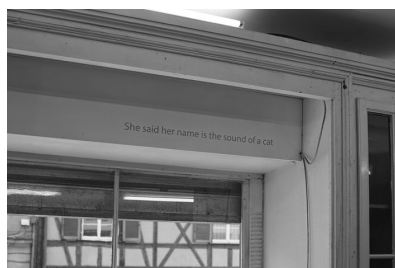
ASMR: *Sleep, Love, Deep Brain & Ear Massage*,
Fairy Char, 2015
Video on monitor, 45min11sec

Autonomous sensory meridian response (ASMR) is described on Wikipedia as the experience of “low-grade euphoria” characterized by “a combination of positive feelings, relaxation, and a distinct static-like tingling sensation on the skin.” The term ASMR was coined on 25 February 2010 by Jennifer Allen, a cybersecurity professional residing in New York. It has been compared with auditory-tactile synesthesia, in which certain sounds can create a sensation in the skin without being touched. Many of those who experience ASMR report that the voice, but also specific non-vocal ambient noises, are also effective triggers of ASMR, including those produced by fingers scratching or tapping a surface, the crinkling and crumpling of a flexible material such as paper, writing, and a person or animal eating. Many intentional ASMR videos posted to YouTube capture a single person performing these actions and their subsequent sounds.



(2)

Bespoke Alarm Clock (cushion)
Norwegian Deaf Museum



(3)

Blueberry Surprise (complete utterance) Joseph Grigely, 2006

Vinyl wall text, dimensions variable
Courtesy of the artist and
Air de Paris, Paris

Deaf since the age of ten, Joseph Grigely essentially focuses on the art of conversation, exploring issues of communication and language. *Blueberry Surprise* consists of one continuous text of 45000 words collected over the last ten years, written by people with whom the artist spoke. Each change of color (red, orange and black) signifies a switch to “a new voice,” characters who always remain unknown.

Drawing influence from modernism and still-life paintings, JOSEPH GRIGELY maintains an extensive archive of his daily conversations on scraps of paper and napkins, organizing them into installations of varying sizes. For Grigely, this “materialization of everyday life” is linked to notions of still-life painting in that both are composed of banal moments or forgettable interactions. Of his work, Grigely says, “I want to take people inside the experience of being deaf and share it with them. At the same time, I want to conflate it with various historical conventions.”



(4)

Hearing Voices Café,
Dora Garcia, 2014 - ongoing
Newspaper made
of transcriptions from
conversations

The name “Hearing Voices Café” actually applies to every well-patronized coffee shop, but the phrase “hearing voices” is also associated with the phenomenon of hearing inner voices. The project is grounded in the artist’s interest in the Hearing Voices Movement that has its roots in the anti-psychiatry movements of the 1970s and which conceives of itself more as a civil rights movement than as a form of therapeutic self-help. The Hearing Voices Café functions as a public meeting place for voice-hearers and their friends, people interested in the phenomenon, and chance guests. Structurally it is composed of various proposals, including detailed information material, a regularly updated newspaper and an audio work. The Hearing Voices Café has been hosted by the Traumzeit Café in Hamburg, by Les Laboratoires d’Aubervilliers in France and by the Welcome Collection in London.

DORA GARCÍA draws on interactivity and performance in her work, using the exhibition space as a platform to investigate the relationship between artwork, audience, and place. She creates situations of interaction, often using intermediaries (professional actors, amateurs, or people she meets by chance) to enhance critical thinking. In recent years, she has used classical TV formats to research Germany’s most recent history (*Die Klau Mich Show*, Documenta13, 2012), attended Finnegans Wake reading groups (*The Joycean Society*, film, 53’, 2013), set up meeting points for voice-hearers (*The Hearing Voices Café*, since 2014) and researched the crossovers between performance and psychoanalysis (*The Sinthome Score*, 2013, and *Segunda Vez*, 2017).



(5)

Pronounceable Boxes,
Douwe Jan Bakker

Pronounceable Boxes, 1974

152x30x14 cm

Pronounceable boxes, 1973

80x30x14 cm

De Hallen Harlem Museum
collection

In 1973-74, Douwe Jan Bakker made a series of 236 meticulously produced, painted wooden sculptures, which he presented in smaller series in special cases. These so-called Pronounceables are small objects that can be placed between the lips, like speech balloons in a comic strip. Some have recognizable shapes, such as an eye, an ear or a house; other series are more abstract and show the transition from one geometric shape to another. Influenced by popular linguistic studies such as semiotics, many artists at that time reflected on the limitations of language for describing reality. With his Pronounceables, Bakker developed a visual communication system with which people could express themselves in an alternative way without words.

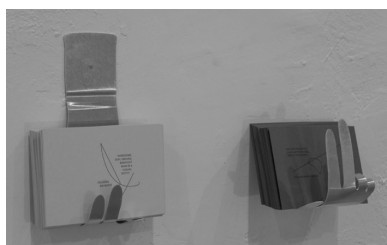
Maria Barnas, *Speak, Speak,*
2016

In this photographic series, Maria Barnas enters into a dialogue with Douwe Jan Bakker's Pronounceables.

Speak Speak is screened on the SLIDESHOW - see page 54.

DOUWE JAN BAKKER was born in Haarlem (The Netherlands) where he lived and died in 1997. He gained national recognition in the 1970s with conceptual art in which performance, sculpture and an interest in language converge.

MARIA BARNAS is a Dutch artist, poet and writer. She studied at the Rietveld Academy, Amsterdam and was resident at the Rijksakademie, Amsterdam and had several other residencies in Rome, Brazil and Paris. In 2008, Barnas was awarded the Cees Buddingh' Prize for her first collection of poetry *Twee Zonnen* (2003) and her latest collection of poems *Jaja de oerknal* (2013) was awarded the Anna Bijn prize in 2014.



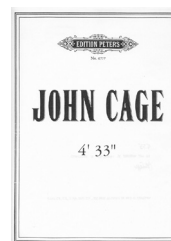
(6)

Tug of war, Deep,
Antonia Carrara, 2016
36 printed cards on aluminium
holders

These texts are captions taken from an image databank that Antonia Carrara translates into a movement, as a breath or sigh.

ANTONIA CARRARA's work involves methods of translation, displacing elements in the realm of the visual, shifting between what cannot be articulated into language and very recognizable moments. She assembles found objects, texts and documents into sculptures and installations. Her work tests our potential to establish associations, capturing moments of uncertainty to redirect our attention. Antonia Carrara is also the co-founder of the Rongwrong art space in Amsterdam, and is part of the team of the Section 7 Books bookstore in Paris.

IN THE SMALL POOL



(7)

4'33', Tacet (any instrument or combination of instruments), Sheet Music. With performance notes.
John Cage, Composed 1952.
2 pages. Duration 4min33sec.
Published by Edition Peters

In August 1952, the pianist David Tudor walked slowly on the stage of Maverick Concert hall in Woodstock, New York, sat in his place in front of the piano and opened the score in front of him. For the next 4 minutes and 33 seconds he followed the score and played nothing, allowing the silence and motionlessness to take over and shape the ambience in the hall. At the end of this timeframe, David Tudor stood up and left the stage. The performance in fact shifted the focus from the performer to the audience, in a way confronting them with what is left — silence — and therefore noises they would not be able to absorb otherwise; the sound of coughing, of creaking seats, snippets of conversations of passers-by, the distant humming of the subway.. to play "silence" is no small feat, and it is indeed a symphony of effort to execute such profound "silence." TACET was the main score indication. We would like to interpret it as an invitation to expand our listening awareness and ability.

John Milton Cage Jr. was an American composer, music theorist, writer, and artist. A pioneer of indeterminacy in music, electroacoustic music, and non-standard use of musical instruments, Cage was one of the leading figures of the post-war avant-garde. Critics have lauded him as one of the most influential American composers of the 20th century. He was also instrumental in the development of modern dance, mostly through his association with choreographer Merce Cunningham.



(8)

Ammassalik wooden maps
Facsimile from photography

These hand-made wooden carved objects function as tactile maps of the Greenland coastlines. They belong to the 'strip map' which offers a different tradition of cartography. They are common among the Inuit Eskimos in eastern Greenland and were used to represent the coast and island chains. Their special shape allows one to navigate by feeling and through interaction with the object. They were purchased and collected by a Danish naval officer, Gustav Holm, in an 1880s expedition to the area. Only several original maps exist today, kept in various museums and institutions.



(9)

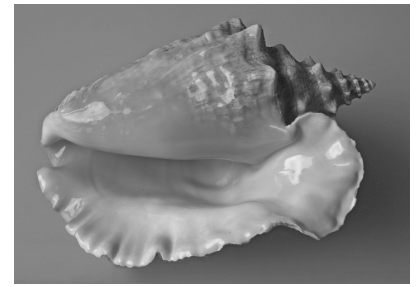
Bespoke Alarm Clock (vibrations)
Norwegian Deaf Museum



(10)

The cochlear implant of Mark A. W. Dallas, Alexandre Guirkinger 2008.
Pigment inkjet print

Alexandre Guirkinger did a brief stint at Magnum Photos as a production manager before deciding to focus on photography full time in 2006. He has worked for *M Magazine*, the *Wall Street Journal Magazine*, *AD*, *Les Inrockuptibles* and *T Magazine*, developing a photographic language that runs the gamut from landscapes to portraits, still life and archival images. In 2010, Alexandre Guirkinger started making collaborative pieces with artists such as Étienne Chambaud, Raimundas Malasauskas, Alex Cecchetti and Tarek Atoui. Meanwhile, he has worked on personal projects that have been likened to conceptual documentaries. He completed a long-term project titled *Maginot Line* in Les Rencontres d'Arles.



(11)

Conch Shells
University Museum of Bergen,
Natural History Museum

Kongesnegl (common Whelk),
Buccinum undatum
(Linnaeus, 1758)
Kaurisnegl (Tiger Cowrie),
Cypraea tigris (Linnaeus, 1758)
Snegl (Snail),
Fasciolaria trapezium (Linnaeus,
1758)
Snegl (Common Music Volute),
Voluta musica Linnaeus, 1758
Harpesnegl (Ventral harp),
Harpa ventriocosa
Lamarck, 1816
Snegl (Snail),
Turbo crassus wood, 1828
MidasØre (Midas's ear),
Ellobium aurismidae
(Linnaeus, 1758)
Snegl (Top Shell), Trochus niloticus
(Linnaeus, 1767)
Snegl (Marble Cone),
Conus marmoreus
(Linnaeus, 1758)
Snegl (Crowned Baler),
Melo aethiopica
(Linnaeus, 1758)
Snegl (Snail),
Achatina zebra
(Bruguière, 1792)
Snegl (Snail),
Bolinus brandaris (Linnaeus,
1758)

"The shell operates at once as mouth, damp and resonant grotto, and doppelgänger ear — an eerie object becoming (never entirely) a disenchanting scientific thing."

Stefan Helmreich, *Seashell Sound* (Cabinet Issue 48)



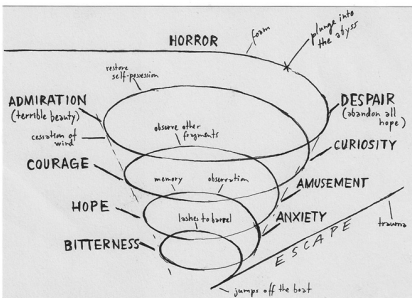
(12)

Deaf Society Journal
Bergen Deaf Society (BGDS)



(14)

Ear Drum from Blue Whale
Bergen University Museum,
Natural History department.



(13)

Diagram 1 (maelström agency) and Diagramme 2 (emotional response), Aurelien Gamboni and Sandrine Teixido, 2012

Set of two drawings, Chinese ink on paper, Dimensions: 10.5x15 cm (each drawing).

Courtesy of Fonds d'art contemporain de la Ville de Genève
Based on Edgar Allan Poe's short story "A Descent into the Maelström" (1841), these diagrams use the motif of the spiral to account for the modes of attention required to engage with complexity.

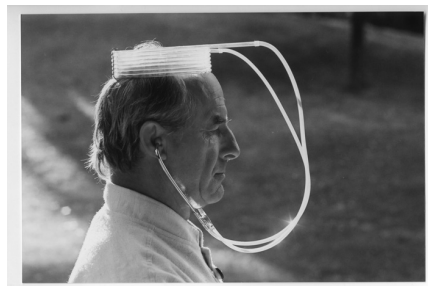
AURELIEN GAMBONI is an artist who develop a practice of critical investigation by means of art, often involving field research and collaborations, and leading to multiple forms of installations, texts and lectures-performances.

SANDRINE TEIXIDO is an anthropologist and a music journalist of Lusophone countries (in Brazil and Cap verde specifically).



(15)

Ear Plug, 2016



(16)

Etant donné et Prothèses,
Baudouin Oosterlynck
6 objects, glass and metal

Prothèse avec chambre,
opus 125, 1995

- Prothèse double*, opus 137, 2011
- Etant donné n°7*, opus 151, 2002
- Etant donné n°12*, opus 157, 2003
- Etant donné n°13*, opus 160, 2003
- Etant donné n°18*, opus 165, 2003

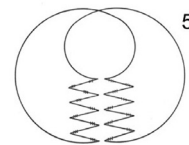
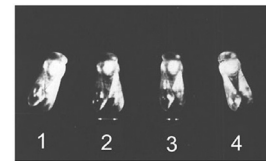
BAUDOUIN OOSTERLYNK is a Belgian composer, sound artist and visual artist. He is known for his early concrete music works and his later installation pieces and *objets d'art*. His works include a series of 23 preludes, 3 over-

tures, 5 oratorios, and a sonata, collectively known as *Variations du silence*, that consist of recordings of the ambient sound in particular locations selected by the composer. Since 1990, he has also designed a variety of highly sensitive instruments for listening ("*instruments d'écoute*") that propose to experience unheard sounds. With these instruments, he often invites the audience to manipulate his "acoustic prosthesis" of various forms. He has presented a number of performances and installations in Belgium, Holland, France, Germany, Spain, the United States and other countries.



(17)

Foghorn from MS INNVIK.
Produced by Skudeneshavn,
Skudeneshavn.
Bergen Maritime Museum



(18)

High-speed filming of a bee dancing, and split-second signal dancing bees (the further the feeder, the more waggings in a straight run of the dance).
Two facsimile
Origin Unknown

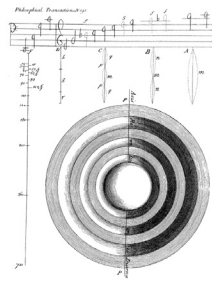
"I shall show the inadequacy of the conception of 'language as a sign' by the very manifestation that best illustrates it in the animal kingdom, a manifestation which, if it had not recently been the object of an authentic discovery, it seems it would have been very necessary to invent for this purpose.

It is now generally admitted that when the bee returns to the hive from its honey-gathering it indicates to its companions by two sorts of dance the existence of nectar and its relative distance, near or far, from the hive. The second type of dance is the most remarkable, for the plane in which the bee traces the figure-of-eight curve — which is why it has been called the ‘wagging dance’ — and the frequency of the figures executed within a given time, designate, on the one hand, exactly the direction to be followed, determined in relation to the inclination of the sun (on which bees are able to orientate themselves in all weathers, thanks to their sensitivity to polarized light), and, on the other hand, the distance, up to several miles, at which the nectar is to be found. And the other bees respond to this message by setting off immediately for the place thus designated.

It took some ten years of patient observation for Karl von Frisch to decode this kind of message, for it is certainly a code, or system of signalling, whose generic character forbids us to qualify it as conventional.

But is it necessarily a language? We can say that it is distinguished from language precisely by the fixed correlation of its signs to the reality that they signify...”

In Jacques Lacan, “The Resonances of the Time of the Subject in Psychoanalytic Technique,” Part III of “The Function of Field of Speech and Language” in *Écrits: A Selection* (London: Routledge, 2011).



Hollow earth schema, in *Philosophical Transactions no. 95*, Edmond Halley, 1692 Engraving (?).

In this article Edmond Halley claimed the earth is hollow. Focusing on the study of magnetic compass variation, he reached the conclusion that Earth has 4 magnetic poles. He argued that Earth is composed of a shell like system, dividing Earth into three spheres, and each one is separated from the other by 500 miles of atmosphere.

As a British astronomer and mathematician, HALLEY is known for calculating the orbit of Halley’s Comet. He developed bells for underwater exploration and contributed to other fields such as archaeology, geophysics, history of astronomy and more.



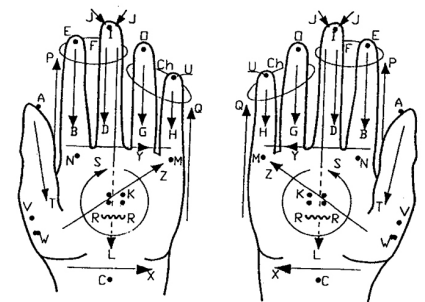
(21) *Line of Sight*, Alison O’Daniel, 2016

Musical triangles, enamel paint, dimensions variable

Line of sight is part of a body of works inspired by the musical score of her film *The Tuba Thieves* (see movie program). O’Daniel treats these sculptures as expanded cinematic forms, each object with its own narrative arc examining non-verbal communi-

cation. Sound becomes physical in sculptures she considers “quasi-closed captions” for music, inviting access through material, shape, color and form.

See Alison O’Daniel biography in Movie program page 51



(22) *Lorm Glove*, Hieronymus Lorm, c. 1885 Facsimile

The Lorm Glove is a communication and translation device; it translates the hand-touch alphabet Lorm, used by people with hearing and vision impairment into digital text and vice-versa.

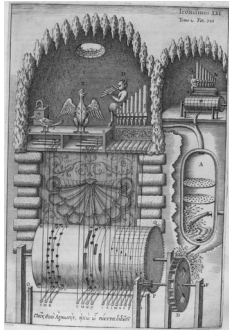
HEINRICH LANDESMANN, aka Hieronymus Lorm was an Austrian poet and a philosopher who suffered from loss of sight and hearing since the age of fifteen, eventually becoming completely blind. He developed a form of tactile alphabet signing which was published after his death by his daughter, that linked up with other forms of language developed for the deaf and blind like Tadoma, in which the deaf or blind person puts their finger on the speaker’s lips and along the jaw-line, tracing the speaker’s movement, as if lip-reading by sensor.



(23) *Map for Auriculotherapy*, n.d Facsimile from drawing

This image functions as a map of the human body, but a condensed one in which all body parts and

organs can be diagnosed and treated through the ear, by stimulation.



(24)

Musurgia Universalis
(illustration),

Anthanasius Kircher, 1650
Facsimile of an engraved plate

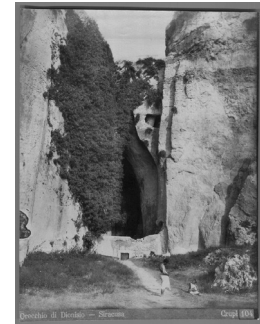


(25)

*Nykirke Church Bell after the
explosion, 1944*
Facsimile

The Image Collection, Bergen
University Library

See *SLIDESHOW: A Memorable
Sonic Event*, page 59

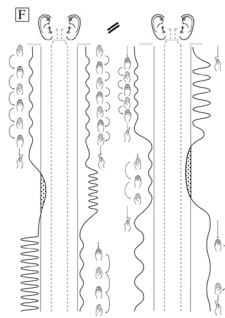


(27)

Orecchio di Dionisio (Syracuse),
Giovanni Crupi, 1899
Photography

This drawing of a musical grotto comes from *Musurgia Universalis* (1650) — considered to be the first comprehensive encyclopedia of music, it was published in two volumes in Rome and included about 20 large engraved plates, tables, diagrams and musical notations. It combines music theory and composition as well as the technology of music, introducing instruments, acoustics and music-making machines invented by Kircher himself.

During his lifetime, the Jesuit polymath ATHANASIUS KIRCHER (1602-1680) was widely regarded as the physical embodiment of all the learning of his age. A refugee from war-torn Germany, Kircher arrived in Rome just after Galileo's condemnation, where he was heralded as possessing the secret of deciphering hieroglyphics. He wrote over thirty separate works dealing with subjects ranging from optics to music, from Egyptology to magnetism. He invented a universal language scheme, attacked the possibility of alchemical transmutation and devised a host of remarkable pneumatic, hydraulic, catoptric and magnetic machines, which he displayed to visitors to his famous museum, housed in the Jesuit Collegio Romano. His books, lavishly illustrated volumes destined for Baroque princes with a love of the curious and exotic, are permeated with a strong element of the Hermetic philosophy of the Renaissance, synthesized with the Christianized Aristotelianism of the Jesuit order to which Kircher belonged.



(26)

Ehr, Robin Hoffmann, 2006
Score

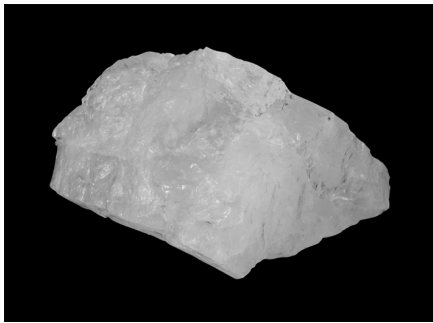
Ehr listening solo is a piece of music that remains silent for the audience. It does not impart itself through external acoustic events, but rather orients its attention towards the individual listening situation of the performer or musician. In the video installation, the interior of the ear, the real concert space where the piece takes place, is shown with the help of technical instruments: a mysterious place which is inaccessible to all, where the sensory perception of the recipients of the world remains unheard.

Robin Hoffman is a German composer, orchestrator and arranger living and working in Berlin, Germany. Between 2004-2008 he attended Hochschule für Musik Carl Maria von Weber and studied under Rainer Lischka, Marko Lackner, Lars Jüling, Clemens Kühn and Jochen Al-

dingler. He wrote the orchestral music for the Swiss/UK film production *Save Angel Hope* and he co-founded the music composition and production company Nachos and Cheese and has worked on several European film productions. He has been collaborating constantly with ensembles and artists such as the London Symphony Orchestra, Anna Karkowska and more.

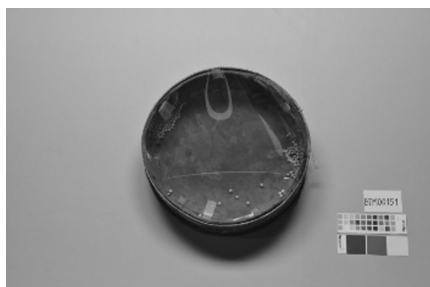
This man-made limestone cave known for its humar ear-like shape served the Syracusans during the Siege of Syracuse (413-414) as a place of captivity for the Athenian prisoners of war. According to some sources, it was also used by Dionysius the Elder who lived during the same period but was named after him by the Italian painter Caravaggio only in the sixteenth century. Its special shape contributes to its special acoustic characters which allow “the tearing of a piece of paper” to sound like “knocking a heavy stick against a stone” (Malt-Brun, Conard, 1829). According to legend, Dionysius used to spy on its prisoners from the top, hearing their whispers as well at their screams.

Giovanni Crupi was an Italian landscape photographer who often collaborated with his friend Wilhelm von Gloeden — and on certain photographs one indeed finds both signatures.

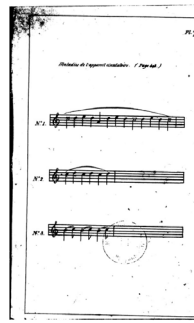


(28)
Quartz

« Quartz is known as the “master healer” and amplify energy and thought. It absorbs, stores, releases and regulates energy. Quartz draws off negative energy of all kinds, neutralising background radiation, including electromagnetic smog or petrochemical emanations. It balances and revitalises the physical, mental, emotional and spiritual planes. Cleanses and enhances the organs and subtle bodies and acts as a deep soul cleanser, connecting the physical dimension with the mind. Quartz enhances psychic abilities. It aids concentration and unlocks memory. Stimulates the immune system and brings the body into balance. Quartz harmonises all the chakras and aligns the subtle bodies. » (From the website Caryl Haxworth, Charms of Light)



(29)
Rainmaker
Theatre Prop
University Museum of Bergen,
Cultural History Museum



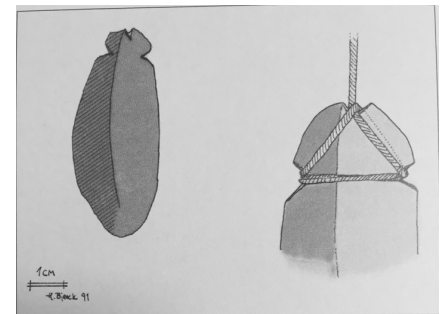
(30)
Score of maladie de l'appareil circulatoire, René Laennec (origin and date unknown)

As the story goes, one morning in the month of September, 1816, Laennec observed two children playing with a long piece of wood and a pin to send signals to each other –one child scratched one end of the piece of wood with the pin while the other listened to the amplified sound at the other end. The other part of the story depicts the embarrassment the young doctor experienced when having to place his ear on the breast of a female patient in order to diagnose her condition. This led him to take a piece of paper and roll it into a cone in order to perform the diagnosis from a decent distance.

“I recalled a well known acoustic phenomenon: if you place your ear against one end of a wood beam the scratch of a pin at the other end is distinctly audible. It occurred to me that this physical property might serve a useful purpose in the case I was dealing with. I then tightly rolled a sheet of paper, one end of which I placed over the precordium (chest) and my ear to the other. I was surprised and elated to be able to hear the beating of her heart with far greater clearness than I ever had with direct application of my ear.” Laennec translated from French by John Forbes, 1834

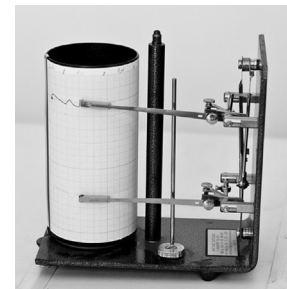
RENÉ THEOPHILE HYACINTHE LAENNEC was a French physician who is fa-

mous for inventing the stethoscope, which allowed him to extend his investigation of the sound made by the heart and lungs in order to determine his diagnoses. He published in 1819 the first seminal work on the practice of listening to body sounds *De l'auscultation Mediate* (on Mediate Auscultation) and was the first to write descriptions of bronchiectasis and cirrhosis.

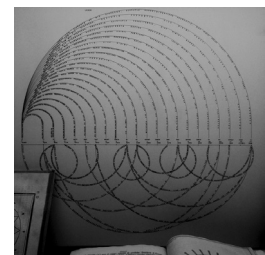


(31)
Bull Roare
Facsimile from drawing

It is said that this object (originally a stone) could have been used as one of the earliest musical instruments. When rotated, the supportive string vibrates with the wind.



(32)
Sismographe
Bergen University, Department
of Earth Science



(33)
Illustration from Speculum Musicae, Jacob of Liège, 1330
Facsimile

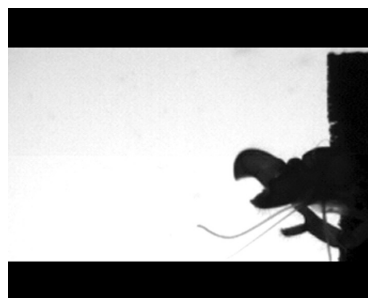
Speculum Musicae (The Mirror of Music) is considered to be the largest surviving medieval work on music. It consists of seven large books that attempt to give a comprehensive account of the field of music as a whole, and it contains two main types of musical treatise: the first discusses music as a mathematical discipline and as a part of philosophy, the second reads as a handbook for training musicians. It includes definitions, inventors, etymologies, divisions and more. For many years it had been attributed to Jehan de Murs by its first editor, Edmond de Coussemaker, and for many years the actual author remained a mystery. The only hint concerning his identity lay in the initials that appear at the beginning of each of the seven books, representing the given name “Jacobus.” According to research carried out on the subject, the treatise enabled the formulation of a hypothesis concerning the career of Jacobus — that he was born in the diocese of Liège, that he was a student in Paris in the late-thirteenth century and that he returned to Liège to complete the final books of his treatise – books 6 and 7. Recent studies argue that it was written by Jacob of Liège, also known as Jacobus Leodiensis.



(34)

Thunder Clap Balls

Theater Prop

University Museum of Bergen,
Cultural History Museum

(35)

*Tiny movements*Video program on monitor,
loop*Tiny Movements*, Michael Rubinstein, 2014

This sequence taken from a TED Talk by Michael Rubinstein shows the magnified neck vibrations of the scientist while singing. It is just one example of the process of recovering sound by using high-speed video footage of an object or a person, making it possible to retrace vibration, movement and sound in seemingly still objects or subjects.

Tsunami Animation: Tohoku, Japan 2011 (rotating globe), US NWS Pacific Tsunami Warning Center (PTWC) 2014, 2min43sec

This animation video shows how PTWC's real-time tsunami forecast model, RIFT, predicts the behavior of the tsunami following the 9.0 magnitude earthquake that struck offshore near the Tōhoku region, Japan, on 11 March 2011.

Hair Cells: Bundlestim, David P. Corey Laboratory, 0.04sec

In this very short sequence, one sees the hair bundle of a live hair cell being removed from a bullfrog's inner ear. The stimulus probe attached to the tip of the bundle moves the bundle the way sound or head movements would.

Chorthippus Brunneus Stridulation,
0.26 sec, n.d.

The stridulation is produced by rubbing body parts together, in this case the forewing and the hind leg.

Ultrasonic Fluid Levitation Tasting Experience, J. Broen, H.2014, Bloxham, P. Carnelli, C. Marples, University of Bristol 1min45sec

These videos demonstrate the ability to float objects in mid-air, simply using the power of sound. The ultrasonic speakers enable the levitation of objects such as water drops.

Sequence from *On the Sound of Snapping Shrimp*, Physics of Fluids group, 40sec

University of Twente, Enschede, The Netherlands

This film emphasizes the sound and rapid movements of the snapping shrimp. The snapping shrimp produces sound by using both its normal claw and its snapping claw, which is also how it communicates, by releasing a cavitation bubble.

Tsunami Animation: Valdivia, Chile, US NWS Pacific Tsunami Warning Center (PTWC), 1960 (rotating globe) 2015, 1min45sec

The largest earthquake ever recorded struck southern Chile on May 22, 1960. This 9.5 magnitude earthquake generated a tsunami that crossed the Pacific Ocean, killing as many as 2000 people in Chile and Peru, 61 people in Hilo, Hawaii, and 142 people in Japan as well as causing damage in the Marquesas Islands (French Polynesia), Samoa, New Zealand, Australia, the Philippines, and in Alaska's Aleutian Islands.

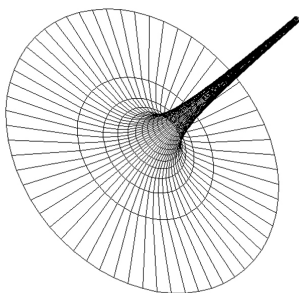
The Tsar Bell Sound,
Greg Niemeyer, 0.07sec

The Tsar Bell, located in the Kremlin courtyard in Moscow, is considered the largest bell ever built but also the most “reserved”, as it has never been rung. It was broken while still at the metal casting site. A team of researchers from University of California, Berkley, Stanford and the University of Michigan used Finite Element Analysis (FEA) and other simulations — a computational model of what it would have sounded like.

Ultrasonic Levitation, Asier Marzo, Sue Ann Seah, Bruce W. Drinkwater, Deepak Ranjan Sahoo, Benjamin Long and Sriram Subramanian, 2015, 3min20sec

Honey Bee Dance Language, Kirk Visscher, n.d, 0.26sec.
University of California, Riverside

The video follows a dancing bee in a swarm, marked with a blue dot. The bee returns from a sugar water feeder to perform a dance that indicates to the other bees where the sugar water source is located, in relation to the sun’s azimuth.



(36)

Diagram of Torricelli's Trumpet
(origin unknown), Facsimile

The discovery of this geometric figure, also known as Gabriel’s Horn, is associated with Evangelista Torricelli, although its basic function was known before his

time; the figure is characterized by finite volume and infinite surface area, leading to many philosophical questions about infinity.

Evangelista Torricelli was an Italian physicist and mathematician, best known for his invention of the barometer, but is also known for his advances in optics and work on the method of indivisibles.



(37)

Visible Speech, Alexander Melville Bell, 1895
Facsimile

“To ask the value of speech is like asking the value of life” A.G. Bell.

In 1895, Alexander Melville Bell published the book *English Visible Speech in Twelve Lessons*, introducing and illustrating the phonetic alphabet system he invented and which preceded the International Phonetic Alphabet. In his system, each shape corresponds to a sound that exists and is used in human speech. He also addresses notations for tone, pitch and suction, affording more accurate pronunciation of the sounds in language. The system was then used and developed by his successor, his son Alexander Graham Bell.



(38)

Wind Machine
Theater Prop
University Museum of Bergen,
Cultural History Museum



(39)

Within/Infinite Ear research documentation
Video program on monitor,
loop

Sign & Sounds, Sharjah, 2013

These videos were produced as a result of Council’s research in Sharjah (titled *TACET*). Based on Jeffrey Mansfield’s workshop, they feature students of the Al Amal School for the Deaf in Sharjah (U.A.E.) putting together an index of gestures describing sounds. These often illustrative gestures account both for the attention deaf persons pay to particular sounds and for sign language’s specific regime of experience. These videos provided the starting point for Jeffrey Mansfield’s and Noé Soulier’s collaboration. (see Movie Program).

Portraits of Instruments, ZKM
(Karlthue), 2016

These videos were produced as a result of Tarek Atoui’s workshop at ZKM in 2016, as part of of the *New Sensorium* exhibition. They feature three participants describing the instruments (part of the WITHIN collection) insisting on the techniques they invented to play them and how they perceive the sound.

MOVIE PROGRAM

Pray consider that if to judge correctly of intonation, we must listen to an actor without looking at him, it is very natural to watch an actor without hearing him, if we are to judge correctly of his gestures and action. — Denis Diderot

This program is a selection of films and videos or various sources (documentary, essays, artists' videos, films and recordings of dance performances). The program is an invitation to hear music through different languages and gestures created by artists and choreographers and through different experts' "ears." It also suggests a short history of Deaf culture in cinema.

Everyday:

11am – 2.45pm : daily program (see calendar in the movie theater)

2.45pm : selected feature film

RUBBER COATED STEEL

Lawrence Abu Hamdan, 2016, video, 21min

As part of the daily program (11am - 2.45pm)

In May 2014, Israeli soldiers in the occupied West Bank (Palestine) shot and killed two teenagers, Nadeem Nawara and Mo-hamad Abu Daher. The human rights organization Defence for Children International contacted Forensic Architecture, a Goldsmiths College-based agency that undertakes advanced architectural and media research. They worked with Abu Hamdan to investigate the incident. The case hinged upon an audio-ballistic analysis of the recorded gunshots to determine whether the soldiers had used rubber bullets, as they asserted, or broken the law by firing live ammunition at the two unarmed teenagers. A little over a year after Abu Hamdan completed his report, he returns to the case of Abu Daher and Nawara in his video *Rubber Coated Steel*. *Rubber Coated Steel* acts as a tribunal for these serial killing sounds. It does not preside over the voices of the victims but rather seeks to amplify their silence, fundamentally questioning the ways in which rights are being heard today.



TITLE WITHDRAWN

Robert Ashley, 1976, film, 45min

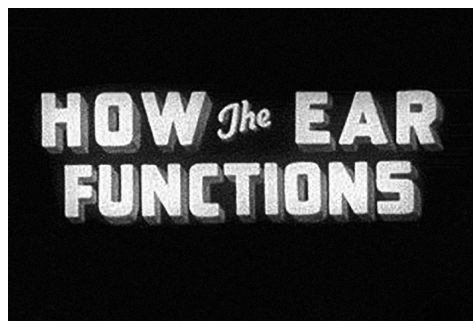
As part of the daily program (11am - 2.45pm)

Title Withdrawn belongs to a series of videos, *Music with Roots in the Aether*, directed by Robert Ashley, in which he establishes a panorama of the New York experimental scene of the early 1970s through interviews and concerts by Pauline Oliveros, Philip Glass and Alvin Lucier, among others.

Title Withdrawn is a film based on the music of his piece *Automatic Writing*. Ashley used his own involuntary speech that results from his mild form of Tourette's Syndrome as one of the voices in the music. The second voice is a French translation of his ideas. Ashley was intrigued by his involuntary speech, and the idea of composing music that was unconscious. His interest in the use of voice and words went beyond their explicit denotation, believing their rhythm and inflection could convey meaning even if one does not understand the actual phonemes.

It features David Peterson and Donald Renzulli from the California School of the Deaf signing the involuntary speech heard in *Automatic Writing*.



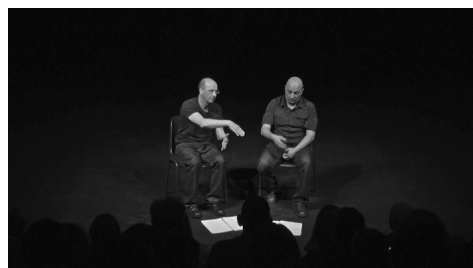


HOW THE EAR FUNCTIONS

KK Bosse, 1940, 11min38

As part of the daily program (11am - 2.45pm)

An educational film with animation describing how the ear functions from a physiological point of view. This film was approved by the American College of Surgeons' committee on medical motion pictures.



BOTH SITTING DUET

Jonathan Burrows and Matteo Fargion, 2002,
video excerpt, 10min

As part of the daily program (11am - 2.45pm)

The two artists have stated that *Both Sitting Duet* has no direct link to sign language, being rather a gestural translation from the score (not the sound) of a piece of music - Morton Feldman's 'For John Cage' - and that the gestures were chosen according to rhythmic properties in relation to the demands of this music, accepting meaning where it arose but never accentuating or developing it. The primary effect for audiences over the years has been described by many people as hearing music where none exists, which is a kind of synesthesia where one sensory experience or expectation is confused with another. People have, from time to time, asked if the gestures are meant to mean something, but usually in relation to particular performances where one or other set of linked gestures sparked a reaction, specific to that country or culture. The piece has never been performed for an audience of deaf people, though the profoundly deaf choreographer Chisato Minamura did indeed see it and entered into a long and ongoing exchange about the 'visibility' of unheard music, which conversation has been greatly illuminating.



THE LIFE AND LOVES OF BEETHOVEN

Abel Gance, 1937, (excerpt), 4min39sec

As part of the daily program (11am - 2.45pm)

The Life and Loves of Beethoven is a biography of the classical composer based on his love affairs. The biography chronicles the years in which the master began to lose his hearing. This excerpt is a pivotal part of the film, in which we see the composer becoming deaf but holding on to the memory of sound in his work and his surroundings. The director makes a notable use of sound to represent Beethoven's affliction. The music is played by the Orchestre de la Société des Concerts du Conservatoire de Paris under the direction of Louis Masson.

SIRENENPROJEKT

Friedrich Kittler, 2011, Footage, 6min38sec

As part of the daily program (11am - 2.45pm)

Friedrich A. Kittler and a group of friends (Anthony Moore, Pink Floyd songwriter and former Dean of the Academy for Media Arts Cologne, Humboldt media theorist Wolfgang Ernst, Peter Weibel, and others) travelled to the Sirenasas, an archipelago off the Amalfi Coast (Italy) where mythological sirens once lived. The idea was to prove that the *Odyssey* actually happened and that the alphabet was invented in order to give Homer's poem a fixed form (Barry B. Powell). Friedrich Kittler wanted to demonstrate that Odysseus, one of Homer's heroes, was a liar. By placing two opera singers on the island in a form of reenactment, he proved that Odysseus cheated on his wife Penelope, certainly having an affair with the sirens, because only vowels and not consonants travel over water.



SACRE DU PRINTEMPS

Xavier Leroy, 2007, video excerpt, 3min7sec

As part of the daily program (11am - 2.45pm)

Observing the Berlin Philharmonic during a rehearsal of *Le Sacre du Printemps* in 2003, Xavier Le Roy decided to work on Stravinsky's classic from an interest in the movements of conducting. Having no musical training, Le Roy ventured into a laborious process of studying a conductor's interpretation as if it were a choreography of its own. An inversion of cause and function unfolds: the gestures and the movements that are meant to prompt musicians to play appear at the same time to be produced by the music they are supposed to produce. When is one playing and when is one being played by this highly motile music? What is the moment before and after the sound, the movement, the intention to move, the motorics of the play? How much is our pleasure in listening to music rise in live performance conducted by a desire for, and an unsettledness about, the synchronicity of a well-functioning machine? There are as many bodies as there are different roles and perspectives in listening: what does the musician, the conductor or the spectator hear when hearing thus becomes part of an embodied, inevitably visceral experience of movement and sound?



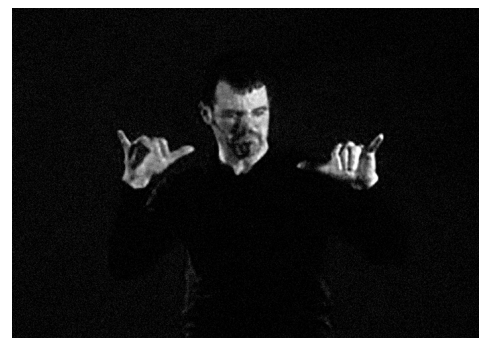
MIXED REVIEWS

(AMERICAN SIGN LANGUAGE)

Christian Marclay, 1999/2001, 30min

As part of the daily program (11am - 2.45pm)

This video depicts American Sign Language (ASL) interpreter Jonathan Kovacs signing a long, collaged text made by artist Christian Marclay from reviews of musical performances and records.



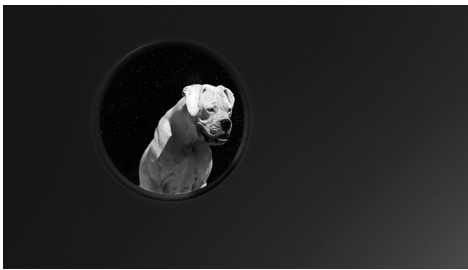


THE TUBA THIEVES SCENE 55 THE PLANTS ARE PROTECTED

Alison O'Daniel, 2013, video, 21min

As part of the daily program (11am - 2.45pm)

Over the past few years, tubas have been stolen from high schools all over the Los Angeles area to be sold on the black market for a high price. *The Tuba Thieves*, responds to these thefts as a springboard for exploring the material and aural space of cinema through collaborations with hearing, Deaf and hard of hearing artists and musicians. *The Tuba Thieves - Scene 55* is based on a score by Deaf artist Christine Sun Kim who was given poems, artworks, news stories about the tuba thefts, and other references to interpret as a score. Alison O'Daniel's approach reversed the usual filmmaking process by starting with the music, which then informed all the other cinematographic decisions (film plot, settings, images and atmosphere). A process of deep listening orchestrates the narrative which involves different historical or anecdotal events that have incorporated Deaf history, silence or altered experiences of listening. Six short film segments of *The Tuba Thieves*, made between 2013 and 2015, are completed, and each iteration influences the next.



NIGHT SKY

Alison O'Daniel, 2011, 75min

2.45pm — Tuesday, Thursday, Saturday

Night Sky explores the tactile dimension of sound often overlooked by hearing people. This film centers on two women, Cleo (played by Deaf actress Evelina Gaina) and Jay (played by Jeanne-Marie Mandell). Cleo is deaf, Jay is hearing and they take a road trip to the California desert near Joshua Tree, where they receive a cosmic message by touching vibrational surfaces during the course of a sound bath. Simultaneous to their travels, there is a dance contest happening in a parallel universe, in which the touch of dancers' hands affects the music being played. A deaf dog is the only character that traverses both planes of existence — through a membrane delineated by a hula hoop. Alison O'Daniel is hard of hearing; she grew up in the hearing world and wears hearing aids and lip-reads. *Night Sky* contains multiple mirrors of that perceptual experience, and disability is examined as providing the possibility of an alternative form of communication and reception which is not lesser than that considered medically normative — by Danielle McCullough.

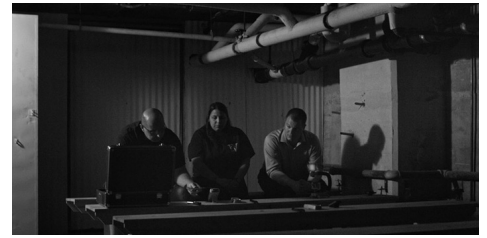
THE SILENT KEYS

Simon Ripoll-Hurier, video, 11min

As part of the daily program (11am - 2.45pm)

In 1959, Friedrich Jürgenson played back a recording he had made of birdsong in the surrounding area of Stockholm. He believed he could make out a voice evoking night birds. This experience and his numerous subsequent recordings led him to develop his theory of Electronic Voice Phenomena (E.V.P.). According to him, the voices we seem to pick up through white noise on the radio or the background noise of certain recordings are the voices of the dead trying to communicate with the living. He believed spirits have the ability to articulate certain noises in order to imprint their voices on magnetic tape. The techniques and tools available have developed greatly since Friedrich Jürgenson's day, and the number of enthusiasts has also multiplied.

The Silent Keys shows a session with the group Behind the Wall Paranormal in the basement of Camp Evans, Wall Township, New Jersey. On the alert for the slightest vibration, surrounded by wave detectors, microphones and infrared cameras, they politely ask the spirits to imprint their presence on one of the machines.



LOOSING BIRDS

Simon Ripoll-Hurier, video, 17min

As part of the daily program (11am - 2.45pm)

In *Loosing Birds*, Kenneth Ward (president of the North Alabama Birdwatching Society) and his wife Rufina are shown in their garden in Huntsville, Alabama, constantly switching between attempts to communicate with the birds around them, chatting to each other about this and that, and voicing their ecological concerns about the future of local species.

Birdwatchers or "birders" spend their free-time trying to observe birds. They position themselves in a strategic place, in the forest or at the edge of a forest, and wait. They are equipped with binoculars and a list of bird species found in the area. Each time they see (or hear) a particular species, they tick it off the list. To improve their results, they practice "pishing," which involves imitating certain bird calls (mainly those of predators such as the scops owl in the American East) to trigger reactions among smaller birds, who will give their alarm call and start to move, making it easier to spot them.



BERLIN: SYMPHONY OF A METROPOLIS

Walter Ruttmann, 1927, 65min

As part of the daily program (11am - 2.45pm)

Berlin: Symphony of a Metropolis is a 1927 German film directed by Walter Ruttmann, co-written by Carl Mayer and Karl Freund.



The film is an example of the city symphony film genre. A musical score for an orchestra, to accompany the silent film, was written by Edmund Meisel. As a “city symphony” film, it depicts the life of a city, mainly through visual impressions in a semi-documentary style, without the narrative content of more mainstream films, though the sequencing of events can imply a kind of loose theme or impression of the city’s daily life.



THE TRIBE

Myroslav Slaboshpytskyi, 2014, 132min

2.45pm — Sunday

The Tribe is an Ukrainian film set in a boarding school for deaf children, where a new arrival is drawn into an institutional system of organized crime, involving robbery and prostitution. The film is entirely in Ukrainian Sign Language with no subtitles and received an award at the 2014 Cannes Film Festival.

DEAF SOUND WORKSHOP

Noé Soulier, 2014, video excerpt, 1min37sec

Performance project in collaboration with Jeffrey Mansfield



As part of the daily program (11am - 2.45pm)

How does sound manifest itself in the body and consciousness of the deaf? Sign language itself offers no answer to this paradoxical question, since it only takes into account sound as perceived by the non-deaf. Upon the invitation of Council (Gregory Castéra and Sandra Terdjman), the deaf architect Jeffrey Mansfield and the non-deaf choreographer Noé Soulier have been looking into this inconceivable lack or gap at the heart of language. This video was shot in MoMA PS1 studio where they met for the first time to start a cross-inquiry into the different manners of hearing and expressing the inaudible. Together, they pinpointed a series of parameters and material qualities — volume, amplitude, elevation — which make it possible to map out what deaf people sense in response to sounds. They used this to extract a monologue blending together first-person accounts, anecdotes, and analyses. Experimenting with all the effects of manipulation and spatialization afforded by sign language, they invent a choreography and set out an equal challenge to deaf and non-deaf alike. The work *Deaf Sound* will be presented for the first time in September 2016 at PACT Zollverein (Essen) and during the Paris Autumn Festival.



ANDREI RUBLEV

Andrei Tarkovsky, 1966, 186min (excerpt), 5min47sec

As part of the daily program (11am - 2.45pm)

Andrei Rublev is set against the background of 15th-century Russia. Although the film is only loosely based on the life of artist

Andrei Rublev, it seeks to depict a realistic portrait of medieval Russia. The film's themes include artistic freedom, religion, political ambiguity, autodidacticism, and art-making under a repressive regime. This selected excerpt and one of the final scenes of the film shows Andrei witnessing the casting of a bell. Bell-ringing scenes are a classic feature of Soviet cinema and also a frequent symbol in Tarkovsky's work.

THE PRESERVATION OF SIGN LANGUAGE

George W. Veditz, 1913 (14min41sec)

As part of the daily program (11am - 2.45pm)

Presented without subtitles, *The Preservation of the Sign Language* features George W. Veditz demonstrating in sign language the importance of defending deaf people's right to sign. Veditz made this film specifically to record sign language for posterity at a time when oralists (those who promoted lip reading and speech in lieu of sign language) were gaining momentum in the education of the hearing-impaired.

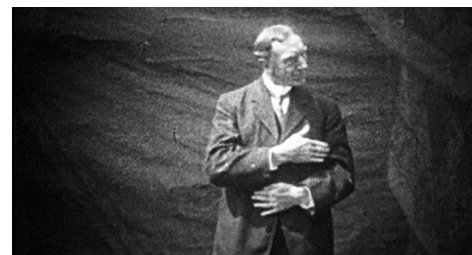
An excerpt of his speech: "A new race of pharaohs that knew not Joseph, is now seizing control in many of our American schools. They do not understand signs because they themselves cannot sign. They proclaim that signs are worthless, of no help to the deaf. Enemies of sign language, they are enemies of the true welfare of the deaf. We need these films to preserve and pass on our beautiful signs. As long as there are deaf people on earth there will be signing. And as long as we have our films, we can preserve our beautiful signs in their old purity."

DEAF

Frederick Wiseman, 1986, color, 164min

2.45pm — Friday

The School for the Deaf at the Alabama Institute is organized around a theory of total communication i.e., the use of signs and finger spelling in conjunction with speech, hearing aids, lip reading, gestures and the written word. Frederick Wiseman presents an empathetic picture of the disabled students and loving staff, but he makes his way into organizational meetings, the parental decision-making process — all the facets of the lives of disabled people, as they come to play an increasing role in today's society.



BIOGRAPHIES

LAWRENCE ABU HAMDAN is an artist and “private ear” whose projects have taken the form of audiovisual installations, performances, graphic works, photography, Islamic sermons, cassette tape compositions, potato chip packets, essays, and lectures. Abu Hamdan’s interest with sound and its intersection with politics originate from his background in DIY music. In 2013 Abu Hamdan’s audio documentary *The Freedom of Speech Itself* was submitted as evidence at the UK asylum tribunal where the artist himself was called to testify as an expert witness. He continues to make sonic analyses for legal investigations and advocacy for organizations such as Amnesty International — and was prominently part the *No More Forgotten Lives* campaign for Defence for Children International.

ROBERT ASHLEY was an American composer best known for his operas and other theatrical works, many of which incorporate electronics and extended techniques. Ashley was indelibly linked to the performance of his pieces, particularly through the use of his voice in such works as *Automatic Writing* and *Perfect Lives*. His work defied ready classification. Technically, many of his compositions were chamber operas, scored for a handful of singers, with recorded backgrounds of electronic sounds. He was best known for his operas, he wrote most of his librettos with little conventional plot. They were operas of ideas, he broadened the genre in strange and unexpected ways.

JONATHAN BURROWS and MATTEO FARGION started their collaboration in 2002. The work of Burrows and Fargion sits somewhere between dance, music, live art and comedy, radiating delight even as it makes the audience think. Over the past twelve years the two artists have built a body of duets including *Both Sitting Duet* (2002), *The Quiet Dance* (2005), *Speaking Dance* (2006) and *Cheap Lecture* (2009) which mix the formality of classical music composition with an open and often anarchic approach to performance and audiences, bringing them a worldwide following.

ABEL GANCE was a French film director and producer, writer and actor. He was a pioneer in the theory and practice of montage. There were few aspects of film technique that he did not seek to incorporate in his work. He explored the use of image superimposition, extreme close-ups, and fast rhythmic editing, and he made the camera mobile in unorthodox ways. His influence was acknowledged by contemporaries such as Jean Epstein and later by filmmakers of the French New Wave.

FRIEDRICH A. KITTLER was a literary scholar and media theorist. He is considered one of the founders of Media Studies in Germany. He was appointed to the Chair for Media Aesthetics and History at the Humboldt University of Berlin from 1993 to 2008 and received many awards for his research. His most well known books are *Aufschreibesysteme* (Fink Verlag, 1985) and *Grammophon, Film, Typewriter* (Brinkmann & Bose, 1986). His notion of technological determinism, a theory that presumes that a society’s technology

controls the development of its culture, inspired contemporary analyses digital society.

XAVIER LE ROY holds a doctorate in molecular biology from the University of Montpellier, France, and has worked as a dancer and choreographer since 1991. He has performed with diverse companies and choreographers. His latest works such as the solo pieces *Le Sacre du Printemps* (2007), *Untitled* (2014), the group piece *low pieces* (2011), and works for exhibition spaces such as *production* (2011) created in collaboration with Mårten Spångberg, *untitled* (2012), for the exhibition *12 Rooms, Retrospective*, first performed in 2012 at the Tapiès Foundation-Barcelona, *Temporary Title* (2015), created in Sydney as part of the John Kaldor Public Art Project or *For The Unfaithful Replica* at CA2M Madrid, all produce situations that explore the relationships between the spectator, visitor and performer, and the production of subjectivities.

CHRISTIAN MARCLAY is a New York-based visual artist and composer. Over the past 30 years, he has explored the fusion of fine art and audio cultures, transforming sounds and music into a visible, physical form through performance, collage, sculpture, installation, photography and video. He is a pioneer in using gramophone records and turntables as musical instruments to create sound collages.

Working across film, sculpture, performance and music, ALISON O’DANIEL asks audiences and collaborators to navigate, deconstruct and reimagine sound. She aims to examine the politics of production, representation, and reception regarding sound and acts of listening. In 2011, she completed a feature-length film called *Night Sky*, which has been screened with live Sign Language and musical accompaniment at multiple venues. *The Tuba Thieves* is an on-going project that manifests as short films, moving image installations, sculptures, textiles, and performances. Alison O’Daniel’s work has been presented in solo exhibitions at Samuel Freeman Gallery (Los Angeles), Centre d’Art Contemporain Passerelle (Brest, France) and Art In General (NYC) in March 2016.

SIMON RIPOLL-HURIER is a visual artist and musician. His interest in oral description techniques — as in *Périphériques* (2008) and *The Curtain* (2013, with Myriam Lefkowitz) — has led him to look into conspiracy theories bearing on cloud formations (*This Cannot Be Natural*, since 2012). In 2013 he made the experimental film *Dreamland*, which documents the process of creating a song. Since 2014, he has been developing “Diana”, a film project based on a radio transmission technique using Moon reflection, gathering a series of portraits and documenting “listening practices” involving radio hams, bird-watchers and ghost hunters. In this way, *The Silent Keys* and *Losing the birds* contribute to Diana. He also plays with Les Agamemnonz, an instrumental surf music band, and co-founded *DUUU, an artist-based web radio.

WALTER RUTTMANN was a German film director and a practitioner of experimental film. He was also a prominent exponent of both avant-garde art and music. His abstract films of the early 1920s found recognition during his lifetime, before the Nazi period. He died in Berlin of wounds sustained when he was working on the front-line as a war photographer.

MYROSLAV SLABOSHPYTSKYI is a filmmaker and a Member of the Ukrainian Association of Cinematographers. He shot his first film in 2006 and gained international recognition with *The Tribe* in 2014.

NOÉ SOULIER dances and studies philosophy. In lieu of holistic speculations, he prefers to analyze linguistic operations. He is thus interested in the relation between analytic philosophy and choreography. *Idéographie* (2011) deals with the expression of chains of arguments through dance. *Signe Blanc* (2012) explores the tension between movement and language in pantomime, and *Mouvement sur Mouvement* (2013) reveals the choreographic dimension of gestures that comment on William Forsythe’s dancing in his *Improvisation Technologies*.

JEFFREY MANSFIELD is a designer and architect. Profoundly deaf since birth, in his *M.Arch*. Thesis he explored the intersection of deafness and architecture. He is now an associate designer at MASS, an architecture agency in Boston, and he continues to write regularly.

ANDREI TARKOVSKY was a Soviet and Russian filmmaker, writer, film editor, film theorist, theater and opera director. His work is characterized by long takes, unconventional dramatic structure, distinctly authored use of cinematography, and spiritual and metaphysical themes. His contribution to cinema, with his best known films such as *Solaris* (1972), *Mirror* (1975), and *Stalker* (1979) was highly influential.

GEORGE W. VEDITZ was a former president of the National Association of the Deaf of the United States. He lost his hearing at the age of 8. He attended Gallaudet College, where he studied to be a teacher. Its greatest preoccupation was the preservation of sign language, which Veditz considered under threat by the advancement of the oralist proposals in schools. He was one of the first to film American Sign Language.

FREDERICK WISEMAN is an American documentary filmmaker. His work has offered an intimate, extracurricular history of his country by way of its institutions: a high school, a welfare office, a hospital, a military training camp. He gets permission to film, whether in the prison cells of Titicut Follies, operating theaters (Hospital, 1970), the Paris Opera Ballet for the exquisite *La danse* (2009) or America’s most dilapidated housing projects (*Public Housing*, 1997), and does so in an unobtrusive manner, always keeping a distance, with no direct interviews — what is referred to as a “pure” or “direct” form of observation.

SLIDESHOW

The dolphin can hear, but has no ears... Of ears, some are fine, some are coarse, and some are of medium texture; the last kind are best for hearing, but they serve in no way to indicate character. Some ears are large, some small, some medium-sized; again, some stand out far, some lie in close and tight, and some take up a medium position; of these such as are of medium size and of medium position are indications of the best disposition, while the large and outstanding ones indicate a tendency to irrelevant talk or chattering.

— Aristotle, History of Animals, Part II

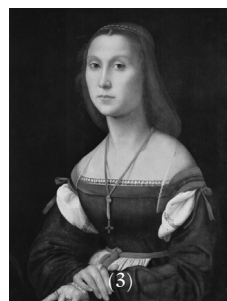
This visual essay brings together a set of documents which make up the exhibition's fictional framework — each chapter presents ongoing research into extending the imaginary of hearing. The visual essay is screened against the windows separating the White Cat and the pool, and its duration corresponds to the opening hours of the exhibition. In this way, the entire exhibition finds different associations as the day progresses. (detailed credits are at the end of this section)



(1)



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FOUR PORTRAITS (11.30 am)

People say world comes to your ear, you come to the world with your eyes: Two self-portrait of artists depicting their deafness; a Deaf woman painted by a hearing painter; and Saint Lucy, saint patron of the blind.

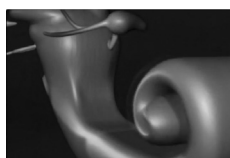
IN THIS SEQUENCE

Self-portrait, Francisco Goya 1815 (1)

Self-Portrait as a Deaf Man, Sir Joshua Reynolds, c.1775 (2)

Portrait of a Woman (La Muta), Raffaello Sanzio known as Raphaël, 1507 (3)

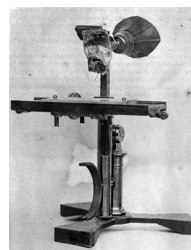
Saint Lucy, Francisco de Zurbarán, c. 1625/1630 (4)



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THE CUTTED EAR (12 pm)

In *The Theory of Hearing* (1987), Thomas Gold claimed that the cochlea is an “underwater piano” — a bank of strings that are highly tuned despite immersion in liquid. To make “an underwater piano” work, we would have to add sensors and actuators to every string so that once a string is funded the damping is counteracted by positive feedback — “if we supplied each string with a correctly designed feedback circuit, then the underwater piano would work again.” Alexander Graham Bell and Clarence J. Blake’s ear phonautograph incorporated an actual human ear, taken from a corpse, into machinery designed to draw shapes based on a deaf student’s vocalizations. The phonautograph inspired Bell to invent the telephone. Sound caused the eardrum to vibrate, and an attached stylus traced a line representing those vibrations on a soot-coated glass plate.

IN THIS SEQUENCE

3D Animation of a cochlea (5)

Blue Velvet (excerpt), David Lynch, 1986 (6)

Phonautograph, Alexander Graham Bell (7)

Hellen Keller and a piano (8)



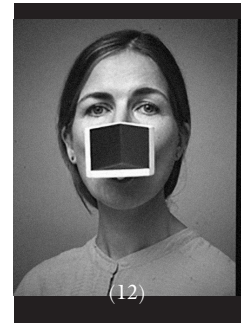
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DEAF VOICE (12.30 pm)

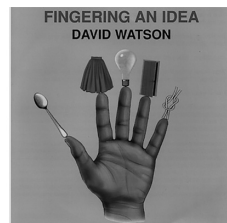
“In the film version of Mark Medoff’s play, *Children of a Lesser God*, James (William Hurt) is a speech instructor at a deaf school who believes his students must be educated in oral culture by being taught to lip-read and speak. He falls in love with Sarah (Marlee Maitlin) who is deaf but who refuses to participate in his pedagogical project. She signs throughout the film, insisting on her right to remain silent, until one climactic scene when, under James’s badgering, she suddenly screeches out a stream of speech. It is a powerful scene because it is the first time the hearing audience has experienced her voice and realizes that she can speak but prefers not to. It is also powerful because instead of achieving the desired result, Sarah’s vocalizing illustrates the coercive force of an educational system based around speech rather than manual signing. [...] For the hearing educator, speech is the key to normalization in hearing-based culture; for the Deaf signer, speech is the sign of an alienating process that only performing can make evident.” (Michael Davidson, usually called *The Scandal of Speech in Deaf Performance*.)

IN THIS SEQUENCE

Speak, Speak, Maria Barnas, 2016 (From Douwe Jan Bakker, Pronounceable boxes) (9) - (12)



(13)



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(16)

EACH HAND IS A WORLD (1 pm)

Deaf culture developed in parallel to the demand that sign language be recognized as a mother tongue or first language. As Stefan Helmreich writes, “Studies of sign language would seem to offer little intersection with Sound studies, since here questions of visibility are paramount and sound has no clear relevance. We would like to experiment, however, with the notion that spoken and signed language both concern articulation. For phoneticians who make their living tracking the sounds of speech, articulatory phonetics details the physiological motion of parts of the vocal tract in the production of speech. Sign language also operates through a process of articulation, though here not of bodily managements of the flow of air via the larynx, glottis, tongue, and teeth, but rather through the positioning of fingers, hands, and facial expressions in space and time. But by articulation, we also wish to move beyond the bodily mechanics of speech and sign, attending to the ways language and sociality are entangled with one other in fashioning phenomenological and cultural worlds (Hall 1980). Sound studies’ sometimes phonocentric approach and Deaf studies’ often oculo-centric epistemology can miss shared interests in articulations of communicative practices with lived experience.”

In the book *Handtalk: An ABC of Finger Spelling & Sign Language* (1974) Remy Charlip (1929-2012), a dancer, artist, children’s book author, in collaboration with Mary Beth Miller, an actress, teacher and a member of the National Theater of the Deaf, and George Ancona, a photographer, introduced a

playful and creative way to teach sign language using photography and illustration to capture gestures and expression. It was not necessarily intended for deaf children but for all children and young readers, believing they have much more ability than adults to acquire a non-verbal language and gestures. “You don’t have to use your voice to talk. You can talk with your eyes, your face, your hands, your body...” In a 1978 painting by the Italian artist Francesco Clemente titled *Map of What is Effortless* he depicts five animals common to sub-Saharan Africa on each of the five fingertips of a hand. Not much is known or certain about this painting and the artist’s intention, thus inviting multiple interpretations which seem to start a tradition. In 2007 Barbara Bloom traced Clemente’s painting, creating her own version for the cover of David Watson’s album *Fingering An Idea*. Francesco Clemente’s right hand is switched to the left and the animals are replaced by various objects. Katja Mater’s 2009 piece *Balancing Task*, seems like the modern reply to Francesco Clemente’s image; as the title implies, it shows men and women to be constantly caught up in balancing tasks, leaving little if any room for other things. Damian Ortega’s sculpture *Transición del mono al hombre* (Transition from Ape to Man) can be apprehended as a three-dimensional variation on this tradition.

IN THIS SEQUENCE

Alphabet (documentation), Noé Soulier and Jeffrey Mansfield, 2014

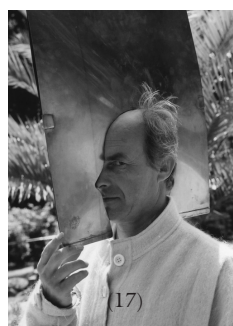
Handtalk: An ABC of Finger Spelling & Sign Language, Remy Charlip and George Ancona, 1974

Map of What is Effortless, Francesco Clemente, 1978 (13)

Fingering An Idea, Barbara Bloom, 2007 (14)

Balancing Task, Katja Mater, 2009 (15)

Transición del mono al hombre (Transition from Ape to Man), Damian Ortega 2015 (16)



EXERCISES IN HEARING (1.30 pm)

Hearing is an exercise employed across a range of disciplines, from music to ethology, and from healthcare to geology. For each of these practices, hearing is not strictly bound to the auditory system but employs different techniques and tools to extend and sharpen our perception of sonic phenomena. The publication *Gilbert Sound Experiments* was published as a manual to accompany the Gilbert Sound set, and both were part of the “Boy Engineering” series. It describes the origin of sound, the transmission of sound, intensity, pitch and quality. It presents exercises in body vibration and sound resonance production, to give just a few examples. The introduction states, “We are living in the age of the world’s greatest discoveries and inventions, and you should realize the importance of the fact that the world’s biggest scientific and engineering problems are yet in front of us.” The artist Lygia Clark said her work is simultaneously a deceleration of the death of the art object and a proposition allowing the spectator to become a participant: “The first time I heard that breath, my awareness of my own breathing obsessed me for several suffocating hours, whilst an unknown energy seemed to be born within me.” Between 1979 and 1988, Lygia Clark moved increasingly towards art therapy rather than creating new works. She used her art therapy to treat psychotic and mildly disturbed patients.

IN THIS SEQUENCE

Gilbert Sound Experiments, Alfred C. Gilbert, 1920

Protheses Acoustiques, Baudouin Oosterlynck, 1994-1995 (17)

Pieces d'eau – Aquaphones, Baudouin Oosterlynck, 2000-2001 (18)

Etant donné un objet, Baudouin Oosterlynck, 2002-2004 (19)

Ad Libitum, Baudouin Oosterlynck, 1994-2007 (20)

Photographs of *Respire Comigo (Breathe with Me)*, Lygia Clark, 1966

Photograph from *La Piscine*, first edition at Leclerc swimming pool in Pantin,
Les Laboratoires d'Aubervilliers, October 2015



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ORIENTATION (2 pm)

On April 22 and 23, 2013, during the workshop set up in Sharjah with the TACET researchers, artists Wendy Jacob and Hasan Hujairi invited students of the Al Amal School for the Deaf to choose sounds to collect. The virtual experience of sounds was very marked here: often students would record a sound because they thought the object was a sonic one (the doors of an elevator, the wheel of a stationed bicycle) while other sounds were perceived directly (like the siren of a police car). The recordings made during this second experiment were then diffused on a vibratory device made up of balloons and traducers. This enabled the students to feel the vibrations of the sounds they had recorded.

IN THIS SEQUENCE

Documentation of a workshop, Wendy Jacob, 2013 (21) – (24)



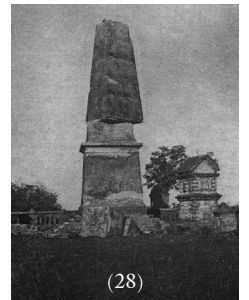
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TRANSMISSION (2.30 pm)

Graham Bell's photophone allowed the transmission of sound on a beam of light, it worked by projecting the voice through an instrument towards a mirror. Vibrations in the voice caused similar vibration in the mirror. Bell directed sunlight into the mirror, which captured and projected the mirror's vibrations. The vibrations were transformed back into sound at the receiving end of the projection. The Writing Ball, invented in 1865 by Rasmus Malling-Hansen, was the first commercially produced typewriter. Rasmus Malling-Hansen was a Danish pastor and principal of the Royal Institute for the deaf-mute in Copenhagen. Its singularity lay in its design, fitting in the human hand like a small cushion, allowing the fingers to reach all the keys without making much movement.

IN THIS SEQUENCE

Illustration of the photophone's receiver

Early Typewriters, Jeanne BrehmWide, World Photos, Chicago Bureau, 1945 (25)

Communication with Aliens goes both ways. As early as the seventeenth century, depictions of unex-

plained crop circle phenomena started to appear. Some said it was caused by storms, that either cut or swept away the crop, others mentioned the devil and other bad spirits. References to aliens, meteors and other outer-space characterizations became common from the twentieth century, especially since the 1970s, attracting a vast community of believers and producing extensive documentation. Another interpretation suggests crop circles are the side effect of sound transmitted from the space, and that by studying its shape one might ascertain the source of the sound. The Voyager Golden Record is a set of phonograph records that were to be sent with the Voyager aircraft. The contents of the records were selected for NASA by a committee chaired by Carl Sagan of Cornell University, The set consists of 116 images., and a variety of natural sounds such as wind, thunder, whales and birds, greetings in 55 ancient and modern languages, as well as a selection of music and sounds from different times and cultures were encapsulated in the golden record. According to NASA, the voyager is meant to present our world to extra-terrestrials. Each record is encased in a protective aluminum jacket, with a cartridge and a needle. Instructions, in symbolic language, explain the origin of the spacecraft and indicate how the record is to be played.

*Cochlea-shaped crop circle at Pewsey, Wilshire, UK, Steve Alexander,
Aerial view of a crop circle in Switzerland, 2007*

Windmill Hill 2. Nr Avebury, Wiltshire, Lucy Pringle, 2011

*Flying board Voyagers 1 and 2 are identical "golden" records, carrying Earth's story far into deep space,
NASA, 1977 (26)*

Hildegard of Bingen (1098-1179) was a German Benedictine abbess and polymath talent of the Middle Ages. Her knowledge ranged from music to composition and philosophy, mysticism and medicine. She is considered to be the founder of scientific natural history in Germany. An image of a nineteenth-century obelisk was the basis of a workshop run in 2007; the George Inglis monument in India was rotated as a result of the 1897 Shilong earthquake, according to Richard Dixon Oldham who wrote a report on the earthquake, and is considered to this day to be the first to identify separate arrivals of P-waves, S-waves and surface waves on a seismometer.

*Illumination from the Libar Scivias Showing Hildegard receiveing a vision and dictating to her scribe and secretary, Hildegard of Bingen German Manuscript 1165 CE
The Hearing Forest and the Seeing Field, Hieronymus Bosch, c.1500 (27)*



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PAVILLONS (3 pm)

The study of sound and its behavior, both production and consumption (acoustics), has simultaneously influenced the development of hearing aids and military technology for many years. A fascinating and creative moment of kinship and mutual influence occurred during the two World Wars, especially with the invention of acoustic locators (which preceded the radar), both portable acoustic locators, for personal use, and massive formats suitable for a team. Historically, before the invention of the airplane, the acoustic locator, also known as "ears," used to trace the presence and location of ships in low visibility

conditions such as fog, and was later used to detect aircraft by picking up the sound of its engine, helping to confirm the visible result available in the field. The Acoustic Vase was invented by F. C. Rein in the early 1880s, concealing the hearing aid- multiple sound receptor-hearing device with a decorative object that can be used as flower vase or to hold fruits. The Acoustic throne was designed in 1819 by F. C. Rein — a famous British manufacturer of hearing aids for King John VI of Portugal who suffered from hearing loss. The hearing aids (tube and receptors) were concealed as part of the chair's design.

IN THIS SEQUENCE

- Listening equipment "Waalsdorp", front side and listening operator, 1930s*
- Listening equipment "Waalsdorp", back side with the scale reading operator, 1930s*
- Portable sound locating apparatus, c. 1917*
- Dutch personal parabola: 1930s (29)*
- Dutch personal horns, n.d*
- A four-horn acoustic locator in England, 1938*
- Hawksley Table Top Vase in use at the library of the Central Institute for the Deaf, c. 1926*
- Acoustic throne, F.C Rein, 1880s*
- Vase Receptacle, c. 1810 (30)*
- Collection of Hearing Aids, all mid-nineteenth century (31)*
- Nineteenth-century format salt print portrait, date*
- Two Victorian ear trumpets, nineteenth century*
- Flexible tube hearing aid, 1801-1900*
- Miniature ear trumpets, F.C. Rein & Son, London, 1805-1900*
- Ear trumpet, possibly used during a period of mourning, Europe, 1850-1910*
- Hearing aids 02, c. 1915*

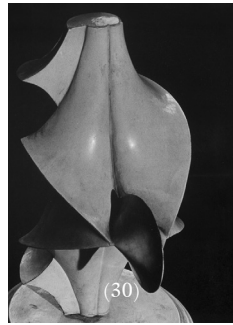
During Late Antiquity or the Middle Ages, acoustic pottery could be found in churches and places of worship in order to improve the resonance of the sacred edifice and was used mostly in Europe. The acoustic vases were usually placed in one of the angles of the choir and their shape could vary from the familiar vase shape to longer, more conical forms. Among the first publications to expand on this matter was the 1673 book by Athanasius Kircher — Phonurgia Novae sive conjugium mechanico physicum artis et naturae paranympa phonosophia concinnatum. Written in Latin, this publication's aim was to enrich and broaden the already existing knowledge in the field of music acoustics. It includes studies on acoustics and its relation to engineering and architecture. "Kircher, in the laboratory of his room, has realized such a tube that the concierges can call him at the entrance, avoiding to go to his far apartment, but they can stop and call him with a usual voice from the garden," Giorgio de Sepi. *Musaeum kircherianum, ex officiana Janssonio-Waesbergieriana*, Amsterdam, 1678. That revelation had influenced what some regarded as "Sonorous Voyeurism," being able to sit in one room, hearing all sorts of sounds from the wider part of various tubes located elsewhere. Interestingly, that very same year Sir Christopher Wren designed St Paul's Cathedral in London, introducing what came to be known as the whispering gallery due to its special acoustic feature which allows a subtle whisper against the wall to travel along the walls and be heard from the other side of the gallery. The innovation and creativity of designing sound has an extensive history that varied from a single instrument to the construction of a space to consume sound. Some of these innovations were never carried out in reality and exist only in sketches or written ideas, leaving a lot of space for imagining their becoming from a contemporary perspective – like the Tubo Cochleato described by Athanasius Kircher in *Phonurgia Nova* (Rome, 1673) and by Filippo Bonanni in *Gabinetto armonico* (Rome, 1723). This wind instrument was designed in the spiral form of the cochlea to increase the volume of its user's voice. Or the Tower Orchestra by Adolphe Sax, the inventor of the saxophone, designed to be a gigantic and loud orchestra structure — almost satirical in Sax's description.

- Phonurgia Novae sive conjugium mechanico physicum artis et naturae paranympa phonosophia concinnatum (selection of illustrations), Athanasius Kircher, 1673*
- Auvergne - MOZAC - L'abbatiale Saint Pierre, n.d*
- Children trying out the Whispering Gallery at St Paul's Cathedral, London, 1954, photo by Henry Grant (32)*

The Tubo Cochleato in Phonurgia Nova, Athanasius Kircher, Rudolphum Dreherr Campidonoe, 1673
 “*Le public visitant la trompette de M. Sax*,” Le Charivari, 1855



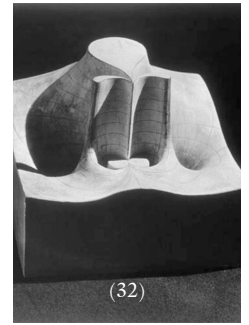
(29)



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(32)

MATHEMATICAL FORMULA (3.30 pm)

In 1934, Man Ray was a frequent visitor to the Institut Henri Poincaré in Paris. His objective there was to photograph the Institute’s collection of three-dimensional mathematical models, which were used to illustrate the geometric properties of mathematical equations. The result was a series of iconic photographs which, by means of dramatic lighting and daring compositions, made the enigmatic mathematical models seem almost human.

IN THIS SEQUENCE

Photographs of the Man Ray Catalog – *Human Equations: A Journey from Mathematics to Shakespeare*, 2015 (33) – (36)



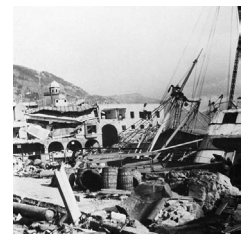
(37)



(38)



(39)



(40)

A MEMORABLE SONIC EVENT (4 pm)

On the morning of April 20, 1944, the Dutch ship Voorbode exploded on Bergen’s harbor loaded with more than 120,000 kilos of dynamite belonging to the German occupying forces. 158 people were killed, and major damage was caused to the whole harbor and the nearby houses. This event was reported by many inhabitants of Bergen as the most important sonic event of Bergen’s history.

IN THIS SEQUENCE

Photographs of the ship explosion and the destruction of the harbor. Ongoing selection. (37) – (40)

CREDITS

Self-portrait, Francisco Goya (1746-1828), 1815 (oil on canvas, 45.8x35x6 cm, Museo del Prado Collection) ; *Self-Portrait as a Deaf Man*, Sir Joshua Reynolds (1723-1792), c.1775 (oil on canvas, 749x622 mm, Tate Collection) ; *Portrait of a Woman (La Muta)*, Raffaello Sanzio known as Raphaël (1483-1520), 1507 (oil on wood, 64x48 --, Galleria Nazionale delle Marche, Urbino) *Saint Lucy*, Francisco de Zurbaran (1598-1664), c. 1625/1630 (oil on canvass, 104.14x77 cm, National Gallery of Art, Washington DC) ; *Speak, Speak*, Maria Barnas, 2016 (From Douwe Jan Bakker, *Pronounceable boxes*) ; *Alphabet (documentation)*, Noé Soulier and Jeffrey Mansfield, 2014 ; *Handtalk: An ABC of Finger Spelling & Sign Language* (text by Remy Charlip and Mary Beth Miller, photographs by George Ancona, 1974, Parents' Magazine Press) ; *Map of What is Effortless*, Francesco Clemente, 1978 (gouache on paper 152.4x144.8 cm) ; *Fingering An Idea*, Barbara Bloom, 2007 (Cover of David Watson's album, CD) ; *Balancing Task*, Katja Mater, 2009 (c-print 20x25 cm) ; *Transición del mono al hombre (Transition from Ape to Man)*, Damian Ortega 2015 (wooden hand model and steel knives) ; *Gilbert Sound Experiments*, Alfred C. Gilbert (1884-1961), 1920 (The A. C. Gilbert Company, 94p.) ; *Protheses Acoustiques*, Baudouin Oosterlynck, 1994-1995 ; *Pieces d'eau - Aquaphones*, Baudouin Oosterlynck, 2000-2001 ; *Etant donné un objet*, Baudouin Oosterlynck, 2002-2004 ; *Ad Libitum*, Baudouin Oosterlynck, 1994-2007 (copyright Baudouin and L.Oosterlynck.) ; Photographs of *Respire Comigo (Breathe with Me)*, Lygia Clark, 1966, from the catalogue *To Capture a Fragment of Suspended Time*, Lygia Clark. Barcelona: Fundacio Antoni Tapies, 1998 (Industrial rubber, 0.4x40 cm ; Image 4669: copyright Eduardo Clark, courtesy of Associação Cultural Mundo Lygia Clark. Image 4670, 4671, 4672. Photograph by Alexandre dos Santos Silva, courtesy of Associação Cultural Mundo Lygia Clark) ;

Documentation of a workshop, Wendy Jacob, 2013 ; *Illustration of the photophone's receiver*, originally from: El mundo físico : gravedad, gravitación, luz, calor, electricidad, magnetismo, etc. / A. Guillemin by: Guillemin, Amédée, published by: Barcelona Montaner y Simón, 1882. Public domain ; *Early Typewriters, Jeanne Brehm, demonstrate at the Chicago Museum of Science and Industry*, Wide World Photos, Chicago Bureau, 1945 ; *Cochlea-shaped crop circle at Pewsey, Wiltshire, UK*, Steve Alexander ; *Aerial view of a crop circle in Switzerland*, 2007 ; *Windmill Hill 2. Nr Avebury, Wiltshire*, Lucy Pringle, 2011 ; *Flying board Voyagers 1 and 2 are identical "golden" records, carrying Earth's story far into deep space*, NASA 1977 ; *Illumination from the Libar Scivias Showing Hildegard receiving a vision and dictating to her scribe and secretary*, Hildegard of Bingen German Manuscript 1165 CE, Wiesbaden, Landesbibliothek, Ms. Scivias Codex, folio 5r ; *The Hearing Forest and the Seeing Field*, Hieronymus Bosch, c.1500, pen and brown ink, 20.2x12.7 cm, Kupferstich-Sammlung der königliche Museen ; *George Inglis*, photo from Oldham, R.D. (1899). Report on the Great Earthquake of June 12 1897. Mem. Geol. Survey India, vol. 29.] ; *Listening equipment "Waalsdorp", front side and listening operator*, 1930s, Waalsdorp Museum, Netherlands ; *Listening equipment "Waalsdorp", back side with the scale reading operator for the chart angle and elevation*, 1930s, Waalsdorp Museum, Netherlands ; *Portable sound locating apparatus*, c. 1917 No source ; *Dutch personal parabola*: 1930s, Waalsdorp Museum, Netherlands ; *Dutch personal horns*, n.d, Waalsdorp Museum, Netherlands ; *A four-horn acoustic locator in England*, 1938, No source ; *Hawksley Table Top Vase in use at the library of the Central Institute for the Deaf*, c. 1926, Central Institute for the Deaf - Max A. Goldstein Historic Devices for Hearing Collection at Washington University Bernard Becker Medical Library in St. Louis, Missouri. ; *Vase Receptacle*,

c. 1810 Central Institute for the Deaf - Max A. Goldstein Historic Devices for Hearing Collection at Washington University Bernard Becker Medical Library in St. Louis, Missouri. ; *Collection of Hearing Aids*, all mid-nineteenth century (left) Miss Martineau's Trumpet, silver dome by Rein and Son, Conversation tube, (below) banjo-type ear trumpet Collect Medical Antiques, Virtual Museum ; *Nineteenth-century format salt print portrait* ; *Two Victorian ear trumpets, one made of tin made by Atkinson, Union Court, Holborn, London, and the other swathed in black silk and lace mourning*, nineteenth century, Wellcome Library, London ; *Flexible tube hearing aid*, 1801-1900, Science Museum, London and the Science Society Picture Library ; *Miniature ear trumpets, F.C. Rein & Son, London, 1805-1900* ; Science Museum, London and the Science Society Picture Library ; *Ear trumpet, possibly used during a period of mourning, Europe, 1850-1910* Science Museum, London and the Science Society Picture Library ; *Hearing aids 02*, c. 1915, Alexander Graham Bell Association for the Deaf and Hard of Hearing, Disability History Museum ; *Phonurgia Novae sive conjugium mechanicum physicum artis et natvrae paranympa phonosophia concinnatum (selection of illustrations)*, Athanasius Kircher, 1673 ; *Auvergne - MOZAC - Labbatiale Saint Pierre*, n.d ; *Children trying out the Whispering Gallery at St Paul's Cathedral, London*, 1954, photo by Henry Grant, Henry Grant Collection, Museum of London ; *The Tubo Cochleato in Phonurgia Nova*, Athanasius Kircher, Rudolphum Dreherr Campidonoe, 1673 ; *"Le public visitant la trompette de M. Sax," Le Charivari*, 1855 ; Sax's Sextett-Horn, *Kladderadatsch*, c. 1860 ; Photographs of the *Man Ray Catalog - Human Equations: A Journey from Mathematics to Shakespeare*, 2015 ; Photographs of the ship explosion and the destruction of the harbor. Ongoing selection.

LIBRARY

The great achievement in the form of the Greek vocal alphabet—whoever may then have invented it—was making it possible, by means of a finite number of symbols, to write the infinite of the acoustic... and to mark the edges of sound. — Paul Feigelfeld

You will find in the White Cat a selection of books and the following compilation of texts edited by Emma McCormick-Goodhart:

- Lendl Barcelos, *The Nuclear Sonic: Listening to Millennial Matter* (excerpt), 2014
Lendl Barcelos, *Audition Under Sensory Deprivation* (excerpt), 2014
John Cage, *Music Lovers' Field Companion*, 1961
Roald Dahl, *The Sound Machine* (excerpt), 2011
Denis Diderot, *Letter on the deaf and dumb for the use of those who hear and speak* (excerpt), 1751
H-Dirksen L. Bauman and Joseph J. Murray, *Deaf Gain: Raising the Stakes for Human Diversity* (excerpt), 2014
Steven Connor, *Auscultations* (excerpt), 2010
Charles Michel de l'Épée, *How the Deaf and Dumb may be brought to understand, in some measure, what it is to hear, auribus audire* (excerpt), 1784
Veit Erlmann, *Descartes's Resonant Subject* (excerpt), 2011
Paul Feigelfeld, *Sirens, Symbols, Serendipity* (excerpt), 2016
Michele Friedner and Stefan Helmreich, *Sound Studies Meets Deaf Studies* (excerpt), 2012
Madeline Gins, *Helen Keller or Arakawa* (excerpt), 1994
Steve Goodman, *Sonic Warfare: Sound, Affect, and the Ecology of Fear* (excerpts), 2010
Mike Gulliver, *Deafscapes: The landscape and heritage of the Deaf world* (excerpt), 2005
Stefan Helmreich, *Seashell Sound* (excerpt), 2012
Adolf Loos, *The Mystery of Acoustics* (excerpt), 1912
Emma McCormick-Goodhart, *Ausculting at the Edge of the Audible*, 2016
Jeffrey Mansfield, *Space, Time and Gesture: Gestural Expression, Sensual Aesthetics and Crisis in Contemporary Spatial Paradigms* (excerpt), 2014
Tom McCarthy, *Tintin and the Secret of Literature* (excerpt), 2006
Pauline Oliveros, *Deep Listening: A Composer's Sound Practice* (excerpt), 2015
Avital Ronell, *The Telephone Book: Technology, Schizophrenia, Electric Speech* (excerpt), 1989
Louise Stern, *Ismael and His Sisters* (excerpt), 2015
Jonathan Sterne, *The Audible Past: A Cultural History of Sound Reproduction*, (excerpt), 2003
John Varley, *The Persistence of Vision* (excerpt), 1978
Ines Weizman, *Tuning into the Void: The Aurality of Adolf Loos's Architecture* (excerpt) 2014
Norbert Wiener, *Sound Communication with the Deaf* (excerpt), 1949
Sophie Woolley, *Cyborg* (excerpt), 2011

EMMA MCCORMICK-GOODHART is an artist, writer and researcher currently based at the Centre for Research Architecture at Goldsmiths College (London). Her own work is contoured around spatialities of sensing, auscultating the occult and esoteric, (pre)histories of oral and aural cultures, biosemiotics, and choreographic notation. She recently presented a paper at the *Sound Art Matters* conference at Aarhus University (Denmark) and staged a trilingual silent lecture at Nahmad Projects (London) as part of "I am NOT tino sehgal," curated by Francesco Bonami.

ABOUT

TAREK ATOUI is a musician and sound artist. His work has involved initiating and curating multidisciplinary concerts, performances, and workshops, and is often concerned with large-scale, collaborative performances that develop from extensive research into the history of music and instrumentation while also exploring new methods for production. Using custom-built electronic instruments and computers, Tarek Atoui often articulates social realities and histories in his work, while presenting music as a powerful mode of expression and identity. Tarek Atoui served as artistic director of STEIM in Amsterdam, a center for research and the development of new electronic musical instruments. He has presented his work internationally; his most recent projects were presented at Documenta 13 in Kassel (2012), Serpentine Gallery in London (2012), the 8th Berlin Biennale (2014), and at Tate Modern (2016).

Tarek Atoui is one of the artistic directors of the Bergen Assembly 2016.

COUNCIL is an art institution founded in Paris in 2013 by curators Grégory Castéra and Sandra Terdjman which aims to bring the creative process to unexpected contexts. It is an attempt to initiate new forms of exchange between art, science and civil society. Council follows the hypothesis that a better composition between different disciplines could result in better political representation.

Since its beginning, Council has developed its methods through three research-based projects: *Tacet* (Sharjah/New York/Bergen, 2013-2016), *The Manufacturing of Rights* (Beirut, 2014-2015), *On Becoming Earthlings* (Paris, 2015), respectively exploring the representation of hearing diversity, the construction of Nature in law, and measuring the Anthropocene. These projects have given rise to various forms: field research, workshops, publications, exhibitions and the production of video and performative works.

www.houseofcouncil.org

GRÉGORY CASTÉRA served as co-director of Les Laboratoires d'Aubervilliers from 2010 to 2012, where he conducted various research projects on discourse formation within artistic practices, giving rise to publishing projects, events and exhibitions. Since 2007, he has co-authored *L'Encyclopédie de la parole (Encyclopaedia of Spoken Word)*, a collaborative inquiry into the formal properties of speech. In 2010, he initiated *Ecologies*, a program focused on the creation of tools for the representation of art as an ecology (awarded the Hors les Murs grant by the Institut Français in 2013). He also curated the exhibition *Foreign Places* (Wiels, 2016), the festivals *TJCC* (Théâtre de Gennevilliers, 2015) and *Playtime* (Betonsalon, 2008, 2009). He regularly gives talks and workshops on curating in different contexts.

SANDRA TERDJMAN is the founding director of Kadist, a foundation for contemporary arts based in Paris and San Francisco. From 2006 to 2012, she developed a residency program for artists and curators, curating their research and overseeing the production of a series of artworks, films, performances and exhibitions in Kadist's local venues and abroad. She is presently a board member and advisor for its collection. She regularly gives talks and workshops on curating and collection building internationally (in art fairs, schools and institutions).

BERGEN ASSEMBLY is a perennial model for artistic production and research that is structured around public events taking place in the city of Bergen every three years.

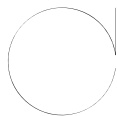
Originating from the "Bergen Biennial Conference" in 2009 and its critical thinking around the biennial format, the Bergen Assembly seeks to devise alternative timeframes and densities for public presentation and perception today. The flexible model is reinvented for each edition, responding in particular to a perceived need for alternative temporalities of art production and experience within an oversaturated information culture, where attention itself is increasingly commodified and subject to pressure.

Pointing to the multitude of practices in contemporary art and related research, the Bergen Assembly 2016 offers three distinct propositions, expanded and developed in different temporal registers by the artistic directors: Tarek Atoui, freethought, and PRAXES. Exhibitions, live events, and publications are continually introduced and produced throughout the year, with a convergence of activities taking place in September 2016.

www.bergenassembly.no

COLOPHON

BERGEn
ASSEMBLY



WITHIN
by Tarek Atoui

&

Infinite ear
Curated by COUNCIL (Gregory Castéra and
Sandra Terdjman)

ARTISTIC PROJECTS OF THE Bergen As-
sembly, 2016

SENTRALBADET
Teatergaten 37, 5010 Bergen, Norway

OPENING HOURS
TUESDAY – SUNDAY : 11 AM - 5PM

FOR SPECIAL EVENTS AND CONCERTS,
DOOR OPEN AT 8PM

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and Slideshow)
Rayya Badran (White Cat)
Emma Mc Cormick-Goodhart (Library)
Flora Katz (Hearing Things and Slideshow)

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Don Pippo

COPY EDITOR
Anna Preger

DESIGN
Stefano Faoro

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Maung Aye, Maria Helena K. Nerhus, Frida
Nytun, Türid Skålden, Christina Vaagland, Rag-
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Based on a first proposal by architect and long-
term collaborator Jeffrey Mansfield
Exhibition set up by Jacob Alrø and Terje Sand-
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this exhibition and this publication to fruition.
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Editor Gregory Castera and Sandra Terdjman

Infinite Ear's concept has been written
by Gregory Castera, Sandra Terdjman,
Emma McCormick-Goodhart and Tarek Atoui.

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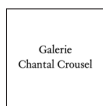
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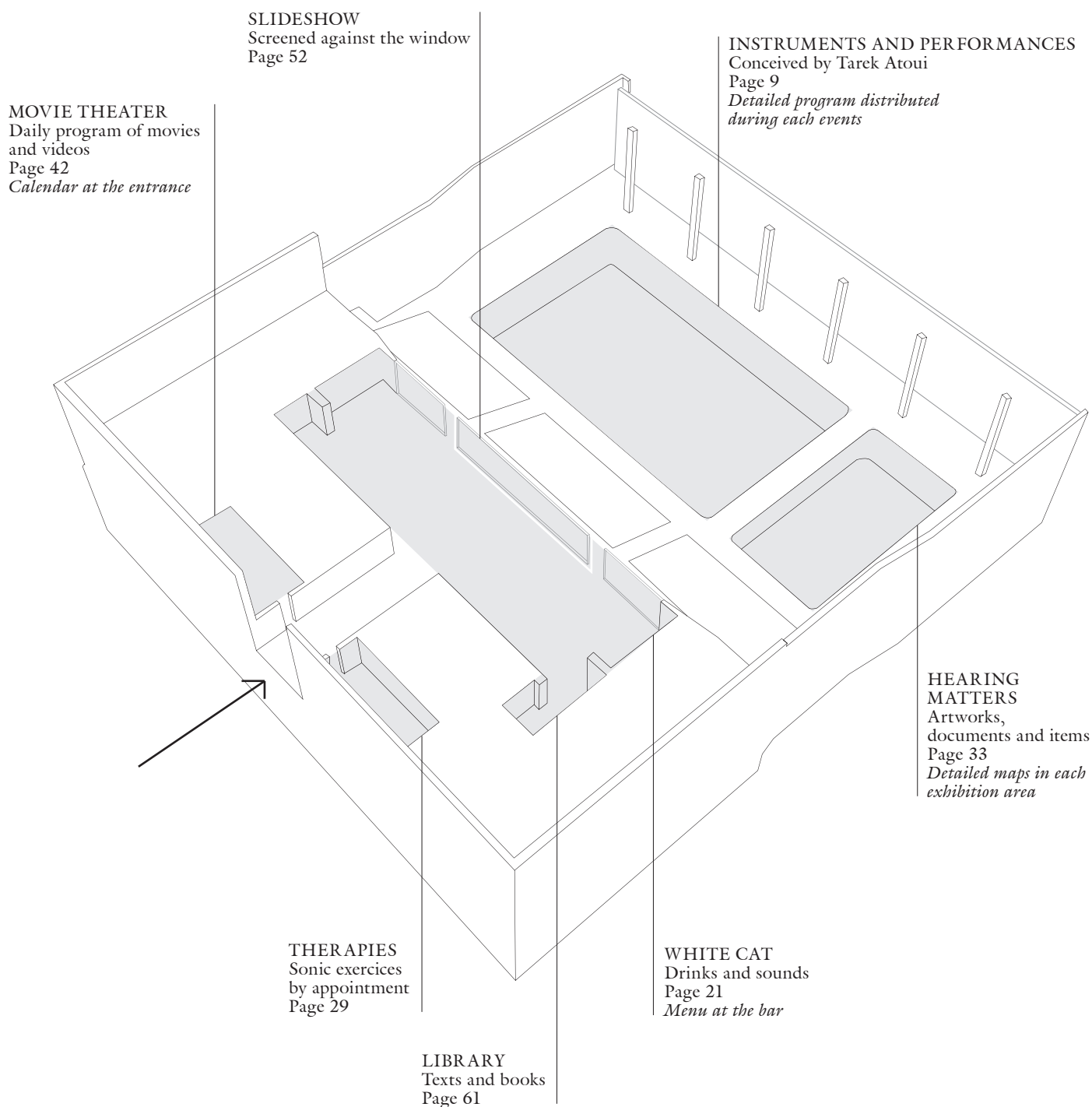


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MAP OF THE EXHIBITION



TAKE THIS BOOKLET, you will find it helpful for navigating the space: Book a sonic therapy session, go and see a movie (rooms at the entrance). At the White Cat bar come and enjoy a drink while listening to recordings of inaudible phenomena and read our selection of texts. Visit our collection of objects and artworks and follow the documentation screened on the plate-glass window. Finally, in the pool, attend the rehearsals and concerts conceived by Tarek Atoui and his guests.