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# INVASIVE SOUND

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**Sonic events – noises, sounds, music – are not perceived by the ear alone. Their effect on the human body goes beyond even the stimulation of the other sensory organs. Acoustic vibrations transmit impulses that obtrude and invade the body and its tissues; they are not only processed on a conscious level, but can also provoke unconscious psychological and uncontrollable physiological reactions. "Invasive Sound" presents artists who make use of all these aspects in order to get close to the human body in disquieting ways. Their work is aimed directly at both physiological and culturally encoded perceptions of the body. The experiences they offer audiences engender both conflict and corporeal pleasure.**

The hearing and understanding of sounds and music is a complex aesthetic-semiotic process. The interpretation of what we hear is, on one level, a culturally moulded, notional activity: We evaluate sounds and music based upon origins, orchestration, characteristics and organizational principles – the rhythm, the order of the tones, harmonies and melodies as well as dissonances, pauses and jumps – and can accordingly understand the intentions of the composer or musician. On another level it is a physical experience, a bodily encounter based upon affective response, sensory reception and involuntary reactions beyond the realm of consciousness. Consciousness springs back into play, however, when it comes to whether the experience is pleasurable or objectionable – consider the dramatically different responses to bone-rattling vibrations in the low bass frequencies of drone music or the beats of contemporary club music – immensely pleasurable to some, unbearable for others.

The physical reaction to sonic events such as alarm signals, construction site noises or the soothing burbling of running water is commonly experienced in everyday life. As such, the close affinity between sound and the human body seems at first banal. Like all physical things in this world, our bodies themselves produce noises and sounds when they are made to vibrate or when setting other things into vibration. And equipped with the voice, we have, like every other higher-order organism, a sophisticated, built-in sound-making apparatus. Conversely, everything that we perceive is first transmitted through the body's sensory system. And so for a long time, noises and sounds seemed to be inextricably linked to the presence of bodies and the interaction of matter. For thousands of years, the notional activity of the musician was inseparable from the tangible articulations of his body and their interplay with the acoustically resonant body of an instrument.

All that changed with the discovery of electricity. With the invention of sound recording and electroacoustics, the old affiliation was no longer inevitable. The complete decoupling of sound and the sounding body was

achieved between the early 18th and mid 20th centuries. Sound became independent from the objects of the material world, and has since resided not only in the parts of the physical world accessible to the sensory organs, but also within electromagnetic fields that can only be perceived with the aid of technology. In the digital flow of information within the computer, sound has finally become truly autonomous: As pure information, it is subject to any kind of analysis, synthesis or transformation. These days sounds can be freely programmed or generated from unmusical data and be played back on technical systems – without any need for a musician to perform it or even any sounding body in the conventional sense.

The Canadian artist duo *Artificiel* refers to this development in their current project, "POWer" – a performance for which the only visual and sound source is a Tesla coil. Named after its inventor, the coil generates a very high-voltage alternating current that discharges in the form of visible arcs of electricity. The duo controls and modulates the voltage frequency using electrical signals. The arcs ionize the surrounding air at the same frequency as the signal, setting it into a plasmic state. This creates oscillations in the air pressure, which can be heard as sound waves. The coil becomes a musical instrument. At the same time, the artists convert the sound and light events generated by the coil into digital signals. They then use computers to create an intricate, real time audiovisual composition.

"POWer" impressively demonstrates that sound is first and foremost physical energy, energy that can be conveyed by different media and transformed into other forms of energy. Simultaneously, the performance becomes a theatrical demonstration of energy tamed by its conversion into pure information, which, detached from its original source and potential, can be manipulated in any way. The destructive force of electricity bolts in "POWer", however, points to the relationship between sound and body: If one comes too close to the sound source, it will literally enter the body, delivering massive shocks and internal burns – with potentially fatal consequences.

In reaction to the decoupling of sound and body accomplished by digitalization, today's artists are increasingly searching for ways to bring their own bodies (and those of others) back into electronic music. In part, this practise aims at the rehabilitation of a sensually affective means of performance in electronic art, but it is also based upon the individual's interest in introspection and the millennia-old practice of manipulating consciousness, which since Huxley has been known as psychedelics. Interestingly, it is the very same technologies that initially decoupled sound and body that are now enabling a renewed convergence. The sensitivity of technical devices and the universal transformability of electronic data is allowing artists to analyze the invisible and process-based aggregate states of the body, to manipulate them, and to ultimately intertwine them with technology to create innovative instruments in the form of hybrid human-machine systems. In the process, borders are increasingly dissolving between inner and outer, between biology and technology, and between individual and collective, mirroring our altering perception of the body.

The current forms of such systems make use of interfaces that read the movements of a performer by means of sensors and use these for the generation and modulation of sounds and images. Likewise the signals from the nervous and circulatory systems are applied to the generation of scores and the synthesis of sounds in brain wave music, biomusic or regenerative music. As early as 1965, Alvin Lucier used brain waves to generate sounds in his piece "Music for Solo Performer". Electrodes attached to his head picked up signals, which he amplified and sent to speakers, causing the membranes of percussion instruments to resonate.

Performances by the US artist duo *Lucky Dragons* are similar, but more complex: Voltage impulses are passed through the audience and modulated by means of "body-contact relays" and skin resistance. Music is created by the spontaneous and collective process of interconnectivity. After overcoming social and bodily distances, the participants transform their bodies into components of an electronic instrument.

Similar principles of biofeedback and interconnection are used by the artist duo *Terminal Beach* (Peter Votava and Erich Berger) in their project "HeartChamberOrchestra". Via algorithms, the signals from electrocardiographic (ECG) sensors attached to the musicians are used to create scores, which are played by the musicians in real time. This biofeedback allows the influence of usually unconscious physiological processes. The musicians play the technical apparatus, and the apparatus plays the musicians: Together they form an instrument.

A closeness to the natural sciences is also apparent with the Japanese artist *Daito Manabe*. His project "Face Visualizer" refers to discoveries of Jean Jallabert (1747), Luigi Galvani (around 1780) and, above all, Duchenne de Boulogne (1862), scientists who discovered the electrical system of the body. They found that the brain, muscles and senses communicate through control signals transmitted by the nervous system in the form of tiny electrical impulses, and that these impulses can be stimulated artificially. Applying electronic stimulation controlled by sound to the facial muscles, Manabe visualizes music, thereby giving sound physiological control over parts of the body.

In these and other works, the artists draw both practically and aesthetically upon forms of scientific research and self-experimentation. This is also the case with the Canadian artist *Christof Migone*, who uses sensitive microphones and cameras to conduct sometimes painful self-observation, exploring the most intimate areas of the human body. He has composed, for example, pieces of music using the cracking noises of the joints or sounds of the passing of bowel gasses, has explored the faces and body cavities of his subjects with the tactile use of microphones, and amplified the noises made by eye movements. In doing so, he is not only following the traditions of early video art. He is also drawing from the discipline of bioacoustics and the development of modern medical diagnosis that came with the invention of the stethoscope by René Théophile Hyacinthe Laënnec in 1816.

The musical instrument literally cuts into the body during performances by *Justice Yeldham* (Australian artist Lucas Abela). Pressing a sharp-edged piece of glass with contact microphones attached to it against his mouth, he creates aggressive layers of noise until the performance ends abruptly with the glass shattering onto his face. The observer is unavoidably confronted with the precarious vulnerability of his own body in vicarious anticipation of pain. Confrontation by forcing the audience into self-perception is also the theme of the Spanish-Basque artist *Mattin*. Shock tactics and the surprising circumvention of customary forms of performance make the audience conscious of their own physical, fragile presence as Mattin assaults them with flashes of blinding light, maximum volume white noise and sudden interludes of complete silence.

The direct physiological effects of sound and other frequencies form the focus of other artistic strategies that attempt to make music physically perceptible. American *Mark Bain* describes his installations and performances as a mixture of sound and vibrational events. Using seismic sensors and mechanical activators, he vibrates structures at their resonant frequencies at and below the limits of human hearing. Entire buildings

become instruments, and listeners viscerally experience the sonic event as a strong vibration through the body. Bain refers to the pulsating infrasonic compression waves as a "sonic wind", which has a peculiar effect upon the psyche and physiology of those present. Not least, he refers to effects commonly observed with constant winds such as the Mistral or Foehn. Infrasound can trigger sensations from nausea and breathlessness to a feeling of relaxation. It's not by chance that in drone doom – an extreme, low-pitched sub-genre of heavy metal – a fetish has developed for the mysterious "brown note", which is reputed to induce the spontaneous evacuation of the bowels.

The perception of space and the body is also the theme for Lynn Pook and *Julien Claus* with their tactile audio installations. Here, sound is transferred to the inner ear directly through flesh and bone by means of an interface of emitters attached to listeners. Acoustic and tactile sensations are perceived in synchrony and move choreographically across the surface of the body.

Other examples utilize the principle of the brain's tendency to synchronize its frequencies to corresponding external stimuli (brain entrainment) to create audiovisual stimulation for the purpose of altering consciousness. Such gadgets – such as the Dream Machines designed in the 1960s by Brion Gysin or the project "Feed" by the Austrian *Kurt Hentschläger* – provoke physiological reactions beyond the control of the subject and exploit the peculiarities of the human perceptual apparatus as a constituent element of the compositions and their effects. During the second half of "Feed", the room is filled with an artificial fog illuminated by coloured stroboscopic light. A physical sensation of immersion is increased by sub-bass and pulsating sounds, which are synchronized with the light, dissolving all spatial coordinates. Participants see kaleidoscopic two and three dimensional patterns and movements, which are not in fact generated by the artist, but are created by the brain's efforts to synchronize its frequencies with the external stimuli. It is only the "tactile" perception induced through the synaesthetic interaction of the individual senses within an immersive set-up that renders the artwork complete. This form of perception drives the consciousness inwards and so actively brings about experiential qualities inseparable from real-life experience.

Acoustic space naturally has a similar, inherent "tactile" quality that envelopes the listener. We experience sound without distance, as if in direct contact with the body, and thus the perception of sound feels unmediated. This is demonstrated by *Jacob Kirkegaard's* project "Labyrinthitis" which, as in "Feed", is based on the inclusion of the "tactile" perception of the audience, but using only audio: Two frequencies of a particular ratio create internal vibrations in the listener's inner ear. This leads to the creation of a third frequency, the so-called *Tartini* tone, which is solely perceived by each respective subject.

The process-based nature of these works and their performance practice is obviously inspired by performance art, by happening, fluxus, expanded cinema and the closed-circuit installations of video art. Yet their roots extend beyond the art history of the 20th century and into the history of scientific technical innovation and the theatrical demonstrations thereof, which were popular during the 18th and 19th centuries. It is primarily the biological body – rather than the symbolic one – which serves as raw material.

However, because the body can never be dissociated from either its metaphors or the emotions, utopias and dystopias which these generate, the works provoke a multiplicity of associations and ambivalences. One issue is the problematization of the separation of the "lived body" (*Leib* in German) as a place of direct

phenomenological experience, and “the body” as the objectified subject of social conditioning. The instrumentalization and medialization of “the body” confronts the reality of the *Leib*. Yet it is by virtue of its permeability that the *Leib* can assert itself over technology, when the effect of “technology” is experienced as exposure to external stimuli and consequently perceived as difference.

Conversely, these external stimuli can be internalized by triggering physiological reactions experienced as originating from within the body. Then, the clear division between body and machine no longer seems possible. The overwhelming dynamism of undergoing involuntary physiological responses is consequently experienced as an incursion by something formless and unknown, both in the rigid control architecture of the technical apparatus and in the integrity of the subject. This incursion is made possible only through the correlation of technology and physiology. In the process, organic attributes are assigned to technology, while technology closes in on the body in multiple ways. The body becomes concurrently a sender and receiver, interface, network node, data source, resonating cavity and output medium. As a final consequence, it becomes unclear when the body is the object and when it is the subject. In various ways, these works of art conceive notions of a cybernetically linked, hybrid physicality that is less and less a fixed form but is instead a dynamic plurality of communicating streams of information, technological zones and organic concentrations.

*Jan Rohlf, 2009*  
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