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Abstract

This paper seeks to trace the genealogy of surface noise as a tool of musical expression by surveying a range of artistic practices based around the record and turntable that privilege detritus, abrasion, repetition and decay as key compositional devices. The paper begins by examining the acoustic properties of the oldest playable recording (Frank Lambert's talking clock) in order to outline the numerous characteristics and flaws inherent in early models of mechanical reproduction and storage that vigorously conspired to interfere with the listening experience. This is followed by an examination of the way recording technology was converted from a tool for reproduction to one of production to facilitate new methods of composition and performance. It then discusses a broad range of concepts and methodologies forged by sound artists and musicians interested in methods of production and articulation that exploit the constraints and defects of recording technology to afford new modes of listening and aesthetic appreciation.

Introduction

The industrious French émigré Frank Lambert was a late nineteenth century inventor who developed a line of typewriters, water meters and striking mechanisms for clocks. His mutual interests in time measurement and mechanical reproduction led him to explore the possibilities of combining the clock with the newly invented phonograph in the development of a fully functional talking clock. Despite the eventual failure of the project, aspects of Lambert's research into sound reproduction and storage conducted at these technologies' most formative period have provided him with newfound success courtesy of the Guinness Book of Records.

The recording Lambert made for his talking clock in 1878 may not be as old as Thomas Edison's tin foil recordings made months earlier, but it is acknowledged as the oldest playable recording currently available. Lambert's device has lasted some 125 years because the recording was inscribed into lead and not onto tin foil, the latter of which inevitably disintegrated after several plays. The attempt to use phonographic technology to produce a talking clock is on a similar trajectory to that of Edison who foresaw his invention as a utilitarian device that was more suitable for the office than the home. Yet, the question of how the lead cylinder would be accurately synchronized to a time mechanism remains unanswered and is perhaps the reason behind the project's eventual failure.

So what does the oldest playable recording reveal? Running at one minute and forty seconds, the lead cylinder contains the faint annunciation of the time by Lambert in one hour intervals starting from one o'clock and ending at twelve o'clock, omitting ten o'clock in the process. The high ratio of noise to signal masks any further detail the recording may have possessed, except for what appears to be a conversation, the details of which are obscured by a complex amalgam of crackles, clicks, noise, splutter, and rhythm. These artefacts result from the primitive recording pick-up and diaphragm, both quite insensitive to the sound source, as well as the limitations of lead as an inscription and storage device. Add over a century of dust and debris and the result is an astonishing range of sound that is in many ways prescient of modernist explorations into abstraction and decay.

Although the surface noise of the talking clock cylinder sounds as contemporary as the abstract manipulations of the latest generation of turntablists, Lambert's device was made in a time obsessed with perfection where artefact and surface noise were an unintentional consequence of an imperfect technology. Yet this imperfection reveals another significant glimpse into the future of music achieved through fluctuations of time and pitch. Halfway into the lead cylinder, the direction of the recording changes from forward to backward motion, reversing the attack and decay of sounds to form new sonic shapes. Although Lambert is engaged in pure mechanical experimentation to improve his recording device, it foreshadows the early explorations of music pioneers such as Edgard Varèse, Percy

Grainger and Paul Hindemith who were all interested in the transformations that could be achieved by phonographic manipulation of source material such as the voice and piano. Pierre Schaeffer would later refine these experiments in the development of musique concrète, in which a profound change in consciousness occurred during the manipulation of phonograph recordings, not only flagging a perceptual shift in the way abstraction was heard as music, but the possibilities of technology to create a new repertoire of musical gestures.

While the turntable has not totally disappeared from all households, or the collective conscious of listeners, the prominence of digital technologies has erased much of the surface noise that has accumulated since its introduction 125 years ago. As recording and playback technologies mature, and as musical instrumentation become more versatile, a broad range of activities occurring on the margins of the avant-garde and often passing as Sound Art, nevertheless continue to privilege the turntable, the record, and the pick-up cartridge in the development of a new aesthetic. The current redeployment of surface noise is part of this trend, transforming what was once an undesired consequence of technology into a base material for new paradigms of musical expression. Similarly the turntable over recent decades has gradually evolved from a tool for reproduction into a versatile instrument for musical performance that is at the forefront of an esoteric range of sonic investigations. Ignoring the perceived benefits provided by digital workstations and digital practices, in favour of the artefacts of analogue technology, a new series of haptic and conceptual approaches to sound production have been formed that celebrates the tactile, textural, and expressive possibilities of both record and turntable.

New Mechanical Harmony

In his 1922 essay "Production-Reproduction," László Moholy-Nagy suggested turning the gramophone from an instrument of reproduction into an instrument for musical performance, generating acoustic phenomena without any previous acoustic existence by scratching the necessary marks directly onto the record.[1] Moholy-Nagy wanted to initiate a new method of sound production that transformed the medium of the record into a sculptured object with its own set of unique musical etchings and groove patterns that extended the sonic experience beyond the capabilities of existing acoustic instrumentation.

Despite some initial experimentation, Moholy-Nagy failed to achieve the results that he had anticipated, and soon diverted his activities towards optical film, a medium better suited to this form of intervention. However his specific ideas related to the gramophone has manifested itself over the course of time, perhaps most comprehensively in the prepared vinyl explorations of Thomas Brinkmann and his austere and spacious arrangements of locked grooves, surface densities, and polyrhythmic spikes. On *Klick* (2000), Brinkmann cuts the run out grooves of vinyl with a knife to form different rhythmic patterns embellished by surface abrasion. By using multiple turntables or tone arms as well as digital effects, simple patterns are moulded into complex arrangements of shifting rhythms and modulating textures that dynamically evolve in stereo space.

Aspects of Brinkmann's repetitive abstractions recall *Pagan Muzak* (1978), a multi-axis locked groove seven inch record, in which thirty odd locked grooves of dense noise are provided for the listener to manipulate, either by changing playback speed or axis of the record, thus creating variable permutations for each loop. The multi-axis feature is provided by a second, hand drilled hole that enables the single to rotate off centre, inducing variations in pitch and speed. The locked groove appears in its most extensive form on the *Lockers* LP (2000), containing 162 locked grooves from various artists working between noise, techno, and ambient; however, it does not include multi-axis capability. A more recent version of the locked groove is the quartet of releases by Melbourne artist Marco Fusinato titled *0_synaesthesia Edition* (2005) in which an elaborate amalgam of spirals etched across the surface of a set of soundless records initiate a series of interactions between needle and record to create an intricate set of rhythms and staccato effects. As each record comprising the series has a different arrangement of patterns, the records become a flexible musical instrument capable of an infinite array of rhythmic possibilities—transforming it from reproductive mechanisms into a uniquely playable sound object that continues a line of development that has peppered avant-garde music through the twentieth century.

Operating on a different tangent is Swedish sound artist Leif Elggren with his recording *The New Immortality* (1991) in which the vibrations of his screams are faintly registered onto wax by a dry

point needle, forming the dub plate from which a master record was pressed. The result is a caustic sheet of angular noise generated by an irregular series of grooves that are too unstable for regular playback. Here, microphonic manipulation transforms the groove into an ungainly carrier, unsympathetic to the sounds etched into its undulating canyons, while providing variable resistance to the tone arm as it awkwardly tries to navigate the hostile grooves. Although Moholy-Nagy wanted to achieve a purely abstract experience, the numerous characteristics of mechanical reproduction (surface noise, poor signal to noise ratio, narrow bandwidth, limited duration, and spacialization) already interfered with the concept that recordings could clearly and naturally render acoustic phenomenon. These characteristics forged new methods of production and articulation that exploited the constraints of technology, while suggesting new modes of listening and aesthetic appreciation that were distinct from those experienced in an ordinary acoustic setting.

Decomposition

Pierre Schaeffer conducted some of the very first studies of phonographic manipulation including looping, envelope shaping, and time pitch manipulation and editing in his formulation of musique concrète in the immediate post- World War II period. However optimistic he may have been about the value of his research, he could not have predicted how rapidly his discoveries would colonize other zones of musical exploration, eventually becoming standard tools within any sampling workstation or hard disk recorder.

More difficult to harness was the surface noise of the record, often overlooked by the avant-garde as detritus, and targeted by the sound engineer as an unsavoury consequence of inferior technology. It took some exhaustive examinations by Dutch electro-instrumentalist Dick Raaijmakers, co-founder of STEIM, to discover the artistic potential of surface noise in his series of works titled *Canon 1-5* composed between 1964 and 1967. Within these compositions, Raaijmakers focused on texture, density, and space, which he dynamically shaped to amplify the musical possibilities of even the smallest, thinnest sound. In quite a unique series of studies, Raaijmakers meticulously choreographed surface noise into a sound field of explosions and noises, ruptures and silences. Although confining himself to abstract sounds for the first four *Canons,* the fifth *Canon* closely resembles Lambert's talking clock for its iridescent interplay between modulating noise washes and fractured rhythmic bursts, set against the eroded, incoherent voice of Edith Piaf.

Czech born Fluxus artist Milan Knizak's broken vinyl explorations that occurred between 1963 and 1965 initially appear to be irritating acts of transgression against totalitarianism. However, they complement Raaijmakers' explorations into deconstructionism by focusing on juxtaposition, rupture, and destruction as key compositional techniques. Here, shattered records are reassembled, creating collages of unrelated sounds stuck in locked grooves where the tone arm sporadically skips across the unstable surface before resting on another combination of splintered sounds. Unlike Raaijmakers' austere and exacting studies, Knizak's indeterminate exploration of montage enables a polyglotic combination of sounds to interlock and malfunction in often unexpected and humorous ways. Having subjected his prepared vinyl works to processes of melting, painting, scratching, and taping, Knizak has presented some of the damaged slabs of vinyl as mute sound sculptures, implying the caustic noise within through visual cues. The techniques that inform the aptly titled *Destroyed Music* series would prove to be prescient of concepts and practices that would become more commonplace in the 1980s.

Melbourne based turntablists Gum (Andrew Curtis and Philip Samartzis) would further Knizak's "broken vinyl" concept by fusing prepared records and multiple record players with studio production techniques, best exemplified by their debut release *Vinyl* (1987). Unbeknown to Gum, *Vinyl* embodied techniques pioneered by Knizak such as smashing and reassembling records, as well as incorporating techniques of their own, including melting, sanding and baking materials like metal filings and saw dust directly into the vinyl. The library of prepared records were eventually assembled across eight turntables and performed as a series of improvisations in a recording studio with additional overdubs, equalization and spacialization applied to the final mixes. Gum would introduce other elements to their investigations such as tape loops, drums, guitar and synthesizer on later works such as *Twenty Years in Blue Movies and Yet to Fake an Orgasm* (1988), but prepared vinyl would always inform their compositions until they concluded their exploration in 1990.

Apparently released as a prank, the anonymously authored *The Nothing Record* from the late 1970s is a wonderful study of the textural and rhythmic qualities of pure, unadulterated surface noise. By arranging ten tracks of silence into one full hour of nothing, it clearly demarcated a conceptual framework that draws attention to the materiality of vinyl in which detritus and decay become the sole focus of the listening experience. Although *The Nothing Record* was mischievously proffered as a celebration of silence and an antidote to noise, it in fact reflexively highlighted the corrosive accumulation of crackle and pops dynamically ingrained in its own decaying grooves. The idea of an evolving textural bed comprised of particles of dust, dirt and fluff would eventually form the conceptual foundation of Christian Marclay's *Record Without A Cover* (1985).

Jonty Semper's *Kenotaphion* is a compendium of archive recordings of two minute silences that observe Armistice Day and Remembrance Sunday recorded at the Cenotaph, Whitehall, London, between 1929 and 2000, and is an eerie example of the way surface noise has evolved over time. Each recording begins with the tolling of a bell and then silence until cannon fire dramatically ruptures the solemn atmosphere. Between these two acoustic events, varying grades of noise induced by the recording technology of the time, beginning with records and film and moving on to analogue and digital tape, underscore the palpable silence. These perceptible shifts in residue mark the passage of time, reminiscent of the film version of H.G. Wells' *The Time Machine* (1960), in which the device of changing clothes on a mannequin was used to indicate leaps in time. Within the recordings contained on *Kenotaphion*, the bell and cannon fire essentially remain the same, but the space between gradually altered with each passing year.

Cartridge Music

The exploration of surface noise is not only confined to composers and artists who modify and manipulate records, but includes those who work with the phonographic mechanism itself as a source of sound. Here technology is turned upon itself to amplify its inner workings comprised of belt drives, metallic plates, vibration dampeners, and spring suspension. The tone arm and cartridge amplify each thump and whirr as turntables are exhaustively prodded and probed to magnify the smallest sound occupying the deepest crevice.

John Cage's *Cartridge Music* (1960) made use of the phonograph cartridge's ability to amplify sounds by directly inserting objects into the cartridge's aperture, transforming the tone arm into a flexible instrument capable of generating a broad palette of sound and gesture from the subtlest movement. Spring toys, wires, feathers, and matches were gently probed to create brittle ripples upon a bed of silence occasionally ruptured by the thud of amplified furniture. Cage's interest in the capacity of the phonograph as a sound shaper extends all the way back to the mid 1930s. His oft cited text "The Future of Music: Credo" (1937), in which he stated, "the use of noise to make music will continue and increase until we reach a music produced through the aid of electrical instruments," was prescient of the profound changes that were to soon overtake music production and performance.[2] By 1939, Cage was testing his theory within *Imaginary Landscape No. 1*, which incorporates two phonographs upon which varispeed manipulation is applied to test tone records to affect pitch oscillation. *Cartridge Music* however, belongs to his oeuvre dedicated to the amplification of small sounds or sounds occupying the threshold of perception, explored in works such as *Williams Mix* and *4'33",* as well as other compositions comprising the *Imaginary Landscape* series.

Installations and performances by Melbourne artist Michael Graeve are often based on multiple turntable manipulations that rest cartridges on rotating metal platters and rubber mats. Carefully positioned loudspeakers generate a variety of feedback loops, amplifying the resistance encountered by the two surfaces. Graeve uses the capacity of the cartridge to amplify surface noise, while shaping the amplified sound to create immersive environments by positioning loudspeakers around the performance space. This enables him to incorporate spacialization and spatial manipulation as integral components to his improvisations and installations, shifting the emphasis from the purely tactile.

The Bruel and Kjaer 4379 accelerometer has enabled Michael Gendreau to uncover an extraordinarily dense world of mechanical hums, tones and rhythms by directly amplifying the mechanical components that drive the turntable. Within his album *55 Pas de la Ligne au N°3* (2002), Gendreau brought the interior of the mechanism to the foreground, while external musical recordings incomprehensively grind and wobbled in the background. Gendreau fulfils the promise of the Italian

Futurists by highlighting the morphology of the mechanical apparatus over any specific sound recording and by subverting the notion that technology should be servile and transparent in its amplification and distribution of the sonic experience. Gendreau's microphonic explorations not only modulate interior and exterior perspectives, but also bridge past with present by presenting the phonograph mechanism as a musical instrument capable of generating a complex spectrum of sound, while recalling the artefacts of previous generations of mechanical reproduction preserved within the components themselves. Perversely, this kind of formal investigation seems to occupy the realm of acoustic archaeology. With the loss of mechanical reproduction comes the loss of the sound of the mechanism itself, forgotten until someone like Gendreau draws attention to it in a digital audio age.

Grain

After 125 years of recorded music, it is reassuring to know that the phonograph continues to draw the interest of sound artists working across an ever expanding range of musical exploration. Despite the general lack of awareness of the history of anti-records, conceptual records and techniques of manipulation, an intuitive set of responses have developed around current investigations of the phonograph, born from the concepts and practices derived from the research of László Moholy-Nagy, John Cage, Milan Knizak, et cetera. The artefacts of technology continue to provide a nexus for scrutiny and debate that reminds us of the fusion which exists between the act of expression and the available modes of communication and distribution, emphasizing the fact that the medium does dictate the form. Cage's dictum that all sound is music enables us to enjoy Lambert's talking clock as an exhilarating piece of avant-garde music, the long forgotten ancestor of Christian Marclay, Philip Jeck, Loren Chasse, Institut Fuer Feinmotorik, to name just some. We are also reminded that surface noise has become an integral component of the listening experience, psycho-acoustically shaping the way we listen, restraining transparent articulation with a film of fuzzy realism, and moulding a convention that implies authenticity, warmth, and nostalgia. These are qualities clearly exemplified in releases such as *Music! The Berlin Phonogramm-Archiv 1900-2000* (2002) and *American Primitive Vol 1: Raw Pre-War Gospel 1926-1936* (1997). It is a relatively new era in which we can choose to hear digital silence over surface noise, and its growing absence may well be the governing principle behind the increasing explorations occurring on the esoteric margins of the avant-garde.

Discography

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Notes

[1] László Moholy-Nagy, "Production-Reproduction" (1922), in *Painting, Photography, Film,* trans. Janet Seligman (Cambridge, MA: MIT, 1969).
[2] John Cage, "The Future of Music: Credo" (1937) in *John Cage: Documentary monographs in modern art,* ed. Richard Kostelanetz (Praeger, 1970), http://www.ele-mental.org/ele_ment/said&did/future_of_music.html accessed March 2006.