

# Earworms, Daydreams and Cognitive Capitalism

**Eldritch Priest**

Simon Fraser University

Theory, Culture & Society

2018, Vol. 35(1) 141–162

© The Author(s) 2016

Reprints and permissions:

[sagepub.co.uk/journalsPermissions.nav](http://sagepub.co.uk/journalsPermissions.nav)

DOI: 10.1177/0263276416667200

[journals.sagepub.com/home/tcs](http://journals.sagepub.com/home/tcs)



## Abstract

Although the cognitive neurosciences are currently conducting research to determine the brain networks that are implicated in the production of ‘earworms’, my project seeks to address the technical nature of these abstract parasites that hears their spontaneous irruption in thought as both a product and source of contemporary capitalism’s aim to draw value from involuntary nervous activities. In this respect, I approach the earworm from a deliberately speculative perspective in order to conceptualize its appearance as a technical matter expressive of the way historically ‘useless thinking’ (daydreaming, mind-wandering) is being imaginatively recuperated as a passive technology of the self. However, the earworm is a peculiar case of useless thinking, for its redundancy not only implicates it in the broader process of recuperation, but seems to realize a fatal tendency in sonic technics in ways that at once rely on, advance and disturb contemporary capitalism’s encroachment on human cognitive capacities.

## Keywords

abstraction, cognitive capitalism, distraction, earworm, listening, sound, technics

Almost all of us know what it’s like to have a song ‘stuck in our head’ or, more accurately, we know what it’s like to have the refrains of a melodic shard or lyrical splinter spread to the finer tissues of feeling that we call thinking and gently take us hostage with our fondness for patterns, flair for obsession and fundamental distractibility. Far from extraordinary, these repetitive musical thoughts, which have acquired the odd but agreeable handle ‘earworms’, nevertheless not only have a peculiar psychological status but also seem to occupy a strange ontological station. In many ways they are like hallucinations: real experiences without actual sense impressions. But earworms are also like daydreams: unprompted

---

**Corresponding author:** Eldritch Priest. Email: [epriest@sfu.ca](mailto:epriest@sfu.ca)

**Extra material:** <http://theoryculturesociety.org/>

and aimless figments that seem to have you more than you have them. Yet no one with an earworm mistakes its phantasmatic spasms for an actual broadcast or performance, and similarly, where daydreams shuffle off our mortal coil (one can only hope), earworms bring us back again and again to the bustle and ado in which at times they play a leading part. Perhaps what makes earworms peculiar, besides the fact that they're not really hallucinations or dreams, is that something about them feels like they're not first-person thoughts, as though they are thoughts that you're thinking from outside of the mind. But if earworms are not in the mind then where are they? Or alternatively, if they are in the mind whose mind are they in?

Although research in experimental psychology and the neurosciences is currently under way to determine the memory systems and brain networks that are implicated in the production and maintenance of earworms, my project addresses the technical nature of these abstract parasites to hear their spontaneous irruption in thought as both a product and source of contemporary capitalism's aim to draw value from involuntary nervous activities. In this respect, I approach the earworm from a deliberately speculative perspective in order to conceptualize its appearance not as a mere neurological anomaly but as a technical matter expressive of the way historically useless thinking, the kind of thinking we associate with reverie and brooding, is being rhetorically and imaginatively recuperated as a passive technology of the self. However, the earworm, I suggest, is a strange case of useless thinking because its redundancy not only implicates it in this process of recuperation, but seems also to realize a fatal tendency in sonic technics in ways that at once rely on, advance and disturb the progressive encroachment of capital on human cognitive capacities.

From this perspective, earworms do not represent a pathological brain state but are instead signs of a fatalistic tendency intrinsic to contemporary capitalism's nonstop expropriation of attention driven by 'the imposition of a machinic model of duration and efficiency onto the human body' (Crary, 2013: 3). This is to say that there is something strangely intelligent or logical about the appearance of earworms, and the correlative disappearance of musical sounds in them, that is proper to the accelerated functioning of capitalism. Perhaps, as Nick Land, the philosopher who gave capitalist acceleration its contemporary profile, suggests, 'what appears to humanity as the history of capitalism is an invasion from the future by an artificial intelligent space that must assemble itself entirely from its enemy's resources' (Land, 1993: 479). If this is the case, then it makes a certain sense that this intelligence would target the ears, for, as we like to remind ourselves, we are never *not* listening. The ears are always on and the body is always vibrating. What better way to capture an adversary's reserves than to listen to everything, all the time, everywhere and at once? Leave no sound unheard, or better still, no sound unthought.

Although it seems fantastic, it's really not difficult to imagine the history of sound production and listening as a gestation period of sorts, a veritable education of the larval intelligence that is growing in our ears. First instruments, with their acoustic refinement of sound, taught our ears to hear symbolically, to hear something in sound that is not indexical but internally relational. Then recording technologies tutored us in the materiality of sound, its vibrational nature and acoustic reality – a nature that would later, through the manipulation of its wax-vinyl-magnetic-digital trace, be understood as plastic and thus, in a sense, artificial. More recently, we have begun to receive training in listening to 'unsound', to the infra- and ultra-sonic ranges of acoustic reality that lie beyond the ear's physiological limits. For example, Oliver Lowry's 'Silent Subliminal Presentation System' (SSPS), which describes a method that uses what Lowry terms 'nonaural carriers' (infra- and ultra-sonic vibrations) to deliver messages of affirmation (or whatever message the sender desires) directly into the brain, shows us the non-conscious side of listening.<sup>1</sup>

But what of sounds that we can't hear, not because they're too quiet or lie outside our range of hearing, but because they're virtual, or more exactly, because they are thought? Perhaps Lowry's SSPS brings us closest to answering this question, for using infra- and ultra-sonic sound to transmit propositions directly to the brain turns unsound into something approaching thought. However, because the 'affirmation' deposited in the brain by the SSPS – despite being delivered acoustically – is linguistically composed, its perception is indistinguishable from the internal chatter that we tend to qualify as thinking. A more decidedly 'sonorous thinking' (as odd as that sounds) might, however, be found at the point where the ears' education started – the point where listening becomes technical. Like Heidegger's 'hammer', musical instruments and their performing protocols are a type of enframing and thus a technology that reveals a world into which their material forms and activities withdraw as sound becomes a collection of 'musical' things. By adapting to these instrumental technics the ear learns about the 'dissonance' and 'consonance' of sounds, the 'tension' and 'resolution' of tonal forms, and, importantly, the symbolic affordance of (more and less) organized sonorous events. In short, instrumental technics, or perhaps we should say 'musical' technics, direct the ear towards an intensive dimension of sonic activity whose expression is not so much heard as it is felt, felt in sound as a quality of aliveness or abstraction of feeling that philosopher Susanne Langer (1953) calls a semblance of vital activity. This is key, for abstractions, insofar as they are perceivable, are felt. And as Brian Massumi notes, 'What is felt abstractly is *thought*' (Massumi, 2011: 110). But also, if what technologies and techniques produce are abstractions, and music is a kind of technology that produces an abstraction of feeling, then what is felt in music as the thought of feeling is *non-sound*,

an extra-sonorous semblance of aliveness that appears in sound through a technical mode of listening.

While this stages an argument for the technogenesis of all musical audition, in this article I want to focus only on how musical technics have become integrated into our daily perceptual routines by the proliferation of recording technologies such that the distinctive thinking-feeling of 'non-sound' we identify with listening to music has become a type of habit. More specifically, I want to consider how the techniques that give sound its profile as music have been taken up in thought as a kind of second nature, and how the psychic events that we've given the name 'earworms' function as a limit case of this technology of lived abstraction and its fatal end.<sup>2</sup> Additionally, I suggest that earworms, whose prevalence is noted in several recent studies (see Bailes, 2007; Beaty et al., 2013; Liikkanen, 2008, 2011), are symptomatic of a cultural addiction to offload music's technical mode of listening to external devices. However, like all addictions, indulgences come at a cost, and the cost of offloading listening is paid out in the currency of attention.

But some, as I'll discuss, have argued that offloading certain cognitive routines to external media is not inherently detrimental to the species. Offloading tasks associated with memory, for example, to technological devices, is thought to allow us to focus on the otherwise overlooked possibilities of present demands, as well as indulge in certain types of so-called 'non-functional thinking' that are not only pleasant but essential for mental health. However, the language of productivity that recalibrates 'that which was previously inscribed as and through negativity' (Callard and Margulies, 2010: 342) – namely, the apparent distraction that daydreaming is – formally resembles neoliberal capitalism's conception of labour that reconfigures our always-available general intellect and social skills as a form of work that we are, so to speak, never not doing. For both neuroscience and neoliberal capitalism, thought is no longer simply idle. A wandering mind 'consolidate[s] past experience in ways that are adaptive for our future needs' (Buckner et al., 2008) and in this sense is a kind of nondescript labour whose value lies in the ongoing production of an unspecified future producer.

But earworms, too, like daydreams used to be, are 'inscribed as and through negativity'. Yet does this dysfunctional thinking have a veiled use? Can the earworm's importunate refrains be put to work, like a broken record's repeating phrase used for keeping time, for hearing what would otherwise go unnoticed, for learning a language? Perhaps. But the recursive form of earworms complicates the image of endlessly productive thought. Unlike a wandering mind whose obliquities give it an 'inspired' profile, the earworm's autism purges it of value, of function, for it can only be exchanged for another iteration of itself. And as Baudrillard notes, when things are relieved of their value they are 'free to circulate without passing through exchange and the abstraction of

exchange' (Baudrillard, 2001: 121). Freed of curiosity, of forecasting tomorrow and contemplating yesterday, unburdened by knowing or caring, the thought that an earworm is becomes free to be useless, free to deploy itself as radical thought, to be more of what thinking is – 'understanding without hope, but a happy form' (Baudrillard, 1995: 60).

Although earworms may escape the destiny of daydreams to become a properly non-functional form of thinking, it may be that in the end that begins over and over again begins over again, again, begins again and over again, all they have to show is what the fate of human thinking that is free to lead nowhere thinks like.<sup>3</sup>

## Offload

It can't be that melodies are significantly more 'catchy' now than they were, say, 300 years ago, or that we simply remember things better than we used to. In fact, it could be argued that owing to their sheer abundance and utter ubiquity, and to the fact that we have iPods and other devices to remember how they go, tunes should be *less* catchy. Why exercise the memory when we can simply hit repeat or catch the same song on another station, or, more likely, just make do with another song that basically does all the same musical and psychological things that made the previous song (and the one before that one, and before that, etc.) desirable? In short, why not offload listening to the 'collaborative online filters, consumer preference algorithms and networked knowledge' that David Brooks (2007) describes as our 'external cognitive servants'?

In a sense, there is nothing particularly novel about outsourcing attention and memory to external devices, and this would seem to sanction Benjamin's (1968b) cautious enlisting of technological reproducibility in the development of more supple forms of perception and experience. However, where Benjamin's reinvention of perception and experience through technology hopes for a matching re-articulation of the task of thinking, those like *Wired* writer Clive Thompson (2007) suggest less a cognitive metamorphosis than a wish that 'by offloading data onto silicon, we free our own gray matter for more germanely "human" tasks like brainstorming and daydreaming'. What Thompson is advocating is not that we give our intelligence over to machines for the tranquil activity of wool-gathering, but that we recognize the symbiotic and augmented nature of human intelligence.

Now, this is not inconsistent with Bernard Stiegler's position that there is no properly 'human' mentality without its technical exteriorization, or, that human being has *always* been constituted by its relationship to mnemotechnologies, or what he calls 'organized inorganic beings' (Stiegler, 1998: 17). Daydreaming and brainstorming *are* human tasks, but their human character is a function of a non-human organization of memory and attention that not only regulates the things that we can

recollect, anticipate, contemplate, and even forget, but ultimately governs what counts as thinking. The problem with Thompson's argument is not its call to hive off cognitive functions to algorithmic processors and mnemotechnical equipment. The problem is that it misjudges how 'thinking', which is technologically accomplished by collaborating with smartphones or computers, is implicated in what Stiegler (2010: 69) describes as 'a combat for a politics of memory'. As 'we exteriorize ever more cognitive functions in contemporary mnemotechnical equipment,' writes Stiegler (2010: 68), 'we delegate more and more knowledge to apparatuses and to the service industries that network them, control them, formalize them, model them, and perhaps even destroy them'. Although our cognitive activities have never not been bound up with processes of exteriorization, their distribution in mnemotechnical organs on an industrial scale has changed the game – namely, because the mass production and global dissemination of (especially) audiovisual media not only standardizes the temporal modalities of consciousness but defines perception and attention in a way that intensifies the production and proliferation of contemporary psychotechnologies.

As a counterpoint to Stiegler's model, which largely assumes the passive reception of media and unintentional synchronization of psychic activity, Jonathan Crary suggests that the reflex activity of attention is being remade into a repetitive and compulsory action by virtue of the way current media stages itself and its flow of content 'as resources to be *actively* managed and manipulated, exchanged, reviewed, archived, recommended, "followed"' (Crary, 2013: 52, my emphasis). These, along with other industries of electronic media such as 'online gambling, internet pornography, and video-gaming' (Crary, 2013: 52) work, as he writes, to effect a 'generalized inscription of human life into duration without breaks', a time that is 'defined by a principle of continuous functioning' (Crary, 2013: 43). Yet more than simply being subjected to an economy of permanent expenditure supported by a technical array that is never not on, the life of the mind is becoming defined by compulsions to multiply choices and options. And because the accelerating tempo of novelty production (or its simulation) 'prevents any significant period of time elapsing in which the use of a given product, or assemblage of them, could become familiar enough to constitute merely the background elements of one's life', thinking is becoming synonymous with 'patterns of acquiring and discarding' (Crary, 2013: 44, 45). A general aesthetic equivalence between media content not only 'circulates to habituate and validate one's immersion in the exigencies of twenty-first-century capitalism' (Crary, 2013: 52), but also promotes a form of attention that is characterized by its flitting from one budding occasion of awareness to the next.<sup>4</sup> While attention of this sort often goes favourably by the name of 'multi-tasking', it is more accurately described as thought in the mode of distraction: thought as wandering attention.

For Crary the concern is that (*pace* Thompson) such a mode of thought doesn't expand our perception and cognitive capacities but instead calibrates them to 'the calculated maintenance of an ongoing state of transition' (Crary, 2013: 37). In other words, the proliferation of attention that Crary registers as 'a qualitative dilation of one's accommodation to and dependence on 24/7 routines' (Crary, 2013: 43) is the true consequence of a techno-socio apparatus not only bent on finding ways to 'eliminate the useless time of reflection and contemplation' but also resolved to preclude a sense of protracted time that might 'sustain even a nebulous anticipation of a future distinct from contemporary reality' (Crary, 2013: 40, 41). Thus to manufacture a state of continuous transition is to place undue emphasis on the experience of discontinuity such that the relations of disjunction that compose a world of 24/7 routines cannot help but forestall the articulation of longer cycles of experience that could yield trans-individual interests and responsibilities.

But as real as Crary's worries are, on an experiential level they overstate something that I think cannot be sustained from a processual point of view, a view that Crary himself strives to show is being systematically controlled and contoured by an apparatus whose 'purpose is directing its user to an ever more efficient fulfilment of its own routine tasks and functions' (Crary, 2013: 44). Processually continuity and discontinuity cannot be dissociated from each other. Each is a matter of relative emphasis in a flow of experience. As such, the 24/7 semblance of continuity is in fact only an alibi for a functioning technical discontinuity sustained by the way a ramified autonomic impulse to tag and track changes in the cognitive and perceptual field shuffles the punctuality of experience to the background. This is to say that the logic of displacement operates perceptually as well as economically. The technicity of the global apparatus of distraction not only swaps obsolescence for novelty but also stages the conditions whereby one moment uneventfully supersedes the next by drawing the force of awareness that would otherwise bring a currently perceived change to punctual attention into the next moment, and then the next and the next, and so on. Accordingly, distraction is a technologically displaced continuity, and our 24/7 routines a technique of attention that abstracts from the flow of experience a veritable 'distraction span'.

Interestingly, attention does not entirely disappear in this regime, and in fact it is preserved, albeit in a very strange form, by the most unlikely of events. If the 24/7 world is composed of distraction spans that substitute a variation of nextnesses for a variation of nows, then earworms appear in the 'succession of groundless points of temporary focus and shifting alertness' (Crary, 2013: 127) *not* as a distraction but as a concentration. By this I mean that the periodic intrusions that earworms make into the texturally feeble cascade of transitions we call 'being distracted' produce a rhythm, a contour in the flow of activity that we

register, if only more often with irritation or surprise than whole-hearted delight, as an affectively laced contextual transition. Put differently, the intermittent appearance of earworms is the provenance of a thinking-feeling emerging from distraction. In this respect the earworm, which is simply the thought of music – it is the chronic thought of a vital rhythm in its most abstract – demonstrates something technical of the nature of musical form and its powers of abstraction.

### Music: Technique of Existence<sup>5</sup>

If earworms have something to do with offloading memory to cognitive surrogates that channel psychic energies into circuits of continuous nascent attention, then how we experience the thought of music will be a matter of how the technics of our techniques of existence are modulated by these surrogates. Perhaps it helps first of all to understand our senses as a kind of technology. As Brian Massumi explains, the senses are themselves ‘prostheses of the body’ that work ‘to detach from their objective (organic) functioning events of lived abstraction’ (Massumi, 2011: 147). Basically, a lived abstraction is ‘an effective virtual vision of the shape of [an] event’ but it is also ‘the form in which potential is relayed from one experience to another’ (Massumi, 2011: 15, 17). These virtual yet liveable forms of relationality are technical products insofar as they refer to *experience* as that which results from the execution or performance of certain techniques – techniques of existence.

From here we can think about music, in the most general sense of the term, as a technique of existence that humans have developed to achieve an abstraction characterized by the appearance in sound of fluctuating ‘tensities’ – that is, ‘to-ing’ and ‘fro-ing’, ‘rising’ and ‘falling’ – that effect the appearance of multidimensional motion which is almost impossible not to perceive as a simulacrum of aliveness. This semblance of vital activity, which detaches or ‘lifts off’ from the objective combinations of things (tones, rhythms, lungs, lips, fingers, mood, etc.) that make up its occasion, is an animateness virtually yet directly perceived (or not) in the ongoing relational involvements of its contributory elements. However, there’s something peculiar about the technique of existence of music that sets it apart from the way moving bodies host a ‘dance’ or the manner in which an arrangement of pigments, canvas and frame host a ‘painting’. Music, as Massumi notes, ‘does not have to use the body as a local sign. Its local signs are *incorporeal*’ (Massumi, 2011: 145). Music is hosted by sound waves that belong to no body in particular, and, as such, the quality of aliveness perceived as a properly ‘musical’ effect is something that goes wherever sound waves go – which is virtually everywhere.

This is all to say that audio technologies do not introduce abstraction into musical experience. Music is already a lived abstraction. The coupling of a music’s operative constraints (its techniques of abstraction)



with recording technology does not further abstract sound so much as it works to multiply, disseminate and ‘impel [musical] techniques of existence into evolutions, and speciations’ (Massumi, 2011: 146). In other words, musical recordings spread an ‘abstractive manner of appearing’ (Massumi, 2011: 148) to places and times beyond an initial occasion of production where new relational involvements and individuation of existential events can be invented. Playback technologies – our external audible servants – literally invent new involvements that initiate a phase-shift in audition.

One of the possible reasons, then, for the prevalence of earworms may extend from the fact that audio technology has invented a new involvement that affords unprecedented repeatability and new ways of attending to sound. In *On Repeat* Elizabeth Margulis notes that audio technology has not only generated ‘a degree and pervasiveness of repetition that was previously unheard of’, but also wrests from an otherwise ephemeral event an occasion in which ‘sound could be contemplated and attended to for its own fundamental characteristics’ (Margulis, 2013: 80). Playback means that sound can be listened to again and, as such, becomes something that could be listened to *otherwise*, could be heard (as the history of 20th-century compositional practices might attest to) as something to emphasize or to eliminate. But the technological affordance of playback also brings to present effect another type of involvement – namely, a way of listening that’s perhaps more easily described as a way of *not* listening.

Plainly, at this point in history, musical sounds are more often heard through some form of audio technology that redistributes music’s involvements to affect how its abstractions may be paid attention to. For example, recordings give passing musical events a semblance of fixity so that they might be attended to again, but their coupling with headphones also gives audition an intensive and private form, and listening a mode of intimacy that it did not have beforehand. However, the splitting of sound from its original source also has a psychological effect that R. Murray Schafer (1969) named ‘schizophonia’, a condition that describes both the event of decoupling as well as the sense of disorientation that a sound out of context can produce. However, what schizophonia identifies is not simply a nervous state, as Schafer would have it understood, but a phase-shift in musical technics whereby a latent relationship between the technical object of music and the affect of nervous systems is concretized as a complementary function. Walk into any coffee shop and you’ll know exactly what I mean: the sound of recorded music playing in the background is an occasion of how audio technologies have concretized a tendency to unconsciously perceive ‘aliveness’ in the semblance of vital activity that musical objects create. Although any music shuttled to the background will express this function,<sup>6</sup> audio technology makes this function a more stable and coherent part of music’s technics, and,

by extension, a more integral part of our psychic life. In other words, the abstract aliveness we hear in the technical object of music (e.g. a melody, a chord progression, a song...) is given by the mechanization of its expression (technological playback) a functional autonomy that connects to audition through the negative relation of not-listening.

What recording's schizophonic moment points to is a new technical disparity through which attention and stimulus are paradoxically brought into productive effect through a relation of indifference that is passive in form but active in meaning – much in the way that 'dying' is both something that happens to us and something we do. Simply put, the technological redoubling of music's technique of existence that speciates its technical objects makes this 'deponent' profile not simply articulate but exceptionally functional. Just as a computer mouse makes our body's potential to suffer repetitive strain injury a functional phase of our prehensile dealings with a technological milieu, so too do recordings make listening distractedly – that is, listening non-listeningly to the technologically occasioned abstractions of vital activity – a functional phase of our evolving auricular relations with the world.

Despite the oxymoronic formulation that suggests a dysfunctional condition, listening non-listeningly is nevertheless productive. Because distracted listening takes place largely alongside bodily and neurological routines that carry us through our day-to-day activities, its expression will be submerged among habits and other automatic sequences of conduct that are tributary to what we call 'mood'. As Massumi notes, the 'launching of music into everyday movement can be expected to become powerfully immanent to how the technique of existence of music can make itself felt, and what expressively it can do' (Massumi, 2011: 146). The concretization of musical technics as an autonomous feature of the technological environment, and thus its occurrence as something taken up quasi-passively (like a habit), will be felt not as something heard, but as something occurring at a point of indistinction with vital activity, specifically with that vital activity that is felt as thought – namely, mind.

### **Worm-like**

Why music felt as thought should exhibit the kind of repetition that seems characteristic of obsessive-compulsive disorder or Tourette syndrome is not exactly clear.<sup>7</sup> However, from the point of view that I've been developing here the repetitive persistence of the earworm is linked to the workings of a techno-socio apparatus (*dispositif*) that aims to desynchronize and scatter attention across what Crary describes as 'fabricated microworlds of affect and symbols' (Crary, 2013: 53). Writing nearly 30 years before Crary, when the 24/7 world was just getting its legs, media theorist Vilém Flusser sees an emerging apparatus producing a programme of what he terms 'entertainment', a programme of

sustained diversion that not only serves the interests of capitalism but also functions as a technique for relaxing ‘*the dialectic tension* that characterizes human consciousness’ (Flusser, 2013: 108). For Flusser, entertainment is ‘a motion that runs perpendicular to the plane of the dialectic of consciousness’, where it carries attention along ‘an intermediary ground [...] of *immediate sensations*’ to figure the mutually alienating I–world coordinates of thought ‘as specters that circle concrete experience’ (Flusser 2013: 108–9). ‘Sensation is more primitive than consciousness,’ he writes; ‘it is anterior to the alienation between man and world’ (Flusser, 2013: 109) and so presents at the order of our body’s reflex workings an image of immediacy that diverts consciousness from its intrinsically strained and unhappy concern to know itself or to know the world. However, ‘entertainment as a search for sensations’ – their production and accumulation, specifically – has led to the construal that our society is ‘the digestive apparatus of a producing apparatus’ (Flusser, 2013: 109). Yet, as Flusser notes, this would be a mis-construal, for ‘that which entertains itself [...] is characterized precisely by its lack of memory, by its incapacity to digest what has been eaten’ (Flusser, 2013: 109). The entertainment apparatus, by virtue of design, diverts energy from the chronic sadness that afflicts being’s attempt to orient itself such that it affords no memory and thereby perpetrates no sense of interiority wherein sensation might get lost and become thought, become an idea. Our society is therefore not a digestive system – a contemplation complex – but ‘a channel through which sensations flow, in order to be eliminated without being digested’ (Flusser, 2013: 110). Entertainment’s diversion is the systematic bracketing of the hesitation that consciousness is, and this bracketing is how ‘sensation passes without obstacles’ (Flusser, 2013: 110). Sensation of this sort, the free-flowing sort, is essentially pure ‘information’, or, more accurately, it is a *sheer fluctuation* in the force of existing that refuses to take expression in anything more elaborate than the experience of its own occurring. For this reason, Flusser contends that ours ‘is a society of [sensation] channels that are more primitive than worms: in worms there are digestive functions’ (Flusser, 2013: 110).

Where there is simply input and output – sensation as information – there is only swallowing and shitting: no memory, no digestion, no gathering up of awareness in a difference that makes a difference. A worm, because it has no apparatus for diversion, loses the purity of sensation to the bureaucracy of its living organism. For a worm, sensation enters into an advancing matrix of vital activity and tendencies where it feeds into already established circuits with more or less apparent functionality. In other words, sheer fluctuation for a worm becomes tributary to a new phase in the evolving activity of its vermicular ecology. Our diversions, which have no bureaucracy apart from their vying for increasingly refined forms of immediacy, render sensation nothing but a direct,

concrete, and fleeting fluctuation of being that supports nothing but the next immediacy. However, the retentionlessness of ‘pure’ sensation, the perpetual immediacy of sheer fluctuation, is not an organic phenomenon. Pure sensation is a technological achievement effected by the way the entertainment apparatus continually focuses our energies and attention towards a fractalized specious present, a ‘now’ that is really ‘a next’ that signifies ‘a now’ over and over again. Or in more familiar (and more lurid) Freudian terms: forgetting sensation is the entertainment apparatus’s programme to direct libidinal forces towards the mouth and anus, a programme that makes pure sensation ‘a counter-revolution of the *anal and oral libido* against the genital one’ (Flusser, 2013: 110). Coded in this way, where ‘only the oral and anal apparatus function’ (Flusser, 2013: 110), sensations become reusable. This means that we distract ourselves, via the apparatus of entertainment, from the unhappiness of consciousness by recycling sensations that ‘have already been eliminated’ (Flusser, 2013: 110). We are in effect used by our own apparatus for feedback: ‘*We are channels for eternal repetition*’ (Flusser, 2013: 111).

But the very nature of the feedback loop that habituates us to sensation’s eternal return – making sensation all the more indigestible and concrete – contains within it the conditions of digestion, for repetition is a kind of immanent bureaucracy in which subsists an ineliminable form of contemplation. Flusser mentions the “‘*worm-like*” feeling, by which we are sometimes taken over’, and refers to it as ‘an optimistic sensation’ (Flusser, 2013: 110, my emphasis). What he means by this is ‘despite our programming to be channels of feedback, there still persist in us some remains of interiority’ (Flusser, 2013: 111). The very cyclicity of entertainment that feeds us shit cannot help but at the same time stir it.

It is in this sense that earworms are aptly named, for the writhing returns of a melody are surely our vermicular selves insisting on the red tape of organic existence. Not unlike Deleuze’s (1994) ‘larval selves’, the veriform eddies that bend our stream of awareness speak to an ancient part of our organism that cannot help but contract repeated sensations into habits to produce what amounts to a primitive and obscure kind of intelligence. Flusser qualifies these worm-like feelings as ‘optimistic sensations’ because the very apparatus that assembles our nervous system into spiralling circuits of mouth-anus-mouth-anus-mouth-anus...-∞ makes us think and behave cyclically. And as Flusser writes, ‘Such cyclical thought and action are symptoms of a semi-conscious interiority’ (Flusser, 2013: 111). With this semi-conscious interiority we have then a worm’s-ear view of the tension that grips consciousness at its core, which is to say that the worm-like feeling of the haunting melody, the convulsively recurrent abstract squirming of music felt as thought, is how the bureaucratic organism stirs the shit of pure sensation. Earworms – psychic coprophilia.

## Of Worms, Brains and Virtuosity

So earworms are not simply anomalous cognitive processes. In fact, they are expressive of how a technological movement is 'immanent to the continuing self-constitution of techniques of existence' (Massumi, 2011: 146–7). The matter of outsourcing or exteriorizing music to external cognitive devices does not 'denature techniques of existence' so much as it 'var[ies] their events' and 'boost[s] the natural dynamic of self-differing inherent to experiential dynamics' (Massumi, 2011: 145). However, this does not mean that earworms have no cognitive profile. To the contrary, as far as contemporary capitalism is concerned, earworms not only have a distinct, if somewhat elusive, cognitive purchase but a calculable and exploitable one.

The industry of popular music, for instance, relies on the memorability and auto-inculcation of melodic material that it calls 'hooks' in order to sustain the semblance of a desire for its products. The field of sonic or audio branding, too, treats sound effects and jingles – 'musical slogans' – as a psychological matter critical in the management of perception, recollection and the flow of desire.<sup>8</sup> But perhaps the most unabashed example of the earworms' cognitive appeal is Berlitz's 'Earworms<sup>mbt</sup>',<sup>9</sup> a tool that seeks to instrumentalize the peculiar way in which music can be felt as thought to induce rapid language acquisition by setting common phrases in different languages to (bad) music. Essentially, in these recordings we hear two voices speaking one after the other in time (sort of) to the groove of a musical soundtrack. The music used is always at a mid-tempo 4/4 meter, harmonically static and with little to no melodic or timbral variation, much like the 'acid-jazz' you might hear when placed on hold during a phone call or when a radio station goes off air during a technical difficulty. The basic claim of 'Earworms<sup>mbt</sup>' is that assimilating cognitive events to the highly efficient and robust mnemonic force of musical repetition will (perhaps) impart to these events a similar memorability.

In each of these examples, the functionalization of music's catchiness is representative of contemporary capitalism's ongoing reconfiguration of labour to draw surplus value directly from the activity of human psychic and affective faculties. Although these faculties have always played a productive (if not directly remunerative) role in society, as Paolo Virno argues, it is only recently that they have been made 'public', that is, that basic sentience and know-how have become calculable forces that can be put to work and made 'a pillar of the production of surplus-value' (Virno, 2004: 66). What the terms 'cognitive', 'cultural' and 'creative capitalism', or 'immaterial' and 'affective labour' characterize is essentially a shift in how the patterns of production and consumption are organizing less around the exploitation of raw, physical labour and more around our general capacity to analyse, communicate,

recollect, contemplate, invent and relate to one another (virtually or actually).<sup>10</sup> In other words, the life of mind – our general intellectual and social faculties – has become a significant source of labour-power and the industrialization of its exercise a means of generating wealth. It should come as no surprise, then, that a psychic peculiarity like the earworm should be targeted as a form of labour-power, for there is nothing more potentially productive, more ‘virtuosic’ as Virno would say, than that which demonstrates its own powers.

Virno, after Aristotle, defines virtuosity as an activity without an end product, an action whose purpose is the event of its own occurring (Virno, 2004: 52). Such an activity would typically be indistinguishable from servile (waged) labour in that neither the virtuoso’s nor, for instance, the custodian’s labour produces a surplus. The work of each entails expenditure. However, the custodian still produces a product – ‘cleanliness’ and ‘hygiene’ – and does so without putting on a show of it. Thus, as ‘productive labour, in its totality, appropriates the special characteristics of the performing artist’ (Virno, 2004: 54), virtuosity as an action without an end product, more than custodial competence, becomes the new locus of value. Contemporary capitalist models of production are ‘virtuosic’, then, precisely because labour has been organized around activities that simultaneously demonstrate and affirm a capacity to perform, communicate and relate their own expenditure. In essence, that which affirms its own potential force in its doing is virtuosic, and the virtuosic is a demonstration of a potential for producing, a potential that has value not because it can be used to produce objects but because it can service the production (and control) of social relations and, by extension, the production of subjectivity.

To the extent that ‘for an ever increasing number of professional tasks, the fulfillment of an action is internal to the action itself’ (Virno, 2004: 61), the psychic activity of the earworm is virtuosic precisely because it is its own spectacle and fulfils nothing but the demonstration of what the mind can do. In this regard, the experience of an earworm is a highly proficient performance of a certain type of cognitive talent – namely, a talent to remember, but also to ‘think’ alongside other activities. But the virtuosity displayed by an earworm’s occasion is, paradoxically, unruly. Unlike the performance of speech, for example, whose regulability signifies a degree of agency or volition and embodies a sense of self-control, the earworm’s performance of memory is always suffered. It is a habitual virtuosity, an automatic competence that *befalls* the performer. Like phatic utterances – ‘Some weather we’re having’, or ‘uh-huh’ – that issue from us automatically to establish and sustain the mood and sociability of a conversation rather than express information or spur contemplation, getting songs stuck in our head is something we’re so skilled at doing that it seems to *happen* to us. My point here is that some modes of virtuosity reach such levels of wizardry that their performance becomes

second nature, which is to say that their technique of existence acquires the status of a reflex or bare nervous activity – call it an autonomic virtuosity. Because it is an *involuntary* activity, but also because it is a private performance whose ‘product is not separable from the act of producing’ (Marx, 1991: 1048), the earworm’s unruly mode of virtuosity has difficulty affirming itself as a dimension of labour-power. Instead its private performance finds purpose in affirming the feeling of thinking. The potential that a habitual virtuosity makes conspicuous then is our capacity to feel ourselves existing *in potential*, in abstraction – in thought. And in this respect, as strange as it may sound, an earworm’s performance is an expression less of labour-power and more of onto-power – a power to be rather than not (be).

Another example of such virtuosity, one that shares the technique of spontaneity with earworms, is the performance of daydreaming or mind-wandering – what in cognitive psychology and cognitive neuroscience is referred to as ‘self-generated thought’. This form of virtuosity develops from what is currently understood as ‘resting-state’ research, an emerging model in cognitive neuroscience that asks whether there is ‘an organized mode of brain function that is present as a baseline or default state and is suspended during specific goal-directed behaviours’ (Gusnard et al., 2001: 4259). What neuroscientists have observed is that the resting brain, the brain not currently engaged in a goal-directed task, exhibits a network system that is rife with endogenous activity that researchers classify variously as ‘mind-wandering’, ‘free association’, ‘self-focused attention’ and ‘introspection’. In other words, the resting brain is not resting at all but is extremely active, more active in fact (which for neuroscientists means more lighted brain regions seen during fMRI tests) than it is during task-related activities (see Greicius et al., 2003). The implication that most of the field has run with is that the so-called ‘default-mode network’ is evidence of a neural system in which ‘endogenous dynamics would be meaningful and not simply unconstrained noise’, meaningful precisely in the sense that the system describes ‘a matrix that is constituted as perpetually productive, as intrinsically creative, and as thrown toward the future’ (Callard and Margulies, 2010: 334, 337).

However, as Felicity Callard and Daniel S. Margulies (2010) suggest, the rhetoric used by cognitive neuroscientists to interpret the activity of the resting brain draws many of its tropes from the same generalized concept of productivity that Virno contends is guiding contemporary capitalism’s erasure of the distinction between labour and non-labour. The resting brain, like the subject of contemporary, or what some call ‘cognitive’ capitalism, is never *not* working. Just as a nondescript form of work based on the generic potential to think at all times invades leisure time to effectively make the latter an unremunerated version of the former, neuroscience’s focus on ‘unconstrained mental activity’ as

productive cognitive activity creates an image of thought in which *all* cerebration is rendered purposeful, useful – valuable. As Callard and Margulies suggest, daydreaming and mind-wandering have lost their marginal status as useless – ‘amateur’ – cerebration via neuroscientists’ adoption of a rhetoric of productivity that favours eccentric, distributed and highly flexible/irregular labour, a rhetoric that converts neoliberalism’s ideological aims to rarefy the accumulation of capital into epistemological and ontological claims. Daydreams and wool-gathering are, then, private performances in the same way that earworms are: the spontaneous occurrence of absent-mindedness demonstrates a potential to think and thus a power to be, a power to do. As such, daydreaming and other goalless attentions are another form of autonomic virtuosity in the sense that they produce our ability to feel ourselves existing in the potential of a thinking-doing.

But there is something that distinguishes the virtuosity of earworms from that demonstrated by daydreams. My sense is that the former’s technical origins and repetitive character make it less available for recuperation than the divagations of the latter. Although unruly in their general aimlessness, daydreams lend their virtuosity to contemporary capitalism’s speculative investment in cognitive activity for their digressive yet narrative-esque form exemplifies the type of ‘creative’ obliquity valued by the successful entrepreneur. Whether or not the resting brain is in fact essential for maintaining ‘a coherent neuronal representation of the “self”’ (Fransson, 2006: 2844), daydreaming’s associative mechanics, speculative thrusts and lateral articulations that spontaneously plot out lines of flight are an indisputable boon to a system that thrives on the production of difference – or at least the simulation of difference – especially a system whose points of operation, control and forms of labour make the drifts and wanderings of existence integral to its functioning.

The earworm, however, is a little more peculiar. As I wrote above, music is itself a technology of abstraction whose coupling with recording technologies spread its ‘abstractive manner of appearing’ not only to other places and times, but to other registers of expression and experience. Via a techno-entertainment apparatus whose ubiquity short-circuits sensation in order to avoid the dialectical tension of consciousness, musical abstractions are taken up over and over again as information that is eliminated without being digested. This makes the habitual virtuosity that an earworm stands for an excrescent feature of an apparatus inclined towards constant change. Unlike daydreams, whose affair with counterfactuals and anticipated futures makes its streamy content rife with narrative coordinates and trajectories that can be continually exchanged for possibilities and alternatives, earworms just twist and turn. The earworm’s loopy performance, in which its ending is at the same time its beginning, cannot be exchanged for anything but itself, and as such the



change or difference that it is and which it demonstrates is nothing but an *ex-change* – a change beyond change. Having, as Peter Szendy writes, ‘nothing to say beyond the naked exposition of this structure of interchangeability, general equivalence, and circulation’ (Szendy, 2012: 69), earworms realize the entertainment apparatus’s desire for sensation that ‘passes without obstacles’.<sup>11</sup> Earworms are, then, expressive of a sheer fluctuation, a lived abstraction, or a pure sign of variation that epitomizes entertainment’s principle of indigestion. But at the same time earworms mark the limits and fate of indigestion. Their play of appearance and disappearance short-circuits the bureaucracy of organism in a way that brings out the latter’s power of variation and capacity to perform, communicate and relate to a place ‘where things reach their end without passing through their means’ (Baudrillard, 2008: 192).

This is to say that earworms are the destiny of musical technics taken up in an apparatus of distraction, the destiny of indigestion where music ‘attains [its] effects without passing through causes’ (Baudrillard, 2008: 192). A something doing becoming thought that is becoming something doing.

### **Fatal Strategies of Lived Abstraction**

To end I want to return to the future that began this article by considering first what it might mean that the earworm’s ideosonic persistence is indicative of capitalism’s alien intelligence, and, second, how this intelligence is not exactly alien so much as it is mad and fatalistic.

Clearly there is something about the proliferation of earworms that lends itself to Land’s fantasy of an inhuman techno-social acceleration. However, while it may not be strictly human, there is nothing alien about a system’s fate. From Baudrillard’s (2008) perspective, all systems – organic and inorganic – are fatalistic. Systems are driven by an immanent compulsion to maximize their particular forms of exchange and techniques of organization. Although non-conscious, this vector of excess is a form of intelligence – a madness – that, for Baudrillard, tends towards the implosion of a system’s terms and, ultimately, a reversal of its functions. But this ‘mad intelligence’ is not essentially negative. It is better understood as a process of intensification – ‘hyperfication’ if we want to stay with Baudrillard’s poetics – that inheres in any and all efforts to integrate a heterogeneity of elements. Baudrillard’s infamous ‘more  $x$  than  $x$ ’ is therefore not a fundamentally negative formula but marks instead a qualitative shift in a system that seduces itself into doing more of what it does and thus lures itself not towards its end but to a transition-point, what we could justifiably dub ‘an event’. Strange as it may be, a body overrun with ‘hypervitality’, what we’d typically call cancer, is a system transitioning to the event called ‘death’. In other words, death is the fate of an excessive cellular enthusiasm.

Curiously, it is also the case that techniques of existence are fatalistic, but affirmatively so. Insofar as their performance is a process, and ‘approaching the expressive limit is what process never ceases to do’, techniques of existence are driven by a certain self-enjoyment to accomplish more of what they do – to maximize their ‘abstractive intensity’ (Massumi, 2011: 151). The qualitative change that techniques of existence effect is no less fatalistic than that of systems whose activities have multiplication as their object. It’s just that whereas Baudrillard sees *madness* in fatal systems that terminate in events of reversal, in techniques of existence an immanent and irresistible *appetition* leads to occasions of novelty. So then, whither the earworm? To madness or appetite? Reversal or novelty?

As an achievement of music’s techniques of existence the earworm is a novelty and expressive of an appetite to carry abstractions to their most intensely perceptually felt occasion. The earworm is in this respect the limit case of perceivable abstractions in sound, which is to say, it is thought. However, as a technical artefact supplementing the musical technics that audio technology now makes ubiquitous, the earworm is a reversal and product of madness. Recall Flusser’s contention that our society is governed by a system of pure sensation that ‘spill[s] itself over the world as method’. The metastasis of musical technics is the outgrowth of an extreme effort to make music’s abstractions always available, an excrescence that not only obscures the categorical distinction between background and foreground music (see Kassabian, 2001), but the perceptual difference between figure and ground. In their ubiquitous phase musical sounds are omnipresent, and thus hyper-audible, which in turn makes their semblance of vital activity, their lived abstraction, hyper-apparent. Yet, like the constant droning of a ventilation system, these sounds and semblances become deafening, unhearable, as both a matter of volume and distraction. There’s a whole world of sounds to *not* listen to. The din of musical ubiquity afforded by the phonograph, radio broadcasts, cassette players, Walkmans, internet streaming services, satellite radio, MP3 players, smartphones and integrated even more fully and subtly into our ambient perpetual routines with hidden and invisible speakers,<sup>12</sup> ex-terminates music, pushes it beyond its own end so that it no longer has any reason for being heard, contemplated, noticed or even remembered. Baudrillard once described ‘music in which sounds have been clarified and expurgated... shorn of all noise and static’ as integral music (Baudrillard, 2005: 27–8). But it is actually only in the earworm that music becomes fully integral, a complete coincidence between perception and thought. Completely ‘restored to its technical perfection’ (Baudrillard, 2005: 28), music felt as thought, felt in its most abstract, becomes pure technics. ‘Flawless and without imagination, merging into its own model’ (Baudrillard, 2005: 28), earworms are music’s fatal strategy of lived abstraction.

And yet is this still music? Even Baudrillard hesitated to completely judge a music whose ‘sounds have been clarified and expurgated and... so to speak, restored to technical perfection’ (Baudrillard, 2005: 28) as no longer music because ‘technical perfection’ entails the insertion of engineered noise into the signal to make it more ‘musical’. The earworm, however, has no frequency to tune, no wavelength to modulate, and for that matter, no signal to corrupt. Where integral music disappears in its hyper-fidelity, ‘in the technical perfection of its materiality... its own special effect’ (Baudrillard, 1994: 5), the earworm disappears in the thought of itself, in the technical perfection of its mentality – its own nonsensuous perception. In other words, relieved of listening by the thought of listening itself, music, ironically, makes room for radical thought in the form of a hopeless but happy audition.<sup>13</sup>

## Notes

1. Strictly speaking, Lowry’s ‘Silent Subliminal Presentation System’ (SSPS) exists only as a US-Patent (#5159703), filed 28 December 1989, that describes how spoken messages may be placed in an acoustic or vibratory field without them being consciously heard.
2. I borrow the expression ‘technologies of lived abstraction’ from Brian Massumi’s and Erin Manning’s book series with MIT Press, not so much to mobilize its concept that philosophy and creative production share a common experimental ground but to hijack its valences and overtones that point to life’s technical and virtual premises.
3. Those familiar with Proust’s *A la recherche du temps perdu* may be inclined to compare the earworm’s irruption in thought to the involuntary memory triggered by the taste of the madeleine. However, while there is clearly a resemblance between the way an earworm hijacks one’s thinking and Swann being taken hostage by the memory of ‘Sunday mornings at Combray’, because the earworm doesn’t seem to drag much if anything of its past into its event it lacks the affective intensity that is crucial to Proust’s experience. However, Walter Benjamin’s reading of Proust’s *mémoire involontaire* through Freud suggests that memory, in fact, relies on the initial experience not having entered consciousness. According to this model, then, the experience of an earworm is like the taste of the madeleine on the condition that we don’t consciously hear the song from whither the earworm came. And this is hardly an uncommon condition; in fact, the music industry and sonic branding companies bank on its frequency. For how Benjamin complicates the distinction between voluntary and involuntary memory see his essay ‘On some motifs in Baudelaire’ (Benjamin, 1968a).
4. The idea of a general aesthetic equivalence is the thrust of Peter Szendy’s recent work on the political economy of musical hits, which sees the circulation and repetition of pop tunes as exemplifying advanced capitalism’s reliance on a ‘pure structure of exchange’. Although Szendy doesn’t articulate it as a technical issue, his characterizing the repetition of hits as effecting an existential blockage that gives access ‘to what is most singular and hidden within oneself’ (Szendy, 2012: 81) points to an essence that is entirely

- technical, for what is most singular and hidden within oneself is an aptitude for systematically extracting a qualitative form from the quasi-chaos of the world's vague goings-on for use in another occasion of something doing. In other words, we are essentially abstraction machines (see Szendy, 2012.)
5. 'Technique of Existence' is an expression that Massumi uses to describe a way of doing something that 'event-fully effects a fusional mutual inclusion of a heterogeneity of factors in a signature species of semblance' (Massumi, 2011: 143).
  6. Think of *tafelmusik* (table-music), for example, which describes the music played at banquets to set the mood.
  7. Most of the experimental psychology literature treats exposure, familiarity, emotional association, along with repetition itself and the latter's neurobiological responses, as requisite factors in the contraction of an earworm (see Beaman and Williams, 2010; Beaty et al., 2013; Liikkanen, 2011; Williamson et al., 2011). Clearly repetition has something to do with the onset of earworms, but despite the seeming plainness of it, repetition is a rather enigmatic thing, for it is at one and the same time a force of preservation and extinction, the refrain of a self-subverting stability. For Margolis, the compulsive character of earworms is linked to the way our brains encode phenomena in sequences or 'chunks' that cannot but be experienced in their entirety. Moreover, highly repetitive sequences acquire a psychological robustness because of the way musical sounds enlist the neural circuitry responsible for motor activity and habit formation. It is in this sense that the earworms become, as Margolis (2013: 74) writes, 'a literal hook, compelling a person to execute the sequence imaginatively'.
  8. See Steve Goodman's 'The earworm' in *Sonic Warfare* (Goodman, 2010) on the ways in which jingle makers and sonic branding companies attempt to bind affects to earworms.
  9. 'Musical Brain Trainer'.
  10. See for instance the work of Tiziana Terranova (2000), Michael Hardt and Antonio Negri (2004), Maurizio Lazzarato (1996) and Yann Moulier-Boutang (2011).
  11. Just to make it clear, earworms do not have a sensory correlate. Melodies and 'tunes' have actual correlative acoustic impressions; however, properly speaking, the melodies and tunes to which earworms correspond are abstractions. In other words, earworms are nonsensuous perceptions of nonsensuous perceptions.
  12. 'Clio', <http://www.clearviewaudio.com>
  13. This research was supported by the Social Sciences and Humanities Research Council of Canada.

## References

- Baudrillard J (1994) *The Illusion of the End*, trans. Turner C. Cambridge: Polity.
- Baudrillard J (1995) Radical thought. *Parallax* 1(1): 53–62.
- Baudrillard J (2001) *Impossible Exchange*, trans. Turner C. New York: Verso.
- Baudrillard J (2005) *The Intelligence of Evil: Or the Lucidity Pact*, trans. Turner C. Oxford: Berg.
- Baudrillard J (2008) *Fatal Strategies*, trans. Beitchman P and Niesluchowski WGJ. Los Angeles: Semiotext(e).

- Bailes F (2007) The prevalence and nature of imagined music in the everyday lives of music students. *Psychology of Music* 35(4): 555–570.
- Beaman C and Williams T (2010) Earworms (stuck song syndrome): Towards a natural history of intrusive thoughts. *British Journal of Psychology* 101(4): 637–653.
- Beaty R, et al. (2013) Music to the inner ears: Exploring individual differences in musical imagery. *Consciousness and Cognition* 22(4): 1163–1173.
- Benjamin W (1968a) On some motifs in Baudelaire. In: *Illuminations: Essays and Reflections*, edited by Arendt H, trans. Zohn H. New York: Schocken Books, pp. 155–200.
- Benjamin W (1968b) Art in the age of mechanical reproduction. In: *Illuminations: Essays and Reflections*, edited by Arendt H, trans. Zohn H. New York: Schocken Books, pp. 217–252.
- Brooks D (2007) The outsourced brain. *The New York Times*, 26 October.
- Buckner R et al. (2008) The brain's default network: Anatomy, function, and relevance to disease. *Annals of the New York Academy of Sciences* 1124(March): 1–38.
- Callard F and Margulies D (2010) The industrious subject: Cognitive neuroscience's reevaluation of 'rest'. In: Hauptmann D and Neidich W (eds) *Cognitive Architecture. From Bio-politics to Noo-politics*. Rotterdam: 010 Publishers, pp. 325–345.
- Crary J (2013) *24/7: Late Capitalism and the Ends of Sleep*. London: Verso.
- Deleuze G (1994) *Difference and Repetition*, trans. Patton P. New York: Columbia University Press.
- Deleuze G and Guattari F (1983) *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Hurley R, Seem M and Lane HR. Minneapolis: University of Minnesota Press.
- Flusser V (2013) *Post-History*, trans. Maltez Novaes R. Minneapolis, MN: Univocal Publishing.
- Goodman S (2010) The earworm. In: *Sonic Warfare: Sound, Affect, and the Ecology of Fear*. Cambridge, MA: MIT Press, pp. 141–148.
- Gusnard DA, et al. (2001) Medial prefrontal cortex and self-referential mental activity: Relation to a default mode of brain function. *Proceedings of the National Academy of Sciences of the United States of America* 98(7): 4259–4264.
- Hardt M and Negri A (2004) *Multitude: War and Democracy in the Age of Empire*. New York: Penguin Press.
- Kassabian A (2001) Ubiquitous listening and networked subjectivity. *Echo* 3(2). Available at: <http://www.echo.ucla.edu/volume3-issue2/kassabian/index.html> (accessed August 2016).
- Land N (1993) Machinic desire. *Textual Practice* 7(3): 471–482.
- Langer S (1953) *Feeling and Form*. New York: Charles Scribner's Sons.
- Lazzarato M (1996) Immaterial labor. In: Virno P and Hardt M (eds) *Radical Thought in Italy: A Potential Politics*. Minneapolis: University of Minnesota Press, pp. 133–150.
- Liikkanen L (2008) Music in everymind: Commonality of involuntary musical imagery. In: *Proceedings of the 10th International Conference of Music Perception and Cognition*. Japan: ICMPC10, pp. 408–412.

- Liikkanen L (2011) Musical activities predispose to involuntary musical imagery. *Psychology of Music* 40: 236–256.
- Margulis E (2013) *On Repeat: How Music Plays the Mind*. New York: Oxford University Press.
- Marx K (1991) *Capital, vol. 1: A Critique of Political Economy*, trans. Fowkes B. London: Penguin Classics.
- Massumi B (2011) *Semblance and Event: Activist Philosophy and the Occurrent Arts*. Cambridge, MA: MIT Press.
- Moulier-Boutang Y (2011) *Cognitive Capitalism*, trans. Emory E. Cambridge: Polity.
- Schafer RM (1969) *The New Soundscape: A Handbook for the Modern Music Teacher*. Canada: BMI.
- Stiegler B (1998) *Technics and Time, vol. 1: The Fault of Epimetheus*, trans. Beardsworth R and Collins G. Stanford, CA: Stanford University Press.
- Stiegler B (2010) Memory. In: Mitchell WJT and Hansen MBN (eds) *Critical Terms for Media Studies*. Chicago: University of Chicago Press, pp. 19–34.
- Szendy P (2012) *Hits: Philosophy in the Jukebox*, trans. Bishop W. New York: Fordham University Press.
- Terranova T (2000) Free labor: Producing culture for the digital economy. *Social Text* 18(2 63): 33–58.
- Thompson C (2007) Your outboard brain knows all. *Wired*, October.
- Virno P (2004) *A Grammar of the Multitude: For an Analysis of Contemporary Forms of Life*, trans. Bertoletti I, Casciato J and Casson A. London: Semiotext(e).
- Williamson V, et al. (2011) How do ‘earworms’ start? Classifying the everyday circumstances of involuntary musical imagery. *Psychology of Music* 40(3): 259–284.

**Eldritch Priest** is Assistant Professor in the School for the Contemporary Arts at Simon Fraser University and writes on sonic culture, experimental aesthetics and the philosophy of experience from a ‘pataphysical perspective. His essays have appeared in various journals and he is the author of *Boring Formless Nonsense: Experimental Music and the Aesthetics of Failure* (Bloomsbury, 2013). He is also a co-author (with fellow members of the experimental theory group ‘The Occulture’) of *Ludic Dreaming: How to Listen Away from Contemporary Technoculture* (Bloomsbury, 2017) and is active as a musical composer and improviser.