

Marrington, Mark ORCID logoORCID:

<https://orcid.org/0000-0001-5404-2546> (2019) The DAW electronic music aesthetics and genre transgression in music production. In: Hepworth-Sawyer, Russ ORCID logoORCID: <https://orcid.org/0000-0001-8266-0149>, Hodgson, Jay and Marrington, Mark ORCID logoORCID: <https://orcid.org/0000-0001-5404-2546>, (eds.) Producing music. Routledge, pp. 52-74

Downloaded from: <https://ray.yorks.ac.uk/id/eprint/3942/>

The version presented here may differ from the published version or version of record. If you intend to cite from the work you are advised to consult the publisher's version:

<https://www.routledge.com/Producing-Music-1st-Edition/Hepworth-Sawyer-Hodgson-Marrington/p/book/9780415789226>

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. [Institutional Repository Policy Statement](#)

RaY

Research at the University of York St John

For more information please contact RaY at ray@yorks.ac.uk

Please note that while the text below is identical to the published version of this chapter, this is *not* a reproduction of the published chapter itself (due to copyright restrictions). For accuracy regarding pagination all citations should therefore be referenced to the published version as follows:

Marrington, M. (2019) The DAW Electronic Music Aesthetics and Genre Transgression in Music Production: The Case of Heavy Metal Music. In: R. Hepworth-Saywer, Jay Hodgson & M. Marrington eds. *Producing Music*. New York, Routledge.

‘The DAW, Electronic Music Aesthetics, and Genre Transgression in Music Production: The Case of Heavy Metal Music’

Mark Marrington, York St. John University

This chapter continues my ongoing research into the DAW and its role in re-configuring popular music practice (see Marrington, 2011, 2016, 2017a), with particular reference to genre characteristics in heavy metal music. My focus is on the manner in which those “rules” that determine the “compositive” elements of the metal genre (see Fabbri, 1982) are “transgressed” as a result of their interaction with new technological forms. These ideas are applied specifically in relation to DAW-based practices, highlighting the manner in which this medium might be regarded as an agent of genre deconstruction and destabilization. Key to my argument is the hypothesis that the DAW is essentially a *genre-specific* medium in the sense that it foregrounds specific notions of creative practice associated with the aesthetics of electronic music. To illustrate this, I trace the route by which the DAW and its inherent electronic music aesthetics have become gradually integrated into metal music practice, from metal musicians’ uses of the DAW during the mid-1990s through to the activities of DAW-based metal practitioners during the mid- to late 2000s and the hybridized forms of “electronic” metal that emerged at this time, including djent, djent-step, and cyber-grind. The concluding part of the chapter discusses situations in which older metal bands have attempted to incorporate, from outside their idiom, the traits of DAW-derived genres, with a particular focus on the dubstep collaborations on Korn’s 2012 album, *The Path of Totality*. The chapter’s key assertion is that metal artists who have gravitated toward either the DAW, or DAW-based practitioners, are all engaging to some degree with the aesthetics of electronic music and, while this has enabled the domain of metal music

practice to be re-imagined, it has not been without consequences for the genre's integrity and its standing among metal purists.

MUSICAL GENRES: RULES AND TRANSGRESSION

Central to this discussion is the idea of genre, a term that requires some initial definition prior to considering the ways in which the DAW may be regarded as inculcating specific genre inclinations. For this purpose, I draw on genre theory originating from the discipline of popular music studies and in particular Franco Fabbri's well-known essay "A Theory of Musical Genres: Two Applications" (1982), which defines genre as "a set of musical events (real or possible) whose course is governed by a definite set of socially accepted rules". Fabbri views genres as sets with their subsets (i.e., subgenres) – essentially individualized manifestations of structures within broader "musical systems" (or codes) – and his account outlines a number of "generic rules" that can be usefully brought to bear in considering the nature of a particular genre, respectively: formal and technical, semiotic, behavioral, social and ideological, economic and juridical. Of the rules of genre presented by Fabbri, this chapter's focus is on the formal and technical – namely, rules which operate on what he calls the "compositional level", essentially referring to the music's substance (codes governing "note systems"; "conception of musical time"; the nature of its melodic, harmonic, and rhythmic aspects, and so on) as well as rules relating to performance techniques and instrumental characteristics. Fabbri suggests that the "codification" of a genre is dependent to a certain degree on aspects of already existing musical systems defined by such rules, with those genres that are recognized as being new distinguishing (or "individualizing") themselves via some form of "transgression" of the rules of a particular system. Pertinent to this discussion, a particular factor identified by Fabbri as potentially transgressive in this regard is "the application of new techniques, made possible by technological development". It is thus the purpose of this chapter to consider the ways in which these kinds of genre elements, specifically in the context of metal practice, have been re-configured as the result of a particular technological development – the DAW – and the consequences of this for the genre's identity.

ELECTRONIC MUSIC AESTHETICS AND THE DAW

Discussion of the DAW in the literature has ranged widely in its focus, along the way encompassing theories of affordance, metaphor, human-computer interaction, and the psychology of creativity (see for example, Duignan et al., 2004, 2005; Barlindhaug, 2007; Brown, 2007; Mooney, 2011; Zagorski-Thomas, 2014; Bell et al., 2015; Marrington, 2016, 2017a; Strachan, 2017; Bell, 2018). In effect, this body of work has come to constitute a detailed inventory of characteristics of the DAW that potentially inform creative practice, revealing what Duignan et al. (2005: 3) have referred to as “the underlying assumptions and structures that favor one form of musical structuring over all others”.¹ My own research, which is indebted to much of this literature, initially took place within the educational context in reference to students’ working practices within DAW environments (Marrington, 2011). In particular, I drew attention to the nature of the DAW as a mediating technology which re-configured musical thought as students transferred their ideas from a “traditional” technological context, for instance a guitar-oriented approach, to creating songs using chord shapes, to certain DAW-determined ways of working (for example, programming within the Arrange window). From this emerged the idea of DAW-specific literacies – in essence languages engendered by the DAW that condition the ways that users articulate their musical ideas and which they take on board when they immerse in these environments. This was then pursued in further articles (Marrington, 2016, 2017a) discussing the DAW in the context of songwriting practice in which I explored the idea that DAW-based music creation effectively inculcated a literacy derived from electronic music aesthetics, ultimately with consequences for the ways in which songs were conceived and produced.

The notion that the DAW engenders electronic music genre aesthetics requires a certain amount of unpacking. Essentially, however, what this refers to are creative practices associated with the various tools that the DAW has inherited from analogue and digital hardware and earlier forms of computer software. This includes, for example, the programming of musical ideas using sequencers (hardware and software) and drum machines, sound design processes typically associated with synthesizers, and the application of digital sampling technology to isolate audio objects as basic raw materials. Examples I have discussed in relation to this include Radiohead, whose move to early versions of Logic and Cubase in the early 2000s effectively converted the band into an electronica outfit (see the albums *Kid A* and *Amnesiac*), and more recently, James Blake

(on his 2011 debut album *James Blake*), whose singer-songwriter leanings were shaped by dubstep-derived editing approaches and sound design. Recent work on the DAW, most notably Strachan (2017), has echoed this view that the DAW engenders electronic music aesthetics and has considered this directly in relation to concepts of genre. Strachan posits a number of what he calls “cyber-genres”, including dubstep, hauntology, vaporwave, and the metal subgenre djent, asserting that these are “simultaneously resultant from, and reflective of, the contexts of digitization”, and that the “wide- spread availability of computer-based music production technologies has been integral to these post-digital musics” (2017: 135).

It is arguable that of the various electronic music practices engendered by the DAW, the sampling aesthetic – characterized by the appropriation and re-combination of pre-existing audio materials – has become particularly dominant in DAW-based creative practice, with audio objects in essence, constituting a DAW’s “primary fuel”. This has to a degree been encouraged by the propensity of the typical DAW GUI to encourage the “atomization” of the musical material within its visual paradigm. Zagorski- Thomas (2014: 134), for example, has remarked on the “block diagram”, which “would seem to encourage the user to think in terms of sound as an object rather than a stream”, while Strachan (2017: 99) similarly draws attention to the “visual representation of sound as frozen in time” leading to “a conceptualization of musical material into distinct, temporally located blocks of musical information”. A DAW’s cut, copy, and paste functions, which are a staple of computer software environments, also contribute to this atomization, enabling relationships between the musical elements contained within these objects to be infinitely re-configured. This ultimately plays down the notion of there being a *necessary* relationship between musical ideas, which in the case of music that draws on a wide range of audio sources can lead to some striking juxtapositions. Another by-product of this mode of engagement with musical material, which I have discussed elsewhere (Marrington, 2016, 2017a), is the “loop paradigm”, which describes the tendency to organize audio objects into repeating patterns which are layered one upon the other within the sequencer environment of the typical DAW.² The net result of this is, as Strachan (2017: 7) observes, that “computer-based music production has increasingly brought the physical and textural properties of sound to the fore within the creative process” and with the user working “directly with captured and generated sounds that are at a

remove from processes and competencies of performance traditionally associated with musicianship”. The examples of hybridized metal genres discussed later in this chapter in the work of Gautier Serre (Whourkr/Igorrr) and Remi Gallego (The Algorithm) epitomize this particular creative paradigm of the DAW.

In addition to the DAW’s foregrounding of the sampling aesthetic and audio-object as a primary unit of musical design, the DAW has also inherited electronic music practices concerned with sound design and synthesis. For example, most DAWs are equipped with onboard tools that model synthesis engines of various types (including analogue, FM, and granular) and support numerous third-party plugins, many of which emulate analogue synthesizers of the past (such as Arturia’s Minimoog and Native Instruments’ B4). These have been harnessed by the current generation of DAW users in much the same way as their earlier electronic musician counterparts to generate music of comparable character, albeit with the greatly increased level of refinement that computer-based equivalents of these older tools bring to the editing process. Certain DAW-evolved cyber- genres owe much of their character to the application of such sound design tools in their production. Dubstep, for example, is defined by the attention to detail accorded to the sonic design of its bass and lead synth lines, which typically operate both as riffs and attention-grabbing sonic elements (see Pearson and Mullane, 2014). In essence, this is the characteristic “dirty” bass sound, which is heavily reliant on the unique qualities of particular third-party FM synthesizer plugins, such as Native Instruments’ FM8 and Massive. This, in conjunction with careful MIDI programming, enables the achievement of what John von Soggeson describes as “increasingly twisted bass riffs with complex rhythmic modulations and subtle changes” (2012).

A final point, which also has significance in relation to genre, concerns the inherent “musical” leanings of certain DAWs with regard to the domains of musical practice they imply. This refers to the idea that most DAWs are, to varying extents, revisiting past technological paradigms of music making, often accompanied by skeuomorphic representations (see Bell et al., 2015; Marrington, 2016), and that these have the potential to inform the character of the music they are used to create. Propellerheads’ Reason, for example, closely models the visual characteristics of older technologies – samplers and synthesizers and old-school sequencers – within a rack of gear, as well as their behavior. This arguably has the purpose of appealing to a user group whose

musical outlook is sympathetic to the aesthetic characteristics of the music these kinds of technologies were originally used to create (see Barlindhaug, 2007). For example, it might be suggested that Reason's interface is designed to appeal to hip-hop producers and electronic musicians of various stylistic persuasions. Compare to this to a DAW such as ProTools, which, while possessing a number of comparable studio tools, by contrast, does not parade these in front of the user in this manner – instead the emphasis is on working in the multi-track recording environment and mixer window. Production tools – EQs, compressors, effects, and so on – are called upon when required rather than being pointed to by the software. ProTools remains today the standard for professional studio recording and production, appealing primarily to engineers whose focus is on recording musical performances, and the conservatism of its interface ultimately reflects this.

Interestingly these tensions between the DAW's various implied creative aesthetics can be discerned in the hobbyist literature that supported the rapidly expanding DAW user-base during the early- to mid-2000s, including (in the UK) *Computer Music*, *Future Music*, and *MusicTech*. On the one hand, these magazines focused on contemporary DAW-based artists and their innovative techniques, the vast majority of whom were working within the context of electronic music production. On the other, they ran features that looked backward in the “rearview mirror”³ to musical genres that had evolved in studio contexts prior to the DAW. *Computer Music*, for instance, ran a series of short articles entitled “Sound like . . .”, providing walkthroughs of the production styles of artists as stylistically varied as My Chemical Romance, the Police, and Orson, whose genre characteristics and production aesthetics were mimicked using the virtual studio tools provided by the DAW. In one issue, the magazine also ran a feature exclusively devoted to metal music (*Computer Music Magazine*, 2007), which took a similar approach, discussing the genre in terms of the production values associated with earlier classics, such as Metallica's *Metallica* (“black”) album (1991). The perspective on the metal genre expressed here is a narrow one relative to contemporary developments and largely unaware of the transformations that had taken place since the 1990s, such as the move toward sequencing and sampling aesthetics in industrial and nu metal. What is particularly interesting about this article, however, is that although its primary focus appears to be traditional metal production techniques, the same magazine

is also accompanied by a DVD containing “1815 24-Bit Metal Samples”, which it claims provides “everything you could possibly need to create your own metal masterpiece. From thrash to screamo, there’s a little something for the metal maniac in everybody”. The inclusion of this library of metal samples, coupled with such tongue-in-cheek remarks, is clearly designed to court the electronic musician – i.e., the magazine’s core readership – and effectively places the audience for the publication some considerable distance from the traditional metal practitioner. There is an irony in this, however, in that a decade on from this article, it is ultimately the younger generation of DAW-based artists, fully immersed in the electronic music aesthetics of the DAW, who have contributed most to the re-situation of the metal genre.

LOCATING THE METAL GENRE: RULES, BOUNDARIES, AND TRANSGRESSION

Having established some ideas regarding the DAW’s relationship to the compositive elements of music and considered the sense in which DAWs can be deemed genre-specific in their leanings, I now wish to consider the nature of metal’s music’s code as evaluated by writers working in the academic context. The purpose here is to provide a context for this article’s later discussions of the ways in which the metal genre has been modified through contact with the DAW and its inherent creative practices. Commentators have frequently discussed the metal genre in terms not unlike those adopted by Fabbri in his aforementioned article. For example, Weinstein (2000: 6) states that heavy metal is a musical genre with

a code, or set of rules, that allows one to objectively determine whether a song, an album, a band, or a performance should be classified as belonging to the category “heavy metal”. That code is not systematic, but it is sufficiently coherent to demarcate a core of music that is undeniably heavy metal. It also marks off a periphery at which heavy metal blends with other genres of rock music or develops off- shoots of itself that violate parts of its code or develop new codes.

Specifically, for Weinstein, “the sonic, the visual, and the verbal dimensions all make crucial contributions to definition of the genre” (2000: 7), and the two earlier subgenres

of heavy metal that she specifically discusses – namely lite metal and thrash metal – are treated “in terms of their similarities to and differences from the core of heavy metal. Each of these offshoots changes or even breaks the heavy metal code in some ways, but still retains enough of this code to be placed in the same ‘family’ with it” (2000: 7). The genre has also been discussed in terms of specific defining features that cohere with Fabbri’s “formal and technical” attributes. Weinstein (2000: 22–27), for example, focuses on metal’s “sonic dimension”, drawing attention to the influence of the blues rock and acid rock traditions on the genre’s musical language, the role of “loudness” and amplification, the importance of the lead guitar solo executed with “great manual dexterity” and “elaborate electronic technology that distorts and amplifies”, the specific timbres of the drumkit, the wide expressive range and power of the vocalist, and so on. Walser (1993: xiv) also adopts an overtly music-focused approach to discussing the genre, which serves to support a cultural studies perspective that these musical details constitute “significant gestural and syntactical units” that come to constitute “a system for the social production of meaning – a discourse”. He posits that “guitarists have been the primary composers and soloists of heavy metal music”, in effect affirming the pivotal role of that particular technological form in shaping the genre’s musical identity, as well as noting heavy metal’s reliance on “effects that that can be created only with the help of very sophisticated technology” (1993: 16). Walser places particular emphasis on heavy metal’s timbral characteristics, identifying the distorted powerchord as a key signifier of metal music’s power, which is reliant on technology – i.e., the unique characteristics of amplifiers and guitar pickups – for its effect. Other key “rules” of the genre listed by Walser include volume, vocal timbre, modal (Aeolian/Dorian/Phrygian) and harmonic language (use of certain chords and progressions), rhythm (4/4 time, “monolithic inexorable pulse”), the downplaying of melody (relative to timbre), and the importance of the virtuosic guitar solo (which often borrows from classical music tropes).

Where “transgressions” of metal’s genre rules are concerned, these have tended to be discussed in reference to the ways in which metal’s musical language has been re-worked within particular subgenre contexts. Pieslak (2007), for example, has explored Meshuggah’s “re-casting” of metal music in terms of the band’s experimentation with rhythmic and metrical complexity in the progressive/math metal subgenre. The most extensive study of this type is Phillipov (2012), who has demonstrated, in reference to

bands such as Cannibal Corpse and Carcass, the ways in which the death metal subgenre subverts musical conventions, such as harmony, melody, rhythm, and form, and redefines vocal performance techniques, including some reference to studio production strategies. Such writing, along with coverage of metal's technologically achieved sonic characteristics in Weinstein and Walser, has thus begun to hint at the role that technology plays in shaping/re-shaping metal's genre characteristics. More recently, academics working in the music production studies field have begun to explore the sonic aspects of metal in reference to the studio production process. Mark Mynett's work, for example, in his recent doctoral thesis (2013) and subsequent *Metal Music Manual* (2017), expands the discussion of the metal's timbral rules in reference to the concept of "heaviness", whose successful achievement in the production process is key to the articulation of the genre's musical elements. Similarly Williams (2015) has discussed the ways in which digital technologies (including DAW software) have effected significant changes in metal music's timbre. It is interesting to note, however, that both of these authors have expressed reservations regarding the boundaries of the metal genre relative to the role of new technological forms in the music's execution. Mynett, for example, stresses the metal genre's concern to foreground "idealized performative nuances" above mediation by technological forms:

The majority of Contemporary Metal Music's sounds index sound producers in the form of performing musicians, rather than computer, or synthetic based sound production. Additionally, despite the tendency for high levels of technological mediation in CMM's recorded and mixed form, producers in the field invariably focus the results of this technological mediation toward the performative nuances, or idealised performative nuances, of performing musicians. (Mynett, 2013: 52)

In a similar vein, Williams's comments assert that the compositive elements of metal music have remained immune to the effects of new technological forms: "sampling, synthesis and digital editing techniques have given rise to entirely new genres of music, yet metal as a genre has remained ostensibly with much the same musical format" (2015: 39). While Mynett does acknowledge in his discussion the industrial metal subgenre, whose character owes much to a willingness to adopt new

technologies, both statements imply the delimiting of the genre rules of metal to production contexts in which the music's integrity remains intact in the face of technological change. This is understandable given the focus of both writers on unique timbral aspects of metal production within a specified context, but it does tend to misrepresent metal's changing relationship with a range of new technologies over the last forty years.

METAL, ELECTRONIC MUSIC AESTHETICS, AND THE ADOPTION OF THE DAW

Until very recently, the only writer on metal to give any serious attention to the role of digital technologies in re-conditioning metal aesthetics is Ian Christie (2004), in his detailed historical survey of metal's evolution. As Christie's account implies, while technological forms, such as samplers, sequencers, and drum machines (whose characteristics, as aforementioned, anticipate the DAW), have tended to be employed at the peripheries of metal music, they have nonetheless impacted significantly on the genre's musical character. Christie's particular focus is on the affinities between metal and electronic music aesthetics that began to become apparent in the 1990s, for example in regard to the influence of 1990s techno-derived genres, such as Gabber (2004: 334–345). In an attempt to expand this perspective, my own research (Marrington, 2017b) has traced the interchanges that have taken place since the 1980s between metal artists and musicians working in genres whose practices have been largely defined by new technological forms, including hip hop, electronica, and industrial music. In particular two subgenres of metal that evolved in the 1990s owe much of their identity to the fusion of conventional metal tropes (riff-based guitar and metal vocal styles) with the aesthetics of sampling and programming (sequencers and drum machines in particular) – namely, nu metal and industrial metal. Indeed, it was artists working within these subgenres who were the first to adopt the DAW as a creative tool within their production practice. The band Fear Factory, for example, whose industrial music leanings had previously led them to work with remix artists such as Frontline Assembly, as a means of imbuing their sound with a certain electronic character, began to adopt ProTools into their armory as soon as it began to become a studio fixture in the mid-1990s (Dean, 2013; Marrington, 2017b). For Fear Factory, this technology did not function simply as a virtual tape machine; rather, it

provided the ultimate means for the realization of their “machine” aesthetic:

We used technology even though there was a human playing it. After it was edited, and after the tones have been changed, we were trying to go for that electronic sound. That was our purpose. We were trying to create a machine. We thought “What would a machine sound like if it was in music? What would it sound like if the guitars and kick drums played the exact same thing over and over again”? It would sound like a machine, so that’s exactly what we were trying to create. (Dean, 2013)

In practice, Fear Factory’s machine aesthetic is characterized by the use of the DAW to dissect and reiterate fragments of their own recorded performances (hence a manifestation of the DAW’s sample loop paradigm) as can be heard on albums such as *Fear Is the Mind Killer* (1993), *Demanufacture* (1995), and *Obsolete* (1998). Metal artists’ gravitation toward the sampling aesthetic is also apparent in the nu metal subgenre in the work of artists as Slipknot and Deftones in the early 2000s. These bands were notable for including in their line-up personnel chosen for their affinities with forms of technology outside the traditional metal context, including hardware-based samplers, synthesizers, turntables, drum machines, and DAW software.⁴ Thus even in this earlier period of the DAW’s development, the rules of the metal genre had already begun to be modified as a result of their interaction with new forms of technology and indeed in the years leading up to the establishment of the DAW at the center of contemporary record production, there had already been a certain conditioning to the technological aesthetics of that medium.

BEDROOM-PRODUCED METAL: THE EMERGENCE OF DJENT

The first high-profile metal subgenre to emerge from a primarily DAW- based production context was djent,⁵ a form of progressive metal that was evolved by individual metal practitioners (typically guitarists) working within “bedroom production” environments. Its proliferation during the mid-2000s was catalyzed by social media formats for the distribution of independently produced music, most notably Soundclick, and by 2011, it had become recognized as an identifiable metal

subgenre.⁶ Djent emerged precisely during the period of the DAW's widespread acceptance into home studio practice and neatly straddles the line between older genre traditions of metal and the electronic music hybrids that began to appear in the late 2000s. The subgenre's debt to the digital music production environment can be understood in two ways. Firstly, DAW-based tools contributed significantly to the subgenre's sonic characteristics, mainly as a result of its practitioners' heavy reliance on sampler plugins to program their drum parts – typically Native Instruments' Battery and the sampler instruments provided within Propellerheads' Reason. The sounds triggered by these samplers were also “authentically” sourced from a library recognized for its metal leanings – the Toontracks “Drumkit from Hell” sample pack (Laing, 2011), which was notable for having been developed in association with Tomas Haake, drummer in the Swedish progressive metal band Meshuggah (Lentz, 2012).⁷ Djent's characteristic guitar sound was also shaped by digital amp modeling hardware, most commonly the affordable Line 6 POD units (Laing, 2011; Shelvock, 2013). Secondly, the DAW's influence on djent's character can be seen in its conditioning of the performance precision that became associated with its guitarists. This was in essence a by-product of spending many hours recording guitar parts against the sequencer grid using click tracks. To this effect, Misha Mansoor, guitarist with the influential djent band Periphery, has commented that

When you're playing that way you start to focus on parts of your technique that make all the difference in the world. Things you'd never have noticed if you weren't sitting in front of a computer and hearing your playing back. It taught me how to play guitar. (Laing, 2011: 52)

The character of djent guitar performance thus owes something to the DAW's sequencer paradigm, which, in effect, led djent musicians to develop a machine-oriented virtuosity. Nonetheless, these various interactions of djent artists with the DAW were primarily the product of expediency – a means of achieving the effect of a band performance on a budget – rather than the conscious cultivation of an electronic music aesthetic. The first wave of Djent artists – including Periphery, Tesseract, and Animals as Leaders – regard themselves first and foremost as metal musicians, placing emphasis on the guitar performance aspects of the sub- genre and foregrounding slick production values that reflect consummate engineering skills.

Ironically, all these acts today perform live in a full-band context and refer to the DAW primarily as a vehicle for conventional recording and production operations.⁸

BREAKING METAL'S BOUNDARIES: THE DAW AND GENRE HYBRIDIZATION

While djent can be regarded as a typically guitar-centered metal subgenre whose sonic characteristics were incidentally inflected by the DAW, other parallel developments during this period illustrate a more thorough integration of metal elements with electronic music aesthetics. These developments were typically spearheaded by artists who, while professing authentic metal leanings, also possessed a strong affinity with electronic music and the range of subgenres that were developing within the context of DAW-based practice, such as breakcore and dubstep. A number of these artists evolved simultaneously both as performing musicians, typically proficient on either guitars or keyboards, and experts in programming, sampling, and sound design skills. This naturally led to the creation of various forms of hybridized metal – which have typically been referred to using terms such as electrogrind or cybergrind – and, consequently, a certain amount of genre instability. Important early pioneers of this synthesis during the mid-2000s are Genghis Tron, a New York-based three-piece with prominent extreme metal guitar/vocal leanings but also a strong appreciation for contemporary EDM and even synth-pop styles.⁹ The trio comprises an adept lead guitarist but neither a bass player nor a drummer, assigning these aspects to live-performed synthesizers and programmed drums using NI Battery run through Ableton Live (Surachai, 2008). Unlike djent artists, Genghis Tron do not use the latter as a harmonic/percussive backdrop to the guitar-led metal elements, rather synthesizers and programmed beats are there to represent defined electronic music styles, which appear as unique sections alongside the metal passages. The typical approach is to juxtapose the two genres within the course of a single track using hard edits, as can be heard on songs such as “Endless Teeth”, “I Won’t Come Back Alive”, and “City on Hill” on the album *Board Up the House* (2008). As *New York Times* reviewer Ben Ratliff noted with insight, “Letting go of the old metal-band code of virtuosos playing in real-time helps these musicians: It lets the songs on *Board Up the House*, the band’s second album, take sudden bizarre turns and allows them moods and textures that cross genres” (Ratliff, 2008).

This hybrid approach can be seen to have reached its extremes in the work of Gautier Serre, a French musician known both for his earlier Whourkr project and, at the time of writing, his profile as the artist Igorrr.¹⁰ Serre's primary musical influences are extreme metal (as a performing guitarist) and computer-based electronic music, but, as his more recent music demonstrates, he also has affinities with classical music and traditional folk. Much of his earlier work in Whourkr (a two-man band featuring Mulk on vocals) is clearly situated within the death metal subgenre, characterized by fast "blast" beats,¹¹ growled vocals, and heavy guitar riffs. What makes Whourkr unique, however, is Serre's unquestionably "electronic" approach to programming and editing the duo's recorded performances in the DAW environment (in this case, Cubase). Typically, Serre's strategy, on albums such as *Concrete* (2008) and *4247 Snare Drums* (2012), is to cut up and reiterate fragments of the material at high speeds (using the stutter-editing technique), as well as subject it to various forms of processing, including audio transposition. In his later work as Igorrr, Serre has collaborated with musicians working in a wider range of genre contexts, including classical music and jazz, as a means of sourcing diverse recorded material for his composite multi-genre mashups. The result is not unlike Genghis Tron, although here the contrasting musical elements are presented one after the other with such rapidity that there is little chance to orient one's listening in genre terms. This can be heard, for example, in the track "Tendon" (on the album *Nostril*, 2010), which comprises a barrage of samples and passages of metal, opera, folk fiddle, and classical string ensemble, as well as speech, all interspersed with, or accompanied by, frenetic high-speed beats and samples. The latter, in particular, are a hallmark of the Igorrr style and reflect the influence of breakcore¹² in particular, which Serre suggests is the "base for mixing all the genres I love" (Ume, 2012). Like breakcore itself, Igorrr's work appears to be genre-less, and despite his claim to metal roots, there is little concern with maintaining the integrity of the metal elements he uses: "I don't know from where this idea is coming, I'm just making the thing I want to hear, I think there is no concept or something, I'm making the music I feel. I love Baroque Music, I love Metal and I love Breakcore, I'm just expressing everything at the same time" (Melo, 2012).

Another French artist who has been of equal importance in the re-situation of the metal genre in relation to DAW-based electronic music practice is Rémi Gallego, a guitarist and DAW-based musician who is known as The Algorithm. Gallego, for whom "the idea

of combining electronic music with metal just came naturally”, bases his production practice within Ableton Live, which he also uses for onstage performance. In addition to being referred to variously as “a crossover between IDM and metal” and a pioneer of “heavy computer music”, Gallego’s work has notably received the label “djent-step” (Clarity, 2011; DemiGodRaven, 2012; NewFuryMedia, 2016), implying a fusion of the djent subgenre with dubstep. In reference to this, Gallego has stated that “Metal is like my first love, and still the music genre I prefer because it conveys the violence and the intensity of feelings very well. Dubstep is like an electronic version of metal, this is why combining the two of them can bring of the best of two worlds” (Clarity, 2011). In practice, Gallego’s music is comparable to the work of Igorrr, comprising an eclectic and changeable collage of many elements, including djent-like metal riffs, blast beats, dubstep-influenced bass lines, and 1980s-style synthesizer arpeggio figures as well as samples drawn from video game music and electronic art-ists, such as Daft Punk (for a recent representative example, see the album *Brute Force*, 2016). Unlike Igorrr, however, there is a greater consistency in the preservation of stylistic coherence within individual tracks, with metal riffs and lead lines more seamlessly integrated with the electronic textures. Gallego has provided some useful insights into his creative process in an interview, including the following remarks on the influence of the DAW on his musical thinking:

I compose songs directly on the DAW (Digital Audio Workstation), like an electronic artist, and it allows me to visualize directly what I’m writing. It’s like a horizontal 2D retro game. Just imagine a character running through different universes and ambiances. In fact, this way I can actually “see” a song, it’s not just random sounds. I think I’m trying to record each song just as if it were a story full of twists. That’s why I love brutal changes, and abnormal progressions. I want each part to be unpredictable. Just like a great scenario! (Clarity, 2011)

Such comments, which recall ideas discussed earlier in relation to the visual affordances of the DAW, offer valuable clues as to the conceptual processes by which DAW-based artists, such as Gallego, Igorrr, and Geng- his Tron, have arrived at their particular juxtapositional approaches to the organization of their material.

OLD DOGS, NEW TRICKS: KORN'S *THE PATH OF TOTALITY*

Finally, it is significant that DAW-based electronic musical aesthetics have also attracted “old school” metal artists whose idiom was evolved in the more traditional band format, most notably Korn on their 2012 album, *The Path of Totality*. This was a unique project in which the band consciously attempted to experiment with metal’s genre rules through collaborations with North American dubstep artists, including Skrillex, Dutch production trio Noisia,¹³ and Western Canadian “bass” musicians Downlink and Excision.¹⁴ Lead singer Jonathan Davis’s claim that in undertaking these collaborations, the band were “fighting the fight to break a new genre through” (*Billboard*, 2011), reflected the view that despite their nu-metal origins (see Udo, 2002; Pieslak, 2008), Korn were not confined within any metal-related genre boundaries: “There’s a lot of closed-minded metal purists that would hate something because it’s not true to metal or whatever, but Korn has never been a metal band, dude. We’re not a metal band” (Giles, 2012).¹⁵ As with Gallego’s djent-step experiments, the project also appears to have been driven by Davis’s notion that dubstep had a particular affinity with metal music: “North American dubstep is the new electronic heavy metal. It’s the filthier, the better in that world, and with heavy metal, it’s the heavier the better, so it’s kind of the same thing” (Goodwyn, 2012). While some critics have been skeptical about this claim (for example Deviant, 2011), such a statement is not as far-fetched as it might seem. Excision, for example, in a 2011 Roach Coach Radio interview, revealed that his influences were a “strange” combination of metal and hip hop so “when dubstep came along it was kind of the culmination of those like heavy riffs that I liked in metal and the slower paced laid back beats of hip hop and it just kind of combined into one thing that I fell in love with and had to learn how to produce” (Scion AV, 2011; see also Davis, 2013). Downlink has also acknowledged his early rock and metal leanings prior to developing an interest in electronic music via the drum ‘n’ bass scene in the 1990s (Bass, 2012).¹⁶

The particular significance of Korn’s association with these artists lies in the fact that the project allowed them to explore creative perspectives deriving from a range of DAW production contexts.¹⁷ Indeed, in the sleeve notes to the album, Davis has included

specific thanks to Ableton Live, Native Instruments, and Novation, acknowledging the impact of their software tools on the character of what was created. In practice, the interaction between the band and their collaborators is characterized by varying degrees of synthesis of metal and DAW-situated aesthetics. In many cases, the band's approach was to build their guitar and vocal parts on sketches that had been worked out beforehand by their collaborators in the form of fragments of programmed beats, bass, and synth lines (*Billboard*, 2011). Here, Korn's strategy was to situate their metal-oriented songs in relation to these fragments, expanding the material where necessary to create more involved song structures. For example, Noisia's contribution on the track "Let's Go" was a 16-bar riff at 125 bpm, which was used as the foundation for the song's chorus, in combination with new verses written by Korn. Another track, "Sanctuary", a "pet project" with Downlink, involved Davis undertaking the programming of certain parts of the song to expand the material beyond the basic fragments he had been supplied with (Davis incidentally credits Downlink in the album's sleeve notes "for teaching me mad skills and dubstep production"). Sometimes there is greater integration of material with the band's idiom, showing that Korn were to some degree open to modifying their musical style in relation to ideas conceived in the electronic music context. This can be seen on the track, "Kill Mercy Within", generated from a 32-bar programmed "riff" written by Noisia, which Korn's guitarist Munky attempted to transfer to his instrument. Munky has remarked on the unusual character of this riff, which was "challenging to recreate" because it was "all over the neck" and unlike anything he had played before (*Billboard*, 2011).

The tracks written and coproduced by Skrillex ("Chaos Lives in Everything", "Narcissistic Cannibal", and "Get Up!"), whose work on the EP *Scary Monsters and Nice Sprites* (2010) had inspired Korn to undertake the project in the first place, constitute the most commercially effective song structures on the album and feel the most natural relative to Korn's idiom. This is unsurprising given that Skrillex had played in a post-hardcore band prior to moving into the EDM field – as Davis has commented, "he knows rock structures and it was very easy working with him" (*Billboard*, 2011). For the most part, however, the seams of the contrasting genres of metal and dubstep tend to be apparent, with Korn's sound benefitting from a kind of dubstep sonic colouration and bass heaviness, which ultimately does not compromise their essential musical aesthetic. In this way, the album recalls the remixing fad of the 1990s, when

industrial artists such as Trent Reznor and Laibach re-worked a range of metal tracks with varying degrees of success. It is this lack of integration between the two genres that has invoked the most critical consternation, as in the following comments by one reviewer: “these aren’t remixes, but two alternating components working side by side, and the end result is an awkward collision that fails to be heavy and yet is still too insistent to be mere background music” (Deviant, 2011). Compared to industrial music’s heyday of the 1990s and early 2000s, there have been relatively few examples of collaborations of this nature between established metal practitioners and contemporary electronic musicians in recent years. Indeed, it is significant that since *The Path of Totality*, Korn themselves have neither repeated this experiment nor wholeheartedly adopted modern DAW-based electronic music practices into their idiom.

IDEOLOGY, METAL AESTHETICS, AND GENRE SPECIFICITY

The comments quoted in response to Korn’s album have been fairly typical of attitudes of the metal community toward metal artists who have attempted to court electronic music aesthetics, particularly those working in the industrial and nu metal subgenres. Vince Neilstein’s comments in a recent *Metal Sucks* article discussing The Algorithm’s 2016 *Brute Force* album highlight the persistence of these attitudes in reference to the more recent examples discussed in this chapter:

Certain metalheads feel a need to shove a stick in the mud whenever bleeps and blips get anywhere within the vicinity of chugs and blasts. “Get that shit out of my metal!” And so I venture that The Algorithm will rub a lot of metalheads the wrong way within just a few seconds of pressing play. (Neilstein, 2016)

These kinds of observations draw attention to the ideological conflicts that exist within the wider community that surrounds a genre (e.g., critics, fans, record labels, and so on) and the exercise of what Fabbri calls its “competence” to validate the changes that may develop within it. Fabbri illustrates this as follows:

Let us suppose that a new musical event is brought to the public attention.

One part of the musical community, let's say the critics, can, thanks to their analytical competence codes consider it an admissible variant of a genre already known. But another part, let's say the audience, can consider a particular combination of rules to which the event conforms so unusual as to be significantly against the well-established ideology, so that the creation of a new genre is considered necessary. (Fabbri, 1982: 63)

In the present context, fans, critics, and practitioners alike have all demonstrated varying degrees of “analytical competence” in their bids to validate these metal-electronic music fusions. One strategy, as has been noted in regard to The Algorithm and Korn, is to try to make comparative relationships between metal music and the electronic musical aesthetics that are adopted in their work. This can be seen, for example, in Davis's aforementioned comments that electronic music genres such as dubstep have qualities that are somehow akin to metal in either feel or attitude, or in critic Vince Neilstein's concluding comments to his article on The Algorithm that, “It's incredibly complex music, and it's also decidedly heavy. No, it isn't for everyone, but those with an open mind about what heavy music can and should sound like will certainly find something to like” (2016).

Another approach is to sidestep the issue of the “creation of a new genre” and advocate the benefits that accrue to both parties when they explore the possibilities of unfamiliar genre rules in relation to one another. This is implied in Gautier Serre's (Igorrr) response to a question concerning metal fans' inability to react well to “artificial” metal-electronic fusions:

Metal heads are not so much open specially for the electronic music. I feel pity for this, I like Metal as much as Electronic Music, it's just two really different perspectives of music. There are really amazing things on both sides, the primitive energy of the Metal and the mathematic precision of the Electronic Music, both are very different and worth the attention. (Melo, 2012)

Fans' commentaries have also offered insightful ways of articulating the relationship

of metal/electronic music syntheses to the metal genre. In the following *Encyclopedia Metallum* review of Whourkr's *4247 Snares* album, for example, a fan employs terms such as "nihilistic", "antimusic", and "Dada" as a means of accounting for the band's avant-garde progressiveness while still acknowledging its extreme metal roots:

The term "metal" might fail to describe what this is. *4247 Snare Drums* is nihilistic antimusic, an ugly, malformed creation that dares you to hate it and exists to mock the notion of arranging sounds in a pattern. The extreme metal scene's Dada movement crystallized in the form of a single album, *4247 Snare Drums* isn't for everyone. It might not even be for anyone. (Valfars Ghost, 2015)

The question of metal's evolving genre identity in the context of contemporary musical developments has also been addressed in the academic literature by Keith Kahn-Harris, who, in an essay entitled "Breaking Metal's Boundaries" (2014), has called for an open-minded view of metal's capacity for re-contextualization. Kahn-Harris's argument hinges on the idea that the essence of the metal genre – what he terms the "inner core" – is the distorted guitar riff, which remains consistent in all metal subgenres regardless of what else changes. His purpose in reducing metal's genre rules in this way, while clearly provocative, is designed to raise the question of how much modification the genre will bear before it begins to lose its identity as metal:

Whatever metal is it almost always utilises distorted guitars that draw on a quite limited selection of riffs – this is metal's inner "core". To be sure, lite metal at one end, and grindcore at the other, differ substantially in song structure, instrumentation, timbre, vocals, tempo, lyrics and other aspects. Yet the repetition of distorted guitar riffs mobilising augmented fourths, and a limited set of other intervals, is common to both.

(Kahn-Harris, 2014)

Kahn-Harris's remarks do in certain respects cohere with the attitude adopted by DAW-based metal musicians whose perspective has been conditioned by the sampling aesthetic, which in essence concerns the abstraction and re-situation of definitive metal gestures. Kahn-Harris goes even further than this, however, in an assertion within the same essay that further innovation within metal will be concerned with the introduction of musical elements "outside this riff-based format" as well as "questioning and transforming the core itself", begging the question – what actually should remain if the genre is to be regarded as metal at all?

CONCLUSION

The foregoing commentary has highlighted a number of contexts of contemporary electronic music practice in which the compositive elements of the metal genre have been re-situated. Those artists who have pioneered the genre experiments discussed, namely Genghis Tron, Serre, and Gallego, on the one hand, exhibit a strong allegiance to traditional performance- oriented metal aesthetics. Hence, when aspects of metal's genre rules (guitar riffs, drum patterns, and so on) appear in their work, they are executed with conviction and a conscientious observance of appropriate genre conventions. However, at the same time, these metal elements have been subject to the aesthetics of computer-based electronic music production, in which context they possess a dual function as audio "objects" for re-situation alongside other, often strongly contrasting, genre tropes. This freedom to juxtapose materials is, to a certain degree, a by-product of DAW environments, whose cut and paste aesthetics are naturalized in the work of these artists, rendering the notion of genre-multiplicity unproblematic. What makes their metal re-imaginings ultimately convincing is their committed and proficient utilization of such DAW-based electronic music conventions. I have contrasted this with Korn, whose metal idiom was constructed outside the contemporary electronic music format and prior to the DAW's rise to prominence. Here the band's working approach prevented their musical identity from being reconstituted within the DAW environment, resulting in little more than a timbral re-imagining of their idiom, even with the involvement of DAW-based dubstep practitioners. Indeed, one might imagine the difference in outcome if, for example, Korn had instead provided their ideas in the form of samples to their respective collaborators. Finally, I have noted that if a sense of the metal genre is to be preserved in the light of the radical re-imaginings of its rules discussed in this chapter, it

falls to both enlightened critics and the artists pursuing these electronic music fusions to demonstrate the analytical competence to connect these new developments to the metal genre concretely.

NOTES

1. Much attention has been given, for example, to what Strachan (2017: 92) has termed the DAW's "visual affordances", namely the mode of representation of musical material within the visual domain (or GUI) of the typical DAW and the implications of this for the conceptualization of musical material and its organization.
2. The naturalization of the loop paradigm / sampling aesthetic within the DAW is in effect confirmed by the default presence within most packages of onboard libraries of pre-created audio loops, which suggest an assumption on the part of developers that the processes involved in generating them (via traditional forms of musical performance and composition) are less important to the user than their value as raw material.
3. An expression used by Marshall McLuhan to account for the tendency to employ unfamiliar new technologies in terms of older practices.
4. Other bands of this period that demonstrate such technological inclinations are Static X and Pitchshifter.
5. Regarding pronunciation, the "d" is silent, thus, "gent", as in the shortened version of the word *gentleman*.
6. As evidenced by the press attention that it had begun to attract, see, for example, Thomson (2011).
7. Meshuggah also has an additional significance where the djent subgenre is concerned, as the word *djent* itself is commonly regarded as an onomatopoeic reference to the band's powerchord riffing style.
8. See, for example, Levine's (2015) interview discussing Periphery producer Nolly Getgood's recording approach.
9. Genghis Tron emerged in 2004 with their acclaimed EP, *Cloak of Love*.

10. The Igorrr project dates from c. 2005.
11. Derek Roddy (2008: 11) defines blast beats as “an alternating single-stroke roll broken up between the kick and snare, with your ride hand generally playing in unison with the kick drum”. Blast beats are typically played at high tempos and have been associated with the death metal and grindcore scenes in particular.
12. Whelan (2008: 265–280), in an extensive discussion of breakcore aesthetics, has drawn attention to the notion of “breakcore as *method*” characterized by an “edit-tightening, plunderphonic aesthetic” and “incongruous sample juxtaposition”. Igorrr has cited the artist Venetian Snares as a particular influence on his approach.
13. A Dutch electronic music production trio based in Groningen, Netherlands, comprising Nik Roos, Martijn van Sonderen, and Thijs de Vlieger.
14. Based in Kelowna, British Columbia (as is Excision, aka Jeff Abel). Both are associated with the Rottun Recordings record label (established mid-2000s) and also members of the dubstep supergroup, Destroid. Other contributors on Korn’s album include Datsik, Feed Me, and 12th Planet.
15. Davis has indicated that it was the EDM scene’s genre fluidity and resistance to pigeonholing that appealed to him in particular, a situation which contrasted sharply with what he referred to as the “stale” (i.e., overcoded) rock genre (*Billboard*, 2011).
16. For further technically focused discussion of the musical connections between rock/metal and dubstep, see von Soggerson (2012).
17. Skrillex (aka Sonny Moore), the most high-profile collaborator on the album, was producing his tracks entirely “in the box” with Ableton Live (*Computer Music Specials*, 2011). Noisia, had evolved their “blend of Dubstep, Breaks and Drum ‘n’ Bass” (*Future Music*, 2013) using Cubase in conjunction with a range of third-party plugins, including NI Massive and Sylenth1, Toon-track’s Superior Drummer and iZotope’s Trash for “creative distortion effects” (*Future Music*, 2013; *iZotope*, n.d.). Downlink, whose influence is felt on a number of tracks on *The Path of Totality*, was producing tracks in Logic using synthesizer plugins, such as NI Massive and Sylenth 1 (Bass, 2012), while

his colleague Excision employed a combination of Cubase, Logic, Ableton, and FL (Excision, 2014) alongside NI Massive and Rob Papen's Albino and Predator synths for sound design (Excision, 2013).

BIBLIOGRAPHY

Barlindhaug, G. (2007) Analog Sound in the Age of Digital Tools: The Story of the Failure of Digital Technology. In: R. Skare, N. Windfeld Lund & A. Vårheim eds. *A Document (Re)turn: Contributions From a Research Field in Transition*. Frankfurt am Main, Peter Lang Publishing Group, pp. 73–93. Available from: <<http://munin.uit.no/bitstream/handle/10037/971/paper.pdf?sequence=1>>.

Bass, Vivien. (2012) Downlink interview for Bass Island. *Bass Island*. Available from: <<https://www.youtube.com/watch?v=ntIJWK8OLu0>> [Accessed 16 March 2018].

Bell, A. (2018) *Dawn of the DAW: The Studio as Musical Instrument*. Oxford, New York, Oxford University Press.

Bell, A., Hein, E. & Ratcliffe, J. (2015) Beyond Skeuomorphism: The Evolution of Music Production Software User Interface Metaphors. *Journal on the Art of Record Production*, 9. Available from: <<http://arpjournal.com/beyond-skeuomorphism-the-evolution-of-music-production-software-user-interface-metaphors-2/>> [Accessed 17 July 2015].

Billboard (2011) Korn Talks 'Path of Totality': Video Track-By-Track. *Billboard*. Available from: <www.billboard.com/articles/news/42333/korn-talks-path-of-totality-video-track-by-track> [Accessed 21 October 2016].

Brown, A.R. (2007) *Computers in Music Education: Amplifying Musicality*. New York, Routledge.

Christe, I. (2004) *Sound of the Beast: The Complete Headbanging History of Heavy Metal*. London, Alison and Busby.

Clarity (2011) Exclusive: Interview With the Algorithm. *got-djent.com*. Available from: <<http://got-djent.com/article/exclusive-interview-algorithm>> [Accessed 15 October 2016].

Computer Music Magazine. (2007) The CM Guide to Metal. *Computer Music*

Magazine, pp. 24–31.

Computer Music Specials. (2011) Interview: Skrillex on Ableton Live, Plug-Ins, Production and More. *MusicRadar*. Available from: <www.musicradar.com/news/tech/interview-skrillex-on-ableton-live-plugin-ins-production-and-more-510973> [Accessed 16 March 2018].

Dean, J. (2013) Fear Factory: The Making of 'Demanufacture'. *Faster Louder*. Available from: <<http://fasterlouder.junkee.com/fear-factory-the-making-of-demanufacture/847981>> [Accessed 29 October 2016].

DemiGodRaven. (2012) No Clean Singing – the Algorithm. *No Clean Singing*. Available from: <www.nocleansinging.com/tag/the-algorithm/> [Accessed 28 November 2016].

Deviant. (2011) Review: Korn – the Path of Totality. *Sputnik Music*. Available from: <www.sputnikmusic.com/review/46804/Korn-The-Path-of-Totality/> [Accessed 16 March 2018].

Duignan, M., Noble, J., Barr, P. & Biddle, R. (2004) Metaphors for Electronic Music Production in Reason and Live. In: M. Masoodian, S. Jones & B. Rogers eds. *Computer Human Interaction*. Lecture Notes in Computer Science. Heidelberg, Springer Berlin Heidelberg, pp. 111–120. Available from: <http://link.springer.com/chapter/10.1007/978-3-540-27795-8_12> [Accessed 17 July 2015].

Duignan, M., Noble, J. & Biddle, R. (2005) A Taxonomy of Sequencer User-Interfaces. *Proceedings of the International Computer Music Conference*, pp. 725–728.

Excision. (2013) I Am Excision, dubstep producer/dj/robot dinosaur – Ask Me Anything: IAmA. *Reddit*. Available from: <www.reddit.com/r/IAmA/comments/1dwbbj/i_am_excision_dubstep_producerdjrobot_dinosaur/> [Accessed 16 March 2018].

Excision. (2014) @MuffinZ_ Depends on the Song, Cubase, Logic, Ableton, FL [Internet]. Available from: <https://twitter.com/Excision/status/506650111125225472?ref_src=twsrc%5Etfw> [Accessed 16 March 2018].

Fabbri, F. (1982) A Theory of Musical Genres: Two Applications. In: D. Horn & P. Tagg eds. *Popular Music Perspectives: Papers From the First International Conference on Popular Music Research*. Gothenburg and Exeter, International Association for the Study of Popular Music, pp. 52–81.

Future Music. (2013) Noisia in the Studio With Future Music. *MusicRadar*. Available

from: <www.musicradar.com/news/tech/noisia-in-the-studio-with-future-music-581078> [Accessed 14 March 2018].

Giles, J. (2012) Korn's Jonathan Davis: 'We're Not a Metal Band'. *Loudwire*. Available from: <<http://loudwire.com/korn-jonathan-davis-were-not-a-metal-band/>> [Accessed 21 October 2016].

Goodwyn, T. (2012) Korn's Jonathan Davis: 'Dubstep Is the New Electronic Heavy Metal'. *NME*. Available from: <www.nme.com/news/music/korn-17-1258109> [Accessed 21 October 2016].

Kahn-Harris, K. (2014) Breaking Metal's Boundaries. *Souciant*. Available from: <<http://souciant.com/2014/01/breaking-metals-boundaries/>> [Accessed 16 November 2016].

Laing, R. (2011) What Is Djent? *Total Guitar*, (214), pp. 49–54.

Lentz, A. (2012) Tomas Haake: Meshuggah's Djentle Giant. *DRUM! Magazine*. Available from: <<http://drummagazine.com/tomas-haake-meshuggahs-djentle-giant/>> [Accessed 27 April 2018].

Levine, M. (2015) Tracking and Mixing With Nolly. *Audiofanzine*. Available from: <<http://en.audiofanzine.com/sound-technique/editorial/articles/tracking-and-mixing-with-nolly.html>> [Accessed 15 October 2016].

Marrington, M. (2011) Experiencing Musical Composition in the DAW: The Software Interface as Mediator of the Musical Idea. *Journal on the Art of Record Production*, 5. Available from: <<http://arpjournal.com/experiencing-musical-composition-in-the-daw-the-software-interface-as-mediator-of-the-musical-idea-2/>> [Accessed 17 July 2015].

Marrington, M. (2016) Paradigms of Music Software Interface Design and Musical Creativity. In: R. Hepworth-Sawyer, J. Paterson, J. Hodgson & R. Toulson eds. *Innovation in Music II*. Shoreham-by-Sea, Future Technology Press.

Marrington, M. (2017a) Composing With the Digital Audio Workstation. In: K. Williams & J. Williams eds. *The Singer-Songwriter Handbook*. New York, Bloomsbury Academic.

Marrington, M. (2017b) From DJ to Djent-Step: Technology and the Re-Coding of Metal Music Since the 1980s. *Metal Music Studies*, 3 (2), pp. 251–268.

Melo, F. (2012) Igorrr: Interview With Gautier Serre. *Groundcast*. Available from: <<http://groundcast.com.br/igorrr-interview-with-gautier-serre/>> [Accessed 25 March 2018].

Mooney, J. (2011) Frameworks and Affordances: Understanding the Tools of Music-Making. *Journal of Music, Technology and Education*, 3 (2), pp. 141–154.

- Mynett, M. (2013) *Contemporary Metal Music Production*. Unpublished PhD thesis. University of Huddersfield.
- Mynett, M. (2017) *Metal Music Manual: Producing, Engineering, Mixing and Mastering Contemporary Heavy Music*. New York: Taylor & Francis Group.
- Neilstein, V. (2011) The Latest Metal Micro-Genre Bastardization: Dubstep + Djent = Djentstep. *MetalSucks*. Available from: <www.metalsucks.net/2011/02/16/the-latest-metal-micro-genre-bastardization-dubstep-djent-djentstep/> [Accessed 14 October 2016].
- Neilstein, V. (2016) 'Pointers' on How to Be Both Metal and Electronic at the Same Time From the Algorithm. *MetalSucks*. Available from: www.metal-sucks.net/2016/03/11/pointers-on-how-to-be-both-metal-and-electronic-at-the-same-time-from-the-algorithm/ [Accessed 29 March 2018].
- NewFuryMedia (2016) Featured Interview: The Algorithm (Remi Gallego). *The New Fury*. Available from: <<http://thenewfury.com/wordpress/featured-interview-algorithm/>> [Accessed 15 October 2016].
- Pearson, C. & Mullane, L.O. (2014) The Ultimate Guide to Producing Dirty Dubstep – Part One. *MusicTech*. Available from: <www.musictech.net/2014/10/dirty-dubstep-1/> [Accessed 16 March 2018].
- Phillipov, M. (2012) *Death Metal and Music Criticism: Analysis at the Limits*. Lanham, Lexington Books.
- Pieslak, J. (2007) Re-Casting Metal: Rhythm and Meter in the Music of Meshuggah. *Music Theory Spectrum*, 29 (2), pp. 219–245.
- Pieslak, J. (2008) Sound, Text and Identity in Korn's 'Hey Daddy'. *Popular Music*, 27 (1), pp. 35–52.
- Ratliff, B. (2008) Genghis Tron – Board Up the House. *New York Times*. Available from: <www.nytimes.com/2008/02/18/arts/music/18choic.html> [Accessed 25 March 2018].
- Roddy, D. (2008) *The Evolution of Blast Beats*. Pembroke Pines, FL, World Music 4all Publications.
- Scion AV (2011) *Excision – Interview With 12th Planet of Roach Coach Radio*. Available from: <www.youtube.com/watch?v=6jsXNCnn0-o> [Accessed 16 March 2018].
- Shelvock, M. (2013) The Progressive Heavy Metal Guitarist's Signal Chain. In: Hepworth-Sawyer, J. Paterson, J. Hodgson & R. Toulson eds. *Innovation in Music*. Shoreham-by-Sea, Future Technology Press, pp. 126–138.
- Strachan, R. (2017) *Sonic Technologies: Popular Music, Digital Culture and the Creative*

Process. New York, Bloomsbury Publishing USA.

Surachai Workspace and Environment: Genghis Tron. (2008) *Trash_Audio*. Available from: <<http://trashaudio.com/2008/03/workspace-and-environment-genghis-tron/>> [Accessed 25 March 2018].

Thomson, J. (2011) Djent, the Metal Geek's Microgenre. *Guardian*. Available from: <www.theguardian.com/music/2011/mar/03/djent-metal-geeks> [Accessed 3 February 2017].

Udo, T. (2002) *Brave Nu World*. London, Sanctuary.

Ume (2012) MxCx Interview#1 'Igorrr'. *MxCx Blog*. Available from: <<http://mxcxtokyo.blogspot.co.uk/2016/09/this-interview-was-recorded-on-november.html>> [Accessed 25 March 2018].

Valfars Ghost (2015) What Insanity Sounds Like. *Encyclopaedia Metallum: The Metal Archives*. Available from: <www.metal-archives.com/reviews/Whourkr/4247_Snare_Drums/339803/> [Accessed 8 April 2018].

Vivien Bass (2012) *Downlink Interview for Bass Island*. Available from: <www.youtube.com/watch?v=ntIJWK8OLu0> [Accessed 16 March 2018].

von Soggerson, J. (2012) Electronic Music Theory: From Funk and Metal to Dubstep. *Dubspot Blog*. Available from: <<http://blog.dubspot.com/electronic-music-theory-from-funk-and-metal-to-dubstep-excision-rage-against-the-machine/>> [Accessed 16 March 2018].

Walser, R. (1993) *Running With the Devil: Power, Gender, and Madness in Heavy Metal Music*. Middletown, CT, Wesleyan University Press.

Weinstein, D. (2000) *Heavy Metal: The Music and Its Culture*. New York, Da Capo Press.

Whelan, A. (2008) *Breakcore: Identity and Interaction on Peer-to-Peer*. Unabridged edition. Newcastle, Cambridge Scholars Publishing.

Williams, D. (2015) Tracking Timbral Changes in Metal Productions From 1990 to 2013. *Metal Music Studies*, 1 (1), pp. 39–68.

Zagorski-Thomas, S. (2014) *The Musicology of Record Production*. Cambridge, Cambridge University Press.

DISCOGRAPHY

Algorithm (2012) *Polymorphic Code*, Basick Records.

Algorithm (2016) *Brute Force*, FiXT.

Animals as Leaders (2009) *Animals as Leaders*, Prosthetic.

Downlink (2010) *Crippled Camel*, Rottun Recordings.

Excision (2013) *X Rated: Remixes*, mau5trap.

Fear Factory (1993) *Fear Is the Mindkiller*, Roadrunner. Fear Factory (1995) *Demanufacture*, Roadrunner.

Fear Factory (1998) *Obsolete*, Roadrunner.

Genghis Tron (2008) *Board Up the House*, Relapse Records.

Igorrr (2010) *Nostril*, Ad Noiseam.

Igorrr (2012) *Hallelujah*, Ad Noiseam.

Igorrr (2017) *Savage Sinusoid*, Metal Blade Records.

Korn (2011) *The Path of Totality*, Roadrunner.

Noisia (2010) *Split the Atom*, Vision Recordings.

Periphery (2010) *Periphery*, Roadrunner. Periphery (2011) *Icarus*, Roadrunner.

Skrillex (2010) *Scary Monsters and Nice Sprites EP*, Big Beat Records/Atlantic.

Slipknot (1999) *Slipknot*, Roadrunner.

Tesseract (2011) *One*, Century Media.

Various (2011) *Metal Hammer Presents Djent*, Future Publishing [Online]. [Accessed 3 December 2016].

Various (2012) *Basick 2012 Free Sampler*, Basick Records [Online]. Available from: <<http://music.basickrecords.com/album/basick-2012-free-sampler>> [Accessed 19 October 2016].

Whourkr (2008) *Concrete*, Crucial Blast.

Whourkr (2012) *4247 Snare Drums*, Ad Noiseam.