What Do We Know that Varèse Didn't?

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This article reflects on significant technological, musical and cultural processes that took place since Varèse envisioned the concept of *organised sound*: understanding these processes may provide a strategic vantage point from which to gain insight into our evolving attitude to modern aesthetic and technological development and thus formulate informed strategic decisions concerning our relationship with the latter. The discussion begins by focusing on technological processes, including accelerated change, cycles of enhancement, obsolescence, retrieval and reversal, and the non-neutrality of technology. This is followed by a focus on musical issues resulting from the decoupling of sound control from sound production, interactivity, the expansion towards time-based media and the possible active role of audiences in the realisation of music. Discussion is then posited within the wider cultural context of modernism and the postmodern era, the eroding popular/art divide and the obsolescence of music as a cultural artefact resulting from technological change. This leads to the conclusion, which identifies tentative learning outcomes that may be helpful in formulating future strategic decisions.

1. WHAT DO WE KNOW?

Do we know something Varèse did not know? Indeed we do! We use technologies he could only dream of. We have listened to music that might possibly escape his acute and imaginative inner ear; often, we can access archived realisations of such music at will.[1] We might be in the midst of something resembling Attali's era of *composition*, in which music 'emerges as an activity … that creates its own code at the same time as the work' (Attali 1985: 135) and individuals are able to create their own tools.[2] Immediate global access to musical documentation, resources and alternative distribution channels is now able to foster creative diversity and the easing of constraints resulting from market forces currently operating in a centralised music industry model. The popular/art schism, which reached a peak during Varèse's lifetime, seems to be eroding, especially where it matters most – that is, musical content.

We are also experiencing a turbulent age that might resemble Varèse's time during the interwar period, rather than the postwar growth and development of his later life.[3] However, this resemblance is superficial, since the interwar period was part of a process involving the conflict between old European and Asian colonial powers, and the emergence of new geopolitical players (e.g. the USA and the Soviet Union), whereas our epoch is witnessing a subsequent process of political, social and economic reconfiguration in response to a global system of premises that assumes inexhaustible financial and natural resources.[4]

We have the benefit of hindsight provided by sixty years of creative experience during a period of unprecedented technological development in the sonic arts. This provides an opportunity to understand achievements, learn from oversights and mistakes, and begin to form a critical attitude that may help us channel future technology for creative pursuits. In this spirit, the following sections will identify and examine relevant issues that have posed emerging challenges on creativity in the past and will probably remain relevant in the future.

2. TECHNOLOGY

Our understanding of the effects of technology has increased significantly since the second half of the twentieth century. While there are many nuances and ramifications to the way we have come to understand these, it is possible to identify three encompassing issues, consisting of the accelerated pace of development, its conceptualisation within a cycle of stages and its biasing of creative thinking and practice.

[1]For instance, through online resources such as *YouTube* (www.youtube.com) and *Vimeo* (https://vimeo.com/) (accessed on 10 June 2014).

[2]This is true for public domain software forums and users (e.g. *LinuxMusicians*, http://linuxmusicians.com, and *Sourceforge*, http://sourceforge.net (accessed on 10 June 2014)), applications created for the design of musical processes and software instruments (e.g. *MAX*, http://cycling74.com; *PD*, http://puredata.info; *SuperCollider*, www.audiosynth.com; *Common Music*, http://commonmusic.sourceforge.net; *Reaktor*, www.native-instruments.com/en (accessed on 10 June 2014)); the hosting of plug-ins by a constellation of music software packages and mobile platform apps.

[3]During the late 1920s and 1930s Varèse had difficulties in engaging support for the establishment of an electronic music studio and related projects such as the Dynaphone (Manning 1993: 8–10).

[4]For a historical analysis of the current global financial crisis see Gokay and Whitman (2009).

Organised Sound **26**(1): 23–29 © Cambridge University Press, 2015. doi:10.1017/S1355771814000387

https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press

2.1. Ever increasing pace

The pace of technological development has been accelerating at an unprecedented rate. This has affected the functioning of slower-changing social, political and cultural structures in general (Toffler 1970, 1980), and musical creativity in particular. For instance, compare the pace of change in roughly sixty years following the 1877 invention of sound recording by Thomas Edison and Charles Cros (Wikipedia 2014), and the subsequent sixty years since Pierre Schaeffer's initial experiments. The first period saw the relatively slow development of sound recording and reproduction up to the first creative uses of magnetic tape and the invention of the first electronic instruments (Manning 1993: 1–16), which were mostly modelled on existing acoustic instruments and/or intended to be used as the latter.[5] In comparison, the following sixty years witnessed diverse parallel developments which, as technology improved, became more complex, sophisticated and faster, thus allowing new approaches to composition and performance to emerge. Technological developments include improved sound capture, audio synthesis and processing in deferred and real time, automated device control from analogue devices and MIDI, to an expanding set of interfaces for musical expression, customisable music software,[6] and the customisation of devices originally unintended for musical purposes.[7] These, in turn, enabled a flourishing of the aesthetics and methods of all forms of sound-based music (Landy 2007: 17) such as acousmatic composition, electronica, visual music,[8] computer-aided composition,[9] live processing and interactivity,[10] and music-making between participants in virtual spaces and remote locations.[11]

The assimilation of such technologies into the sonic arts may be conceptualised as a succession of '"waves" of response … a "first wave" response might be to embrace the most immediately "seductive" or accessible characteristics of the technology in a relatively "uncritical" manner – what may be regarded as a "line-of-least-resistance" approach to producing with digital means' (Waters 2000: 2–3). This is counterbalanced by more critical approaches which constitute a 'second wave', varying from full embracement of technologies and their use to enhance and revitalise pre-existing aesthetic premises, to the negation of the latter in favour of new aesthetics and shifts of artistic focus (e.g. shift from content to medium). Regardless of these differences, it is often in these second-wave approaches that imagination and creativity find their most original realisations. However, critical responses require time to germinate and mature within a process fraught with trials and errors as they consolidate. Therefore, accelerated technological development and corresponding obsolescence of predecessor technologies pose a potential danger to such blooming since they deprive creators from the temporal span required to nurture a critical approach.

2.2. Ever decreasing cycles

McLuhan and Powers developed a *tetrad* metaphor for understanding the effect of technological development, which 'is applicable to the full range of human artifacts, whether hardware (objects) or software (ideas)' (Mc Luhan and Powers 1989: 7). The tetrad takes into account both *figure* and *ground*: figure is considered to be 'an area of psychic attention', whereas ground is a type of 'cognition which senses all figures in the entire environmental surround at once'. Thus, 'every new artifact, whether idea or object, reshapes the environment as it impacts upon it as figure against ground; yet, at the same time, the ground is being altered and eventually reshapes how the artifact is used' (Mc Luhan and Powers 1989: 180). The tetrad consists of four interacting processes: 1) the artefact *enlarges* or *enhances* something; 2) it *obsolesces* something; 3) it *retrieves* something that was obsolesced earlier; 4) it *reverses* or *flips* into something else 'when pushed to the limits of its potential' (Mc Luhan and Powers 1989: 9). This is exemplified in the case of cash money: it 1) *enhances* the speed of transactions; 2) *obsolesces* barter; 3) *retrieves* conspicuous consumption – the display of wealth; 4) *reverses* into credit or non-money, in which the image of wealth becomes more important than actual wealth (Mc Luhan and Powers 1989: 41–42, 173).

These processes have also been affected by technological acceleration, which has decreased the duration of a full tetrad cycle. For instance, in the relatively short time since the rise of the mobile phone (which enhances telephony's oral communication, obsolesces written communication and retrieves mobility), it seems to have flipped back into written communication through the popularity of texting, to an extent that it is often easier to communicate (and obtain quicker responses) by texting, rather than trying to have a voice conversation. A similar case could be made about the

[5]Even revolutionary devices such as the theremin and *ondes Martenot* were generally used as tempered instruments by virtuosi such as Clara Rockmore (Rockmore 1987; Rhea 1989) or together with extended instrumental techniques: for instance, in Messiaen's *Turangalîla*.
[6]See note 2.
[7]Laptops, mobile phones, game controllers, optical and infrared cameras, wearable controllers bio-signal monitors, etc.
[8]See for instance Battey and Fischman (2013).
[9]From algorithmic software running in mainframes (Manning 1993: 233–7; Bohn 2006; Ariza, 2011) to real-time composition (Eigenfelt 2011) and comprovisation (Paine 2009).
[10]From the manipulation of captured sound by means of 'black-boxes' to new modes of interactivity, sound-sculpting using gestural devices, DJ-ing and VJ-ing.
[11]Pioneered by *LiveJam* (Waters 2000), improvements in latency make it possible to envisage realistic music-making between performers in remote locations: for instance, through LOLA, https://community.ja.net/groups/arts-and-humanities/article/lola-low-latency-audio-visual-streaming-system (accessed on 2 June 2014).

https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press

World Wide Web, perceived as the most important archetype of freedom of expression and democracy, which is now the focus of a silent global conflict[12] that might cause its flip into an instrument of surveillance and oppression, as suggested by Edward Snowden's 2013 revelations (Wikipedia 2014b, Electronic Frontier Foundation 2014).

In this context, it is possible to reflect on the rising popularity of *live coding* as a case study of contemporary music making: following the introduction of multitasking and graphic interfaces in musical software during the 1980s, and their subsequent increasing sophistication, live coding practice has reverted to computer terminal typing in order to perform live music. The important issue here is not whether live coders prefer a particular interface, but rather that the latter is intrinsically linked with the musical attributes and processes of the performed works. It should be noted that all this happened in less than thirty years.

2.3. The non-neutrality of technology

Technology is not neutral. It influences behaviours, strategies and decisions: 'the tools of realisation [of a musical work] tend to elicit forms of normative behaviour determined in part by tradition but also, and more significantly, by the architecture and design of the various components present in the production chain' – in other words, the technology used to realise the work (Vaughan 1994: 111). Awareness of this non-neutrality is important when making strategic decisions about musical content and its realisation, especially if it is possible to have some choice in the selection of technologies. Conversely, conceptions and strategies, and, in general, poietic decisions are influenced by previous technological use and experience. Therefore, decisions on our commitment to particular technologies and the desirability (or not) of a 'second wave' technological response require careful consideration.

3. MUSIC

Musical issues that have come to the fore since Varèse's time resulted from the severance of physical causality between musical gesture and corresponding output, interactivity, immersion and the widening of media used in the creation of music.

3.1. Decoupling of sound control from sound production

Technological development enabled the decoupling of *sound control* from *sound production* (Sapir 2000; Wanderley 2001). This had an immediate impact on composition and performance because it highlighted the potential loss of causal logic and lack of *expression*[13] when performers' gestures cannot be associated with sonic outputs. While a thorough discussion is beyond the scope of this article,[14] it is important to point out that it presented challenges to the double role of gesture as 'symbolic function of sound', and 'object of composition' (Cadoz 1988), and emphasised the role of *mapping*[15] in creating convincing *metaphors*[16] (Sapir 2000) that facilitate *transparency*.[17]

Concerns with mapping, metaphor and transparency are conspicuous in the literature and practice of physical gestural controllers[18] and have also influenced less obvious areas such as live coding: for instance, in the case of *Pea Soup*, by BEER,[19] a strong metaphor emerges of performers shaping the constituents of a single sonic entity passed around between them by means of a network, as if they were all sculpting a big common object (Wilson, Lorway, Coull, Vasilakos and Moyers 2014).

3.2. Interactivity

The advent of digital controllers combined with improving computer sophistication fostered the development of interactivity (Chadabe 1984; Rowe 1993; Winkler 1998): technology has become more than a musical tool; it is now a partner that participates in the act of making music and responds to the actions of its human counterpart, imbued with increasingly refined algorithmic behaviours. Interactivity has been extended to audiences through technologies that require little training for basic use and allow skill development through practice (Levitin, McAdams and Adams 2002). In parallel, videogames developed a type of interactive 'performance' which has many commonalities with music interactivity. Admittedly, there are ontological differences between gaming per se and an artistic experience (i.e. pleasure uniquely derived from overcoming challenges within competition as opposed to aesthetic achievement and pleasure). However, this is a matter of content rather than technology or mode of realisation: the gaming paradigm is readily applicable to music interactivity and already has a potential interactive 'audience' in a 'videogame generation that prefers

[12]For instance, through legislation, e.g. the recent amendments to the USA's Foreign Intelligence Surveillance Act (FISA); see Federation of American Scientists (2013).

[13]'The act of communicating meaning or feeling' (Fels, Gadd and Mulder 2002: 110).

[14]See Fischman 2013.

[15]'The correspondence between gestures or control parameters … and sound generation or synthesis parameters' (Levitin, McAdams and Adams 2002: 183).

[16]Emulation of existing gestural paradigms from our lived experience.

[17]The psychophysiological distance between the intent to produce an output and its fulfilment through some action (Gadd and Fels 2002).

[18]See NIME proceedings and performances, www.nime.org (accessed on 5 June 2014).

[19]Birmingham Ensemble for Electroacoustic Research, www.birmingham.ac.uk/facilities/BEAST/research/Birmingham-Ensemble-for-Electroacoustic-Research.aspx (accessed on 5 June 2014).

https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press

interactivity and, although lacking formal musical training, already possesses appropriate strategic and motoric performance skills' (Fischman 2011: 53). For instance, music may be performed as a result of video game play: an equivalent of a *videogame score*.

3.3. Organised media – *SiiMe*

The conception of music as *organised sound*, resulting from the embracement of all possible sonic sources during Varèse's time, led to the incorporation of other media. Following the emergence of film, animation and visual music, this has been propelled beyond the Wagnerian ideal of *Gesamtkunstwerk* as a consequence of developments in interactivity and immersion. Historically, their integration within a single entity in literature has proved problematic; however, interactivity and immersion create strong synergy when incorporated in electronic media (Ryan 2001), and music is no exception: this is readily reinforced by the seamless adaptation of modern gesture controllers and interactive behaviours. In fact, there are initial glimpses of multimedia realistic physical experiences: for instance, a recent British television programme[20] featured the fully immersive multi-modal gaming experience of *Battlefield 3*,[21] combining a variety of technologies, including a multidirectional treadmill, haptic feedback, player tracking, surround sound and vision, automated lighting and so on.

Organised sound has therefore become *organised media* in the sense of a *structured interactive immersive musical experience* (SiiMe): users may advance at their own pace and choose their own trajectory through a musical work, but have to act within its rules and constraints towards a final goal – its performance. In principle, SiiMe can be *structured* as rules and physics of videogames that are applied to musical creativity,[22] and participation in such experiences may take place in both real and virtual spaces, as modern augmented-reality transmutations of the concert hall or leisurely parlour.[23]

[20] *The Gadget Show*, http://vimeo.com/39568309 (accessed on 5 June 2014).
[21] www.battlefield.com/uk/battlefield3 (accessed on 5 June 2014).
[22] In fact, a whole genre of music videogames is now accessible to a wide population. These could be categorised as games in which: 1) users join existing music (e.g. *Singstar*, www.singstar.com; *Guitar Hero* and *DJ Hero*, www.activision.com (accessed on 8 June 2014)), 2) users 'play/conduct' existing instruments (e.g. *Wii Music*, www.wiimusic.com (accessed on 8 June 2014)), 3) music reflects the game state and/or is part of the story (e.g. *Rez*, www.qentertainment.com/eng/cc0000/cb5000, and *Child of Eden*, http://child-of-eden.uk.ubi.com (accessed on 8 June 2014)), and 4) games in which the user can set rules to create music (e.g. *Electroplankton*, www.nintendo.com/games/detail/vIcd8IzmfPyv9Vze-EWv7IC-xEJPoHup (accessed on 8 June 2014)). However, with the exception of the latter (albeit limited in musical scope), these are videogames which feature music, rather than music-making that involves gaming.
[23] Remote play is already a reality in videogames, e.g. *Battlefield*, www.battlefield.com, and *GTA* www.rockstargames.com/grandtheftauto (accessed on 9 June 2014).

3.4. Extra-collaborative work

Broadening of media and mode of interaction (e.g. gaming) has an effect on an artistic approach in which the creation of a work requires the involvement of more than one collaborator. This may be due to the need for a wide range of skills and expertise which are rarely found in a single individual or, simply, because of the physical impossibility of a single individual realising all its aspects within a reasonable time-span. Collaborative work can be traced to the origins of opera and happens as a matter of course in theatre, film/animation, visual music and gaming. However, out of all these, the latter has widened participation to include the audience as an essential partner in this collaboration: without the player, there is no instantiation of the game. Therefore, the former becomes a partner in its realisation: an extra-collaborator.

4. CULTURE

Science, technology and art have altered our perspectives, from the recognition of non-predominance of Western culture resulting from globalisation to our ideas of progress. This, in turn has influenced the modernist and postmodern conceptions, and perceptions of low and high art. Furthermore, technological obsolescence has questioned the longevity of the artistic output that same technology help to produce.

4.1. Cultural progress

The realisation that technological development is not a unidirectional process leading to the bettering of humankind effected a major change in the twentieth century mind-set. For instance, global warming and nuclear annihilation highlighted serious problems resulting from scientific and technological innovations. Therefore, the Hegelian ideal of humanity advancing dialectically towards perfection was seriously challenged. This, in turn, has been reinforced by new scientific approaches, such as the application of chaos theory to weather systems and, in a more fundamental way, the challenge to determinism and objectivity brought about by quantum mechanics and relativity.

This conceptual shift can be applied to the emergence of the postmodernist attitude following modernism and the avant-garde. Furthermore, technological acceleration has contributed to the challenge of elitist views of the musician through the rapid democratisation of computer hardware and software, allowing a wide base of individuals (at least in the developed world) to create music, possibly entering Attali's era of composition.[24] This process has affected musical content due to its

[24] However, it is important to differentiate between the artist's critical approach to society and her/his conceptualisation as a trail blazer and visionary of a future that is not yet apparent to

https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press

pluralistic inclusivity of styles, genres, historical periods, materials and practices. As a result, it has lifted a tacit barrier that the condition of 'newness' posed to artistic legitimacy[25] in the modernist view. Although this presents advantages as well as dangers, one positive outcome is that it reduces the possibilities of a superficial obsession with 'newness' that may lead to an exclusive first-wave approach.

4.2. Crossing the divide

The postmodern challenge is also manifested in an erosion of the popular/art schism. For instance, works by electronic creators such as Laurent Mialon (aka La Peste),[26] Neurocore,[27] Autechre,[28] Aphex Twin[29] and Biosphere[30] would easily fit in a contemporary acousmatic concert, while acousmatic creators are not segregated in contexts outside electroacoustic music: when asked about his favourite artists in an interview given to the online publication *Bass Distortion Zine*, Neurocore provides an interesting list, stating that he particularly appreciates 'Zbigniew Karkowski, Laurent Mialon, Bernard Parmegiani, Krzysztof Penderecki, Duncan Avoid [and] Pink Floyd', and adds a statement that could have easily come from Varèse or Xenakis: 'Musically I'm opened to all kind of acoustic vibrations, from thunderstorms to peaceful nature, from piano to brutal noise. To quote A. Tomatis: "Everything is sound"!' (Kinnunen 2011).

4.3. Musical obsolescence

In a postmodern environment, music may seem immune from obsolescence. However, works that are strongly dependent on technology that becomes obsolete are bound to cease being performable unless remedial action is taken. For instance, early acousmatic tapes had to be digitised not only because of the degradation of media but also because of increasing difficulties in finding appropriate reproduction equipment. Even after digitisation, changing storage media has forced a continuing transference to successive technologies, including digital audio tape, CD, DVD, flash storage, networked servers and so on. The situation becomes more complex for live electronics because of the variety of equipment used and its often shorter shelf-life: for instance, popular devices used for live processing less than twenty years ago[31] are now rare 'museum pieces'. Emmerson has discussed this issue in detail, pointing out that, in addition to not having access to the original technology, it is difficult to ascertain how to perform old live electronics works because of the lack of appropriate documentary materials: a traditional score cannot provide enough information, often requiring additional knowledge encapsulated in sound recordings, video documentation of performances and so on. Initially, these issues could be solved through direct contact with the composers; however, as time passes, composers may not be alive and able to 'describe, elucidate and explain the repertoire that they created' (Emmerson 2006: 209). Emmerson acknowledges that in many cases it may be possible to port old technology to newer devices, but this may introduce problems of authenticity; for instance, due to idiosyncrasies of the older equipment that may be inseparable from the aesthetics of the work or because of extra-musical issues (e.g. the visual tension created by a physical tape loop on stage, which disappears when the loop is executed inside computer hardware). Finally, he addresses a wider issue concerning the will to preserve this music as part of our cultural heritage and the pragmatics of doing so.

5. CONCLUSIONS

The discussion in this article has identified contemporary issues resulting from technical, musical and cultural processes, which affect creative thinking and practice. Recognising these and examining our past behaviour is a first step towards learning from our experience and formulating future strategic decisions. While such decisions may vary from individual to individual depending on aims and aesthetic preferences, they may also have commonalities resulting from shared cultural experience. In this spirit, the following conclusions suggest possible considerations when making strategic decisions, rather than formulating complete strategies that may or may not suit specific individual aims: there are no better or worse approaches as long as decisions are made on an informed basis.

(Fnote continued)
ordinary beings: the former is still very much alive within the contemporary mind-set, while the latter has lost credibility.

[25]In other words, if it is no new, it is not art.

[26]For example, video of live performance at www.hangars-liquides.com/video (accessed on 29 May 2014), which begins with a noise-based texture that becomes increasingly beat driven as the work progresses.

[27]For example, *Relativite Du Sommeil Paradoxal*, www.youtube.com/watch?v=yn7Cc0l2SyI&index=1&list=PL123B4A36CF310ABE (accessed on 29 May 2014), which manipulates vocal samples in ways akin to electroacoustic procedures, articulating tension and relaxation by means of iterative textures of various speeds in counterpoint with more effluvial pitched material (and not through rhythmic development of phrases as in traditional electronica approaches).

[28]For example, the irregular rhythmic structures in *Rae*, www.youtube.com/watch?v=p745327ziEo (accessed on 29 May 2014), which, as it slows down during the middle section, includes heavily distorted sonic material.

[29]For example, the *Windowlicker* video, www.youtube.com/watch?v=7MBaEEODzU0 or www.muzu.tv/aphex-twin/windowlicker-directors-version-music-video/475311 (accessed on 29 May 2014), which contains extended passages of timbral development.

[30]For example, *Cimmerian Shaft*, www.youtube.com/watch?v=UGj4f-tc97k (accessed on 29 May 2014), which articulates discourse timbrally as much as harmonically.

[31]For example, Yamaha SPX-900 and SPX-1000 multi-effects units.

https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press

One of the most salient aspects identified in the previous discussion is the immutability of change, its acceleration and its tetradic cyclical nature. These were not as significant when change was slow enough compared to our average life span because, from the latter's point of view, things were relatively stable. However, as shown above, acceleration has now brought these within human timescales and, faced with this situation, we have to consider them when choosing our options. Focusing more specifically on our attitude to technology, we may purposefully adopt a first-wave response, riding on the back of change as this presents itself to us; alternatively, we may resist it altogether. It is also possible to adopt an exploratory attitude by embracing a particular technological strand and experimenting with its affordances and limitations until it is exhausted. Of course, it is worth considering the prognosis for the longevity of the chosen technology, not only from the point of view of the feasibility of its future availability but also concerning its reproducibility by others in the present and future (assuming that these matters are important to us).

A possible approach to counteracting accelerating technological change consists of shifting the focus to aesthetic content and form.[32] Instead of creating these as a consequence of affordances offered by particular devices or media, content and form may be formulated on the basis of an evaluation of existing technology and an informed estimation of future developments, establishing an invariant that underpins and channels change. A series of stages can be devised that may progress towards the final aim as changing technology progressively enables them. For instance, *SiiMe* embody this approach since there are now technologies that enable interactivity and audiovisual immersion, and it is reasonable to expect that in the future these will be integrated with true 3D visuals, haptics, more sophisticated machine intelligence, and more effective and seamless sensors/controllers. As is evident in this example, the significant advantage of our times in comparison with Varèse's is that there are already enough technologies that allow us to begin the realisation of such aesthetic aims and to make informed long-term planning decisions.

But even if we do not adopt a long-term aesthetic-driven model (e.g. because the current content and form already conform to our long-term aesthetic aims), it might make sense to consider the *adaptation* of existing technology rather than invention from scratch: an intelligent investment of forces and resources, and an awareness of the capabilities of existing technologies may save time and effort. On the other hand, we may accept, or even desire from a conceptual point of view, the obsolescence of the musical work, matching corresponding technological change.

From the musical point of view, there is scope to embrace a more holistic definition of music as *organised media*. The boundaries with other artistic forms (theatre, cinema, animation, etc.) have already been blurred, and mechanisms from other disciplines (e.g. videogames) may be used successfully to integrate multimedia and implement interactive immersion in real and virtual spaces. We can begin to take advantage of technology in order to enable active music-making that involves all levels of proficiency (from professionals to people without musical training) without sacrificing quality or sophistication.

Culturally, we are fortunate to live in a pluralist period. The erosion of a musical *lingua franca* (Fischman 1994: 247–8) enables postmodern cross-fertilisation between disparate materials, genres and periods, promising content diversification and contributing to the blurring of the art/popular divide. Immediate global access to music documentation, resources and alternative distribution channels can potentially foster creative diversity and the easing of constraints resulting from market forces currently operating in a centralised music industry model. At the same time, they also present the danger of stifling creativity resulting in a uniform culture of indistinctive musical output,[33] a cultural *grey goo.*[34] It is also worth remembering that too few constraints can pose creative problems: for instance, when establishing semiotic networks within which the public constructs meaning. In other words, if audiences do not know the conventions within which symbols (in this case musical materials) are articulated, they may have difficulty constructing meaning from their organisation into a musical work. We learned this the hard way when expecting unprepared audiences to 'decode' acousmatic music that articulates timbral development and transformation.

The last few decades have been fertile ground for creative activity and the twenty years elapsed since the appearance of the first *Organised Sound* issue have seen this activity flourish and diversify. However, it is for this very reason that it might be useful to pause briefly and remind ourselves of the human aspect of organised sound/media: it is a *total social fact* (Nattiez 1990: 42). It is more than the sole organisation of materials. Therefore, without human presence, whether this is as a passive observer or a fully immersed participant, there is little point in concerning ourselves with the issues discussed in this article: music is created and realised by humans for humans.

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[32]Form in the sense of structure, medium and mode of delivery.

[33]For a detailed discussion on the prospects for uniformity and diversity see (Emmerson 2001, 2007: 61–88; Fischman 2008).

[34]A cultural equivalent of 'a destructive strand of microscopic machines step out of human control, feeding on organic matter until the earth becomes a barren surface of abandoned edifices and no life (except, perhaps, for grey goo itself…)' (Fischman 2008: 46).

https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press

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https://doi.org/10.1017/S1355771814000387 Published online by Cambridge University Press