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Histories and Affordances

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There are many different traditions that could be signified by ‘composing with electronics’, spanning the twentieth and twenty-first centuries and located across traditions of art musics, popular musics, and even work that is outside of that designated as musical practice, such as in radio studios. The title of this chapter might suggest several traditions: one of combining electronic sounds and tools with acoustic instruments; one of composing with electronic instruments; one of designing and creating electronic tools; or even one of the many DIY music cultures that combine aspects of these approaches. All of these compositional outcomes are ‘electronic’ in the sense that they employ circuits at some stage in the creative process. However, the difficulties inherent in such a description are self-evident: the presence of electronic circuits in music-making says nothing of the sound of this music, the traditions that may have influenced it, or the intentions and interests of its composers’ nor the motivations behind the compositions themselves. Rather, through several historical examples from the mid-twentieth century and three contemporary examples, I here explore a range of approaches, motivations, and sounding results across examples of electronic music that give an idea of the plurality that is – and has always been – present within this area of composition.

The histories of composing with electronics are many and varied. To offer some potential definitions of what composing with electronics might be, and some examples of the diversity of its practice, I sometimes use the terms ‘composing with electronics’, ‘electronic music’, and ‘electroacoustic composition’ interchangeably, while at other times noting that these terms inspire different definitions and aesthetic categories. In addition, I survey some the affordances that composing with electronics offers, such as control over sound morphology and spatialisation; the types of sounds employed and the traditions of making them, including sampling, processing, and synthesis; and the composers of this music and their musical histories. Finally, I briefly examine questions of whether new materials require new modes and means of composition, and whether the availability of electronic means have led to equality of access and representation within

composition of this nature. This brief survey therefore also addresses what plurality within the history of electronic music has to contribute to the understanding of multiplicity in these musical practices today.

Definitions and Elements

To describe unifying elements in electronic music is almost an impossible task. Makis Solomos attempts to do something close to this in the book *From Music to Sound*, describing electronic means as a key component of what he identifies as ‘the emergence of sound in music’.¹ While his book is not focused on electronics, Solomos notes that in electroacoustic music – defined by Simon Emmerson and Dennis Smalley as ‘[m]usic in which electronic technology, now primarily computer-based, is used to access, generate, explore and configure sound materials, and in which loudspeakers are the prime medium of transmission’² – material is ‘sound and form, formal and narrative model, insignificant matter and mysterious sound body with multiple connotations’.³ Here, one might note the ways in which composing with electronics and composing with sounds (as opposed to notated pitches, or musical sounds that emanate from acoustic instruments) are often conflated. Solomos’s categories of sound practice, focused on timbre, noise, listening, immersion, composing sounds, and sound-space respectively,⁴ could similarly frame any discussion of composing with electronics, each of these categories offering multiple strategies for either analysing electronic works or for creating them.

Despite their focus on broad musical and/or sonic categories (and also being written nineteen years apart), the English-language translation and revision of Solomos’s book and Emmerson’s and Smalley’s review article hold in common something that is true of many histories and descriptions of electronic music practices: their examples are drawn from a canon of primarily white, Western, male composers with very little reference to the work of women, composers working outside of Western Europe and America, or work originating from outside of art music traditions, even when all of these are acknowledged to have influenced and cross-fertilised art musics that are made with electronics. As a result, it has become possible to describe ‘alternative’ histories of electronic music, this also becoming the title of a special issue of the journal *Organised Sound*. The editors of that issue, James Mooney, Dorien Schampaert and Tim Boon, articulate exactly this, noting in the academic history of electronic music ‘a reluctance to deviate from a handful of well-trodden narratives about

electroacoustic music's history that stem from the activities of a few "canonized" men (and, where applicable, their associated institutions).⁵ In their 'alternative' nature, these histories represent the 'neglected, marginalised, or simply not considered'.⁶ These observations emphasise that even in the short period of the twentieth century, the inequalities that are observed elsewhere in music history have been preserved in the narrative and canonic histories of composing with electronics; in this discussion, on the other hand, those examples will be considered *as* the history of electronic music, before moving to the plurality of practices in the present day.

It is possible to begin with the deceptively simple question of the date of the creation of the first work of electronic music. The composer Jean-Claude Risset claimed that within Western music the seeds of concepts that are essential to computation can be found, writing that 'the organ may be considered the first information machine: the performer, touching the keyboard, specifies information that is decoupled from the energy (provided by the pump) that actually produces the sound'.⁷ Even though most organs do today contain a circuit of some sort, one might struggle to accept a definition of electronic music that renders solo organ compositions as electronic works. The digital humanities project, *120 Years of Electronic Music* brings together documentation of both successful and failed experiments in electrifying both music and instruments from (and in some cases before) 1880 to the present day,⁸ drawing together 'instruments that generate sounds from a purely electronic source rather than electro-mechanically or electro-acoustically'.⁹ While neither of these categories suggests a specific work or its date as the birth of the composition of electronic musics, they do indicate that its principles draw on ideas, practices, and instrumental approaches that have been present in and have informed music-making long before the twentieth century.

Early Electronic Experiments

Many histories of composing with electronics cite the work of Pierre Schaeffer at *Radiodiffusion Nationale* in Paris. Schaeffer's *Cinq Études des Bruits* (1948) can be considered the first and definitive statements of his method of *musique concrète*: composing using manipulated recordings of sounds on tape. In the case of Schaeffer's works, these included recordings of trains, sounds from toys and objects, speech, percussion instruments, and other musical instruments such as the piano. Schaeffer used this process to find new and musical meanings in existing sounds, commenting

that 'during experiments, things begin to talk by themselves, as if they were bringing us messages from a world unknown to us.'¹⁰ Shortly after the composition of these works, in Cologne, Karlheinz Stockhausen is recorded as pioneering developments in *Elektronische Musik*: music created using wave oscillators as its primary material, resulting in compositions such as *Studie I* (1953) and *Studie II* (1954) which demonstrated the possibilities of sound synthesis within this method. However, when addressing Stockhausen's own claims for the research that underpinned these compositions, Richard Toop found that not only does the often-quoted statement that Stockhausen began the research for these pieces in 1951 in the *musique concrète* studios in Paris not hold up to the composer's own travel schedule, but that his correspondence with the Belgian composer Karel Goeyvaerts demonstrates that he did not actually produce any electronic sound experiments at all until late in 1952, and remained unconvinced by them even into 1953, remarking of the early experimental efforts of others: 'I don't hear anything musically meaningful in them, but [they] indicate pathways . . . [though only] once one tries to hear just single sounds in isolation.'¹¹

Crucially, the emergence of fully electronic compositions in the twentieth century does not only hinge on pinning down the activities of such composers as Schaeffer and Stockhausen in the 1940s and 1950s. In 2007, Rob Young described the work of Halim El-Dabh in Egypt: in 1944, El-Dabh created a 25-minute composition – *Ta'abir Al-Zaar* ('The Expression of Zaar') – from wire recordings manipulated at the Middle East Radio Studios.¹² The condition of the piece's master tapes, along with the relatively little that was widely known of El-Dabh's career – despite compositional acclaim that spanned Africa and the USA – were offered as reasons that this piece, now widely regarded as the 'first' work of electronic music, had been overlooked.¹³ El-Dabh's composition meets the criteria for a 'first' electronic composition because the sounds of the piece were both recorded and manipulated electronically. That his project was motivated by curiosity both about sound and the possibilities of the technologies offered by radio studios demonstrates a parallel between the conditions in which this piece was made and the later compositions made in European studios. One may speculate whether or not the lack of recognition of El-Dabh's work in the electronic music canon has to do with the characterisation of musical innovation – even within the sphere of electronic music and technology – as the purview of the 'canonised' men and their institutions identified by Mooney, et al. This same phenomenon can be found elsewhere in narratives to do with technology and is described by Anna Everett

in the following way with regards to newer technologies as ‘primarily a racialised sphere of whiteness [that] inhere[s] in popular constructions of hi-tech and lo-to-no-tech spheres that too often consign black bodies to the latter, with the latter being insignificant if not absent altogether’.¹⁴ That is, El-Dabh’s composition is demonstrably a ‘first’ electronic composition by many possible definitions, but the composer himself and the circumstances of the piece’s composition do not fit with an overarching narrative of electronic music composition such that it continues to be overlooked.

Innovations: Mixed Media and New Instruments

A second question arises here around which composers made key innovations within the tradition of composing with electronics, and where and how they did so. Of course, those composers already mentioned are a part of this narrative, but one might also look to Edgard Varèse, whose *Poème électronique* (1958) was described by Lombardo et al. as ‘the first electroacoustic work in the history of music to be structurally integrated in an audiovisual context’.¹⁵ The original presentation of this piece combined a specially designed building – the Phillips Pavilion at the 1958 Brussels World’s Fair – a spatialised array of loudspeakers, and film and visual effects designed by Le Corbusier and realised with the composer Iannis Xenakis, who was working with Le Corbusier at that time and also contributed an electronic piece to the event (*Concret Ph* (1958)). *Poème électronique* offers an obvious case study in the ways that innovations in electronic composition are often combined with those in other arts. The combination of possibilities in sound, spatialisation and visual presentation of art works make this piece a milestone in many aspects considered key to composing with electronics today: its potential to explore sound in space, its influence by and on other artistic disciplines, and its embrace of new technological means. The piece itself further demonstrates that these aspects of composition are not ones that necessarily become obsolete with the development of newer technologies; indeed the complexity present in the original staging of *Poème électronique* is such that even in 2009 a reconstruction of the work required the considerable efforts of a multidisciplinary team.¹⁶ This reconstruction further demonstrates the ongoing relevance of the questions of sound, space, and audio-visual relationships that are explored by Varèse in his work.

More than its individual innovations, *Poème électronique* might further demonstrate the link between compositional innovation with electronic

means and innovation elsewhere in music. The composer Milton Babbitt – who himself became interested in electronics as a way to achieve precision beyond that achievable in instrumental music in the 1960s – suggested that in Varèse’s music more generally, ‘concern with and structural utilization of the timbral consequences of dynamic, registral, and durational values approach the condition of nonelectronic synthesis’.¹⁷ For Babbitt, Varèse’s electronic musical experiments should be considered symbiotic with his instrumental music, with innovation in the two going hand-in-hand. Presumably here, Babbitt was thinking of Varèse’s inclusion of early electronic instruments such as the ondes Martenot within his instrumental compositions. In the 1930s, Varèse was turned down for a Guggenheim fellowship for which he applied in 1932 in order to ‘pursue work on an instrument for the producing of new sounds’.¹⁸ This rejection clearly did not set his work back unduly, since in 1934 he composed *Ecuatorial*, a piece for which the Russian inventor Leon Theremin created two instruments to Varèse’s specifications.¹⁹ However, it is this kind of compositional activity, where what can be achieved with electronic means influences the development of the sonic means of music more generally, to which Babbitt referred. Morris claims that in Babbitt’s approach to electronic composition ‘the hierarchy of musical attributes had to be reflected in the medium’s technical implementation’,²⁰ and one can surmise that these electronic innovations followed those musical innovations necessitated by the music of the early twentieth century, whether or not produced through electronic means, and were therefore – in a sense – inherently modernist.

The Radiophonic Studio

Further examples of innovation in the use of electronic instruments and means to develop compositional approaches may be found in comparable work undertaken around the same period by other composers. Many advancements are also evident in the work of female composers, often in electronic studios connected to radio stations and universities. While involved in many of the same technological advances as their male counterparts – working in similar ways and with similar equipment – these artists often found themselves working in circumstances that declined them recognition as composers.²¹ A now relatively well-known example is the composer Delia Derbyshire, who created the theme music to the BBC sci-fi drama *Doctor Who* in 1963 from an idea created by Ron

Grainer, but was not credited for many years. Theresa Winter speculates that ‘Derbyshire was probably very pleased to have been given a relatively large amount of creative freedom because of her artistic aspirations’,²² and David Butler suggests that the general anonymity in which the Radiophonic Studio was held at the time was at fault for the lack of credit received, writing that ‘[Grainer] was delighted with Derbyshire’s contribution and sought, unsuccessfully for her, a share of the credit and royalties, but he was overruled.’²³ However, Winter also suggests that the popularity of the *Doctor Who* theme ‘overshadowed the diversity of [the Radiophonic Studio’s] work’.²⁴

Derbyshire’s predecessor at the Radiophonic Studio and its founder, Daphne Oram, is herself a key example of the diversity of that work. Her innovations in the composition of electronic music spanned electronic instrument design, sound morphology and the integration of electronic sound into orchestral composition. Ten years ahead of the publication of Babbitt’s statement quoted above, Oram suggested a similar desire for technological means to follow and facilitate compositional necessity. In 1956 she wrote to the BBC, arguing for the creation of the Radiophonic Studio, ‘[o]nce the composer can write without the limitations of performance his palette is extended enormously . . . rhythms become anything the composer can visualise without them having to be playable. Timbres have no registration and theoretically any sound, musical or otherwise, is within his grasp.’²⁵ Examples of the diversity of her work in achieving this extension of compositional palette can be found in the electronic instrument she designed – the *Oramics* machine – that realised sound from graphic notations produced by the composer, but also in her notated compositions that sought to harness electronic means in an instrumental context far earlier than other composers who went on to do the same. Richards gives a detailed description of how the *Oramics* machine worked in terms of its electronic processes and build,²⁶ and claims that even though competing patents existed for other instruments and machines that displayed similarities to Oram’s, ‘her method for the digital optoelectronic control of pitch over time, developed with Graham Wrench, is very likely to have been a technological first’.²⁷

Even before the development of the *Oramics* machine, Oram was considering electronic means within large-scale musical composition. Her composition *Still Point* (1948–9) combined electronic sound processes within the orchestra. Like *Poème électronique*, this piece was recently reconstructed, although in this case for its world premiere. In 2018, composer James Bulley and turntablist Shiva Fesharecki realised the piece from

score fragments and instructions within the Daphne Oram archive, working with electronic instruments and processes authentic to the time of composition. Bulley writes of this process that ‘early experiences using turntables and mixing sound in the complex acoustics of the Royal Albert Hall inspired Oram to explore the spatial and acoustic aspects of orchestral composition, harnessing the newfound potential for live manipulation of amplified sound in performance.’²⁸ The realisation was presented at the BBC Proms in 2018 – seventy years after the piece’s composition – in a programme titled ‘Pioneers of Sound’, highlighting Oram’s work alongside that of Derbyshire, Laurie Spiegel and Suzanne Ciani. While this prom demonstrates a mainstream revival of the ‘alternative’ history and tradition of electronic music that can be found in the music of these composers, one might note the need for such revival when the BBC had presented their first Proms programme featuring electronic music (the UK premiere of *Perspectives* (1957) by Luciano Berio) in August 1960.

This history of electronic music then is also one of discovery and rediscovery. Winter suggests that ‘the history of the medium is a relatively fluid field of knowledge’, and that its expansion is driven by ‘people normally considered to be on the fringes of mainstream histories of electronic music’.²⁹ On one hand, the examples described here imply some sort of egalitarianism in the history of composing with electronics. Far from the purview of only white men, this creative discipline found a first instance in Africa, and some of its notable innovations came about in institutions outside of the musical mainstream, from the work of women composers. On the other hand, that these musical examples from the relatively recent past require ‘revival’ may lead one to ask how many times such composers and their music must be ‘revived’ and rediscovered for their contributions to be remembered, and to what extent this reflects the nature of the overarching mainstream narratives of music in this medium. While such non-canon examples may not demonstrate barriers to entry in electronic music, they do demonstrate barriers *after* entry in the recognition of the musical contributions of all composers, comparable to those found elsewhere in musical history and practice.

Contemporary Examples

It is not possible to provide here an overview of all histories, cultures, and strategies for composition found in electronic music, but it is possible to

link some of these aspects of the culture of composing with electronics in the mid-twentieth century to that of some composers working today. This is now explored through three examples of composers working with a variety of concepts, technological means, and aesthetic ideas: Lauren Sarah Hayes, Khyam Allami, and Moor Mother, who represent a variety of approaches to composing with electronics. Of obvious importance to these examples is also the speed with which the available technologies and approaches advance – including the use of the internet, which has facilitated certain aspects of their practice. However, while these composers can be noted as abreast of such advances, an overview of the technologies available to them today will quickly become out of date and will not adequately explain the innovations of their work. These examples are therefore presented as being of interest not because they sit at the cutting edge of technological development but rather because their myriad aesthetic approaches align with some of the principles of electronic music that I have already outlined: in performance, the creation of sounds, and its relationship with other musical disciplines.

Lauren Sarah Hayes

Lauren Sarah Hayes is a composer who combines live electronic performance with unique performance systems that she creates using a variety of instruments, controllers and haptic feedback. Sallis et al. describe live electronic music as ‘not a sub genre of electronic music . . . nor does it rely on a specific technology’, but rather it is music that ‘puts performance at the centre’.³⁰ This description fits Hayes’s work well: while electronic means are at its heart, it is not innovation in the use of technology that drives the composition of her music but its aesthetic possibilities in the moment of music-making. In an overview of Hayes’s music, the Huddersfield Contemporary Music Festival write, ‘[i]t’s as if she’s been fortunate to find every stray tone that’s wandered into her music, each unexpected millisecond of her improvisation a unique bit of viscera worth throwing your hands up for.’³¹ While more informally expressed, this statement parallels those of Oram and Babbitt who wished to harness all performance possibilities of electronics music. Further, HCMF observes that ‘Hayes treats her electronic equipment the way an improviser might treat their guitar, or saxophone, reaching for techniques with a hands-on approach.’³² This summary in particular is worth consideration in her practice. The instrumentality of her materials demonstrates not only the aspects of technological innovation in her work but also their relative lack

of emphasis when compared with the sonic result. For Hayes, technological means are one option of many that may express the embodied and performative ideas of her music.

An online performance given for the UK venue IKLEKTIC art lab captures the many aspects of Hayes's performances well.³³ The performance begins with prepared piano; a link to the themes of instrument design for extended sound highlighted earlier. The 'electronic' nature of the performance at this stage is signalled only as Hayes can be seen wearing headphones and haptic controllers. As she continues to perform, sounds from the piano are extended and gradually take on 'electronic' properties as static, white noise and distortion. This combination of extended sound from the piano and sound that could never be made by the piano is blended into a hybrid instrument. To the listener and viewer it is clear how some of the sounds are made whilst the origin of others is unclear, although it is possible to begin to suspect that Hayes's body movements themselves control these sonic developments. In this way she moves from a hybrid musical practice to a hybrid performance practice which is no longer only about the sound created, but its embodied creation.

Beyond her musical practice, as a researcher working with technology Hayes also advocates for access to technologically informed means of music-making for all, writing that in a project with school pupils that she facilitated, she observed that '[b]y engaging in practices such as listening, sound collecting, recording, hardware hacking, and instrument building, pupils became physically invested in their own learning'.³⁴ This 'physical investment', which is also evident in haptic elements of her work, outlines one way in which accessibility in composing with electronics might be achieved: not just through accessibility of means (the digital audio workstation and laptop, for example) but through linking electronic music-making practices with real-world experiences and activities of sound making and creation. It is this link that makes the practice she advocates for appealing to – and communicating with – her audiences and these workshop participants, opening the door to radical new futures for composing with electronics beyond its technologies.

Khyam Allami

Khyam Allami is a composer, and a performer of contemporary and Arabic music who also plays the oud. He has applied the techniques of his acoustic composition and performance practices to electroacoustic music, in

particular questioning issues of tuning within this tradition. His work offers a parallel with the suggestion that innovations in instrumental composition can also inspire innovations in composing with electronics. Allami observed that instrumental compositional practices with long histories and traditions were not being easily replicated in electronic music. Despite the ostensible ability to create any frequency using electronic means, electronic instruments and compositions most frequently default to Western temperaments, scales and harmonic models. Working with Counterpoint Studio, Allami created the *Apotome* project, the winner of the 2021 Prix Ars Electronica. This project is described as ‘a call to critically address and dismantle these inherent cultural biases that are hard coded (and wired) into today’s digital and electronic music-making tools’.³⁵ As such, this project addresses some of the legacies of the hidden nature of some of the ‘alternative’ histories of composing with electronics described in this chapter. It is not a composition in the sense of a single musical work but rather a tool for listening, creating and performing electronic music. It both provides composers with the tools to combat aspects of under-representation of sounds and tuning systems in electronic music by handing them the means with which to make them themselves, and at the same time highlights the missed compositional opportunities in overlooking what should have been possibilities within electroacoustic music from its conception.

As a performance tool, *Apotome* was showcased by Allami at the 2021 CTM festival in Berlin, which took the theme of ‘transformation’.³⁶ Across two performances, Allami collaborated with musicians Faten Kanaan, Nene H, Tot Onyx, Enyang Ha, Tyler Friedman and Lucy Railton, collectively representing different approaches to composing and performing in electronic music including the use of laptop instruments, MIDI, analogue synthesisers and, in the case of Railton, with the cello. The difference in possible tunings of the instruments is audible as soon as the cello enters: the inclusion of the (albeit amplified) acoustic instrument highlights the contrast in timbres and the texture of each sound as well as the difference in frequency. However, most clear across the performances is not the lack of difference between ‘in tune’ and ‘out of tune’ but rather the creation of a spectrum of sound arising from the spectrum of frequencies and musical ideas in use in this hybrid practice. There are, of course, moments where aspects of different tunings and frequencies meet each other but this is not the focus of the music; rather, this performance demonstrates how electronic tools might allow musicians to access a complete spectrum of sound within a single performance that is not predicated on the tuning or timbral

qualities of a particular musical tradition. While clearly an affordance of electronic music, this possibility is one that is not experienced to the same extent across all the canonic works of electronic music. Rather than an 'alternative history', this music presents a present where performers and sounds meet together to express the possibilities and potentials of working together in this medium.

Moor Mother

Moor Mother (the stage name of American artist Camae Ayewa) is a multidisciplinary artist who combines music, poetry, and visual art in her work to explore and to highlight social issues. Like Hayes and Allami, her work also contains an element of providing tools to others to empower them to express their own voices. Andy Beta describes her work as 'putting avant-garde tactics to humanist ends'.³⁷ Certainly, there is a strong aesthetic link between Moor Mother's work and that of the historical avant garde, in particular free jazz. That her musical tools are often electronic and not instrumental is perhaps incidental, but also an example of the 'at hand' and sometimes DIY nature of her practice that combines not only influences from free jazz but the aesthetics and politics of noise music, and Afrofuturism. While the latter might be associated with a critique of the supposed 'neutrality' of technology,³⁸ she extends this critique to the conditions of life that she experiences and sees around her, notably issues of insecure and inadequate housing. This also links with some of the aims of the collective of which she is a part, Black Quantum Futurism. This collective 'explores personal, cultural, familial, and communal cycles of experience, and solutions for transforming negative cycles into positive ones' and 'focuses on recovery, collection, and preservation of communal memories, histories, and stories'.³⁹

An example of this, *Circuit City* is both a theatrical work and an album released by Moor Mother in 2020. Described as 'part musical, part choreopoem, part play – of public/private ownership, housing, and technology set in a living room in a corporate-owned apartment complex',⁴⁰ the piece foregrounds the relationship between electronics, technology, music and society. The opening moments of the work begin with the saxophone, bass and drums but quickly move to integrate electronic sound not as a separate layer in the composition but as an integrated instrument within the ensemble. Like Oram's compositions, Ayewa extends the ensemble, its capabilities, and its timbre through the integration of electronics. Here, she presents an alternative perspective, where electronic sounds do not only

extend the sounds of ensembles and instruments within the concert hall, but seamlessly integrate into free jazz in an aesthetic way that goes beyond re-creating the sound of the historical avant garde. The use of electronic composition here signals the interconnectedness of many of the aspects of the music and their further-reaching social implications, in particular in the piece's commentary on social housing in Philadelphia, including through a linked essay on that topic.⁴¹

It is clear then that electronic music is one of the means of Moor Mother's work, but that the work itself is not driven by these means themselves but her musical intentions. While she undoubtedly employs innovation in the use of electronic instruments and in the ways that she draws on other musical traditions outside of electronic music within Western art music to do so, the aesthetics of the music are not only to do with these circuits or their possibilities but rather to do with sound. This contrast is most clear in Moor Mother's case but unites all three of my contemporary examples: these artists use technology and draw attention to the uses and possibilities of technologies in various ways, as performance, as sound creation, and as social critique. However, their work is not *about* technology, but rather uses technological means to achieve compositional goals. This is the reality of composing with electronics today: its ubiquity speaks not only to accessibility, but also to the range of applications of electronic means which are themselves diverse and do not belong to a single musical tradition.

From this brief survey of aspects of composition with electronics, it should be clear that there can be no singular lineage or explanation of the development of this aspect of music-making, even where such an explanation might be linked only to a single tradition such as in Western art music. It is, of course, also important to acknowledge that this chapter has centred on the North-Western hemisphere even when describing what have sometimes been considered 'alternative' histories and traditions; even Halim El-Dabh made much of his later work in the USA. In addition, when one approaches the question of composing with electronics, it becomes increasingly clear not only that what the term 'composer' means is no longer in itself a stable entity, but also that electronic media themselves are not the cause of this instability. Rather, working with electronics and electronic instruments is one way in which the twentieth and twenty-first centuries have given voice to a wide range of variation in musical practices and approaches, including those that are adjacent to music, and which can be considered to exist across all aspects of art practice. This plurality and multiplicity of voices is a feature of electronic musics as much as it is a feature of musics of all approaches and genres. The current

accessibility of electronic means may certainly be a part of this but, importantly, electronic media have themselves offered new possibilities for sounding other voices and narratives within and outside the concert hall, even where these remain underground and DIY practices, and it is these potentialities that are leading innovation in this area today.

Listening List

<https://shorturl.at/dqFW8>

Notes

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15. Vincenzo Lombardo et al., 'A Virtual-Reality Reconstruction of Poème électronique Based on Philological Research', *Computer Music Journal*, 33/2 (Summer 2009), 24.
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19. *Ibid.*
20. Robert Morris, 'Listening to Milton Babbitt's Electronic Music: The Medium and the Message', *Perspectives of New Music*, 35/2 (Summer 1997), 86.
21. See David Butler, 'Delia Derbyshire' (2021), www.bbc.com/historyofthebbc/100-voices/pioneering-women/women-of-the-workshop/delia-derbyshire (accessed 21 June 2021).
22. Theresa Winter, 'Delia Derbyshire: Sound and Music for the BBC Radiophonic Workshop, 1962–1973', unpublished PhD thesis (University of York, 2015), 62.
23. David Butler, "'Way out-of This World!" Delia Derbyshire, Doctor Who and the British Public's Awareness of Electronic Music in the 1960s', *Critical Studies in Television*, 9/1 (March 2014), 65.
24. Winter, 'Delia Derbyshire', 11.
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26. Tom Richards, 'Oramics: Precedents, Technology and Influence: Daphne Oram (1925–2003)', unpublished PhD thesis (Goldsmiths, University of London, 2018), 10–14.
27. Richards, 'Oramics', 27.
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