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"THE SAME TRADE AS MOZART": CONVINCING THE SCEPTICS OF ELECTRONIC MUSIC'S VALUE

Abstract

In August 1969, the music docmentary series *Workshop* focused on electronic music in a film titled *The Same Trade as Mozart*. Produced and directed by David Buckton, the film included interviews with composers Karlheinz Stockhausen, Tristram Cary and Justin Connolly; BBC Radiophonic Workshop staff Desmond Briscoe, David Cain and John Baker and the Workshop's founder, Daphne Oram; and Peter Zinovieff, director of EMS (Electronic Music Studios). It presented electronic music in a number of contexts, such as education, pop production and live performance.

Technological change in music has often provoked hostility among the public and critics, and the rapid advancement of electronic music post-World War II was no exception. Adopting a mode of analysis more commonly encountered in studies of the public communication of science, this paper considers *The Same Trade as Mozart* as an attempt by electronic music's advocates, such as those listed above, to convince sceptics of its value. While sceptical responses to the presence of new technologies in music have been widely noted and theorised by scholars in science and technology studies, we call attention to the strategies employed by the advocates of such technologies to defend themselves against such criticisms, including humour, heuristic explanations and a focus on electronic music's educational and thus social value.

The use of computers in electronic music was a new and contentious development in the field, requiring a greater degree of advocacy from its proponents. We examine how the computer's role in composition is presented in *The Same Trade as Mozart*, compared with other media portrayals of computing in the 1960s. Drawing on theories of filmed musical performance, we discuss how visual tropes of 'classical' music are used in *The Same Trade as Mozart* to challenge preconceptions about the relationships between composers, musicians and new technologies.

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> The subject of this WORKSHOP programme is Electronic Music—for many people two words that just don't go together. Alright for background music or sound effects, they say—but not real music.
>
> Now that the computer has invaded the world of music composition, the traditional music lover feels a growing sense of threat. Unnatural, he says; mechanical. You wouldn't catch Mozart working with computers and tape recorders—or would you?[1]

1. INTRODUCTION

In this paper we discuss a television documentary film, *The Same Trade as Mozart*, which was produced and directed by David Buckton as part of the BBC television series *Workshop* and first aired in August 1969. The film introduces the topic of electronic music – music created with, and exploring the musical potential of, electronic sound technologies – through interviews with composers and technologists, including Tristram Cary, Daphne Oram, Karlheinz Stockhausen and Peter Zinovieff, as well as showing footage of electronic techniques being used in popular music and education.

The Same Trade as Mozart was produced at a time when electronic music was not fully understood or readily accepted by the general public and critics. We show that the film can be interpreted as an attempt to advocate for electronic music's value for the benefit of an audience that was presumed to be sceptical – an assumption highlighted in the director's promotional materials quoted above. We go on to describe how the film achieves this: by directly countering what are perceived to be the most common criticisms of electronic music; by taking a heuristic approach that explains how electronic music works; and by emphasising the educational, humorous or approachable, and collaborative potential of

[1] Promotional material dated 2–4 July 1969. BBC Written Archives Centre, Caversham, File T13/258/1.

electronic music, demonstrating that, rather than obviating the need for a human composer or musician, electronic music can enhance and expand the composer or musician's role. We give an account of some of the assumptions and counter-arguments that underpin the film, including the differing attitudes within the electronic music community itself towards the use of computers in composition. Finally, we analyse the closing sequence of the film, demonstrating how advocatory approaches are reinforced – and sceptics' concerns countered – in the visual language of a filmed musical performance.

Two performances of experimental electronic music are shown in *The Same Trade as Mozart*: in the first, an ensemble of mixed electronic and acoustic instrumentation led by Stockhausen performs 'Es', a piece from the Stockhausen's (then) recently completed suite *Aus den Sieben Tagen* (*From the Seven Days*) to a small audience; while in the second, *M-Piriform* (1968), a composition for voice, viola, flute and computer-controlled electronic sound by Justin Connolly and Peter Zinovieff, is performed in an empty building. We focus on the latter performance, drawing on theories of filmed musical performance to demonstrate how electronic music is portrayed in *The Same Trade as Mozart* as novel, unfamiliar and exciting, while at the same time adhering to certain conventions of classical music performance and its presentation on television.

2. ELECTRONIC MUSIC IN THE 1960s

In the 1960s, electronic music was, of course, far less commonplace than it is today, and also technologically different. Whereas nowadays most musicians can buy a synthesizer or access electronic music software, at the start of the 1960s these technologies were not available. Practically all experimental electronic music was made using magnetic tape. The composer would record sounds on tape, transform them by physically manipulating the tape – by playing it backwards or at different speeds, for example – and assemble the sounds into a composition by cutting the tape with a razor blade and sticking the pieces together in the desired sequence. In concerts, tape-only compositions would be played back

via loudspeakers with no performers on stage. In France this was called *musique concrète*; in Germany, *elektronische Musik*.[2]

By the middle of the 1960s, some engineers and composers had begun to experiment with other ways of making electronic music. Some, including Stockhausen, took their studio equipment on stage and performed what was known at the time as 'live electronic music', often incorporating acoustic instruments, tape recorders, microphones and homemade electronic devices (see Manning, 2013: 184–5; 187). Others, from the mid-1950s and on through the 1960s, began to explore the use of a computer for music-making purposes, initially to generate a score that could be performed by instrumentalists, as in the case of Lejaren Hiller and Leonard Isaacson's 1957 composition, *Illiac Suite for String Quartet* (see Hiller, 1970: 49); and going on to experiment with using computers to control analogue sound equipment, in a process known as hybrid synthesis – as demonstrated by Peter Zinovieff in *The Same Trade as Mozart*. Voltage-controlled synthesizers were commercialised in the mid-1960s and more portable models began to be produced in small numbers at the end of the decade by companies such as Moog and EMS London Ltd (the musical instrument company set up in 1969 by Peter Zinovieff).[3] However, it was not until the 1970s, when synthesizers began to appear more frequently in popular music, that they became more widely recognised as musical instruments.

Therefore, although electronic music was relatively advanced as an experimental practice in the 1960s, it was not yet widely understood or accepted by the general public and music critics – and this was particularly true in Britain, which lacked the institutional support for experimental electronic music that was provided by national broadcasters in, for example, France and Germany. In contrast, the BBC's electronic sound studio, the Radiophonic Workshop, which was set up by Daphne Oram in 1958, stuck to a remit of providing functional music and sound design for radio and television drama, allowing little

[2] More specifically, *musique concrète* refers to avant-garde music of the late 1940s onwards created by collecting, transforming, and montaging recorded sounds, whereas *elektronishe Musik* refers to music constructed from electronically-generated sine tones, extending serialist principles. Both were tape-based practices. From the late 1950s, some composers included acoustic, instrumental performers in compositions alongside electronic sounds on tape, a well-known example being Stockhausen's Kontakte for electronic sounds, piano, and percussion (1958–60). For a fuller discussion, see Manning (2013: 17–67) and Holmes (2016: 42–102).

[3] For histories of Moog and EMS, see Pinch and Trocco (2002).

time or space for its composers – occupying the BBC grade 'studio manager' – to create autonomous music.[4] The lack of facilities for electronic music in the UK at this time, compared to other European countries, was an issue of great importance to some of the interviewees in *The Same Trade As Mozart*, as we explain in Section 4.

However, by the late 1960s, electronic music was increasingly making inroads into popular culture. The BBC Radiophonic Workshop's music and sound design for radio and TV dramas throughout the 1960s – including, most notably, *Doctor Who* – had introduced audiences to the possibility of electronic sound used not merely as sound effects but, as with any other kind of functional music, to evoke certain moods or atmospheres (Butler, 2014: 62–76; see also Brend, 2012). Released in 1968, Wendy Carlos's hugely successful album *Switched-On Bach* (Columbia Masterworks, 1968) suggested that the new synthesizers might be used in more traditionally musical ways – as opposed to the unfamiliar sound-worlds of *musique concrète* and *elektronische Musik* – and the availability of portable synthesizers such as the EMS VCS3 meant that, for the first time, electronic musical instruments could easily be taken on stage, and on tour, by popular musicians. Bands such as Pink Floyd and The Beatles had already introduced pop music listeners to the idea that the recording studio could be a place of sonic experimentation, using electronic effects and tape manipulation techniques similar to those used in *musique concrète* on albums such as *Sgt. Pepper's Lonely Hearts Club Band* (EMI, 1967), whose album artwork famously includes Stockhausen in its photo-montage of well-known public figures.

1969 – the year of *The Same Trade As Mozart*'s screening – was a year in which electronic music as avant-garde art, and electronic music as popular culture, mixed and mingled in the public arena, forming part of what Benjamin Piekut has described as a 'mixed avant-garde' (Piekut, 2014: 769–824). This tendency can be seen in the way in which *The Same Trade as Mozart*, perhaps rather awkwardly, juxtaposes the psychedelic pop band The World of Oz with performances of avant-garde music by Karlheinz Stockhausen.

[4] Louis Niebur proposes that the BBC Radiophonic Workshop, and electronic music more generally, was seen as posing a threat to the conservative agenda of the BBC's Music Department, which had also expressed concerns about serialist composition and other new musical ideas and techniques (Niebur, 2010: 39–48).

3. SCEPTICISM TOWARDS ELECTRONIC MUSIC

3.1 New technologies and creativity

As Trevor Pinch and Karin Bijsterveld have noted, technological change in music has often provoked hostility (Pinch and Bijsterveld, 2003: 536–59). This was famously demonstrated in 1966, when Bob Dylan swapped his acoustic guitar for an electric one to cries of 'Judas!' from outraged folk music purists.

Musicologist Kyle Devine has observed that:

> From the late 1920s, when the guitar was first paired with an electrically amplified loudspeaker, it met with the same mixture of wonder and scepticism that was held for electricity more generally during the early twentieth century […]: a young woman encountering the new instrument for the first time blurted "Oh how marvellous!! Don't you get a shock when you touch it?" … Club owners worried that these newfangled guitars would blow fuses and disrupt their businesses… Old-guard guitarists […] [viewed] "the electric guitar as an oddity or gimmick"… [T]he electric guitar amplifier incited debate over the denigration of traditional musical values and playing techniques... Against the "fallacy" that the electric guitar was simple to play and limited to clichés, there were efforts to establish it as an instrument that took serious practice… (Devine, 2014: 18)

Controversy also surrounded the introduction of the Hammond Organ in the mid-1930s, which organ builders and organists alike felt was a poor substitute for 'the genuine article' (Weium in Weium and Boon (eds.), 2013: 73) , and the electronic drum machine in the late 1950s, which the Musicians' Union felt threatened the livelihood of jobbing musicians by '[taking] human musicians out of the supply chain' (Angliss in in Weium and Boon (eds.), 2013: 103). In more recent times, young DJs who use laptop computers have been looked down upon by veteran DJs who use turntables, who scoff, 'How do you know he's not playing Pac-Man while he's supposed to be DJing?' (Montano, 2010: 397). When a new music technology is introduced, there tend to be concerns that it makes creating music too easy. There is often a suspicion that the machine does the work, rather than the person, and that the new technology threatens traditional and hard-earned music-making skills.[5] This is

[5] We do not suggest that these views represent the only way of interpreting technology's status in relation to music-making. By way of a contrast, Fouché (2006) has argued that African American hip-hop musicians used technology to contribute positively to the formation of a black musical and cultural identity. Nonetheless, the idea that technology somehow stands in opposition to 'real' music remains a common trope in discourses on

in part because technologies in general have often been marketed as labour-saving commodities, and indeed the aim of numerous techniques, processes and products developed in the twentieth and twenty-first centuries has been to automate repetitive processes.

Despite these concerns about the effects of automation on musical craft and creativity, the manufacturers of early synthesizers did not always disabuse their potential customers of the notion of the labour-saving instrument. The marketing of the synthesizers made by EMS London Ltd often promised a one-stop solution for composers wishing to experiment with electronic sounds, and press coverage of the devices would refer to an instrument that was itself a miniature studio, or the equivalent of 'a roomful of instruments' (Cubitt, 1970) In some respects EMS's advertising continued a tradition at least as old as the semi-automated mechanical pianolas of the late-nineteenth and early-twentieth centuries, which were often advertised to amateur musicians as providing an effortless pathway to musical virtuosity (see Théberge, 1997: 29–31). However, the tongue-in-cheek tone of the EMS's adverts indicated that, while marketing their small, portable synthesizers as valuable tools for the modern composer, they were also adept at satirising the idea of the 'indispensible' new labour-saving technological device. For example, a series of EMS's magazine adverts from the early 1970s took the mundane "Every home needs a…" slogan to absurd lengths, casting the synthesizer as an essential item for the switched-on modern family by proclaiming, among other things, that 'Every picnic needs a Synthi'. We will see later that parts of *The Same Trade as Mozart* also take a humorous tone, with the aim of making electronic music seem more approachable for the viewer and less threatening to more traditional music-making.

It should not surprise us, then, that the introduction of the new technologies of electronic music in the 1950s, and the unfamiliar sound-worlds that came with them, provoked bafflement and hostility among the public and music critics alike. One prominent sceptic in the early days of electronic music was the English composer and musicologist Reginald Smith Brindle. In 1956, Brindle published a series of articles in the *Musical Times*

music and technology, and one that has potentially racist implications when viewed (as Fouché elaborates) as part of a wider pattern whereby black creativity is dismissed or under-valued.

entitled 'The Lunatic Fringe', in which he lambasted the new electronic music as inauthentic, a hindrance to creative expression for the composer, and baffling and impenetrable for the listener, writing that, 'This "music" will inevitably fall into the wrong hands – those incapable of anything better…' (Brindle, 1956a: 246)

He continued:

> Some hail electronic music as the modern composer's salvation—"no performers, conductors, or even publishers will now be needed, the composer will be his own interpreter"... This must be taken with an enormous pinch of salt. The composer, both as creator and interpreter, is so far a mere slave of the mechanics and mathematics of the system (Brindle 1956b: 300).
>
> How should we listen to this music? The musician's habitual way of listening […] leads to failure and frustration. Here are no tangible motives to grasp and remember. The "logic" and "construction" are absolutely non-apparent. […] The hollow, pure sine-tones seem to ban emotion, the very rhythmic complexity seems to cancel out any sensation of movement (ibid.).
>
> At present, even the most "advanced" critics seem at a loss, for in searching to relate this music with their previous experience (i.e. tradition), they are in the position of a drowning man who clutches at a straw (Brindle 1956c: 356).[6]

Just over a decade after Brindle's articles, Tristram Cary and Peter Zinovieff presented a concert of electronic music at London's Queen Elizabeth Hall, with a programme including works by Daphne Oram, Delia Derbyshire, George Newson and others (Ivall, 1968: 21). Part of the Redcliffe series of Concerts of British Music set up by composer and author Francis Routh, it attracted more attendees than previous Redcliffe concerts, according to Routh's recollections of the event:

> A sell-out, a packed Elizabeth Hall, a taxi queue extending to Waterloo station, and reviews far longer and more detailed than was normally the practice … all reflecting a high level of public curiosity, fed by the novelty value of the new technology. (Routh, 2012)

[6] Over the next thirty years Brindle did not soften his views all that much. Although he went on to acknowledge the technological potential of electronic music, and even described the synthesizer as a 'miracle box' (Brindle, 1975: 111), his ultimate judgement was that 'serious composers' had failed to make effective use of that potential. Of Boulez's *Répons* (1981) he wrote that 'excessive computerized elaboration creates obscurity and difficulty in communication… *Répons* has brought music to the verge of incomprehensibility…' (Brindle, 1987: 197).

However, the mainstream critical attitude towards the music itself was cautious, if not outright suspicious. Reviewing the concert for *The Times*, Stanley Sadie wrote, 'It is easy enough to conjure up aural blandishments; but to produce real music you need to be a real composer, and to observe certain disciplines' (Sadie, 1968).

These suspicions were further amplified when composers began using computers, rather than tape-based techniques, to generate and process music; and much of the scepticism about computer-controlled music came from electronic composers themselves. This dynamic is shown in *The Same Trade as Mozart*, in which Daphne Oram is among a number of the composers interviewed who express their concerns about computers, stating that a computer merely generates 'music by the yard' rather than expressing the 'human spirit'. Peter Zinovieff, advocating for his computer-controlled studio, concedes that a computer could indeed produce 'endless hours' of 'boring, grey computer music' from a simple program. However, he explains, as computers improve, 'in the future it's how inspired people are going to be in using them, not what computers can do' that is the most important, putting the emphasis back on human imagination rather than technology.[7]

Oram's stance was not uncommon in critiques of computer music at this time – for example, Pierre Schaeffer[8] was also concerned that the 'composer in the electro-acoustical media can fabricate miles of music' (Schaeffer quoted in UNESCO 1971: 196). The industrial metaphors of 'yards' of 'fabricated' music suggest the presence of an anxiety, to which there is a class-based undercurrent, that avant-garde music, if composed with computers, could take on the character of any other mass-produced item. However, Zinovieff's advocacy for the computer, and *The Same Trade as Mozart*'s implicit support of his position through its sympathetic portrayal of computer music, demonstrate that, while computer technology was still thought by many to present the greatest threat to creativity, attitudes towards computers were gradually shifting.

3.2. Electronic brains: computers in the media

[7] Similar debates greeted the arrival of the synthesizer, which, to some electronic composers, signalled a unwelcome departure from the tape-only studio and led to a dependence on generic 'electronic' sounds (see Niebur, 2010). The first British synthesiser, the VCS3, was launched by EMS in 1969, and had *The Same Trade as Mozart* been made a few years later, the film might have included some critical voices about it.
[8] Schaeffer is generally regarded as the originator of *musique concrète.*

The portrayal of computer music in *The Same Trade as Mozart* reflects broader changes in the way in which computers were presented in broadcast media in the 1960s, as we can see if we compare it with *Machines Like Men*, broadcast in 1962 and presented by Raymond Baxter, later familiar as presenter of *Tomorrow's World*. *Machines Like Men*'s synopsis announces:

> We must learn to live with them... Fantastic devices that ape human behaviour... Machines that forge signatures, talk, sing, and even recognise and obey the human voice... Now, a brain that works a hundred million times faster than its creator's.

Machines Like Men aimed to convince its audience that computers were far more than elaborate accounting machines. In the programme, they are shown doing 'unusual and surprising jobs', including analyzing a Biblical text, navigating RAF planes, profiling criminals and composing music. A program written for the Ferranti Pegasus computer is seen to produce a kind of 'score' that is transposed into musical notation for violin, viola and bassoon. The viewer hears a short excerpt from this over footage of punched tape being fed into the computer and a music typewriter typing out the score, while the voiceover tells us that we are listening to music 'composed by a computer'.

There is no mention of any human operator, although the composition was, of course, also the work of a programmer; in this case, the computer scientist Stanley Gill. Reflecting on this experiment, Gill was circumspect about the computer's capacity to compose. Instead, he foresaw a future in which a composer and a computer worked together as a 'co-operative venture', which would be made possible by the invention of more powerful computers and specific music software (Gill in Schwanauer and Levitt, 1993: 43) . In *The Same Trade as Mozart* we see that, even by the end of the 1960s, Gill's notion of the 'co-operative' computer was starting to gain ground. However, this was not the overall tone of *Machines Like Men*, which portrayed the computer as an 'electronic brain' poised to take over various human functions, including creative ones.

Throughout the decade, the British media continued to explore the question of the computer's creative capacities, in productions such as the Third Programme's two-part *The Computer and Literature*, in which the poet Edwin Morgan discussed computer-generated poetry in relation to other experimental poetic techniques, and addressed the issue of whether

a computer could be said to possess 'the flash of imagination'. In the late 1960s and early 70s, as computers became more commonplace in universities and workplaces, media portrayals of computing focused more on how a computer could be comfortably integrated into existing systems of work or education. For example, a BBC Radio 4 documentary called *Keeping the Computer Human* (1970) addressed the challenges of transitioning to a computerized workplace, while *Computers and Construction* (1972), a public information film co-produced by IBM and John Laing Construction Ltd., aimed to show how the synergy of human expertise and new digital technology could be effectively deployed in planning and implementing a new building project.

An important technological development accompanied this shift in attitudes. In the early 1960s, the Digital Equipment Corporation (DEC) added minicomputers to its PDP (programmable data processor) range of computers, starting with the PDP-5 in 1962, and followed by the more commercially successful PDP-8 in 1965. These relatively small machines would be used in a number of electronic music studios in the early 1970s, including the Elektronmusikstudion in Stockholm and the Utrecht-based Institute of Sonology, as well as by Peter Zinovieff, who bought a PDP-8S in 1967 for his home studio – a machine that Zinovieff claimed was the first computer to be installed in a private house in the UK. Despite their limitations of memory and processing power, the PDP minicomputers were small enough to be incorporated into a laboratory or office – or indeed a studio – without the need for a special power supply or controlled climate; they were also far cheaper than other available computers at the time (Ceruzzi, 2003: p.129, 135). DEC encouraged their users to develop their own software and hardware systems, as indeed Zinovieff and his colleagues did at EMS, where a designated music program called MUSYS was developed by Zinovieff and programmer Peter Grogono between 1969 and 1972 (Grogono, 1972).

While computers were still major investments that were out of the financial reach of most individuals and many institutions, the minicomputer made the idea of computing more accessible to a greater range of people. Computers began to be used in the applied arts, such as graphic design, and fine art, with the ICA's popular *Cybernetic Serendipity* exhibition in 1968 presented as a celebration of 'The Computer and Arts' (Reichardt, 1968, 1970); Zinovieff loaned his PDP-8/S to the exhibition and wrote an article for an accompanying special issue of *Studio*

International setting out his plans for a computerised electronic music studio that would do away with the 'nostagia and maladroitness of the old techniques of music production, the manipulation by hand of magnetic tape and control knobs', and 'make possible the direct translation of scores into music' (Zinovieff, 1968: 28). Many composers of electronic music who, as Francis Routh remarked in his 1972 survey of avant-garde music, were likely to be 'just as much technician as composer' (Routh, 1972: 304) would have been aware of the possibility and potential of using a computer to compose music; however, until the arrival of minicomputers, opportunities to see and hear what this actually entailed, let alone to try it oneself, were rare. The portrayal of the computer in *The Same Trade as Mozart* should therefore be understood in this context of a new interest in computing in the creative arts[9] as well as an increase of computers in workplaces and educational environments. However, as we have already seen, computers also provoked negative associations with ideas of industrialised production, loss of individuality and the 'takeover' of humans by machines, and it is these associations that *The Same Trade as Mozart* sets out to counter.

4. ANSWERING THE SCEPTICS

4.1 Electronic music and institutional advocacy

The Same Trade As Mozart can be seen as an attempt to advocate for electronic music in response to the hostility shown by critics such as Brindle and Sadie, perceived antagonism from the wider public, and tensions within the field itself (such as the misgivings held by some composers about the musical use of computers, as mentioned previously). However, there were also pragmatic reasons for the film's interviewees to advocate for electronic music, which would not have been evident to many viewers.

Firstly, in 1969, Desmond Briscoe and David Cain were both employed by the BBC Radiophonic Workshop. At the time of filming, Briscoe was the Workshop's director, and was engaged in a programme of expansion of the Workshop, investing in new equipment to be used by studio managers such as Cain. Briscoe's position in the Workshop was frequently one of an advocate, having to persuade various management and technical committees to

[9] For example, the film was aired in the same year that Max Mathews and his colleagues published their seminal text, *The Technology of Computer Music* (Mathews et al., 1969).

fund purchases and allot more space to the Workshop's studios; at the time of *The Same Trade as Mozart*'s filming, he was investigating the purchase of a Moog synthesizer for the Workshop, which was, at the time, a significant investment for any studio (Niebur, 2010: 129; BBC Written Archives R97/10/2).[10] It was therefore in his interests that electronic music and sound design were seen as valid creative forms that were worth investing in.

Secondly, Tristram Cary, Peter Zinovieff and, to some extent, Daphne Oram were involved in efforts to establish a national electronic music studio in the UK in the late 1960s. Cary, an ex-Navy radar operator who was not only one of the first English composers of electronic music, but one of the first in the world to experiment with electronic techniques in the late 1940s, had been advocating for a national studio for some years. In 1966, he wrote a polemical article in the *Musical Times* that framed the UK's lack the lack of a studio as an urgent matter:

> No one seems to notice (or care) that Britain is rapidly losing another race among so many lost races – although […] it would not be difficult even now to lead the world in an important and fascinating field of study. (Cary, 1966: 313).

Spurred on in part by Cary's advocacy, the Society for the Promotion of New Music (SPNM) formed an Electronic Music Sub-Committee in 1968, and in 1969, Cary, along with Zinovieff and the composer Harrison Birtwistle, instigated the British Society for Electronic Music (BSEM), the chief purpose of which was to put in place this national studio, with Zinovieff's private studio, EMS – as seen in *The Same Trade as Mozart* – as its starting point.[11]

The national studio was never realised, but the making of *The Same Trade as Mozart* coincided with high hopes for this project as well as a period of activity and development at the BBC Radiophonic Workshop. During the same period, Cary had also established an electronic music studio at the Royal College of Music in London, and Daphne Oram was making numerous efforts to gain funding and support for her Oramics technique of optical synthesis, which is demonstrated in the film. For the majority of the film's British participants, therefore, there was a clear professional motive for them to convince a

[10] Briscoe eventually opted for synthesizers from EMS London Ltd's new range, and the BBC Radiophonic Workshop was equipped with VCS3s and a Synthi 100. For further discussion of the development of the BBC Radiophonic Workshop during the late 1960s and early 1970s, see Niebur (2010), Chapter 4.
[11] See Candlish (2012) for a full account of the campaign for a national studio.

conservative musical public to take this new music seriously, and it is reasonable to suggest that they saw their advocacy for electronic music at least partially as a means of realising and developing their own projects.

As with any documentary, it is important to ask how much *The Same Trade as Mozart*'s predominant narrative is shaped by the director and how much by its interviewees. In this instance, what we know of the subjects' activities and preoccupations indicates that the prevailing tone of advocacy was one that they themselves adopted in public statements, lectures and articles, such as Cary's numerous pieces in magazines and newspapers on the need for greater acceptance of and support for electronic music (Cary, 1966; 1969, and others).[12] However, for this tone to be emphasised by Buckton to shape the narrative of his film indicates the director's sympathy lay with the aims and ideals of his participants.

4.2 How *The Same Trade as Mozart* makes a case for electronic music

While sceptical responses to the presence of new technologies in music have been widely noted and even theorised (Pinch and Bijsterveld, 2003; Bijsterveld and Schulp, 2004), less critical attention has been paid to the strategies employed by the advocates of such technologies to defend themselves against such criticisms. In the following section, we examine the ways in which *The Same Trade as Mozart* uses advocacy of electronic music to counter scepticism about it. In doing so, we adopt an interpretive frame that has been more commonly applied in analyses of the public communication of science (see for example Davies et al., 2019) than in studies of music and music technology.

The film begins with Karlheinz Stockhausen stating, like a true utopian modernist, 'I find it just marvellous that nowadays we can make sounds that we have no names for. It means that all the magic that had been lost comes back.' His statement is played over rather provocative footage of sex and civil rights violence (see Clip 1). This introduction seems designed to cast electronic music as culturally relevant and full of modernist promise, but also uncompromising and (by the standards of the time) slightly risqué. However, this is not

[12] We might also add to this the Concerts of Electronic Music that Zinovieff and Cary presented at London's Queen Elizabeth Hall between 1968–9, as well as BSEM's launch concert in June 1969.

a mood that continues throughout the film. Instead, electronic music is portrayed more as an art form that is still in its early days but that has strong potential for educational, scientific, creative and fundamentally beneficial use. First, however, various sceptical attitudes about it have to be confronted. Tristram Cary addresses the sceptics directly: 'I think people who judge [electronic music] harshly', he says, 'have to remember that it is in a pioneer stage. It's only been going for twenty years or so as a viable artform.' This anchors the narrative as an appeal to the sceptics, as it pre-empts some of their criticisms.

The film continues to show advocates who share some of the concerns of the sceptics. As we have already seen, Daphne Oram warns against computers being used 'to produce music by the yard', echoing the sceptics' concern that technology is being used to automate the process of music-making and to absolve the composer of any real creative responsibility.

Later on, David Cain, a composer at the BBC Radiophonic Workshop, declares that:

> I still have to be convinced that one can go into a concert hall and sit down and listen to pure electronic music and get a great deal of pleasure out of it, partly because most of the pieces go on probably about 15 times too long, so that one gets very bored and very annoyed even though the first three minutes were rather super. After ninety-three minutes it begins to get a bit wearing.

This becomes part of a constructed exchange between Cain, Stockhausen, Cary, and Desmond Briscoe about how audiences might be expected to engage with electronic music when it is so different sonically and visually from what they might expect in a musical performance (see Clip 2).

The impression given is that that the advocates are aware of the public's scepticism, and wish to address it. There are four main ways in which the advocates try to do that.

4.2.1 Heuristic explanations

> What I have in mind for this programme […] is first, an explanation of the differences in the physical characteristics and potential of electronic sounds as against 'traditional ones'; then an examination of the sort of equipment and techniques that have been and are being used; and finally a study of some electronic music (probably some all electronic and some involving a mixture of electronically generated and 'traditionally' generated sounds) and of the sort of compositional techniques and

> styles that are demanded and employed. I hope it is clear from this that I am aiming primarily at some degree of enlightenment in the audience rather than the stimulation of unproductive controversy (Buckton, 1968).[13]

So explained Buckton in his letter to Stockhausen asking him to participate in the production. In line with Buckton's intentions, in *The Same Trade as Mozart* the advocates explain the concepts and techniques involved in the production of electronic music and relate these to musical practices and paradigms that are likely to be more familiar – the theory being that if the audience understands the principles of electronic music, and particularly if they can relate these to musical concepts that they are familiar with, they might react more favourably towards electronic music in general. A good example of this kind of heuristic explanation is a scene in which Desmond Briscoe explains the fundamentals of electronic sound while the accompanying footage alternates between electronic studio equipment and more conventional musical instruments (see Clip 3). This serves not only to explain the unfamiliar principles, but also to link them with concepts and paradigms that are more familiar to the audience.

This particular kind of advocacy reflected David Buckton's own interests, as well as demonstrating Briscoe's knowledge. Buckton's previous role as a TV studio manager had led him to develop an interest in acoustics, as well as giving him a working knowledge of electronic sound. Subsequent documentaries about the history of the piano and the violin on which he worked as a producer also display a preference for explaining of the processes behind how instruments are built and how they work to the audience.[14] In an interview in 2018, referring to the sequence with Briscoe described above, he explains,

> I've always been fascinated by how things work, and I've always wanted to tell people […] So I was really interested in how you started with a simple sound, and built it up and gave it complexity, and turned it into a sound you could make music with (Buckton, 2018)[15]

There was also a televisual precedent for this heuristic approach to sound, in the educational films some viewers of *The Same Trade as Mozart* – which, broadcast on a

[13] David Buckton, letter to Stockhausen dated 12 August 1968. BBC Written Archives Centre, Caversham, File T13/258/1.
[14] *How Did It Sound to Beethoven?* (1973); *The Violin* (1972).
[15] Interview with David Buckton by Ian Greaves.

Sunday evening at 8.15 pm, was intended for a general adult, rather than a schools audience – might have seen as children. For example, *Science in the Orchestra* (dir. Alex Strasser, 1950), a companion to the 1946 film *Instruments of the Orchestra*, both produced by the Realist Film Unit, took a similarly heuristic approach to sound by showing a scientist recording, analysing and manipulating the sound of an oboe using an audio-spectrometer (Cohen in Rogers (ed.), 2014: p83). *The Same Trade as Mozart* was not an educational programme per se; however, scenes such as the one with Briscoe mentioned above demonstrate a fluency with the visual and verbal style of educational film, which is further emphasised in the sequence described below.

4.2.2 Electronic music in education

In *The Same Trade as Mozart*, electronic music's advocates seek to demonstrate its inclusivity and educational value. The first extended scene in the film features the English composer Brian Dennis working with teenagers at Shoreditch School, in what was then a working-class area of East London, on a group electronic music composition project. He says:

> Most of these boys, they're not musical, they don't play any musical instruments. My idea is to give them a means of making their own created sounds and applying these into some sort of formal shape.

This part of the film highlights electronic music's democratic potential;[16] its capacity to open up creative opportunities to children who otherwise might not have them (see Clip 4). In this way, electronic music is presented as an educationally valuable and inclusive medium that can empower children to work together cooperatively, whether or not they play a classical instrument.[17]

4.2.3 Humour and electronic music

A third approach that the advocates take is to use humour to play along with the public's scepticism – a move which effectively diffuses the threat that electronic music might

[16] For a critical discussion of the idea that electronic technology 'democratised' music, see Théberge (1997).
[17] A similar agenda was pursed by Dennis in his book, *Experimental Music in Schools: Towards a New World of Sound* (London: Oxford University Press, 1970), and by John Paynter and Peter Aston in their contemporaneous book, *Sound and Silence: Classroom Projects in Creative Music* (Cambridge: Cambridge University Press, 1970).

otherwise be seen to pose to traditional music-making practices.[18] The best example of this is the scene in which David Cain presents a piece of electronic music that he has been working on (see Clip 5):

> The piece I'm working on now is a radio spoof… of three medieval instruments that don't in fact exist: the Shagbut, which is a two-man trombone, which is made mainly of boiled leather and twenty-five feet of copper tubing; the Minikin, which is a sort of arthritic virginal, about six yards long, with a mechanism that takes exactly a minute from keyboard to string; and the Flemish Clacket, which is a sort of lute, except that it's fifteen foot high and it hasn't got a fingerboard, and you play it from the inside, that is, the player's inside and the tuner's outside.

Cain was working to a brief, of course – to produce the music for a script satirizing early music enthusiasts[19] – but in the context of the documentary, where Cain's work is presented as an example of current practice in electronic music, this scene can be read in a different way, as a playful satirisation of electronic music's arcane methods, its ridiculous apparatus, and (as a sceptic might argue) its inelegant and rather unmusical sound-world.

4.2.4 Electronic music in performance

Finally, performances of electronic music are shown in order to highlight its potential as a dynamic performance medium. In the performances of works by Stockhausen and Justin Connolly and Peter Zinovieff, musicians interact with electronic instruments and technologies, demonstrating that electronic music is not only a recorded medium to be broadcast on the radio or played over loudspeakers, but also a musical form like any other that can be played 'live'.

In the following section we will examine the way in which the portrayal of the composition and performance of Connolly and Zinovieff's *M-Piriform* can be said to demonstrate advocacy for electronic music and also to counter possible scepticism towards it. We demonstrate that the film's central narrative dynamic of advocating for electronic music and countering scepticism towards it can be detected not only in what interviewees say, but also in the way in which electronic music is 'seen' on screen.

[18] For a wider discussion of the use of humour in persuasion, see Mulkay (1988).
[19] Michael Mason (producer), 'Shagbut, Minikin, and Flemish Clacket', 1969.

5. 'SEEING' COMPUTER MUSIC

5.1 The computer in the studio

Rather than the office or laboratory in which the viewer of the 1960s might have expected to see a computer, *The Same Trade as Mozart* presents the viewer with a very different working environment: Peter Zinovieff's small home studio, which at the time was situated in a building in his back garden – the kind of space recognisable to any viewer who had access to a shed, workshop or art studio. It is from within this cluttered, 'DIY' mise-en-scene that Zinovieff explains how his computer controls devices such as oscillators and filters, and then demonstrates how a program is devised and input into the computer.

Rather than lingering solely on the computer, the camera picks out the most eye-catching dynamic elements of its peripheral devices, such as the numbers on a sequencer counter, a glowing oscilloscope, a plotter, the switches and flashing lights on a digital to analogue converter, and the teletype machine into which Zinovieff types the program. While Zinovieff's explanation of how the system works aligns with Buckton's preferred heuristic approach, the use of close-ups, panning and editing also gives a somewhat fragmentary, impressionistic picture of the studio. Then aim, then, appears not to be to teach the viewer every step from input to output, but rather to create a visual impression of the computerized studio as a dynamic, tactile, experimental environment (see Clip 6).

If we compare this footage to that in *Machines Like Men*, in which a monolithic computer is placed in the television studio, its operator dwarfed by the huge machine which they control from a seated position, we see that *The Same Trade as Mozart* takes almost the opposite approach. Here, the computer is integrated into the studio like any other device, and its operator, depicted as an enthusiastic, creative, standing person, is to the fore (see Fig. 1).[20]

This difference is partly due to the technological developments in the 1960s that

[20] Zinovieff was an early adopter in this sense. Although computers were installed in a few electronic music studios in the 1970s (within the UK, one was installed in studio at University College, Cardiff, for example (Winter, 1976)), computers did not start to become a common fixture in studio set-ups until the 1980s, after the development of specialised digital signal processing technologies, the MIDI protocol, and (later) digital audio workstations. For further discussion, see Manning (2013: 365–416).

produced the more accessible PDP range of minicomputers, as we have already noted. But Zinovieff's PDP-8 computer had not always been in the background like this. In 1968, the same computer had been put on stage at the Queen Elizabeth Hall as part of the concert of electronic music devised by Zinovieff and Tristram Cary that we described in Section 3. In March 1968, BBC's *Tomorrow's World* ran some footage from this concert, showing Cary announcing from a box that the audience is about to see 'the first ever live computer performance without tape or any music recording medium'. The resulting performance of Zinovieff's *Partita For Unattended Computer* was presented as a spectacle intended to provoke feelings of wonder in the audience in the manner of Nye's 'technological sublime' (Nye, 1994), as Zinovieff and an assistant leave the stage once the computer is set in operation, leaving it 'perform' alone (see Fig. 2). In 1968 the computer also appeared in a Pathé newsreel whose voiceover, albeit lightheartedly, characterised it as a composer/performer in itself, creating music while 'Peter helps with the ideas' (British Pathé, 1968). In *The Same Trade as Mozart*, the computer is still highly visible, but it is no longer portrayed as an anthropomorphic stand-in for the composer or musician. Instead, the visual presentation of the relationship between human and machine implies a collaborative relationship, consistent with Zinovieff's notion, expressed in a 1969 article, that a computer could be a 'good interpretive agent' of a composer's ideas (Zinovieff, 1969: 167).

5.2 Human collaborators

The Same Trade as Mozart also foregrounds the collaborative relationship between Justin Connolly, the composer, and Zinovieff, whose role is portrayed – accurately – as more than just that of a technical assistant or engineer. The semi-authorial, 'realisateur' role of the electronic music studio technician has been discussed at much greater length elsewhere,[21] but for the purposes of this paper it might be thought of as similar to that of a producer, as we would understand the term in popular music – and indeed, the pop and rock producer took on an increasingly important, auteur-like status in the 1960s (see Moorefield, 2005).

In *The Same Trade as Mozart* Buckton sets up a kind of re-enactment of how Connolly

[21] See for example: Sean Williams, 'Interpretation and Performance Practice in Realizing Stockhausen's *Studie II*'. *Journal of the Royal Musical Association* 141, no. 2 (2016): 445–81; and Laura Zattra, 'Collaborating on Composition: The Role of the Musical Assistant at IRCAM, CCRMA and CRC'. In *Live Electronic Music: Composition, Performance, Study*, edited by Friedemann Sallis, Valentina Bertolani, Jan Burle, and Laura Zattra, 59–80. Abingdon, Oxon; New York, NY: Routledge, 2017.

and Zinovieff might have worked together on *M-Piriform*. This process is portrayed as relaxed, pleasant and cooperative. The two men are seen discussing, in Zinovieff's house, their plans for the piece. Having decided on instrumentation and some structural parameters, they work on their parts separately; Connolly stresses that, 'the technical knowledge is more or less divided equally between the people' – i.e. him and Zinovieff – 'but each has a field of his own'. Thus the composer's 'field' – here shown by Connolly working on a score with pen and paper – remains untroubled by technology (see Clip 7).

5.3 Classical props and settings

The visual foregrounding of the traditional compositional methods used by Connolly is significant. As sound recording made it possible to separate music from its live performance, electronic music created a further rupture in which a typical listener was not only less likely to be a player or reader of music, but was also now less likely to be able to identify by ear how music had been made and on which instruments. What the philosopher of technology Bernard Stiegler calls the 'machinic development of the senses' in the twentieth and twenty-first centuries in which 'not everything has to pass by way of the hand or voice' (Stiegler, 2015: 12–13) was made particularly apparent by electronic music, whose visual representation has tended towards a machine-like aesthetic that reminds the listener of their physical, temporal and possibly intellectual distance from the music's creation.

In *The Same Trade as Mozart*, classical props and settings are used as if to counteract the 'machinic sensibility' and close, rather than emphasise, the distance between electronic music and our knowledge of how it is made. The sites in which computer music is made, talked about and presented are Zinovieff's shed-like studio, the drawing room of his elegant Victorian home, Connolly's cluttered desk, and the neoclassical building in which the piece is finally performed. For example, in one interview segment, Zinovieff says,

> It would be inconceivable to tackle any part of [the score] by a classical method, because the amount of calculation to realise this really is gigantic, and the amount of information actually given out, even to the bits of apparatus, is probably several thousand per second, and one just couldn't juggle around in this precise mathematical way with sound if you didn't have a computer to do it for you.

However, this statement about the literally inhuman capacities of the computer is delivered by

Zinovieff while sitting at a grand piano, which has a hand-drawn graphic score on its music stand that represents some of the computer operations Zinovieff describes (see Clip 8). As Zinovieff talks about processes that many viewers would find hard to conceptualise, we are visually reminded by these objects and the location in which they are found that what he is describing is still 'composition'. As well as using visual cues and props, analogies are also suggested between traditional and electronic composition methods. For example, when Zinovieff emphasizes the painstaking work of writing, debugging and rewriting a program, it is easy for the viewer to understand programming a composition on a computer as comparable in skill and difficulty to writing a complex score on paper.

5.4 Live performance

Visual tropes of classical music are also evident in the performance of *M-Piriform*, which concludes the film. Importantly, it is not an 'acousmatic', that is to say a wholly electronic performance. The vocal and instrumental parts are performed live by Jane Manning, Judith Pearce and Pauline Scott, while a tape recorder plays the computer-generated material, with which the musicians interact, over loudspeakers (see Clip 9). Unlike Zinovieff's performance at the Queen Elizabeth Hall the previous year, the computer is not on stage – its job by this point is over.

The soprano, violinist and flautist are easily recognizable as classically trained musicians. Dressed in matching, full-length formal dresses, their technique, gestures, performance style and facial expressions send messages to the audience about the music they are hearing. Writing about filmed performances of the violinist Jascha Heifetz, Thomas Cohen stresses the important role of the filmed face – of the performer and the listening audience member – in indicating how we should receive a musical performance, citing early film theorist Béla Balázs's notion that, 'the emotion produced in a human being by music and demonstrated by a close-up of a face can enhance the power of a piece of music in our eyes far more than any added decibels' (Belázs, 1949: 209, cited in Cohen, 2009: 75).

Here the performers' faces are often seen in mid-shot and close-up, their intent expressions helping the audience to understand the piece as 'serious' music (Cohen, 2009: 74) However, there are also a number of visual elements of this performance that draw attention to

the more unusual aspects of the music.

Positioning: Each performer is positioned in her own discrete space from which she cannot see the others – an unusual set-up for a performance of chamber music. Manning and Scott are in upper galleries of the building, while Pearce and one of the loudspeakers are directly below. In the middle, in its own alcove, is the tape recorder (see Fig. 3). Firstly, this positioning divides the group in such a way that the audience is led to perceive the performers as separate entities rather than a traditional ensemble. Secondly, the positioning of the performers, speakers and tape recorder affords equal status to non-human and human sound sources.

***Cinematography*:** The ensemble as a whole is only gradually revealed to the viewer. Instead, the cameras cut or dissolve from one performer to another, with a variety of, zooms, long shots and close-ups. The dissolves between human performer and tape recorder ask us to again think about the convention of the close-up face in filmed musical performance (see Fig. 4). There is a visual suggestion that the reels of the tape recorder, filmed in close-up, also represent a kind of face. If this is so, we might ask what kind of musical proposition is being made here, in which a singer's face and a machine's 'face' are interchangeable.

Editing: the film is tightly edited to the music in a way that constructs a dramatic audiovisual narrative, rather than providing a visual record of a performance as it might have been seen by a live audience,. We might contrast this with the film of Stockhausen's ensemble earlier in *The Same Trade as Mozart*, which, although also edited to the music, generally uses slow panning and zooms rather than fast cuts, and constructs the viewpoint of one of the audience member in the classroom in which the performance takes place, or even that of a participant (see Clip 10). With no theatre or studio audience, only a televisual one, the *M-Piriform* performance draws instead from the non-naturalistic viewpoint and vocabulary of pop music videos and experimental film.

These elements undercut the classical presentation in a playful way by suggesting the possibilities and pleasures of electronic music's 'artificial' nature and emphasising its newness and difference, while simultaneously presenting visual reminders of its kinship and alliance with more traditional music forms.

7. CONCLUSION

The Same Trade as Mozart ultimately promotes a composer-focused, rather than technocentric, portrayal of computer music. The composer, Justin Connolly, is given the last word, reflecting that, 'In many ways the problems of composition don't really change that much', as if to reiterate that the computer cannot provide easy solutions to those problems. It is he who coins the phrase that is the film's title, musing that the job of the composer is the same now as it was in Mozart's day.

By taking the computer off the stage, downplaying its physical presence in the studio and emphasizing its function as a compositional aid, the film reassures us that neither the composer nor the performer can be fully replaced by a computer. Yet in giving equal visual space to the human performers and the tape recorder in the performance of *M-Piriform*, and in portraying Peter Zinovieff as Connolly's intelligent, musically informed collaborator, Buckton also emphasises the aesthetic validity of electronic sound within the overall composition.

In conclusion, *The Same Trade as Mozart* portrays an ambivalence about electronic music which it sets up and then counters, through verbal advocacy from interviewees as well as visual tropes that humanize electronic music, emphasising human participation, collaboration, humour and education. The film gestures towards an integrated view of electronic music that places it within the hands of instrumental ensembles, pop groups, schools and composers, and allows composers, musicians, technologists, educators and studio managers to make a clear case for electronic music's aesthetic and social value. While the direction, cinematography and editing of the performance of Connolly and Zinovieff's *M-Piriform* that concludes the documentary relies on some of the legitimising visual tropes of classical music performance film, it discards or subtly subverts others, demonstrating an overall directorial position that supports the promotion of electronic music as an exciting creative medium and visually represents it as

such. However, the film concludes on a reassuring note, with its closing words appearing to address sceptics directly with the message that, whether composers are writing for orchestra, tape or computer, they are still following 'the same trade as Mozart'.

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FIGURES

Figure 1: Peter Zinovieff in his computer-controlled studio. Screenshot from David Buckton (dir.) The Same Trade as Mozart *(1969)*.

Figure 2: Peter Zinovieff and assistant perform Partita for Unattended Computer *at the Queen Elizabeth Hall, London, in January 1968. Screenshot from* Tomorrow's World, *29 March 1968*.

Figure 3: Jane Manning (soprano), Judith Pearce (flute) and Pauline Scott (violin) perform Justin Connolly and Peter Zinovieff's M-Piriform*. Screenshot from David Buckton (dir.)* The Same Trade as Mozart *(1969).*

Figure 4: Dissolving between musician and tape recorder: Pauline Scott performs Justin Connolly and Peter Zinovieff's M-Piriform*. Screenshot from David Buckton (dir.)* The Same Trade as Mozart *(1969)*