THE SPATIALISATION OF STEREOPHONY: TAKING POSITIONS IN POST-WAR ELECTROACOUSTIC MUSIC

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ABSTRACT

While a growing number of musicological studies attest to the aesthetic importance of spatialisation in electroacoustic music, few have questioned the notion that its aesthetic significance should be reducible to its role in sonic structure. Tracing a path across the tightly knit network of commercial, institutional, technical, and musical players involved in the early development of spatialisation techniques, this paper undermines the presumption of formal autonomy by sketching a history of some of the social and discursive strategies that composers have deployed to distinguish the concept of spatialisation from preexisting and parallel concepts of multichannel stereophony. The paper closes with some reflections on the role of spatialisation in the development of electroacoustic music as a genre.

1. INTRODUCTION

Multiple-speaker projection techniques, spatial simulation methods, site-specific and purpose-built architectural installations are among electroacoustic music’s defining concerns. While these techniques have been the object of a variety of attempts at formalisation in Western Art Music since the end of the Second World War, nowhere has spatialisation played such an integral role in common practice as in electroacoustic and computer music. The majority of the existing musicological treatments of spatialisation, however, have tended to presume that spatialisation methods should be treated solely in terms of their coherence as a component of sonic structure. [31, 45, 58] The historical study which I gloss in this paper troubles the presumption of structural autonomy which has prevailed in the musicological literature on electroacoustic and computer music by tracing a path through the discursive, social, and technical work involved in the process by which multichannel spatialisation became a concern in post-war studios. It was through this work that composers and theorists were able to rationalise their appropriation of the technical apparatus of multichannel stereophony from the telecommunications and entertainment industries while simultaneously constructing an aesthetic of spatialisation which de-legitimised commercial music and sound design.

As I will show in this paper, the discourse used to sever connections between spatialisation and the technical apparatus of stereophonic broadcasting and recording did not spring forth whole, but had to be developed over time. Contemporary use of the word stereophony as a technical term, which only began to normalise after two-channel playback equipment became available on the home market in the late 1950s, is markedly different from the use which was current during the early years of electroacoustic music. In contemporary discourse, the term spatialisation is used to refer to a family of techniques for organising and manipulating the location, movement, and propagation of sound within a listening environment. Use of the word in English can be traced back to its French cognate, which occupied a key position in the technical lexicon of musique concrète in the early 1950s. [54] At the time of the adoption of multichannel stereophony in the early electroacoustic studios a wide variety of competing techniques had been available, some since the early 1930s. As late as 1960, the concept of stereophony was still inclusive enough to encompass any method of sound reproduction involving more than one speaker. [64] The main difference between the contemporary and the post-war concepts of stereophony is that, in the latter, the potential number and positioning of loudspeakers was effectively unlimited.

Following the gradual change in usage reveals that the deep integration of multichannel spatialisation techniques into electroacoustic concert practice, which preceded the establishment of formal compositional methodologies using standardised recording and playback formats, did not mean that these technologies were ever the exclusive domain of electroacoustic composers. In fact, the historical sources cited in this paper call into question the notion that the technologies of spatialisation were ever driven by purely compositional conceptions. Instead, the evidence suggests that electroacoustic composers worked as members of a close-knit network of technicians, theorists, and institutions in which multichannel sound projection was already a concern, developed independently from any notions of musical necessity. Although it is impossible to disentangle the extent to which a change in the use of technical language is the result of industrial standardisation or the work of avant-garde musicians, filling out our account of this shift in uses does cast significant doubt upon...

1The writers and editors of Die Reihe used the German equivalent in this sense [24, 14, 60], and their counterparts in Paris used the French equivalent in the same way. [54, 47] Stockhausen, for one, would continue to use the term with this broader connotation until much later in his career. [62]
the narrative, often rehearsed in the electroacoustic and computer music literature (see for example [19, 38, 4]), in which mono is understood to give way to two-channel stereo, which in turn gives way to more and more sophisticated forms of multichannel reproduction in an uncomplicated linear progression.

The aesthetic discourse used to separate spatialisation in electroacoustic and computer music from parallel techniques in other genres was not only descriptive, but also performative, in that it enacted a set of relationships and distinctions which might not have existed without it. [2] The division of labour between composers and technicians in electroacoustic and computer music may also have been effective (if not deliberately employed) as a tool to reinforce the isolation of a purely aesthetic level of musical structure from the practical level at which it was constructed, amounting to what Paul Théberge has called a social technology of music. [65] By emphasising the social and discursive aspects of this change, distributed throughout the network of post-war musicians, I hope to show above all that it was not simply through technological or formal innovation, but moreover through collective work of distinction that composers of electroacoustic music isolated an independent aesthetic of spatialisation from the wider pre-existing concept of stereophony.

The object of recognising these divisions, however, is not simply to downplay the contributions of individual creators or to extend artistic validation to the previously unrecognised contributions of support personnel, as others have done with reference to a variety of art and music worlds. [33, 7, 32] The social and discursive distinctions through which electroacoustic composers established their aesthetic authority over multichannel spatialisation techniques may be thought of as a nexus of what Pierre Bourdieu has referred to as "position-takings" [17] occurring in the years following the Second World War in response to transformations in the field of musical production. Before the war there had literally been no space for an institutionalised avant-garde. During the immediate post-war period, however, a crop of newly established or reconstructed academies, broadcasting authorities, festivals, and cultural organisations emerged. These organisations afforded a variety of new opportunities for stability suited to artists whose work could be seen as needing institutional support, both aesthetically and financially. The symbolic appropriation of newly available technological resources was only one of the tools used by electroacoustic composers to construct a project which could engage with the cultural and economic capital appropriate to these new positions. In order to capture and consolidate new positions, in securing this construction.

2. MULTICHANNEL STEREOPHONY BEFORE SPATIALISATION

Two multichannel stereophonic techniques designed specifically for playback over loudspeakers were developed independently in the early 1930s, by Harvey Fletcher at Bell Labs and by Alan Blumlein at EMI. While Blumlein’s system was indeed limited to two channels, Fletcher’s technique allowed for three or more, depending on the space in which it was to be installed. For practical purposes, the Bell Labs system was generally restricted to three channels arranged in a row, but this could theoretically be filled in or extended indefinitely. [26] The first demonstration of the Bell technique took place in a 1933 concert funded by the National Academy of Sciences which featured a closed-circuit broadcast over dedicated telephone lines between the Academy of Music in Philadelphia and Constitution Hall in Washington, D.C. [64] Fletcher’s choice of musical collaborators is particularly revealing. In 1928, Edgar Varèse had approached Bell Labs about the possibility of setting up a research studio, but his proposal was dropped due to doubts about the marketability of Varèse’s ideas. [69] Instead, Fletcher’s primary collaborator in the development of stereophonic sound projection was the charismatic conductor of the Philadelphia Orchestra, Leopold Stokowski. Following the initial demonstrations of Fletcher’s system, Stokowski continued to advocate the use of multichannel techniques in a widening range of applications. According to Stokowski, stereophony enabled the engineer to emphasise and enrich "the three-dimensional character of the music.” He recommended the building of large-scale "recreation centres."
where through selective focusing of the speakers several concerts might be broadcast at once, allowing listeners to stroll from one to another at their leisure. [64] "[By] having loud-speakers [sic] around the walls – on the ceiling – behind the galleries," Stokowski wrote in 1943, "the principles of antiphony can be developed in new directions and brought to new heights. Instruments and voices can answer each other from all directions. Or the tone can flow around the theatre." [63]

In 1938, Stokowski lent his support to yet another significant experiment in the development of stereophony, this time in cooperation with Walt Disney Studios and RCA. The development of a dedicated sound system for the animated film Fantasia led to the production and testing of at least ten different working systems between 1938 and 1942. An early version of "Fantasound" required "four circuits using sixty loudspeakers, mak[ing] it possible to chase music right around an audience, out of the screen and back into it, or make notes die into infinity overhead." [10] The "road show" version, which toured the US during the early 1940s, required three on-stage speaker groups, a variable set of auxiliary speakers spaced around the auditorium, and dedicated film channels for automation. The system was also designed to be more or less portable, and positioning was adapted by the engineers to suit the space afforded by the venues where it was deployed. Despite the difficulties the system caused, engineers who worked on the development of "Fantasound" predicted that the multichannel model would remain popular: "having used the multiple-track system, no matter in what form, the ordinary sound-track reproduction is flat and dull by comparison." [29]

In spite of deploying similar (and lately far more famous) rhetoric to that of Stokowski about the future of music in space, Varèse was actually denied access to the technology until well after the establishment of the studios at Paris and Cologne. Indeed, as Anne Shreffler has pointed out, the popular "mad-scientist" image bestowed upon Varèse after the war was greatly romanticised, and did not correspond to any actual technical experience. [57] Whatever his ambitions, in pre-war New York City the conditions did not exist which would have afforded the position in which Varèse might otherwise have established himself. In fact, despite being aesthetically déclassé in comparison with Varèse, Stokowski was much more closely involved in the process of making multichannel sound projection a practical reality for musicians, precisely because his work posed less of an aesthetic challenge.

Following the Second World War, the development and dissemination of stereophonic techniques was partly accelerated through the establishment of professional organisations such as the Audio Engineering Society (AES) in 1948 and the Verband Deutscher Tonmeister (VDT) in 1950. Multichannel film sound continued to gain in popularity through the 1950s with the development of systems like "Cinerama," "WarnerPhonic," and four-channel "Cinemascope." The simultaneous development of competing multichannel systems for musical media continued until 1957, when the adoption of the two-channel Westrex vinyl cutting method was forced through the intervention of the small American record label, Audio Fidelity. [27] Although the marketing of stereo during the 1950s and 1960s did tend to figure the move as enabling aesthetic progress, as Peter Doyle has argued, the lack of a "left-right axis" before the widespread adoption of multichannel formats had not at all amounted to a deficiency. A wide range of approaches to spatial simulation were afforded even by single-channel formats, as evidenced by the sophisticated use of reverberation and microphone distance in recordings made at the Sun and Chess studios, and the elaborate use of multi-tracking in the work of Les Paul and Mary Ford as early as 1949. [22] By the 1950s, deliberate manipulation of spatial cues was ubiquitous in recorded music. It is not surprising, then, that multichannel stereophonic projection systems, adapting and extending pre-war techniques, were also developed at several commercial and radio studios in Europe following the war, including (but not limited to) the famous birthplaces of electroacoustic music. [41] The technicians and composers at these studios did not work in isolation, however, but formed a broad professional network that was well connected even during these early years.

3. POSITIONING ELECTROACOUSTIC MUSIC

During the immediate post-war period, a number of new institutional bodies were established which afforded opportunities for research, development, and public performance for artists whose work could be seen as meriting support in the effort to promote innovation, political neutrality, and diversity in cultural life. [18, 6] These included the newly established Darmstadt New Music Summer Courses in 1946; national and regional broadcasting authorities such as the NWDR in 1945, the SWF in 1946, and the RTF in 1949; music festivals such as that at Donaueschingen, which had existed prior to the war but was largely reinvented by Heinrich Strobel in 1950; and cultural organisations such as the International Music Council of UNESCO in 1949. Although the institutions themselves remain largely unexplored in the history of electroacoustic music, the technical personnel, technological resources and performance venues they provided played an essential role in post-war experiments with multichannel stereophony. Moreover, in the work of "position-taking" I am describing in this paper it was these institutions that opened up the new positions which electroacoustic composers, with the help of a network of technicians and impresarios, were determined to occupy.

In 1954, the Swiss-German conductor and impresario Hermann Scherchen, one of the most prominent champions of new music and technology in post-war Europe with close connections to both the Darmstadt Summer Courses and the Donaueschingen Festival, [59] established a private electroacoustic research centre at his vacation home in Gravesano, Switzerland. That autumn, with funding from UNESCO, he organised the first congress there, invit-
ing musicians, technicians and theorists from many of the newly established radio and research studios in Europe and the US. [41, 1] Most of these researchers had actually met before, whether at conferences, festivals, or at their respective studios; among them were Pierre Schaeffer and his technician Jacques Poullin from the RTF studio in Paris; and Werner Meyer-Eppler, Oskar Sala, and Friedrich Trautwein from the new studios in Cologne and Berlin. What was significant about the 1954 meetings, however, was that their goal was to promote the potential creative applications of the latest in spatial acoustics. The intersection between electroacoustic recording and transmission technologies and concert hall or studio acoustics was one of the hottest topics of discussion. More than a quarter of the presentations dealt directly with multichannel projection, and the agenda also included a number of film, concert, and broadcast demonstrations. At these meetings, techniques developed at the studios in Paris and Cologne were displayed alongside new cinematic and telecommunications industry improvements on the pre-war systems developed by Bell Labs and Disney. Nevertheless, it is already possible to detect a heightened effort in these early presentations to distinguish the work of the electroacoustic studios from mere commercial fancies by emphasizing the production and perceptibility of what were understood to be radically new structures and experiences.

Although Jacques Poullin’s presentation at Gravesano in 1954 was predominantly technical, his discussion of the *potentiomètre d’espace* (“space potentiometer”)2 positioned it not as a new application of stereophony but as affording a fundamentally new form of experience. By the time of Poullin’s presentation the device had been a fixture in the practices of *musique concrète* for some time. It was employed most notably in the *Symphonie pour un homme seul* and the original production of the *opéra concrète, Orphée* in 1951, [20] and in 1953 at the tumultuous production of *Orphée 53* at the New Music Festival in Donaucschen. [52] It was also demonstrated to audiences and journalists during the UNESCO-sponsored “First International 10 Days of Experimental Music” in Paris in 1953. [67] Designed partly in an effort to draw the attention of the audience away from the proliferation of machinery on stage, the *potentiomètre* mapped the panning of sounds from a makeshift multichannel tape deck to a performer’s conductor-like gestures. [54] Setting aside its role in engaging the audience in the spectacle, however, the key innovation of the device was described by Poullin by contrasting a stimulating three dimensional experience to a “normal” two dimensional listening situation: “When the four loudspeakers are properly placed, the listener will sense acoustic impressions from all directions of the space surrounding him; he finds himself thus at the middle point of a sounding information space and thus in an unfamiliar situation, since in normal musical presentations the orchestra is found most often on the frontal plane opposite the public.” [41] His statement echoes a distinction which had already become standard at the studio.

Although early tapes produced in Schaeffer’s studio survive only as single channel masters [38], which was the only suitable format for radio broadcast or commercial release at the time of their production, multichannel projection played a significant role in both theory and performance practice. Like the technicians who had worked on the production of Fantasia twelve years earlier, composers and critics associated with Schaeffer’s studio considered dynamic manipulation of the sound locations to be among their work’s most sensational and revolutionary aspects. [39] In his first book describing the studio, however, written partly as a plea to the RTF to sustain its support for his experiments, Schaeffer was determined to distinguish spatialisation from “ordinary stereophony” by contrasting its potential formal consistency with the banal “realism” of the entertainment industry.3 As he wrote, the role of stereophony was not to “reproduce a preexisting relief, but to give the sound objects of *musique concrète* a spatial development coextensive with their own forms.” [54] His collaborator, the physicist and theorist Abraham Moles, went further:

"The experiments here are much more interesting: leaving aside the criteria of truth, they look towards a new effect, of a new musical art form. As much as music is a dialectic of duration and intensity, the new procedure is a dialectic of sound in space, and I think that the term *spatial music* would suit it much better.” [original emphasis] [54]

Use of the *potentiomètre d’espace* for concert projection even extended to tapes by composers who were far less convinced of Schaeffer’s overall project, such as Olivier Messiaen and Pierre Boulez. [20] Despite their otherwise strong disagreements, Boulez positioned himself somewhat closer to Schaeffer when it concerned the distinction of spatialisation from stereophony. Writing in 1955 for *Die Reihe*, Boulez had come to the conclusion that the complete organisation of musical structure had left only “projection in space” as the “final problem connected with ‘performance’”. Nevertheless, techniques like stereophony would only “begin to be really fruitful when they adapt[ed] to the needs of genuinely modern musical thought.” Stereophony in “common usage,” on the other hand, had been “vulgarized by the cinema and different sorts of *son-et-lumière* pageant.” It had to become a “structural necessity” if it was not to be “swallowed up by these more demonstrative aspects.” [15]

Following in the wake of his work with Schaeffer, Boulez continued to be implicated in multichannel experiments on his early forays away from Paris. He had

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2 Poullin’s presentation describes only one of many versions of this device, alternately known as the *pupitre d’espace* (space desk) and the *pupitre de relief*, which was first used in 1951. Earlier versions had employed only a three-channel speaker system. For contrasting technical descriptions see: [39, 41, 42]

3 Schaeffer’s comments take on special irony when one considers the fact that within the RTF the role of his studio at the time was sustained by its work as an effects shop, producing soundtracks for radio programmes and for flight-training films for the French military. [55]
met the American composer John Cage in Paris in 1949, at the recommendation of their mutual acquaintance Virgil Thompson, and the two maintained contact and correspondence over several years. [56] In 1951, Cage began work on a collective tape music project with funding from the architect and impresario Paul Williams and equipment provided by the sound engineers Louis and Bebe Barron. [50, 3] On a visit to New York in the Autumn of 1952, Boulez personally delivered seven tapes produced at Schaeffer’s studio, which Cage had requested to fill out the program for a concert at the University of Illinois.[44] Boulez brought with him his own Études, as well as recent music by Messiaen, Schaeffer, and Pierre Henry, although he made sure to express that he considered these latter tapes to be "not without irony." [44] The concert was presented on eight speakers, each connected to a single-channel tape machine, arranged in a ring around the bemused audience. The elaborate speaker rig was not only used for Cage’s and Brown’s famous eight channel pieces, Williams Mix and Octet I, however, but for all of the works on the programme, some being played back through all eight, some using only a smaller subgroup, and some made to "travel around the audience," most likely using volume controls to approximate panning. [44]

Writing to Boulez just over a month later, Cage echoed Poullin and Schaeffer in portraying multichannel projection as a new kind of perceptual experience, affording "no room for anything but immediate listening." [44] Unlike his European colleagues, however, Cage had not had significant institutional backing for his tape music project, but had scraped it together with assistance from a variety of sources, and relied upon the academic interest of colleges and universities to secure performance venues. Not being able to rationalise from a comfortable insider position, then, Cage chose to bolster his work not so much against commercial banality or vulgarity as against the rigidity of bourgeois tradition: "Let them build whatever walls," he wrote to Boulez, "someone will always be getting out. [...] I also think that another architecture than the concert hall will be needed for a hearing that is excellent. The loudspeakers around the audience should also be above the audience. Perhaps no architecture at all: out of doors with the loudspeakers on the tops of buildings. A magnetillion!"

Cage’s move to transgress the boundaries of traditional aesthetics left him open to criticism from the "high art" side when he brought his tape music project for its European premiere at the Donaueschingen Festival at Strobel’s invitation the following year. Conservative West-German critics denounced the work as absurd, eccentric, and anarchistic. [53, 51] Composers at the studio for elektronische Musik at the WDR in Cologne were also skeptical of Cage’s apparent "primitivism." [24] Only two days after the Donaueschingen concert, however, he and David Tudor were received in Cologne as guest performers at the studio’s second concert, which featured new tapes realised by Herbert Eimert and Karlheinz Stockhausen[4] and sophisticated stereophonic equipment, including a ceiling-mounted, twelve-sided diffusion speaker.[5, 37, 48] By 1954, the studios at the WDR had been equipped with multichannel equipment for some time, including an idiosyncratic four-channel Albrecht film sound recorder and an early four-channel Telefunken T9 recorder, originally controlled exclusively by the technicians but later used to prepare the concert master tapes for Koenig’s Klängefiguren and Stockhausen’s Gesang der Jünglinge in the spring of 1956. Facilities also included a number of speakers which could either be grouped into a three-channel arrangement approximating the capabilities of the PA system in the broadcasting hall, or used individually to gauge the audible effects of playing back a tape through radios of varying quality.[25, 35]

The potential for a technologically-enabled "spatialisation" of music (in the sense of objectification or materialisation) had long been an important theoretical trope among the founding generation at the WDR studio.[8, 9, 11, 30] Writing nearly twenty-five years earlier, for example, in an essay echoing the heroic modernism of Busoni and Varèse, studio co-founder Robert Beyer had predicted a future utopia of materialised sound: "At the end of the development [of music] stands the space-intoning, space-filling, stationary sound, oscillating around a central core, changeably illuminated from a tone-colour world of cosmic expanse, a sound almost visible." At the Darmstadt Summer Courses in 1951, in a seminar offered by Beyer, Eimert, and Meyer-Eppler with the collaboration of Pierre Schaeffer, Beyer theorised that the escape of the musical object from the "virtual" space of the score into "real" space through the mastery of technology would bring about a "revolution in listening." [9]

It was only following Cage’s visit in 1954, however, that anyone at the WDR studio actually began planning a work which made complete use of the available stereophonic resources. Two multichannel works, by Koenig and Stockhausen (assisted by Koenig) respectively, were prepared by the time of the third concert in 1956. While Koenig downplayed the aesthetic importance of stereophony, [34] however, Stockhausen took the challenge particularly seriously. "Stereophony," he wrote to his close friend Karel Goeyvaerts, was the next "great task" lying before him. [36] A few months later, in an apparent dismissal of the combined multichannel work done by Schaeffer, Boulez, Cage, and Koenig over the previous five years, Stockhausen wrote in Die Reihe that his newest project would be the "first in which the overall structure is to be stereophonically conceived." This, he asserted, would finally constitute a "new, living art-form of musical composition and musical listening." [60]

Even after Gesang der Jünglinge was premiered, remaining unfinished after having been scaled back from six channels to five and finally to four, [68] Stockhausen’s work of differentiation continued. His 1958 lecture Musik Pousseur at the second WDR studio concert were realised, according to the composers’ scores of instructions, by Stockhausen and the technical staff. [43]

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[4]The compositions by Karel Goeyvaerts, Paul Gredinger, and Henri Pousseur at the second WDR studio concert were realised, according to the composers’ scores of instructions, by Stockhausen and the technical staff. [43]
im Raum (Music in Space), presented in Darmstadt and then published at least four times in four different versions over the following year, opened with unqualified dismissals of every imaginable precedent for spatialisation in the western classical canon. [61] Rather than detailing any of the obvious technical differences, however, Stockhausen’s complaints betray his modernist aesthetic bias: Gabrieli is decried as repetitive, Mozart as banal, Berlioz as melodramatic. Acknowledging nothing which could possibly mediate the experiences of his audiences in this “first” exploration of a “new dimension for the musical experience,” Stockhausen spatialised his own work in part by “de-spatialising” that of his forebears: “The tone’s property of being generated in a definite space and in definite locations in this space has – disregarding the few aforementioned entries as exceptions – until now not been further differentiated at all: the tone-location in the concert hall remained fixed (in front of the listener on the stage), not only during one composition, but for all music written until now, and it played no role in composition.” [61]

4. CONCLUSION

The establishment of electroacoustic music in the years following the Second World War required ever new technologies and new concert spaces, and this meant inventing new aesthetics and new modes of listening. Beyond simply describing the formal necessities of their own work, then, the aesthetic and theoretical distinctions deployed by composers helped to enact a new set of spatial norms, differentiating their work from parallel technological development. Although it has become common in the historical literature of electroacoustic and computer music to attribute major technological innovations exclusively to the small group of pioneering individuals encountered in this paper, maintaining such assertions becomes significantly more problematic the closer one comes to the rich documentation which survives from the post-war period. Composers and technicians at the new electroacoustic studios of the 1940s and 1950s were able to meet each other regularly at conferences and festivals, read about each other’s work in the press, and discover new technologies from their colleagues in the worlds of commercial and industrial engineering. By highlighting one aspect of that distinction, the discursive construction of a wall of aesthetic difference between multichannel work inside and outside the electroacoustic studio, my intention has been to show how spatialisation helped to carve out a unique position for electroacoustic music within the broader field of musical production. An ideology of aesthetic isolation supported the otherwise contradictory work of appropriating the tools of commercial recording and broadcasting.

In closing, however, I would also like to emphasise that the process of positioning not be thought of as monolithic or conspiratorial, but asynchronous and open-ended. In fact, the increasingly complex socially and technologically mediated spaces of electroacoustic music have never been completely locked down. Their boundaries require continuous social and discursive work in order to operate. As recent ethnomusicological studies of technologically mediated musical practice such as those of Meintjes [40] and Novak [46] have shown, the aesthetic coalescence of genre never boils down to purely formal categories of works or texts, nor is genre solely the result of deliberate categorisation by industries or audiences. It must be continuously performed by both authors and publics through a complex deployment of discourses, material artefacts, social formations, and ideologies. The open-ended understanding of genre formation in electroacoustic music which I am suggesting can also help to undermine the notion that recent changes in its aesthetic boundaries are the direct result of a decline in the centralisation of technological resources in institutional studios. [70] In fact, the centralisation of the means of production may have been overstated: sophisticated multichannel technologies were always available both inside and outside of electroacoustic studios. The problem for composers, which I have attempted to sketch here, was not that technologies did not exist outside of the studios, but that applications outside of electroacoustic studios were actively constructed as illegitimate. It would be difficult to say without sustained ethnographic study whether such distinctions are indeed beginning to break down, or whether boundaries are simply shifting in a way which legitimises aspects of certain genres which were once outside of the canon. Recognising the fragility of this process complicates both the idea that a monolithic experimental avant-garde can be defined cynically as the result of of male, upper-middle class, or modernist hegemony [66] and the equally problematic notion that a free-floating collection of “progressive” musicians is able to simply bypass the framework of genre altogether. [21] As I have shown, even at this “primordial” stage, electroacoustic musicians had to take and maintain their positions of aesthetic authority by actively differentiating themselves within a complex field of practices and resources.

5. ACKNOWLEDGMENTS

Research for this paper was conducted in part at the library and archives of the Institute of Sonology in The Hague. The author would like to thank the faculty and staff for their support and guidance during the research process.

6. REFERENCES


