the purpose of creating poetry and song.[5] Hatter draws much needed attention to the parallels between musicians' communities and other artisan guilds, which could lead to further studies on the relationship between music and other trades. This is especially important for understanding how musicians may have been involved in the process of printing their own works, functioning as editors for presses that produced volumes of music, and working with confraternities and guilds in composing new masses, offices, and other ceremonial pieces used in their services. One of the greatest strengths of this monograph is its readability. It provides in-depth discussions of a number of polyphonic compositions within their cultural contexts in a way that is accessible for scholars and students in the wider fields of medieval and early modern studies.

SARAH ANN LONG

Electronic Inspirations: Technologies of the Cold War Musical Avant-Garde, by Jennifer Iverson. New Cultural History of Music. New York: Oxford University Press, 2019. xi, 303 pp.

The Westdeutscher Rundfunk (West German Radio) in Cologne (WDR studio), one of the first institutional electronic music studios to be established in either Europe or the United States, has never before been the topic of an entire monograph. Jennifer Iverson's *Electronic Inspirations* finally fills this vacuum. Iverson's groundbreaking analysis is based on the idea that there is a pressing need to revise several persistent narratives surrounding the WDR studio, the Darmstadt Summer Courses, and the role of Karlheinz Stockhausen. This book invites us to turn our attention to a larger network of persons and institutions that fostered new music and electronic music in the postwar era.

Over the decades, several international music laboratories have been the subject of research.[1] The WDR studio, however, has received little attention

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5. On urban *puys* and chambers of rhetoric, see Emily S. Thelen, ed., *The Seven Sorrows Confraternity of Brussels: Drama, Ceremony, and Art Patronage* (Turnhout: Brepols, 2015); Carol Symes, *A Common Stage: Theater and Public Life in Medieval Arras* (Ithaca, NY: Cornell University Press, 2007); and Yolanda Plumley, *The Art of Grafted Song: Citation and Allusion in the Age of Machaut* (Oxford: Oxford University Press, 2013).

1. Among them the San Francisco Tape Music Center (David Bernstein, ed., *The San Francisco Tape Music Center: 1960s Counterculture and the Avant-Garde*, Berkeley: University of California Press, 2008); IRCAM (Institut de Recherche et Coordination Acoustique/Musique) (Georgina Born, *Rationalizing Culture: IRCAM, Boulez, and the Institutionalization of the Musical Avant-Garde*, Berkeley: University of California Press, 1995); the Groupe de Recherches Musicales (Évelyne Gayou, *GRM—Le Groupe de Recherches Musicales: Cinquante ans d'histoire*, Paris: Fayard, 2007); EMS (Elektronmusikstudion Stockholm) (Sanne Krogh Groth, *Politics and*

prior to Iverson's publication, barring some short histories presented in text-books, and scattered essays by scholars, mostly in German.[2] Historians, musicologists, and music theorists have had no choice but to explore the original official publications of the WDR studio, where, in the early days, technicians, musicians, and composers including Stockhausen, Gottfried Michael Koenig, Henri Pousseur, Mauricio Kagel, György Ligeti, John Cage, and numerous others "met and mingled" (p. 7). (The studio was established in 1951 and closed its doors in 2000.) In these writings and interviews, composers working at the studio (note: composers!) presented their views on their positions and musical works (Iverson presents a list of about 150 primary sources), thereby creating their own legacy through an intentional "rhetoric of autonomy" (as described by Charles Wilson), which Iverson questions.[3] It is only in recent years that scholars have begun to produce additional research on the studio and its milieu.[4]

What is Iverson's approach to tackling the project of writing a history of the WDR? With research interests in twentieth-century music, sound studies, and disability studies, Iverson opts for a methodology that gives significantly more attention to hidden and semi-hidden dynamics, actors, and networks of institutions. The topic of the "invisible collaborator" is a recurrent theme throughout the book.[5] In this respect, the "Glossary of Actors" is especially valuable for its attention to short biographies of artists, composers, impresarios, instrument builders, intellectuals, scientists, and studio technicians. These persons collaborated, gathered financial support, and found new approaches to thinking about and creating sound. To understand the broader historical and cultural significance of the studio, Iverson moves away from examining "great men and great works" (p. 2). In so doing, she follows an emerging tendency that attempts to recalibrate certain stereotyped views about electronic music as explored in a recent

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Aesthetics in Electronic Music: A Study of EMS—Elektronmusikstudion Stockholm, 1964–1979, Heidelberg: Kehrer, 2014); CCRMA (Center for Computer Research in Music and Acoustics) (Andrew J. Nelson, *The Sound of Innovation: Stanford and the Computer Music Revolution*, Cambridge, MA: MIT Press, 2015); and the Studio di Fonologia Musicale della RAI (John Dack and Maria Maddalena Novati, *The Studio di Fonologia: A Musical Journey, 1954–1983, Update 2008–2012*, Milan: Ricordi, 2012).

2. Scholarship in English includes Joel Chadabe, *Electric Sound: The Past and Promise of Electronic Music* (Upper Saddle River, NJ: Prentice Hall, 1997); Thom Holmes, *Electronic and Experimental Music* (London: Routledge, 2016); and Peter Manning, *Electronic and Computer Music* (New York: Oxford University Press, 2013).

3. Charles Wilson, "György Ligeti and the Rhetoric of Autonomy," *Twentieth-Century Music* 1, no. 1 (March 2004): 5–28.

4. A number of videos of the dismantled studio are currently available online, one of which ("WDR Electronic Music Studio (1 of 5)") shows Volker Müller (a technician in the generation after Koenig) explaining how the various machines worked.

5. This echoes Steven Shapin's fundamental study, "The Invisible Technician," *American Scientist* 77, no. 6 (November–December 1989): 554–63.

conference held in London, "Alternative Histories of Electronic Music" (2016),[6] and in Andrey Smirnov's study of technological experiments in the early Soviet Union (little known outside of Russia).[7]

Electronic Inspirations takes a bold stance in breaking the "rhetoric of autonomy" that surrounded the studio. The book's full title also reveals the importance of the Cold War as a political backdrop for Iverson's explorations. The WDR studio was created during a period characterized by unstable political alliances and funding streams from Allied governments as reflected in the idea of political progressiveness. Iverson explains that the Cold War was both *cultural* and *musical*: "To embrace midcentury electronic music was to implicitly reckon with past traumas and threats of future violence" (p. 3). The WDR studio (like the Groupe de Recherches Musicales in Paris or the RAI studio in Milan) was situated inside a radio station. Radios had served as an instrument of propaganda during the war; hence, funding such electronic music studios served symbolically to reframe the purposes of technology. A recontextualization of technology and spaces took into account precarious historical circumstances. To give an example, the WDR's basement-level "emergency studio," with its speaker's booth, control room, and editing room, had a dual function: it was intended to provide safe, underground broadcasting facilities in the event of a nuclear emergency, but it was also used for producing electronic music.

Through close attention to archival research, music analysis, and personal communications, Iverson is able to describe in detail significant places (the so-called "Hexenküche," or witch's kitchen, on the third floor, and the "emergency studio"); key figures and their various interdisciplinary backgrounds; technology (including sound generators, magnetic tapes, and loudspeakers); and relationships, such as those between the pioneers who had "optimistic visions of a timbral utopia" and the "technophobic audiences and critics" who initially rejected these sounds (p. 2).

In its organization, *Electronic Inspirations* is a well-conceived book. It is designed to appeal to scholars and students of electroacoustic music, twentieth-century music studies, and media and sound studies, as well as anyone interested in the postwar cultural era more generally. Each of its six chapters, framed by an introduction and an epilogue, is devoted to a specific topic and includes a helpful concluding section. Chapter 1 introduces founders Werner Meyer-Eppler, Herbert Eimert, and Robert Beyer and examines the origins of the studio. It uncovers the role of technician Heinz Schütz and his "piece zero" *Morgenröte* (Dawn), composed in 1952 on the

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6. See James Mooney, Dorien Schampaert, and Tim Boon, "Editorial: Alternative Histories of Electroacoustic Music," in "Alternative Histories of Electroacoustic Music," special issue, *Organised Sound* 22, no. 2 (August 2017): 143–49, esp. 144.

7. Andrey Smirnov, *Sound in Z: Experiments in Sound and Electronic Music in Early 20th Century Russia* (London: Walther Koenig, 2013).

Melochord but never premiered, a piece that was cannibalized, so to speak, by Eimert and Beyer in *Klangstudie II*. This chapter discusses the links with contemporary counterparts in other countries—the Groupe de Recherches Musicales in Paris, the BBC in London, and the ideas of Bruno Maderna and Luigi Nono in Italy. In so doing, it proposes an important historical revision: that the timbral focus of the studio actually began with the collaborations between these founders and technicians rather than with Stockhausen's arrival in 1953.

Chapter 2 focuses on another revision: it anticipates Cage's influence on European composers during the early 1950s and redesigns a larger network of performers, impresarios, promoters, critics, and composers. David Tudor was a key figure in this network as seen against the background of the Darmstadt courses and various avant-garde activities that were taking place in Donaueschingen, Paris, Cologne, and New York. WDR composers emulated Cage's experiments in their own electronic compositions. Chapter 3 brings out other key figures, especially Pousseur and Goeyvaerts, and uses the *fil rouge* of timbre and additive synthesis to excavate their collaborations with scientists and Stockhausen. "Stockhausen's authority," says Iverson, "stemmed in part from his technical ability, in part from his proximity to Meyer-Eppler and Eimert, in part from his assimilation of relevant scientific knowledge, and in part from his physical centrality in the studio space itself. He was the center point connecting various collaborators" (p. 103). She reveals various disagreements, failures, and readjustments in the use of technology, not to mention the role of Meyer-Eppler in overcoming these difficult moments through his support of the studio's aesthetic choices during avant-garde radio programs and concerts. This chapter focuses on Ligeti's incomplete *Pièce électronique no. 3* (1957) (and the acoustical "translation" *Atmosphères*, 1961) in drawing attention to the technique of additive synthesis.

I particularly appreciated chapter 4 and its attention to the limits of technology and technical shortcuts as detailed in information theory (transmitted through Meyer-Eppler) and to the compromise of using "statistical form" techniques as compositional and technological approximations of early information theory. Although critics "often disparaged WDR composers as pseudo-scientists," composers felt they were exerting control by "policing an aesthetic boundary" (pp. 106–7). Contrary to certain traditional views that celebrate the ability of new instruments to create *any* possible sounds, this chapter emphasizes that composers did in fact embrace the limitations of machines. (Iverson focuses on works by Xenakis, Ligeti, Koenig, and Stockhausen in making her argument.)

Chapter 5 considers how questions of noise, probability, indeterminacy, and chance were explored across multiple directions in pieces by Ligeti (*Artikulation*, 1958) and Pousseur (*Scambi*, 1957, realized at the Italian RAI studio) and in other acoustic compositions. Iverson thus introduces another rethinking of music history: Darmstadt 1958 (Cage's arrival) should not

be seen as having established a rift that generated "a well-worn American-European polemic, as crystallized in Boulez's and Cage's mutual critiques" (p. 164). The story is more nuanced. Iverson investigates a larger network that encompasses the WDR studio, the Italian RAI studio, and the New York studio of Louis and Bebe Barron, among others, showing that "their momentary squabbles and polemical insults paled in comparison to the enrichment they received from sharing in an ongoing, contested discourse" (ibid.).

In conclusion, Iverson's *Electronic Inspirations* provides a compelling contribution to a number of scholarly circles including the STS research community, studies in the creative process and oral history, and the analytical and philological studies of electroacoustic music. It stresses the importance of invisible figures and collaborators in the shaping of cultural and musical history, and even denounces the homogeneity of the studio in terms of race, class, gender, and sexual orientation. Chapter 6, with its sections dedicated to Cathy Berberian, demonstrates "an exception to the rule" in an otherwise all-male, all-white electronic music society. The only criticism that can be leveled against Iverson's book is the shortage of details on the technology itself: the construction, functioning, and development of electronic components, and the spaces and accommodations in which these were housed. (In those days, for example, a reverb depended on the size of the echo chamber.) Such details constitute important information, especially when one wants to understand the construction of the aesthetic environment and the actual making of music and sound research.

The timing of this book is remarkable given the recent announcement of the opening of the reconstructed WDR studio. The original equipment will be reinstalled in the Haus Mödrath—Räume für Kunst museum in Kerpen, twenty kilometers southwest of Cologne, in the very building in which Stockhausen was born in 1928 (then a maternity home). Despite a delay in the opening of Haus Mödrath, one can only anticipate the invaluable opportunity to see the original machines firsthand and to consider further questions relating to the creative technical process, specifications concerning machines, and the physical surroundings of the early years. While we wait, Iverson's book contributes to our excitement by accurately evoking WDR's ambience and creative dynamics.

LAURA ZATTRA

Class, Control, and Classical Music, by Anna Bull. New York: Oxford University Press, 2020. xxx, 232 pp.

In *Class, Control, and Classical Music*, Anna Bull poses a key question to classical music stakeholders: "how are musical institutions, practices, and aesthetics shaped by wider conditions of economic inequality, and in what