Iverson, Jennifer. 2018. *Electronic Inspirations: Technologies of the Cold-War Musical Avant Garde*. New York: Oxford University Press.

Reviewed by Ted Gordon

Jennifer Iverson's *Electronic Inspirations* explores the history of electronic music in the studio of Cologne's *westdeutcher Rundfunk* (WDR) in the immediate post-war era, during which *elektronische Musik* developed as an admixture of music, science, and technology. Iverson shows how *elektronische Musik* inhabited a particular social milieu, including figures like impresario Herbert Eimert, ex-Nazi scientist Walter Meyer-Eppler, and firebrand composers such as Karlheinz Stockhausen, John Cage and David Tudor. As Iverson argues, closely following these actors through the WDR studio illustrates what *elektronische Musik* meant in cold war Germany: a promise of a better future through what she calls a "reclamation" (2) of the past, achieved through collaborative work between scientists, technicians, musicians, and performers. Through thorough analyses of numerous works produced in the studio, Iverson concludes that these reclamations were ultimately "attempted, incomplete, [and] tenuous": they failed in achieving their ostensible goal, a "timbral utopia" inhabited by enlightened composers (29). Instead, these reclamations produced what Iverson calls "invisible collaborations," obscuring the distribution of authorial agency, aesthetic possibilities, and ideological meanings created at the WDR and instead reproducing heroic narratives of "remasculinization" and German musical hegemony (18). *Electronic Inspirations* illuminates those invisible collaborations through rich and detailed analyses of archival recordings, sketches, concert programs, and planning documents that show exactly how science and technology contributed to the creation of *elektronische Musik* at the WDR.

The WDR studio was initiated by three men—Herbert Eimert, Robert Bayer, and Walter Meyer-Eppler—who had met in 1949 at a sound engineering conference, participated in the 1950 seminar on electronic music at the Darmstadt *Fereinkurse für neue Musik*, and made a proposal for a new facility to be built at the *westdeutscher Rundfunk* in 1951. All three men positioned the WDR studio within linear, teleological narratives of musical innovation. Beyer framed the studio as continuing what he thought of as the emancipation of dissonance, idiosyncratically citing Ferruccio Busoni and the Telharmonium, an early American electrical instrument from 1897; Eimert framed it as emerging from Weberian serialism, promising

more complete control over sonic parameters; Meyer-Eppler framed it as an exploration of timbre. All three avoided discussing the development of electrical and electronic music technologies between 1930–1945, when electrification and electronic instruments became embraced by the Nazi regime in their aesthetic of "steel modernism." As Iverson argues, the founding of the WDR studio was a "reclamation" of wartime technologies that fantasized a neutral, technoscientific "blank slate" that would allow for a new kind of musical composition unburdened by the past: "Such reclamations do not so much heal the wounds of war as accumulate new meanings and layers that distance us from the trauma" (137).

However, Iverson shows, the traumas of the past were always present—especially in the figure of Walter Meyer-Eppler, a physicist who specialized in radio communication and information theory. Meyer-Eppler authored eight reports for the *Kriegsmarine* U-Boat division between 1943–1945, and was classified a category IV *Mitläufer* during the denazification process. Pivoting away from radio-communications in the post-war era, he brought his substantial background in information theory to bear on experimental phonetics, which he taught to many of the composers at the WDR. Meyer-Eppler appears throughout *Electronic Inspirations* as a composer, teacher, technician, and impresario, and is perhaps the prime example of the "invisible collaborator" that Iverson wishes to make visible; along with "technicians, administrators, performers, and scientists," people like Meyer-Eppler "[made] the creative work of the composer possible" (29). Iverson's discussion of Meyer-Eppler brings up one of the central questions that informs nearly every chapter of her book: "In what sense can the technicians (in a laboratory, studio, etc.) be understood as co-creators?" (30)

This question of authorship lies at the heart of *Electronic Inspirations*, and could be read in at least two significantly differing ways. In one reading, it could ask: "to what extent should we also credit technicians as the creators of musical works"? In another, it could ask: "what does it mean for a musical work to be created?" The first reading retains the integrity of the musical work as a bounded object produced by a human, or a group of humans. The second reading questions both the integrity and bounded-ness of the work, and also the valorization of human authorship in a studio full of new technologies. As Iverson suggests, creating *elektronische Musik* at the WDR was a practice that produced artifacts legible as objects in the musical economy: tape works and scores. But as she also shows, those tape works and scores were co-created by a widening network of humans and technological objects. Especially in the early days of the studio, with composers using technologies they were still struggling to understand, it wasn't

quite clear where one "work" ended and another began; it was also unclear who (or what) held agency over their sound and even their organization. Iverson's concept of "invisible collaborators" suggests that the experimentation undertaken at studios such as the WDR extended far beyond "aesthetics;" indeed, experimentation at the WDR fundamentally destabilized what it meant to be a musicking human, throwing into question the closely held ideological pillars of authorship, mastery, and innovation that formed the self image of this particular community of post-war composers.

The porous boundaries of compositional work at the WDR studio are illustrated through Iverson's deft analyses of some of the earliest "tape works" produced there, including *Spiel für Melochord*, *Morgenröte*, *Klangstudie II*, and *Klang im unbegrenzten Raum* (*KuR*). In all of these cases, the same "sonic material" recorded to magnetic tape was "repurposed" (41)—sometimes cut and spliced, sometimes sped up or slowed down, and sometimes simply copied verbatim. In the case of *Spiel für Melochord*, Eimert and Beyer re-organized sounds from a catalogue of sound-types produced by Meyer-Eppler. This creative process, as Iverson argues, mirrored traditional understandings of "composition": composers organize sonic material in time, rather than creating the sonic material itself. As she writes, "the 'mastery of the apparatuses'—the production of sound effects using the machines—was only the precursor to the work of the composer, who was then responsible for the logical aesthetic development and 'mastery of the material'" (35).

But Iverson challenges this strict separation between "apparatus" and "material" in her analysis of *Morgenröte*, a tape produced by the studio's technician, Heinrich Schütz. Schütz himself had internalized the division between composer and technician: he is on record as stating "I do not see myself as a composer. Pure chance" (46). But as Iverson shows, *Morgenröte* is more than a catalogue of "raw sound-types," and could be read as an integrated work with its own compositional and musical logics. Indeed, *Morgenröte* became the basis for two additional tapes produced by people who *did* think of themselves as composers: Eimert and Beyer. These two tapes—*Klangstudie II* and *KuR*—were presented as co-composed compositions in concert performance programs, with no mention of Schütz. As Iverson's thorough analysis shows, however, these two tapes essentially "cannibalized" Schütz's work, copying the tape wholesale (40).

Again, there are at least two conclusions one could draw from Iverson's analysis. One is that Schütz was actually a composer, and was simply ignored because he only thought of himself as a lowly technician. Iverson comes close to making this conclusion herself in the passive voice: "Technicians remained invisible not only because their skill set differed from that of the

composers, but because their aesthetic orientation and expertise was connected to low-brow, mass-media genres" (48). But Iverson goes on to make a more radical argument: that electronic music does not emerge from a vertical chain of agency, from the lowly technician to the lofty composer; rather, it emerges from a more horizontal network between composers, technicians, instrument designers, and instruments themselves.

For WDR studio musicians, this network extended far beyond Cologne, and included the American musicians John Cage and David Tudor. Chapters 2 and 5 discuss their important role in the development of compositional practices at the WDR, both in terms of Cage's "proportional form" and Tudor's role as a social connector between America and Germany. Even as the WDR studio was being built in 1952, Eimert prominently featured music by Cage—encountered via an LP record given to him by Pierre Boulez—on his *musikalisches Nachtprogramm*, which introduced Cage to other interested musicians and composers in Germany. For Eimert, Cage represented an independent American ethos, so much so that Eimert mistakenly credited Charles Ives's *Three Quarter-tone Pieces of Two Pianos* to Cage; the new sounds produced by Tudor performing Cage's works for prepared piano seemed like a harbinger of the "timbral utopia" to come. Iverson presents substantial archival research on Cage and Tudor's trips to Europe in the early 1950s, showing just how much Europeans like Eimert would pay to hear fleeting moments of a timbral utopia; she also presents substantial analyses showing how Cage's "square root form" contributed to Stockhausen's "proportional form" in *Studie II*.

Stockhausen, along with Karel Goeyvaerts, Paul Gredinger, and Henri Pousseur, becomes the center of the network examined in Chapter 3, which shows how he and others at the WDR developed new studio techniques for producing electronic music. This chapter corrects two commonly held misconceptions about the WDR studio: that it was focused on the technique of "additive synthesis" (adding individually synthesized sounds together to produce complex new sounds), and that the works produced with such techniques were created by individual composers. Iverson shows how work at the WDR studio occurred through collaborative experimentation with a variety of techniques, eventually embracing both the subtractive synthesis supported by Meyer-Eppler's phonetics research, as well as *ad hoc* techniques that emerged from contingent and idiosyncratic human-instrument interactions with the studio's equipment. She also shows how these techniques were co-created by groups of humans working together to experiment and explore the possibilities of those instruments, arguing that the emphasis on heroic, individual composition made "these important collaborations quickly [become] invisible" (103).

Beyond collaborations among humans, the question of human-instrument co-creation holds significant philosophical consequences for the concepts of composer and work. To describe human-instrument interaction, Iverson cites Andrew Pickering's concept of the "dance of agency" between human intentions and machinic captures, and their dialectical interaction that eventually produces results (Pickering 1995). To describe "co-creation" between multiple humans and instruments, Iverson loosely cites a spectrum of "actor-network theories" authored by Bruno Latour, Michael Callon, and others. However, discussion of secondary literature and the philosophy of science and technology is kept relatively brief; instead, Iverson addresses these issues empirically through her extremely detailed analyses. Iverson argues that "the WDR studio of the early-to-mid 1950s was above all collaborative," claiming that her scholarly intervention is located in revealing the connections between composers, technicians, engineers, and scientists at the WDR studio that have previously been kept invisible (103).

In addition to making individual composers visible, Iverson also elucidates the scientific knowledge and theory that undergirded much of their collaborative work. Chapter 4 examines the "reclaiming of technology" at the WDR, "showing direct lines of transmission that connect [Claude] Shannon's information theory to midcentury music" through careful and exacting study of archival letters, diaries, sketches, and scores by Stockhausen, Gottfried Michael König, and Iannis Xenakis (105). This chapter traces the translation of concepts from information theory into *elektronische Musik* through the affordances of specific instruments in WDR studio, which WDR composers described as creating "statistical" and "probabilistic" form in their compositions (128–132). Iverson argues that these composers began to critique their own adherence to serialism in the 1950s, because in the new paradigm of information theory, serialist techniques were revealed to be too "information dense," making them difficult to be perceived by humans. Instead, Iverson argues that many shifted towards statistical forms, sampling and continuity, and probabilistic forms in order to "better accommodate human perception" (137).

In addition to information theory informing the compositional structures of these new works, the related fields of phonetics and speech research were also explored through "aesthetic experiments" by European avant-garde composers (167). Indeed, one of the more profound questions that Iverson's study raises is: what is the relationship between experimental science produced in a laboratory and experimental music produced in a laboratory-like studio? Iverson addresses this question though musical analysis, focusing on works by Mauricio Kagel and Luciano Berio, in ad-

dition to tracing those composers' interests in phonetics through Meyer-Eppler and the writings of Roman Jakobson and James Joyce. This question is addressed most directly in her analysis of Kagel's *Transición I*: Iverson's archival research shows that Kagel's notebooks are full of empirical questions about the nature of sound and music. This could be where experimental music most closely resembles experimental science: the composer wants to find out answers to questions, to make knowledge, and does so through experimentation. But is that the same as making music? Iverson suggests that "[Kagel's] experimental practice with the studio equipment very much mirrors scientific laboratory experiments" (171).

Iverson's use of the verb "mirror" suggests a morphological similarity between what happens in a scientific laboratory and what happened in the laboratory-like WDR studio, but she also argues that the similarities are methodological and ultimately epistemological. Though Iverson frequently cites scholars of science and technology studies, *Electronic Inspirations* does not provide an extended theoretical discussion of the relation between experimental music and experimental science. Instead, Iverson offers rich historical detail of how the musicians themselves imagined this relation. At the end of a short but vibrant section on Cathy Berbarian and Luciano Berio, Iverson concludes:

> In the electronic studio, Berio and Berberian moved from a contextual phenomenon—phonemes in language—into a sensory-aesthetic hypothesis that was demonstrated with the help of technology. It was the studio's technology, and the tape recorder in particular, that allowed them to crack language open, to see what it really contained, and to imagine how it can be further deconstructed, synthesized, and remade as music. (185)

This conclusion contains a nested argument: first, that musical experimentalists like Berio and Berberian were engaged with the production of new knowledge, "mirroring" scientific experimentation; and second, that musicians used new knowledge to create new music. This nested conclusion relies on the assumption that "language" is an objective phenomenon that could be scientifically "cracked open," deconstructed into constitutive parts; and that those parts could be reconstructed into "music" as a "sensory-aesthetic hypothesis." This is perhaps the way that Berio and Berberian imagined their work: they were discovering new universal scientific truths, not producing them as social facts, just as they were likewise remaking music as a universal category, not one that emerged out of social and political discourse. Though Iverson's discussion of the tangle between experimental music and experimental science is brief, her description of Berberian and Berio's experiments clearly addresses a topic that has mostly

remained vaguely metaphorical and too often overlooked in scholarship about experimental music.

Iverson's book concludes with a hermeneutic interpretation of the works of *elektronische Musik* produced at the WDR: they "[make] Cold War anxieties audible" (191). While listening to this music, Iverson argues, "we stumble over the non-sense, we are disgusted by hearing all that which is extra-musical, and we are provoked by sounds that threaten to obliterate and overwhelm" (193). This interpretive stance resonates with Iverson's general ideological critique of the WDR, which holds that its self-narrativization often belied selective, political ideologies of *elektronische Musik*, swerving from wartime origins and instead positing itself as an inevitable rung in the eternal ladder towards "timbral utopia." Iverson stops short of a Kittlerian criticism of electronic music as universally "tainted" with a kind of ontological wartime violence (see Winthrop-Young 2002); rather, she embraces what she calls a "networked perspective" that shows how different composers, and different collaborators, each created their own use and meaning for these technologies (191). This "networked perspective" begins with material—compositions, tapes, sketches—and shows how those objects were co-created by networks of people, whose ideas emerged from networks of technoscientific discourse.

Books like *Electronic Inspirations* are a crucial opening in the discipline of music studies, and especially within the study of experimental and avant-garde musics. Indeed, *Electronic Inspirations* is an extremely valuable model for future scholarship seeking to examine how "the cultural work of electronic music stemmed from its unending dance with the affordances of technologies" (199). Such work has already been undertaken regarding European art music in the 18th and 19th centuries, video game music, and improvised music; Iverson's book examines a musical community where technology was not naturalized or hidden, but was rather the very object of experimentation. Showing how people at the WDR studio re-inscribed ideologies of the heroic world-historical composer, selectively "reclaimed" technology, and fantasized a "timbral utopia" are crucial first steps to understanding how science and technology have shaped both the specificity of *elektronische Musik* and the more general category of electronic music, pointing readers to other possible meanings, social milieus, and networks that have so far remained largely unexamined.

References

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