

REVIEW ARTICLE

## Spectral Mechanics and the Technical Failures of the Monograph

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Deirdre Loughridge, *Haydn's Sunrise, Beethoven's Shadow: Audiovisual Culture and the Emergence of Musical Romanticism*. Chicago: University of Chicago Press, 2016. 291pp.

Gundula Kreuzer, *Curtain, Gong, Steam: Wagnerian Technologies of Nineteenth-Century Opera*. Oakland, CA: University of California Press, 2018. xix + 348pp.

Gabriela Cruz, *Grand Illusion: Phantasmagoria in Nineteenth-Century Opera*. Oxford: Oxford University Press, 2020. xx + 290pp.

In 2018, Maria Callas rose from the dead. During a series of tours dubbed *Callas in Concert*, local orchestras performed with a three-dimensional hologram of the departed diva as she re-sounded arias of her past. This virtual manifestation of Callas put on a convincing show. Listeners were struck by the quality of the diva's voice – ‘from heart-breaking vulnerability to imposing strength’ – and marvelled at foley effects such as the clicking of her heels and rustling of her gown.<sup>1</sup> Notably, however, the performance fell victim to repeated technical failures. In Chicago, a glitch caused her final encore to end prematurely; in Blacksburg, Virginia, audience members were distracted by the transparent nature of the hologram, which gave Callas an ‘especially ghostly appearance’.<sup>2</sup> The performances set the operatic sphere atwitter with questions of ethics and taste, debates over classical music's obligations to the living and devotions to the dead. Anthony Tommasini likened the performances to a grand séance, an act of operatic necrophilia.<sup>3</sup> Catherine Womack interpreted the spectral shows as a sign that ‘in the twenty-first century, living and breathing are not prerequisites for a successful performing career’.<sup>4</sup> However, as Deirdre Loughridge, Gundula Kreuzer and Gabriela Cruz demonstrate in their monographs, *Callas in Concert* is not a phenomenon unique to the twenty-first century. Indeed, the authors show that technologically mediated resurrections of the dead,

<sup>1</sup> Michael Pecak, ‘An Audible Huff of Awe and Amusement: Maria Callas in Concert’, *Schmopera* (September 9 2019).

<sup>2</sup> Tom Huizenga, ‘Raising the Dead – And A Few Questions – With Maria Callas’ Hologram’, *NPR* (6 November 2018).

<sup>3</sup> Anthony Tommasini, ‘What a Hologram of Maria Callas Can Teach Us about Opera’, *New York Times* (15 January 2018).

<sup>4</sup> Catherine Womack, ‘With “Callas in Concert”, an Opera Diva Makes a Holographic Encore’, *Los Angeles Times* (8 April 2019).

operatic appeals to nostalgia, and illusion-busting technical failures are instead part of a long operatic tradition, one which began well before the holographic revivals of Maria Callas.

It is no longer surprising to state that the history of technology and the history of opera are intertwined. In the past decade alone, this argument has been the subject of several volumes, including David Trippett and Benjamin Walton's collection *Nineteenth-Century Opera and the Scientific Imagination* (2019), Karen Henson's edited collection *Technology and the Diva: Sopranos, Opera and Media from Romanticism to the Digital Age* (2016), and Evan Baker's visually striking text *From the Score to the Stage: An Illustrated History of Continental Opera Production and Staging* (2013).<sup>5</sup> With the three works under review here, readers can familiarise themselves with the next stage in opera studies' awareness of its technological underpinnings. As Loughridge, Kreuzer and Cruz each argue in their respective texts, technology is not only imbricated with operatic experience, but also at the centre of fundamental philosophies of operatic aesthetics and performance traditions.

There is much overlap between these three works. Loughridge, Kreuzer and Cruz draw from similar blends of Adorno and Kittler, media studies and material history. All three authors spend some time with French grand opera and untangle the cultural phenomenon that is the phantasmagoria. Structurally, each work pairs musical close reading with technological case studies and enough engaging miscellany to prove its author an adept archaeologist of the archive. There are, however, several notable differences that set the works apart. Loughridge, least bound to the opera house, has the largest generic scope. She begins her first chapter with Haydn's opera *Il mondo della luna* (1777), and ends her final chapter with Beethoven's Fifth Symphony (1808), covering ballads, cantatas, oratorios, piano trios and concerti along the way. Kreuzer, conversely, has the narrowest scope of the three. Focusing on a single composer (Wagner), she delves deeply into the particulars of the *Gesamtkunstwerk* and the everyday mechanics of operatic performance, tackling well-known yet oft-ignored elements of the opera house and orchestra such as the curtain and gong. Cruz's field of inquiry similarly develops from an everyday fixture (literally) of the opera house – gaslight, which made its operatic debut in Paris in 1822. Of the three books covered in this review, Cruz's work is the only one that emerges directly from the study of French grand opera, a subdiscipline wholly familiar with the intersections of science and opera due to the genre's historic preoccupation with technological spectacle. Cruz mobilises this disciplinary familiarity with technology to extend observations on technological influence across borders, covering, in her history of grand opera, performances of Meyerbeer, Wagner and Verdi across Europe. Taken together, these volumes are important methodological models for a new technological era of opera studies, one that not only introduces a dialogue between opera and previously sidelined areas of human experience, but also seeks to deepen connections between opera scholarship and technological encounters of our present moment.

Of the three, Deirdre Loughridge's *Haydn's Sunrise, Beethoven's Shadow* contains the most exciting application of the argument that cultures of technology are foundationally intertwined with musical practice. This is in part because Loughridge's purview moves beyond opera and encompasses a wider range of musical practices. Opera, which is the central subject of Kreuzer's and Cruz's works, has historically had an ambivalent but intermittently acknowledged relationship with materiality due to the genre's practical reliance

<sup>5</sup> David Trippett and Benjamin Walton, eds., *Nineteenth-Century Opera and the Scientific Imagination* (Cambridge, 2019); Karen Henson, ed. *Technology and the Diva: Sopranos, Opera and Media from Romanticism to the Digital Age* (Cambridge, 2016); Evan Baker, *From the Score to the Stage: An Illustrated History of Continental Opera Production and Staging* (Chicago, 2013).

on staging and noisy, gesticulating bodies. Loughridge's argument that essentially all genres of music – including instrumental music such as Mozart's piano concertos and Beethoven's symphonies – are similarly entangled with contemporary optical(!) technologies is a bigger musicological bombshell. Adopting a case study format, Loughridge focuses on optical technologies across the spectrum, beginning with magnifying instruments like microscopes and telescopes, exploring streetside devices of delight such as the peep show and shadow play, and finally alighting upon the magic lantern and phantasmagoria to establish not only that composers from 1760 to 1810 referenced contemporary optical technologies in their works, but also that listeners experienced sonic strategies such as the crescendo in visual and technological terms. The target of Loughridge's argument is clear. She systematically points out that her aim is to unravel the conviction of abstractness that early Romantics established and scholars of eighteenth- and nineteenth-century music upheld for so many classical and romantic genres. 'Even as they policed a boundary between the musical and the visual', she states in her introduction, 'early Romantics perceived music audiovisually' (13).

Loughridge's methodology is appealing in its simplicity. To establish the connection between the worlds of technology and music, the eye and the ear, she mines texts and prints for 'shifting patterns in metaphor' (15), tracing the passage of these metaphors from descriptions of encounters with technology to descriptions of auditory experiences in the opera house, salon and concert hall. In her final chapter, for instance, she extracts metaphors of movement from E.T.A. Hoffmann's famous 1810 review of Beethoven's Fifth to read the symphony 'as phantasmagoria', recontextualising Hoffmann's experience of the work ('Giant shadows that draw closer and closer' (219)) within the broader landscape of magic lantern shows, which regularly projected images of ghostly spirits growing larger as they 'approached' the audience. Loughridge argues that such rhetorical patterns in Hoffmann's writing demonstrate that he was not simply interpreting Beethoven's music as poeticised sublimity, but actively drawing from the established, popular-cultural experience of spirit seeing to inform his interpretation of the work.

At times, Loughridge's mining of metaphors seems overly facile, in part due to her attempts to remain in the supposedly clean and sterile realm of technology. This is most apparent in her third chapter on 'shadow media' where she pairs analyses from musical settings of Gottfried Bürger's *Lenore* ballad (1775) with examinations of streetside shadow-play practices to suggest that the shadow play contributed to the increasing popularity of the through-composed ballad. The technology of the shadow play, she notes, 'fostered a mode of listening better suited to through-composed than to strophic songs' (161). Loughridge argues that this broader narrative preference was taken from visual elements of the streetside ballad show. Performances by ballad singers went from featuring small pictures arranged on a gridded poster, 'with each picture corresponding to a strophe of the ballad' (141), to the single frame of the shadow play. She acknowledges that shadow performances are 'ancient, with highly developed forms being established in China and Southeast Asia at least 2,000 years ago' (125) but does not expand much upon the subject. Readers are thus left to wonder how the sonic structures of shadow-play music in other cultures support or weaken Loughridge's points. The metaphors she traces are intriguing, but her argument seems to call for deeper engagement with a wider network of influences.

Loughridge's efforts to make her tracing of metaphors as clean as possible also lead to other fissures in her narrative. While she notes that the technology and aesthetics of shadow plays became known as '*ombres chinoises*' after 1770, she avoids discussing the implications of this name and the technology's subsequent associations with Asian cultures. '*Ombres chinoises* had little to do with Chinese models', she states, and was more about 'the contemporary vogue for Chinoiserie' (126). While an extended comparison between

Asian examples of shadow play and ‘*ombres chinoises*’ was likely outside the scope of her work, the ease with which Loughridge brushes aside the racial implication of this practice is disappointing. The significance of practices such as ‘*ombres chinoises*’ lies not in the ‘authenticity’ (or lack thereof) of the models, but in how they contributed to broader interpretations of Chinese cultures in the European imagination during this late eighteenth-century period.

Overall, however, Loughridge handles her subjects with care and admirably navigates transformations of metaphor across ‘high’ and ‘low’ musical practices. Each chapter of her work is surprising and delightful, her pairing of commonly understood musical forms and their hidden technological influences effective. While its generic scope expands beyond opera and encompasses late eighteenth-century musical genres more broadly, *Haydn’s Sunrise, Beethoven’s Shadow* has much to offer opera studies. Loughridge not only introduces an alternative narrative to the separation of senses and genres that has dominated musicological discourse since the early nineteenth century, but also models an intriguing methodological structure for scholars wishing to trace lines of influence across diverse cultural experiences within and without the opera house. Indeed, that Loughridge’s book can serve as a scholarly anchor for material-technological explorations of opera is demonstrated in the other two subjects of this review. As Gabriela Cruz notes in her chapter on the diorama and ‘dream image’, her argument that Meyerbeer’s *Robert le Diable* (1831) sonically models the visual strategies of phantasmagoria (light, mirages, shadows) is a development of Loughridge’s reading of Beethoven’s Fifth. *Haydn’s Sunrise, Beethoven’s Shadow* sets the stage for opera scholars wishing to explore the intersections between opera and histories of technology. As becomes evident in Kreuzer’s and Cruz’s works, Loughridge’s methodologies and interdisciplinary eye can be expanded into the material realms of staging technologies (Kreuzer) and be used to trace phantasmagoric strategies of operatic performance (Cruz).

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### gas·light

/ˈɡɑːslɪt/

*noun.* A lamp in which an incandescent mantle is heated by a jet of burning gas.

*verb.* To manipulate (a person) by psychological means into questioning their own sanity.<sup>6</sup>

Readers of *Grand Illusion* are likely more familiar with the word ‘gaslight’ as a verb. This modern use of the term comes from the aptly named 1944 film *Gaslight*. In the film, Ingrid Bergman plays Paula Alquist Anton, the newlywed niece of a murdered opera singer whose husband Gregory uses manipulative tactics to convince his wife that she is going mad. The title of the film is a reference to the lights in Paula’s mansion, which flicker throughout as part of Gregory’s plot to manipulate his wife. The subject of Gabriela Cruz’s book is ‘gaslight’ in its pre-1944 form, as noun and technology. Cruz makes no mention of the Bergman film, focusing instead on strategies of illusion in operatic staging from the nineteenth century. Nevertheless, Cruz’s work is a convincing demonstration that the relationship between gaslighting and trickery is much older than the story of Paula Anton, dating back to the introduction of gaslight technology in opera houses and theatres in the 1820s.

<sup>6</sup> ‘Gaslight, n.’, *Oxford English Dictionary*, [www.oed.com/view/Entry/76963](http://www.oed.com/view/Entry/76963); ‘Gaslight, v.’, *Oxford English Dictionary*, [www.oed.com/view/Entry/255554](http://www.oed.com/view/Entry/255554).

As Cruz details in her book, gaslight technology was installed in the Salle Le Peletier in 1822 and ushered in ‘a revolution in the medium of opera’ (3). Previous theatres were reliant on oil lamps and candles, which had limited lighting power and needed to be trimmed throughout the performance, a process that shattered the ‘fragile ideal’ of Diderot’s fourth wall and prevented sustained audience immersion in the worlds onstage (45). The introduction of gaslight not only shored up this imaginary wall, but also allowed directors to employ total darkness, dazzling brightness and projected images on the stage. With this new lighting technology, phantasmagoria ‘infiltrated’ the opera house and led to a new operatic culture of illusion, one which involved psychologically unsettling audience members by technological means.

As the subtitle of Cruz’s monograph suggests, braided into this story of gaslight technology is a story of phantasmagoria. Techniques for the phantasmagoria were established in 1769 by scientist Edmé-Gilles Guyot and popularised by the showman Paul Philidor in the 1790s. Using magic lanterns, dark drapery, spooky sounds and strategic sepulchral lamps, Philidor and his successors played into the occult fascinations of their audiences to ‘raise ghosts’ in performances that were part supernatural séance and part scientific demonstration. ‘I will not show you spirits’, Philidor was said to have declared at the outset of his shows, ‘because there are none; but I will produce before you simulacra and figures such as those we understand as spirits, in the dreams of the imagination and the lies of charlatans’ (53). As Cruz demonstrates, opera directors borrowed sonic, visual and technological strategies from phantasmagoria shows to establish the opera house as a place of dream-like, spectral experience involving ghostly nuns, magic lamps and phantom ships.

Cruz’s writing style is pleasing to read and often hauntingly evocative. She deftly moves through descriptions of the fragrances and blossoms in Wagner’s works, of phantasmagoria as ‘a tribunal of memory, in which illusion could serve as an instrument of redress’ (61), and details feet ‘mysteriously perfumed [which insist] on speaking and moving about the room’ (174). Her opening description of the Met chandeliers is so enchanting that I cannot help but repeat it here:

Each of these lustres resembles a miniature galaxy, a starburst with a myriad of rays projecting outward from a central bright nucleus. As they climb, they draw the eye upwards, higher and higher, towards the petal-shaped golden dome; their radiance reflects on the ceiling of the theatre, bathing it in a temporary aura. The twelve moving starbursts come to a halt when they reach the ceiling; their lights dim, gradually, and the penumbra falls on the auditorium. (xiii)

A few moments distract from the sonic enchantment of Cruz’s words. While the different chapters of her book are clearly topically related, at times they feel like a diverging collection of arguments. At the outset, Cruz sets her book up as a material history, an examination of the concrete roles that the technology of gaslight and the strategies of phantasmagoria played in creating grand opera’s new era of illusion. Cruz points out that, while other histories of opera have examined theatrical adaptations of technologies such as the *tableau vivant*, panorama and painting, ‘this book draws attention to the important role which the technology of phantasmagoria, often overlooked, played in honing another (haunted) sense of the past on the operatic stage’ (4). Some portions of the book, such as chapters two and three (case studies on the phantasmagoria and diorama respectively), deliver on this promise of unearthing the technologically phantasmagoric foundations of core illusions in French grand opera. Other chapters, however, stray from the argument Cruz lays out in her introduction. Chapter six on *Aida*, Verdi and Egyptomania, for instance, centres around the point that the mummy and its ‘awful ability

to link the material and the ghostly' haunts *Aida* 'by way of the flute' (175, 173). While the themes of materiality and phantoms are present, this chapter is more carefree with the concept of spectrality than her others, moving perhaps too easily between experiences of body and voice, phantasmagoria and *hyperflutes*, for the materialist focus suggested at the outset of the book. Such argumentative dislocation is likely due to the fact that various parts of Cruz's work were taken from other contexts. The article upon which chapter six is based, 'Aida's Flutes', published in this journal approximately twenty years ago, has been a favourite of mine for many years.<sup>7</sup> I have returned several times to the 2017 special issue of *Cambridge Opera Journal* ('Nineteenth-Century Grand Opéra on the Move') that contained the article 'The Flying Dutchman, English Spectacle and the Remediation of Grand Opera', which is now a large part of Cruz's fourth chapter.<sup>8</sup> While Cruz has adapted these earlier works for their new monographic packaging, their original arguments still haunt the reader. Chapter four, for instance, is at times less of a discussion of the phantasmagoric underpinnings of phantom ships than it is a commentary on nautical theatre's influence on Wagner and the transnational reach of grand opera's strategies of technological spectacularity – certainly on theme, but not speaking to the book's central point. In a case like this, where the author's goal is to examine a 'constellation of events, techniques, works, and figures of discourse' (xvi), I would have appreciated more direction from Cruz – in, perhaps, a freestanding conclusion – on how to connect each figurative star.

Gundula Kreuzer's *Curtain, Gong, Steam* offers another (perhaps more focused) example of how to connect a constellation of evidence and adapt previously published works for new monographic packagings. Like Cruz, Kreuzer draws from a wide variety of sources, moving from dense philosophical writing to jests made in the public press at Wagner's expense. Indeed, while reading her work, and inspired by her deep inquiry into the world of caricatures, I was repeatedly reminded of the famous joke about the percussionist who fell asleep during a performance: the specifics of the performance change with each telling of the joke, but certain elements of the percussionist's experience remain the same. The orchestra pit is warm and dimly lit, and the percussion part has several pages of rests, so the percussionist slowly drifts off in his seat. When he suddenly awakens, he realises with horror that he has been asleep for several minutes. In his adrenalinic panic, he becomes convinced that the rest of the orchestra is swiftly approaching the moment in the piece where he is supposed to strike the large gong, so he quickly picks up his mallet and swings. It becomes immediately apparent from everyone's reaction that he was mistaken, that this was not the right time for the gong. Indeed, the misplaced gong is so startling that it shatters the immersion of the performance and causes the other musicians of the orchestra to stop playing. In the ensuing silence, the percussionist stands up, turns to the audience, and says, 'Ladies and Gentlemen, dinner is served'.

Failures like that of the apocryphal sleeping percussionist are featured heavily in Kreuzer's work. The gong itself is one of three technological case studies, alongside curtain and steam, that Kreuzer uses to assemble her core argument on 'Wagnerian technologies'. For Kreuzer, two central features make a technology Wagnerian. First, it must have a component of self-effacing illusion. Wagnerian technologies are 'multisensorial illusionist devices intended to veil the artificiality of stage representation along with their own mechanicity' (xii). Second, Wagnerian technologies are doomed to fail. Steam, for instance, could be theoretically deployed to transform the stage into an ethereal wonderland while simultaneously shrouding scenery changes and enveloping steam-producing

<sup>7</sup> Gabriela Cruz, 'Aida's Flutes', *Cambridge Opera Journal* 14/1–2 (2002), 177–200.

<sup>8</sup> Laura Protano-Biggs, ed., *Cambridge Opera Journal* (special issue: Nineteenth-Century Grand Opéra on the Move), 29/1 (2017).



machinery in obscuring mists. In reality, the shrouding capacity of steam was often ineffective and distracting: 'Its hissing rendered its own high-tech origins audible; its odour divulged the machinery behind the staging on the olfactory level' (192). Stage managers found that steam did not always behave the way it was supposed to. Additionally, audiences often used the shrouding moments of steam onstage to focus on features of the opera house external to the narrative illusion like pipes or wall sconces. The failures of Wagnerian technologies such as the gong and steam are a specific type, a particular brand of technical failure that breaks the illusion and transforms the space of the opera house into an industrial laundry machine or comical dinner party.

The significance of Kreuzer's contribution lies in her exploration of the tensions between Wagner's artistic ideals and the material reality of his stage performances. The *Gesamtkunstwerk*, she demonstrates, not only relies upon an industrial, mechanical framework, but is also cursed to betray its materiality through a centuries-old obsession with 'new' technologies. As an example of the unreliability of new technology, Kreuzer bookends her monograph with an analysis of the rhetorical promise and practical disappointments of Robert Lepage's 2010–12 production of the *Ring* at the Metropolitan Opera. Kreuzer notes that even if new technologies do not fail in performance such as Lepage's infamous 'machine', their veiling capacities collapse due to the illusionist emphasis of *Gesamtkunstwerk* discourse. Borrowing from media scholars Jay David Bolter and Richard Grusin, she points out that each performance of Wagner's *Ring* 'promises to reform its predecessors by offering a more immediate or authentic experience ... the promise of reform inevitably leads us to become aware of the new medium as medium. Thus, immediacy leads to hypermediacy' (233). In focusing attention on the benefits of new mediums and technologies, celebrants of new stagings of the *Ring* centralise technology and render mediums 'opaque', complicating a Wagnerian technology's ability to shroud.

Like Cruz's work, Kreuzer's book is delightfully readable, her more abstract theorisations aided in part by her tendency to sprinkle in evocative rhetorical gestures and entertaining anecdotes from the archives. After reading her chapter on the curtain, for instance, I had a recurring nightmare inspired by her arresting metaphor of the curtain as eyelid and the stage as retina, with Wagner in control of both. In her first chapter (or, as she characterises it, her 'second introduction' (23)), Kreuzer argues that the Venusberg scene from *Tannhäuser* serves as a miniature prefiguring of Bayreuth – an 'epiphany of the *Gesamtkunstwerk*' – and that Venus herself can be read as Wagner's ideal, omnipotent director.<sup>9</sup> To make this argument, Kreuzer draws an enjoyable comparison between the 'sensual materialisms' (41) of rosy Venus and Wagner's real-world obsessions with floral scents and pink silks.<sup>10</sup>

While she succeeds in presenting a detailed account of Wagnerian technologies across an impressive span of multiple centuries, there are moments in Kreuzer's book that might have benefited from widening her scope a little further. In their works, Loughridge and Cruz do a good job of bringing in tangential examples such as peep shows and performances of nautical theatre to demonstrate that so-called 'low' and 'middlebrow' practices contributed to and were influenced by traditions in the opera house. While Kreuzer touches upon examples of touring opera, she largely remains within the borders of Wagnerian performance as defined by Wagner, despite the many other contemporary examples of performances of Wagner's works that took place in less formal venues and

<sup>9</sup> This establishes a pattern – continued in each of Kreuzer's chapters – of declaring the object of her study (Venusberg, curtain, gong, steam) to be a metaphor of Wagner's *Gesamtkunstwerk* as a whole.

<sup>10</sup> As an instance of Wagnerian technology, Venusberg is steeped in irony and ends in failure. The sublime 'naturalness' of Venusberg relies heavily upon technological intervention and *Tannhäuser* ultimately escapes Venus's immersive enchantments as technology fails once again.

in forms (reduced, fragmented and recontextualised) that likely would have shocked Wagner to his core. For instance, Kreuzer mentions the ‘Wagner Theatre’, a mobile *Gesamtkunstwerk* that requisitioned twelve railway cars (‘twice the length of a usual train at the time’ (222)) to bring performances of the *Ring* to twenty-five cities throughout Europe. However, I would have also been interested in her take on performances of Wagner’s music in music halls and by travelling ‘spectral opera companies’ that staged fragments of works such as the *Ring* with comparable aims of technological immersion.<sup>11</sup> While explorations of Wagner certainly do not have to cover every example of performances of his works, these ‘lower’ forms of technological and musical performance add a new dimension to the collapse of Wagner’s aesthetic ideal and might have offered a useful complement to Kreuzer’s other examples of Wagnerian failure.

Throughout her work, Kreuzer is persistent in her attempts to connect her historical excavations to the technological present, often abstracting her observations of Wagnerian failure to make bold claims about technological shortcomings in general.<sup>12</sup> For instance, in her introduction, she asserts that the ‘creaks of Lepage’s hardware thus disclose that *no technology can ever fully bridge the divide* between singers and scenery, real bodies and artificial simulation, man and machine’ (25, italics my own). This is a somewhat distracting statement, given the relative scope of Kreuzer’s monograph. Her present-day subjects are primarily twenty-first-century operatic and theatrical productions. It has been a while since the opera house has been a space of cutting-edge technology. Eyebrows will thus undoubtedly rise at the suggestion that technical failures in Lepage’s production can serve as a broader demonstration of technology’s unqualified limitations. However, Kreuzer’s overall, gestural statement on technology points to an intriguing future for opera studies, a future where observations about music can yield insight into the inner workings of technology writ large. Notably, Kreuzer stops short of expounding outright upon the implications of this statement. This is likely because further exploration of such a statement lies outside the scope of her work. She has made her points and made them well. The question that remains is left for readers to explore: how might we use Kreuzer’s (and Loughridge’s and Cruz’s) methodologies for tracing connections between musical practice and extramusical experience to further these claims about technology today?

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I would like to end with a brief meditation on genre. Reading from the perspective of a reviewer, with issues of methodology and structure at the forefront of the mind, I found my attention consistently drifting to the object of the monograph. I feel as if I can comfortably place some of the responsibility for this focus on the three authors. They did, after all, encourage a heightened awareness of practical mechanisms. There is

<sup>11</sup> For a concise overview of spectral opera companies, see Russell Burdekin, ‘Pepper’s Ghost at the Opera’, *Theatre Notebook* 69/3 (2015), 152–64. See also Alexandra Wilson’s discussion of opera’s ‘entertainment status’ and ‘highbrow’ associations in ‘Killing Time: Contemporary Representations of Opera in British Culture’, *Cambridge Opera Journal* 19/3 (2007), 249–70. While Wilson does not deal with Wagner explicitly, she offers important contextualisation for nineteenth- and twentieth-century performances of Wagner’s *Ring* and earlier works such as *Lohengrin*.

<sup>12</sup> Loughridge and Cruz make similar connections to the present, albeit to a lesser degree. Loughridge’s conclusion centres upon her argument that the so-called ‘audiovisual turn’ of the digital age is in fact an audiovisual return to a mode of multisensorial listening that appeared as early as the eighteenth century. Reading through Adorno, Cruz offers an image of ‘the listener who unexpectedly comes to his senses in grand opera, having been awakened to the world by its music’ (203), an image that channels phantasmagoric nostalgia and ‘potentiates the critical awareness of opera today’ (13).



no secret behind why Loughridge, Cruz and Kreuzer wrote their books. It is an expectation of the field to produce works in this genre, something Kreuzer obligingly indicates in her preface when she notes that *Curtain, Gong, Steam* was conceived with her 'eyes fixed on the tenure clock' (xiii). Indeed, genre lies at the centre of many of the criticisms I have levelled in this review. It is the musicological norm, for instance, for a monograph to involve the partial reprinting of previously released articles. However, the tensions I have identified in these three volumes – the 'ghost of articles past' that haunts Cruz's chapters, for instance, or the limitations to Kreuzer's declarations on technology given her operatic scope – point to a more fundamental question about the ubiquity of the monograph in an academic landscape that increasingly attempts to forge connections between scholarship and the lived realities of today: is this really the right genre? Is the monograph sufficiently distinct from the academic article as a delivery mechanism for theory and argument to justify the time, expense and weight it is professionally afforded? Are there no other formats that might be better suited to outline scholarly thinking on topics as timely and ephemeral as technology?

By failing to ask these questions about the genres we dutifully produce, we fall into the trap – exposed so well by the three authors – of ignoring the practical structures at musicology's disciplinary centre. We are thus ill-positioned to recognise when the needs of the present moment are incompatible with the mechanisms we reproduce. In technological fields, this might be referred to as a 'system error', a concept outlined in Don Norman's foundational work, *The Design of Everyday Things* (1988):

Humans err continually; it is an intrinsic part of our nature. System design should take this into account. Pinning the blame on the person may be a comfortable way to proceed, but why was the system ever designed so that a single act by a single person could cause calamity? Worse, blaming the person without fixing the root, underlying cause does not fix the problem: the same error is likely to be repeated by someone else.<sup>13</sup>

I returned repeatedly to the concept of system error when preparing this review: first, because Kreuzer's demonstration that Wagnerian technologies fail with surprising regularity folds so neatly into this broader idea of who we blame (versus what is to blame) when things go wrong. Second, I have wrestled in my position as reviewer with the questions of what to critique (being careful not to characterise system errors as human failings) and why. Many of the critiques I have levelled seem more like issues of the system than faults of the individual. It is for this reason that I have turned away from the authors and works in question and towards the system itself, offering, in this final critique, not only a review of the monographs, but also a brief review of the *monograph*.

Indeed, the significance of these three volumes is not simply in how their arguments and methodologies can contribute to the shape of opera studies, but also how their shortcomings might allow us to consider how opera studies itself can shift to 'fix' system errors and think of more effective ways to communicate new arguments. There is value, for example, in considering a musicological future where well-written articles such as Cruz's original 'Aida's Flutes' would be allowed to remain in their original form and in encouraging an evaluation process of tenure packages that weighs such articles more heavily. There is intriguing potential for arguments such as Kreuzer's theories on technical failure to be tested more practically in community partnerships and in more explicitly technological spaces. We might ask how such ideas influence the practical

<sup>13</sup> Don Norman, *The Design of Everyday Things* (New York, 2013, originally published 1988), 66.

developments of new technologies and user experiences, or how such an understanding of technical limitations can impact present-day technological policy. As all three authors have demonstrated, much can be learned by unveiling the everyday structures and more practical connections that lie hidden in opera's past. Perhaps this is a key to opera studies' future?