

Wagner's Sublime Effects: Bells, Cannon and the Perception of Heavy Sound

David Trippett

The Dresden Tower

For the purposes of crime and punishment, Richard Wagner's involvement in the violent uprising in Dresden during May 1849 is a matter of historical record. He obtained hand grenades and hunting rifles, had coercive placards printed asking Saxon soldiers 'are you with us against the foreign troops?', liaised daily with the provisional government, and spent several days and one night atop the Kreuzkirche as lookout. That Wagner valued the aesthetic experience of the tower, with its elevated audio-visual panorama, is clear from comments in his third autobiography, *Mein Leben*, and by the fact that he returned there twice, and – in an early form of data sonification – almost certainly used the great bell overhead to signal troop movements to comrades below.¹ Figure 1 shows the neoclassical tower in 1788 and the dome in which Wagner resided. [Fig. 1 near here]

The artist Gustav Kietz recalled Wagner's attempt to induce him up the tower: 'the view [is] splendid', he reportedly declared, 'and the combination of the bells and the cannon intoxicating'.² Elsewhere he spoke vividly of the scene's martial polyphony, of bells and bullets after nightfall: 'in the immediate vicinity of the frightful clangour of the tower bell and to the accompaniment of Prussian bullets splattering against the tower walls, I spent one of the most noteworthy nights of my life'.³ The cognitive insertion here of picturing objects one cannot actually see doubtless enhanced the experience of darkness, corroborating Kietz's account that Wagner was attracted to the unfolding military soundscape – Dresden's 'frightful music' – as much as the vista.⁴ His

¹ Wagner's own account of events was probably drafted several days after he fled the city, and is recorded in his third autobiography, *Mein Leben*. Scholars and interested parties have tended to scrutinise his words, alongside a long letter to theatre historian Eduard Devrient, as a calculated attempt to escape political culpability in view of the failure of the uprising and his subsequent exile. But from a different perspective, his prose is a marvel of literary imagination in the *Künstlerroman* tradition. For biographer Ernest Newman, it constitutes 'the most vivid [autobiographical] writing' of Wagner's entire career. Ernest Newman, *The Life of Richard Wagner*, 4 vols. (London: Cassell, 1937), 2: 69. See also the official Saxon case against Wagner from 1856, reprinted in Stewart Spencer, *Wagner Remembered* (London and New York: Faber, 2000), 64–5.

² Reported in Houston Stewart Chamberlain, *Richard Wagner* (Munich: Wissenschaft, 1896), 52.

³ Richard Wagner, *My Life* [1865], trans. Andrew Gray, ed. Mary Whittall (New York: Da Capo Press, 1992), 399. Hereafter ML.

⁴ ML 403.

account is certainly not alone in the annals of warfare; one clarifying example would be Ernst Jünger, a Nazi operations officer based in Paris, who ‘would ascend to the rooftop terrace [of his Paris apartment] in order to enjoy the “great beauty” and “demonic power” of the multimedia “show” whenever the Royal Air Force bombed the French capital.’⁵

Investigations into historical soundscapes offer a means of accessing the identity of sounds beyond music, its idealised works, and performance events. Here it makes sense to distinguish the heavily semanticised sound of music as an art form from what may be considered the purely sonic, a physical, vibrational event; both are culturally conditioned but the latter is arguably more dependent on the vagaries of mental and physiological perception.⁶ I would like to explore the idea that the acoustic reality of the battlefield Wagner witnessed, and his elevated panoramic vantage, register a quality of lived experience that exceeds normative categories, not least because, at times, it palpably threatened deafness. The extent to which such an acoustic threat plays into mid-century German discourses of the sublime, defined as an aesthetic category for monopolising sensory perspective at the limits of the imagination, is less dependent on philosophical categories than experiential ones. If we allow historical references to the sublime to underpin a reading of Wagner’s historical experience, can its imagined acoustic trace – for us – become reflexive, and inform interpretations of momentary massed noise in Wagner’s works (e.g. the bells in *Parsifal* [1882], the anvil hammers in *Das Rheingold* [1854])? If so, it would offer an alternative to the Nietzschean critique of a bombastic sensory immersion, one that rejects beauty in favour of ‘that which is great, sublime, gigantic – that which moves *masses*’.⁷ In this chapter I seek to probe the value of such a hypothesis.

⁵ Reported in Kriedrich Kittler, ‘World-Breath: On Wagner’s Media Technology,’ *The Truth of the Technological World: Essays on the Genealogy of Presence* (Stanford: Stanford University Press, 2013), 136-37. On the wider uses of the belliphonic and soundscapes of violent conflict see particularly Gavin Williams (ed.), *Hearing the Crimean War: Wartime Sound and the Unmaking of Sense* (New York: Oxford University Press, 2019); J. Martin Daughtry, *Listening to War: Sound, Music, Trauma, and Survival in Wartime Iraq* (New York: Oxford University Press, 2015); Juliette Volcler, *Extremely Loud: Sound as a Weapon* (New York and London: New Press, 2013); and Steve Goodman, *Sonic Warfare: Sound Affect and the Ecology of Fear* (Cambridge, MA: MIT Press, 2009).

⁶ For a fresh consideration of the sonic and ‘sonicity’ in these terms as ‘oscillatory events and their mathematical reverse equivalent: the frequency domain as an epistemological object’, see Wolfgang Ernst, *Sonic Time Machine* (Amsterdam: Amsterdam University Press, 2016), 21–34, here 22.

⁷ Friedrich Nietzsche, ‘The Case of Wagner’, *Basic Writings of Nietzsche*, trans. Walter Kaufmann (New York: Modern Library, 2000), 623.

We learn from *Mein Leben* that on 3 May the bells of St. Ann's church gave the storm signal all of a sudden, indicating the start of the Dresden revolt: 'the sound of the bells, emanating from so close at hand, made a decisive impression on me'.⁸ Wagner had never experienced a warzone; he reflects thereafter on the crippling reality of the noise amid explosion and gunfire, 'which had continued without interruption for days, [and] had made such an indelible imprint on my cerebral nerves that it resounded within me for a long time thereafter'.⁹ He talks of 'senseless chaos surrounding me' (394), of damaged hearing, and the revolutionary excitement, or trauma, of seeing the opera house engulfed in 'an immense sea of flames' (400), redolent of Milton's Lucifer inhabiting a Hell that 'spout[s] her Cataracts of Fire'.¹⁰ Such imagery – purging by liquid inferno – leant drama to the destructive spectacle in Dresden, as an enactment of his controversial call to devastate municipal infrastructure in order to bring about revolutionary change.¹¹ It also testifies to the attractiveness of Mikhail Bakunin's rhetoric during this episode. A charismatic advisor of the provincial government, this exiled Russian officer seemingly matched Wagner's voracious appetite for radical intellectual idealism;¹² he famously advocated an anarchic twisting of the dialect, where 'the passion for destruction is also a creative passion'. Or as he explained in casuistic Hegelese:

⁸ ML 391.

⁹ ML 403.

¹⁰ Milton, *Paradise Lost*, ed. Christopher Ricks (London: Penguin, 1968), book II: 176, p. 33.

¹¹ Wagner's authorship of 'Revolution' [*Die Revolution*] from 1848 remains disputed. This Bakunin-inspired tract was attributed to Wagner in the *Sämtliche Schriften und Dichtungen* but was published anonymously in the *Volkszeitung* without surviving holographs. In it, the author writes in language and vocabulary redolent of Wagner's later description of Dresden: 'across ... the whole of Europe [we see] the fermenting of a violent movement, ... Europe appears as an intense volcano to us, ... out of whose crater dark pillars of smoke arise up to heaven, prognostic of coming storms, ... while individual streams of lava, breaking through the hard crust as the fiery harbinger of total destruction, pass over the valley.' ['überall durch ganz Europa [sehen wir] das Gären einer gewaltigen Bewegung, ... Wie ein ungeheurer Vulkan erscheint uns Europa, ... aus dessen Krater dunkle, gewitterschwangere Rauchsäulen hoch zum Himmel emporsteigen ... während bereits einzelne Lavaströme, die harte Kruste durchbrechend, als feurige Vorboten alles zerstörend such ins Tal hinabwälzen.' Wagner *Sämtliche Schriften und Dichtungen*, *Volks-Ausgabe* (Leipzig: Breitkopf & Härtel and C. F. W. Siegel [R. Linnemann]. 1911 [vols. 1–12], 1914 [13–16], 12: 245.

¹² ML 384–9.

The positive is negated by the negative; and conversely, the negative by the positive. What then is the common element which transcends both of them? It is the fact of negation, the fact of destruction, the fact of the passionate devouring of the positive.¹³

As the crooked ruins, rubble and bloodied bodies of Julius Scholtz's contemporary oil suggests (Figure 2), the degree of destruction was not insignificant. Contemporary reports attest that the Saxon army (2800) and two Prussian battalions (2200) sent to aid King Friedrich August II overwhelmed the poorly armed insurgents (3000, though some reports suggest the influx of neighbouring rebels totalled as many as 8000–10,000). Of the latter 250 were killed, 250 injured, while only eight Prussians and twenty-two Saxon troops were killed.¹⁴ Friedrich Gustav von Waldersee, the Prussian commander tasked with retaking the city, cited the barricades erected in the old town, the so-called 'Semper Barricades' designed by architect Gottfried Semper, as highly effective vehicles that prolonged the conflict: 'they were literally small fortresses, reaching right up to the first floor of the houses, assembled workmanlike from the square stones of the cobbled pavement, capable of withstanding even heavy cannon through paving slabs in the sloping embankment, [and] furnished with ramparts'.¹⁵ When Semper was later pressed by his brother for harnessing his professional expertise and reputation to the uprising, he retorted: 'Everyone must know what his sense of duty demands of him and act accordingly. Half-heartedness is, in any case, too often found among the educated classes, who, even though taking up a cause, will not

¹³ Mikhail Bakunin, cited in Henri Avron and Malcolm Patterson, *Bakounine: absolu et revolution* (Paris: Éditions du Cerf, 1972), 36. His *Confession to Tsar Nicholas I* (1851), written during incarceration as that of 'a spiritual son to his spiritual father', indicates his participation in events alongside Wagner was genuine if sceptical, we learn: 'I did all I could to save the ruined and obviously dying revolution', he recounted, 'I did not sleep, I did not eat, I did not drink, I did not even smoke.' Bakunin, *The 'Confession' of Mikhail Bakunin*, (Ithaca, London: Cornell University Press, 1977), 146. The comment about a spiritual father is reported by Bakunin: 'Sage ihm [Bakunin], daß er mir wie ein geistlicher Sohn an seinen geistlichen Vater schreiben soll', Bakunin to Alexander Herzen, in *Michail Bakunins sozial-politischer Briefwechsel mit Alexander Iw. Herzen und Orgariow*, trans. Boris Minzès (Stuttgart: Cotta, 1895), 35.

¹⁴ Friedrich von Waldersee, *Der Kampf in Dresden im Mai 1849* (Berlin: Mittler and Son, 1849), 9, 12. See also, Harry Francis Margrave, *Gottfried Semper: Architect of the Nineteenth Century* (New Haven and London: Yale University Press, 1996), 169.

¹⁵ 'Es waren förmliche kleine Festungswerke, bis an das erste Stockwerk der Häuser hinaufreichend, aus den Quadern des Straßenpflasters kunstgerecht zusammengefügt, durch die in schräger Böschung angebrachten Trottoir-Platten selbst gegen schweres Geschütz widerstandsfähig, mit Brustwehren versehen.' Ibid., 26.

sacrifice anything for that cause. In short, I feel myself free of blame.’¹⁶ To protect the barricades’ defence, the provisional government ordered the opera house be incinerated. The scene of the ruined building was later captured in an unsigned lithograph (Figure 3), and Wagner found heady symbolism in the fact that his last concert in the now ravaged shell had been Beethoven’s Ninth Symphony ‘a few weeks before’.¹⁷

[Figures 2-3 near here]

But my interest in this episode is less biographical than conceptual: what about Wagner’s vivid narrative and experience accounts for the sheer pleasure he took in observing the noise and violence, the ‘intoxicating ... combination of bells and cannon’?

In one sense, bells and cannon are devices of acoustic orientation; Wagner’s literary imagination here feeds off the spatial organisation of moving soundmasses on the battlefield – in one case, against the chirping of a nightingale, the concealed sound source of the Marseillaise eventually emerges in a spectacular audio-visual displacement:

Sunday 7 May ... a sacred calm and tranquility lay over the city and the broad expanse of its surroundings I could see from my vantage point: towards dawn a light fog settled on the outskirts: penetrating through it we suddenly heard, from the area of the Tharandt road, the music of the Marseillaise clearly and distinctly; as the source of the sound came closer, the mists dispersed and the blood-red rising sun glittered upon the guns of a long column marching into the city. It was impossible to resist the impression of this unfolding sight.¹⁸

This almost reads like a set of stage directions. The arrival of these rebel troops (‘mostly miners’) from the Erzgebirge attests to a degree of sensory confusion in which Wagner’s ears magnify the unconcealed sight. But the imaginative interpolation here is also quite specific. For Heinrich Heine, an early confidant of Wagner’s in Paris during the 1830s, the Marseillaise ensounded the righteous justice of a subjugated people far more powerfully than art music (dismissed as ‘sweet concerts of the Muses in the pleasant

¹⁶ ‘Jeder muss wissen, was sein Pflichtgefühl von ihm fordert und darnach handeln. Halbheit ist ohnedies nur zu sehr bei uns gebildeteren Ständen zu finden, die, wenn schon Parthei nehmend, doch nichts für ihre Parthei opfern mögen. Kurz ich fühle mich frei von Vorwurf.’ Gottfried to Carl, 15 May 1849. Semper Archiv. Cited and translated in Harry Mallgrave, *Gottfried Semper: Architect of the Nineteenth Century* (New Haven and London: Yale University Press, 1996), 170.

¹⁷ ML 400.

¹⁸ ML 399.

drawing rooms of Olympus'). Writing with the Marseillaise resounding beneath his window in 1830, Heine extols the authenticity of this rabble-rousing anthem: 'What a song! It runs through my veins with fiery joy, and kindles in me the glowing stars of enthusiasm and the rockets of ridicule ... Musical streams of fiery song shall fall in bold cascade from the summit of freedom's delight.'¹⁹ That Wagner's setting of Heine's 'Les Deux grenadiers' (WWV 60) from 1840 explicitly incorporates the Marseillaise offers grounds to suspect the composer was both aware of and sympathetic to Heine's attitude, which in turn appears to have fed into his experience of the marching miners filing into Dresden.²⁰ Piecing together the perceptual experience of a composer through such anecdotes and documents need not falsify the significance we attribute to evidence, even if it remains forever speculative, for rather than seeking objectivity through such details – which would lead to an infinite regress – such an approach advocates what might be called a contextual historicism: reading evidence across a network of discursive events that are only rarely causally connected.

Beyond acoustic orientation, bells and cannon are also signal technologies, and mingle as such in Wagner's account: the one a marker of time, the other of territory. Goethe, writing amid the French occupation, provides the model. He signs off a letter to Charlotte von Stein in 1812 as: 'at the Napoleon feast / amid the heaviest tolling of bells and the thunder of cannon'.²¹ As Bernard Siegert points out in his study of bell resonance as cultural semiotics, Goethe coined the term 'Erzklang' – mineral sound or primordial echo – for precisely this merged acoustic identity in his poem 'Dreistigkeit' (Audacity), and it is perhaps no coincidence that Wagner compared his reaction to the sudden, violent tolling of Dresden's bells with Goethe witnessing the historic cannonade at Valmy (1792), an inhuman sound that signalled the start of the Revolutionary Wars.²² Of course, for centuries these two devices – bells and cannon – have intersected at a material level; the artillery used by the revolutionary armies of the early nineteenth century had previously been church bells. Historian Alain Corbin estimates that no fewer than 100,000 bells were melted down during the Napoleonic

¹⁹ Heinrich Heine, *Selected Prose*, ed. Ritchie Robertson (London: Penguin, 1993), 191.

²⁰ Wagner set a French translation of Heine's poem to satisfy his local audience at the time.

²¹ Goethe, *Goethes Werke*, ed. on behalf of Grand Duchess Sophie von Sachsen, pt. 4, vol. 23 (Weimar: Böhlau, 1905), 73.

²² Bernhard Siegert, 'Mineral Sound or Missing Fundamental: Cultural History as Signal Analysis', *Osiris* 28 (2013), 105–18, here 105–6. Wagner, ML, 391. See also Timothy Blanning, *The French Revolutionary Wars 1787–1802* (London and New York: 1996), 76–8.

wars, a practice mirrored across central Europe, where ‘artillery commanders had rights over the bells of a conquered town’ and municipal governments ordered the melting and remoulding of their bells into cannon as soon as hostile forces began amassing outside the city.²³ In short, during the revolutionary period, all bells were potential cannon. Wagner’s vantage in the tower brings the sounds of both devices into a single discursive space, that of the violent sound effect, for *acoustically*, the metamorphosis of bell into cannon merely effects a change of timbre; despite their different applications, both are non-periodic frequencies with unusually complex upper overtones that lack an integer ratio to the sound’s fundamental tone. And both fill a frequency-rich spectrum that far exceeds tuned instruments. In the extreme context of war, we may wonder to what extent this displaced acoustic identity offers an epistemological basis for Wagner’s apparent attraction to threatening sounds.

War and the sublime

Kant’s third critique contains a short discussion about the place of war in the psychological state he ascribed to the sublime, that painful feeling of disconnect between ‘the aesthetic estimation of magnitude formed by the imagination and ... by reason’.²⁴ Central to this is the idea of cognitive self-preservation – a serenity of mind retained amid manifest physical danger. While we confront our limitations in our inability to take in or frame ‘the aesthetic estimation of [nature’s] magnitude’, he argues, we can at least learn to distance our perception from any immediate threat. Or as he puts it, attain

a faculty of judging independently of and a superiority over nature, on which is based a kind of self-preservation entirely different from that which can be attacked and brought into danger by external nature. ... [W]e must regard ourselves as safe in order to feel this inspiring satisfaction.²⁵

²³ Alain Corbin, *Village Bells: Sound and Meaning in the 19th-Century French Countryside* [1994], trans. Martin Thom (New York: Columbia University Press, 1998), 8.

²⁴ Kant, *Critique of Judgment*, trans. J. H. Bernard (New York and London: Haffner, 1951), 96.

²⁵ *Ibid.*, 101.

In other words, we can regard an object or situation as fearful without actually fearing it; under these conditions, the more fearful it is, the more attractive, Kant adds.²⁶ In the face of common emblems of sublimity – ‘the boundless ocean in a state of tumult, a lofty waterfall or a mighty river’ – this self-preservation might consist in imagining what it would be like to drown, struggling against the water’s immense force, while standing safely on the shore. This is where Kant makes the connection to war. The principle of safely embracing our physical impotence in the face of seemingly almighty nature, he continues, may lie at the heart of the most ordinary judgments:

For what is that which is, even to the savage, an object of the greatest admiration? It is a man who shrinks from nothing, who fears nothing, and therefore does not yield to danger, but rather goes to face it vigorously with the most complete deliberation. Even in the most highly civilized state this peculiar veneration of the soldier remains. ... War itself ... has something sublime in it, and makes the disposition of the people who carry it on thus only the more sublime, the more numerous are the dangers to which they are exposed and in respect of which they behave with courage.²⁷

Holding in abeyance the philosopher’s privileged distance from bloody realities, this confirms – if confirmation were needed – that Kant’s category of sublimity is not dependent on nature as a prime cause. What epistemological shifts are effected if we replace nature with immense machines and the dizzying noise of industrial technology, of which warfare is merely a logical extension? While reactions to the immensity of nature form a trope of sublime psychology between Burke and Schopenhauer, it seems uncontroversial to argue that military conflict and its threatening machinery can serve as equally satisfactory venues for this historical perceptual state.

For Schopenhauer (writing twenty-eight years after Kant), the sublime entailed contemplation of objects hostile to the will, not as a vague seat of being, but physically, the will ‘as manifested in its objectivity, the human body’. He goes further than Kant in articulating this perverse serenity of mind, one that could almost be read as a description of Wagner’s joy in an ‘intoxicating’ polyphony of bells and bullets that might have killed him:

²⁶ Ibid., 100.

²⁷ Ibid, 101–2.

[T]he beholder may not direct his attention to this [threatening] relation to his will which is so pressing and hostile, but, although he perceives and acknowledges it, he may consciously turn away from it, forcibly tear himself from his will and its relations, and, giving himself up entirely to knowledge, may quietly contemplate, as pure, will-less subject of knowing, those very objects so terrible to the will. ... [A]s long as personal affliction [i.e. a sense of imminent personal danger] does not gain the upper hand, but we remain in aesthetic contemplation, the pure subject of knowing gazes through this struggle of nature, through this picture of the broken will, and comprehends calmly, unshaken and unconcerned, the Ideas in those very objects that are threatening and terrible to the will. In this contrast is to be found the feeling of the sublime.²⁸

This presence of mind – what Schopenhauer variously calls ‘the peace of contemplation’, ‘pure contemplation’ and ‘aesthetic contemplation’ – allows for aesthetic appreciation of the meaning of hostile objects; it holds in abeyance the direct threat of cannon and bullets, relishing the battlefield through will-less contemplation, that is, without fear for one’s continued existence.

Rhythmic noise

While Wagner’s secluded position made him a low risk for snipers, the constant noise of ‘big and small arms fire’, he reports, was deafening. It reduced the adjacent sound of shouting soldiers to ‘merely an uncanny murmur’.²⁹ That is, it seems he temporarily went deaf at least once. Even in a thriving economy at peace, this problem was acute for factory workers in industrial smelting or locomotive assemblage, particularly boiler construction from the mid-century. In the Dutch boiler-making industry, as Karin Bijsterveld explains, boys aged fourteen to sixteen typically stood directly inside boilers and held rivets in place as these were being hammered in. ‘All of us go deaf’ reported a retired fifty-two-year-old boiler-boy, soberly.³⁰ While a Dutch parliamentary enquiry drew attention to this situation as early as 1887, labour laws only came into effect decades later. In 1896, Karl Bücher advanced an influential theory that ordered

²⁸ Arthur Schopenhauer, *The World as Will and Idea*, trans. E. F. J. Payne, 2 vols. (New York: Dover, 1969), 1:201, 204.

²⁹ ML 404.

³⁰ J. Giele, *Een kwaad leven*, 64 and 366 (see note 1). Cited in Bijsterveld, ‘Listening to Machines’, 152.

movement itself—for him, the origin of all poetry and music—is synonymous with physical labour, with its regular, mechanical non-conscious motions.³¹ And until the 1930s, the public problem of noise was defined as the chaos of simultaneously perceived sounds and the absence of a univocal rhythm.³² As Bijsterveld explains, by the end of the 1920s, The Noise Commission of London felt the arrhythmic nature of street noise make this more distressing than the regular, predictable sounds of factory machines, while experts focusing on industrial noise argued the opposite, that the inhuman speed of multiple steam-driven machines running at different speeds created an intolerable compound polyrhythmic complex: ‘the roar of the machines is so great’, writes the chair of the Committee on the Legal defense of US Labor Laws in 1913, ‘that one can hardly make oneself heard by shouting to the person who stands beside one’.³³ From the 1830s onward, European and American medical journals labelled a range of professions as dangerous to the auditory system, including those of blacksmiths, miners, iron-workers, boiler-makers, coppersmiths, millers and locksmiths. But the point on which both urban and industrial experts agreed, it seems, is that rhythmic sound could be conducive to workers’ health and productivity,³⁴ whereas competing cross-rhythms, devoid of perceptible rhythmic organisation were confusing and stress-inducing, representing ‘the most dangerous side of noise’, as Bijsterveld puts it.³⁵ In short, an irregular patterning of sound was deemed unpleasant, and at high sound intensities, potentially hazardous.

Extrapolating from this brief foray into the cultural history of noise, rhythmic regularity of unpleasantly loud, non-periodic sound allows for cognitive assimilation of the loudness’s totality — that is, aesthetic pleasure despite extreme volume. In this respect, we only have to look at the techno genres of the early 1990s, and EDM and Gabber music in particular, with their rapid, frequency-distorted beats for an example of aestheticising rhythmically ordered sonic crashes. I would like to draw two

³¹ Karl Bücher, *Arbeit und Rhythmus* (Leipzig: Hirzel, 1897).

³² Bijsterveld, ‘Listening to Machines’, 154.

³³ Josephine Goldmark, *Fatigue and Efficacy: A Study in Industry* (New York: Survey Associates, 1913), 54.

³⁴ This was the principal argument in Karl Bücher’s 1897 book *Arbeit und Rhythmus* (Leipzig: Hirzel, 1897), which also claimed the necessity of rhythmic forms for communal singing as part of a broader argument that human musical cognition emanates principally from rhythm. See also Richard Wallaschek, *Primitive Music* (London and New York: Longmans, Green and Co., 1893); and Bücher, *Die Entstehung der Volkswirtschaft* (Tübingen: Laupp, 1893).

³⁵ Bijsterveld, ‘Listening to Machines’, 154.

connections here that hark back to Wagner's tower, and tie his willing absorption within the soundscape of war to the serenity of mind associated with a psychology of the sublime.

First, our cognitive assimilation of industrial rhythm arguably provides aesthetic pleasure in much the same way that the physiologist and acoustician Hermann von Helmholtz spoke of 'a kind ... of artistic satisfaction, when we are able to survey the enormous wealth of Nature as a regularly-ordered whole – a kosmos, an image of the logical thought of our own mind'.³⁶ Rather than sublime perception, he was speaking about the recently discovered law of the conservation of force in which the quantity of force that can be brought into action in the whole of nature is unchanging. The critical meeting point here is where one's perspective attains a stable vantage to survey the whole pattern – of force, of sounding object, of nature – as though viewing from the top of a metaphorical tower. It is the vain satisfaction of delimited omniscience.

Second, the sublime as an aesthetic category accessed via serene detachment arguably becomes reliant on the same totalising perspective, at least in Schopenhauer's metaphysical formulation:

If we lose ourselves in contemplation of the infinite greatness of the universe in space and time ... we feel ourselves reduced to nothing ... But against the ghost of our own nothingness ... there arises the immediate consciousness that all these worlds exist only in our representation, only as modifications of the eternal subject of pure knowing. ... The vastness of the world, which previously disturbed our peace of mind, now rests within us; our dependence on it is now annulled by its dependence on us.³⁷

Beyond Schopenhauer's impulse to internalise the cosmos, security of understanding – or its flipside, cognitive control – arguably lies at the heart of such a reading.³⁸ In this sense, grasping the regular rhythmic impulses of machine labour becomes akin to defining the vastness of the world as internal to our perception, as something securely known.

³⁶ Hermann von Helmholtz, *Science and Culture*, ed. David Cahan (Chicago and London: University of Chicago Press, 1995), 121.

³⁷ Schopenhauer, *The World as Will and Idea*, §29, 1:205.

³⁸ 'In war, revolution and ritual, the irregular and extremely loud use of drums and bells usually expresses intimidation, change and chaos, whereas a restoration of rhythm stands for situations being in control.' Bijsterveld, 'Listening to Machines', 153.

Unsurprisingly, the aesthetic valency and cultural work of rhythm affords writers on music significant license during this period. Within the discourse of music and Romantic philosophy, Friedrich Schlegel – for one – posited rhythm as the hope for music, an unexplored path, perhaps not unwarranted in the context of Viennese keyboard sonatas bracing against the tyranny of the bar line: ‘One has tried the way of harmony and of melody’, he explains, ‘now rhythm is left to form music completely anew; the way of a rhythm where melody and harmony only *formed* and amplified the rhythm’.³⁹ While masquerading as a comment on music theory, this in fact speaks to a more encompassing worldview in which rhythmic order both enables and is constitutive of our comprehension of the world and our place therein. Indeed, Schlegel extends his claim for rhythm to the very means by which the chaos of early human perception could grow into intelligible self-consciousness, that is, nothing less than human thought itself: ‘Rhythm in this childhood of the human race is the only means of fixing thoughts and disseminating them.’⁴⁰ Its limiting function and its amenability to the perception of resemblance and patterning of auditory signs accounts for the comprehensibility of language as much as music. And as Andrew Bowie notes, with a broader purview this quasi-mathematical reading of sound-in-time arguably underscores Kant’s transcendental Schematism, the stabilising means (schema) by which consistent rules of judgment are made possible across categories, appearance, sensibility and concepts. ‘The schema’, Bowie explains,

is meant to overcome the divide between the empirical and the a priori, the receptive and the spontaneous aspects of our relations to the world, by enabling the mind to apprehend what are empirically different things, such as a bonsai and a giant redwood, as in some way the same. Schematism is therefore also the basis of the ability to understand and create metaphors.⁴¹

But when Kant discusses schema of causality, magnitude, succession (subject to a rule) and possibility (as the synthesis of different representations with the conditions of time)

³⁹ ‘Den Weg der Harmonie und den der Melodie hat man versucht; nun bleibt noch der Rhythmus übrig, um die Musik ganz neu zu bilden; eines Rhythmus wo Harmonie und Melodie diesen nur *bildete* und verstärkte.’ Schlegel, *Kritische Schriften und Fragmente I–VI* (Paderborn, 1988), V: 86.

⁴⁰ ‘Rhythmus [ist] in dieser Kindheit des menschlichen Geschlechts das einzige Mittel ... Gedanken zu befestigen und zu verbreiten.’ Schlegel, *Kritische Schriften*, II: 16.

⁴¹ Andrew Bowie, ‘Music and the Rise of Aesthetics’, *Cambridge History of Nineteenth-Century Music*, ed. Jim Samson (Cambridge: Cambridge University Press, 2002), 36.

an underlying temporal dimension of the schema comes into focus. Here, implicitly, the intrinsic rhythmic ordering of music becomes hierarchically prior to that of mathematics. It leads Kant to a stark conclusion:

The schemata, therefore, are nothing but *a priori* determinations of time according to rules; and these rules, as applied to all possible objects, refer in the order of the categories to the series of time, the content of time, the order of time, and lastly, the sum total of time.⁴²

For contemporary music theorists, the determination of time according to rules would seem a viable if abstract historical definition of meter as rhythm. Heinrich Koch refers to just such a concept of macro-rhythmic order in his *Musikalisches Lexikon* (1802) where rhythm constitutes intersecting relationships of predefined patterns or rules: ‘not only the relation of musical feet, from which are derived the various kinds of meter, but also principally the relationship which individual melodic parts or phrases of a period that are connected to such musical feet have to each other’.⁴³ What – for Kant – stabilizes understanding across categories and perceptual phenomena, and – for Koch – creates relationships between ordered constituent parts – centres on *auditory pattern recognition* as a way of comprehending time. Whether this also regulates time, or whether it is time that in fact regulates the formation of such categories must be deferred for discussion elsewhere.

Without reference to Kant, Wagner in 1870 characterises this kind of comprehensible ordering of time negatively, as anathema to the true character of music, which he feels ‘can be judged only by the category of the sublime, since when it fulfils us it arouses in us an ecstatic state of heightened awareness’.⁴⁴ What he dubs ‘architectonic’ music, the four-square periodic syntax of patterned Italianate opera, relates historically to meagre dance forms, he continues, and after Hanslick’s *Vom musikalisch-schönen* (1854) appreciation of its resulting formal complexes now

⁴² Immanuel Kant, *Critique of Pure Reason*, trans. Marcus Weigelt (London: Penguin, 2007), 181.

⁴³ ‘nicht allein das Verhältniß der Tonfüße, aus welchen die verschiedenen Arten des Taktes bestehen, sondern auch hauptsächlich das Verhältniß, welches die einzelnen melodischen Theile oder Sätze einer Periode, die aus solchen Tonfüßen verbunden sind, unter einander haben’. H. C. Koch, *Musikalisches Lexikon* (1802), 1256–7.

⁴⁴ Wagner, *Beethoven*, tr. Allen, 75.

inappropriately occupies the centre ground of the aesthetic judgment of music.⁴⁵

Wagner's Schopenhauer-inflected essay on Beethoven famously presents readers with a sensory allegory to dismantle Hanslick's argument, an allegory that divides perception between axes of visual-appearance-external and auditory-essence-internal: rhythmic order promotes awareness of 'the visual and three-dimensional world ... thanks to the similarity of the laws by which we perceive and understand the movement of visible objects'.⁴⁶ It thus opposes what for Wagner – in 1870 – constitutes the metaphysical nature of music, that which 'speaks to us only by bringing alive, in ever imaginable gradation and with most definite clarity, the very general concept of feeling which is in itself dark'.⁴⁷ To demand that a musical work arouse pleasure in us through beautiful forms is to expose a misunderstanding, he continues, whereby we judge music by the attributes of visual painting. Most relevant for present purposes is Wagner's characterisation of how rhythmic regularity monopolises attention, an experience in inverse proportion to music's 'intrinsic spirit'. In his words:

If ... we now take a piece of dance music or an orchestral movement based on a dance motif or an actual operatic piece, our fantasy is immediately captivated by the regularity of recurring rhythmical periods which determine the forcefulness of the melody by virtue of its innate plasticity. Music developed on these lines has very correctly been designated as 'secular' in contrast to the 'sacred'. ... According to [my sensory] allegory it seems that the awakened eye of the musician now adheres to the appearances of the external world to the point that they become immediately comprehensible according to their inner nature. For the musician the external laws, which determine this adherence to gesture and ultimately to all life's movements, become those of rhythm, by means of which he constructs periods of opposition and return. The more these periods are filled with the intrinsic spirit of music, the less, as architectonic characteristics, they will distract our attention from the pure effect of music. On the other hand, where that inner spirit of music described to our satisfaction is, in its most individual expression, diminished in favour of this regular architectural ordering of the rhythmical caesurae, only that external regularity will still engage our attention; and we will necessarily lower our expectations of music if we now relate it chiefly to that regularity alone. In this way music leaves its state of sublime innocence; it loses its power to redeem from the guilt of appearance, i.e., it no longer proclaims the nature of things but itself is interwoven with the illusion of the appearance of things outside us.⁴⁸

⁴⁵ His comments occur principally in the essays 'Zukunftsmusik' (1860; publ. 1861) and 'Beethoven' (1870).

⁴⁶ Wagner, *Beethoven*, tr. Allen, 73.

⁴⁷ *Ibid.*, 75.

⁴⁸ *Ibid.*, 82–3.

In light of this unequivocal disenfranchisement of rhythmic regularity from music, it may seem surprising that Wagner's most significant use of sonorous bells occurs as a recurring four-note, pitched ostinato. That is, perhaps the most easily graspable and stable pattern imaginable to Western ears.

Musically speaking, the *Erzklang* of four bells occurs briefly in the transformation music to Act 1 of *Parsifal* as the pure fool is first led into the great hall of the castle of the Grail. But it is the setting in Act 3 that I would like to focus on. Here the ostinato is first heard in the far distance (bb. 796–802), as Kundry receives her baptism and against the sombre reality of the funeral procession for Titurel, the former head of the Grail knights, who has died due to his son's insufficient worship of the Grail. Wagner conceived the opera eight years after fleeing Dresden, and already in the 1865 prose draft, he intuits 'the sound of bells increasingly grow[ing] in intensity', a remark that survives in the final stage directions, where the bells come 'ever closer' [*annähernd*] and are played 'ever stronger' [*immer stärker*], before moving away again [*entfernter*] 'with decaying reverberations' [*abnehmend / verhallend*].⁴⁹

This effect is scored through graduated layering and tapering of sounds, that is, single pitches and dyads that gain momentum and subsequently set in train the full ostinato pattern, swelling through bells, timpani, contrabassoons and double basses, and bass tuba, respectively. As Examples 1a and 1b show, a dissonant tonal axis of B-flat minor and E minor radically destabilises the bells' diatonic motif from Act 1. For three bars the tonal pattern yields to harmonic pressure (E-C-G-B-flat, bb. 910–12), during five thematic iterations of the descending tritone (B-flat - E), before the dissonance is forced back into E minor, and the bells resume their earlier course. For Carolyn Abbate, their composite sound works across such harmonic detail, 'drap[ing] everything in reverberation that seems to contain every note ever imagined, all at once

⁴⁹ Wagner, *The Diary of Richard Wagner 1865–1882: The Brown Book*, trans. George Bird (London: Victor Gollancz, 1980), 60. Wagner, *Parsifal*, ed. Egon Voss and Martin Geck (Mainz et al: Eulenburg, 2006), Act 3, bb. 828–56, 904–22. The first prose draft of the scenario for *Parsifal* is likely to date from February 1857, following comments in *Mein Leben*, and the idea that summer of having Parsifal enter *Tristan und Isolde*. See *Wagner Werk-Verzeichnis*, ed. John Deathridge, Martin Geck, and Egon Voss (Mainz: Schott, 1985), 538, 549.

and almost louder than one can bear'.⁵⁰ That is to say, a totalising phenomenon that monopolises the harmonic imagination as well as the sensorium.

Why exactly Wagner opted for such emphatic regularity – seemingly against his earlier prescription for music's true nature – is ultimately unknowable, but three contextual reasons emerge from the foregoing discussion: attention capture, external effect, and comprehending totality. The first was well expressed by J. G. Sulzer in 1794. Writing under the influence of classical rhetoric, he co-opts Cicero to articulate an interdependency between attention and rhythm, illustrating along the way that perceiving the patterning of musical rhythm is no different in kind to perceiving that of heavy industry or nature:

First it is apparent that such strikes which follow one another without the slightest order or regulated dimension of time partake of nothing that could attract one's attention. We hear them without paying attention. Somewhere Cicero compares the *Numerus* of speech with a certain regular alternation of falling raindrops. The example also serves our purposes. As long as we hear a completely disordered noise of drops, we think nothing of it except that it is raining. But as soon as we differentiate the fall of individual drops within the noise, and perceive that these always recur in equal time, or that within an equal timespan two, three or more drops follow according to a certain order, thus forming something periodic like the hammer blows of three or four blacksmiths: so our attention is drawn to observe this order. Herein arises something of rhythm, namely a regular recurrence of individual strikes.⁵¹

An entirely disordered clangour of bells would not attract our attention beyond the fact of its occurrence (as signal) and its status as (white) noise, in this reading. Likewise, the 'senseless chaos' of Wagner's soundscape in Dresden evidently lacked regulated order, so in Cicero's terms would constitute noises-as-signals whose internal organisation we do not find meaningful. As Wagner writes, a spatially ordered soundscape, an

⁵⁰ Carolyn Abbate, *In Search of Opera* (Princeton: Princeton University Press, 2001), 136. See also William Kinderman, *Wagner's Parsifal* (New York: Oxford University Press, 2013), 271–3.

⁵¹ 'Erstlich ist offenbar, daß solche Schläge, die ohne die geringste Ordnung, oder regelmäßige Abmessung der Zeit auf einander folgen, gar nichts an sich haben, das die Aufmerksamkeit reizen könnte; man höret sie, ohne darauf zu achten, Cicero vergleicht irgendwo den Numerus der Red mit einem gewissen regelmäßig abwechselten Herunterfallen der Regentropfen. Das Beyspiel kann uns auch hier dienen. So lange man ein völlig unordentliches Geräusch der Tropfen höret, denkt man weiter an nichts, als daß es regnet. Sobald man aber unter dem Geräusche das Auffallen einzelner Tropfen unterscheidet, und wahrnimmt, daß diese immer in gleicher Zeit wiederkommen, oder daß nach einer gewissen Ordnung auf einander folgen, und so stwas Periodisches bilden, wie die Hammerschläge von drey oder vier Schmieden: so wird die Aufmerksamkeit zu Beobachtung dieser Ordnung angeloket. Da entstehet nun schon etwas von Rhythmus, nämlich eine regelmäßige Wiederkehr von einerley Schlägen.' J. G. Sulzer, *Allgemeine Theorie der schönen Künste*, 4 vols. (Leipzig: Wiedmann, 1794), 4: 92.

‘intoxicating ... combination of bells and cannon’, demanded attention because it was potentially deadly and revolutionary ideals were at stake, but this remains untranslatable on stage without aesthetic rationalisation, i.e. a degree of underlying rhythmic order.

The second reason relates to Wagner’s axes of visual-regular-surface-appearance and auditory-irregular-depth-essence from 1870. The presence on stage of a procession entering is a theatrical effect, a changing auditory environment emanating at least partly from the phenomenal world seen and heard by Parsifal, hence external to the orchestra’s underlying musical flux. As such the visual-spatial implications of a rhythmic order hostile to ‘music’s nature’ would seem only appropriate for this visual event, on Wagner’s terms.

Finally, the broader philosophical ground of rhythm as the sign of comprehension – whether the rule-bound time of Kant’s schematism, Schlegel’s view of rhythm enabling the very formation of thoughts, or Helmholtz’s ‘artistic satisfaction’ in an ordered cosmos – presents us with an awareness of cognitive limits. In this sense, aligning the bells of Monsalvat in Act 3 of *Parsifal* with Wagner’s experience of the Dresden uprising is less a claim for Wagner’s aestheticisation of lived experience than a mode of sublime totality that is expressed through percussive music.

For some, this was not music. With a concern for harmonic consonance, Helmholtz had declared church bells ‘unfit for artistic music’ because the higher partials are always out of harmony. ‘The art of the bell founder consists precisely’, he continues, ‘in giving bells such a form that the deeper and stronger partial tones shall be in harmony with the fundamental tone’.⁵² That is, there must be a discernible pitch, however darkly it is intuited, that can be rhythmically ordered. Within the imagined resonance of the set’s rocky walls and austere architecture, Wagner divides the four-note ostinato between two percussionists, as interlocking perfect fourths. This division of labour is concealed; we hear only the composite sound mass, but it allows for maximum force in the striking of the notes. Precisely the same technique is deployed for Wotan’s journey into Nibelheim, another percussive transition rooted in industrial noise: a depiction of imagined movement through physical space using the perception

⁵² Hermann von Helmholtz, ‘The Physiological Causes of Harmony in Music’ [1857], *Science and Culture: Popular and Philosophical Essays*, ed. David Cahan (Chicago and London: University of Chicago Press, 1995), 67.

of repeating patterns of sound. But the Gods' journey is entirely sonic. Here a team of eighteen percussionists hammer out the ostinato of the gold-mining Nibelungen, as so many military blacksmiths. Its crescendo depicts, in quasi-cinematic realism, the shifting acoustic and spatial experience of the travellers as they descend into the mine.

This is given in Example 2:

[Examples 1a & b, 2 near here]

Though separated by three decades, both transitions draw on ostinatos to establish patterns symbolic of metallic activity, whose shifting harmonisation and sound intensity creates the impression of movement within a finite space, of huge sound masses in the distance coming into threatening proximity before moving away again. And both speak to the cultural trope of industry.

This suggests that Wagner's reported comment about an 'intoxicating' polyphony of bells and cannon rests at least partly on the perception of spatially diffused sound – surveying the changing acoustic scene from an elevated, fixed point. In this case, the feeling of cognitive control mooted earlier as key to the mode of perception associated with sublimity would seem to rest, for sound, on the categories of rhythm and spatial magnitude, that is, formalist categories enlisted to distinctly narratological ends.

To be sure, both bells and cannon had been used in previous operas,⁵³ and it would be difficult to make any straightforward claims about musical depictions of the sublime. In Wagner's literary reception, no writer mined his arguments about the musically sublime more thoroughly than Arthur Seidl, who in 1887 reified Wagner's remarks against the 'architectonic,' arguing – without knowledge of the chaotic 'polyphony' of the Dresden-tower – that an a-metrical music with minimal vestiges of a spatially ordered conception of time cannot but evoke the perceptual state of the 'musically sublime'.⁵⁴ By contrast, Kant's assertion that '[s]ublimity ... does not reside in

⁵³ There are no cannon in Wagner's oeuvre, though cannon fire, typically represented within the orchestra on the bass drum, permeates earlier operas from Donizetti's *Anna Bolena* (1830), signalling the marriage of Enrico and Giovanna, to Meyerbeer's *Romilda e Constanza* (1817; 'cannon shots in the distance') and *Ein Feldlager in Schlesien* (1844; 'a canon shot is heard'), where the muffled explosions establish an element of local colour. See Berlioz's remark that 'the pianissimo of the bass drum on its own ... is dark and menacing ... like distant cannonfire'. See Hugh MacDonald, *Berlioz's Orchestration Treatise: A Translation and Commentary* (Cambridge: Cambridge University Press, 2002), 281.

⁵⁴ As a document in the reception of Wagner's ideas, Seidl's gloss is striking principally in the historical prediction that 'the more rhythm (in the narrow as well as the broad sense) retreats as an end in itself, indeed disappears, the sooner this "musically sublime" will reveal itself as the ultimate, innermost core of

anything of nature, but only in our mind'⁵⁵ leaves the door open to any number of perceptual relations and remains historically persuasive for this reason. Attempts by earlier central European theorists such as Peter Lichtenthal and Christian Friedrich Michaelis to define musical sublimity are heavily reliant on transgressing contemporary stylistic norms – a verdict equally applicable to Seidl's arrhythmia – and can appear naïve for this reason, in effect turning the musically sublime into a supremely relative category.

Michaelis, writing in 1805, finds a sense of the sublime evoked in harmonic boldness above all:

Supposing, let us say, the established tonality suddenly veers in an unexpected direction, supposing a chord is resolved in a quite unconventional manner, supposing the longed-for calm is delayed by a series of stormy passages, then astonishment and awe result and in this mood the spirit is profoundly moved and sublime ideas are stimulated or sustained.⁵⁶

Twenty-one years later, Lichtenthal, an Italian writer who delineated the major aesthetic categories in his *Dizionario e bibliografico della musica* of 1826, is confidently prescriptive, speaking of: 'melody that has few ornaments and ... that moves in bold progressions with many large leaps; [as well as] extremely energetic harmonies ... intermixe[d] from time to time with harsh dissonances'.⁵⁷ If such texts are unconvincing for their matter-of-fact prescription for sound eliciting sublime effect, this is surely because the German sublime rests on a mode of perception rather than an object. Wagner himself knew better than to do this, writing in loose metaphorical terms about

musical art'. [Je mehr der Rhythms (im engeren wie weiteren Sinne) als Selbstzweck zurücktritt, ja ... schwindet, desto eher wird jenes "Musikalisch-Erhabene" als letzter, innerster Kern der Tonkunst sich offenbaren'.] See Seidl, *Vom musikalisch-erhabenen* [1887], 2nd ed. (Leipzig: C. F. Kahnt, 1907), 168. Otherwise, he largely amplifies Wagner's argument, probing its implications through such concepts as *Formwidrigkeit* or constitutional opposition to form, which instils the contradiction of a form harbouring un-form within itself. On this point, see Kiene Brillenburg Wuth's critique, *Musically Sublime: Indeterminacy, Infinity, Irresolvability* (New York: Fordham University Press, 2009), 103.

⁵⁵ Kant, *Critique of Judgment*, 104.

⁵⁶ 'Wenn nämlich der herrschende Ton plötzlich eine unvermuthete Wendung nimmt, ein Akkord sich ganz anders auslöstet [sp.], als nach der Regel sich erwarten ließ, oder wenn die gehoffte Beruhigung nicht eintritt, sondern von manchen stürmischen Bewegungen noch aufgehaltet [?] wird, so entsteht Bewunderung und Staunen, eine Stimmung, die den Geist tief bewegt, und erhabene Ideen in ihm weckt oder unterhält'. Christian Friedrich Michaelis, 'Einige Bemerkungen über das Erhabene der Musik', *Berlinische musikalische Zeitung*, 9 (1805), 676.

⁵⁷ Peter Lichtenthal, *Dizionario e bibliografia [sp.] della musica* (Milan 1826), vol. 2; cited in Peter le Huray and James Day (eds), *Music and Aesthetics in the Eighteenth and Early-Nineteenth Centuries* (Cambridge: Cambridge University Press, 1981), 374.

the category in Beethoven's symphonies as music that 'speaks to us only by bringing alive, in every imaginable gradation and with most definite clarity, the very general concept of feeling which is in itself dark, ... [which] can be judged only in the category of the *sublime*, since it arouses in us an ecstatic state of heightened awareness', as cited earlier.⁵⁸

It is tempting to read Wagner's words here – written during the Franco-Prussian War – again in relation to the Dresden uprising. For the hyperbolic language sees Beethoven, as proxy for the spirit of the German nation, redeem 'the spirit of humankind from deep disgrace'. The militaristic tone blossoms into explicit imagery when he reproaches German women wearing French fashion by recalling 'the blood of our sons, brothers and husbands shed on the most murderous battlefields in history for the most lofty ideas of the German spirit'.⁵⁹ Here, in a synoptic gesture, a 'sublime' field of conflict dovetails with the soundscape of war, the struggle for national identity and a musical talisman, all of which begin to draw together the threads woven earlier in relation to the bells of Monsalvat, rhythmic order and the experience of Dresden.

Resonance

Of course, the cultural meaning of bells varies widely, even within the narrow frame of this discussion. The Temple bells toll heavily for Titurel's funeral, conjuring the grandeur and immensity of the great hall of the Grail, now stripped of its festal accoutrements, a mausoleum for a dying order rather than a venue of redemption and renewal. For Liszt in 1874, the Bells of Strasbourg Cathedral (*Die Glocken des Strassburger Münster*) speak anthropomorphically through Henry Longfellow's Latin incantations, and are set to lines of plainsong. But in a Lied from the same year, *Ihr Glocken von Marling*, Liszt evokes bells entirely differently. As Example 3 shows, the piano accompaniment conjures the natural overtone series, delicately stacking thirds to create undulating seventh and ninth chords, more in wonder at the revelations of natural science than forcefully in awe of magnitude and complexity. It evokes the simplicity and intimacy of pure resonance. Both speak to the associations of bells as objects: the one towards religiosity, the other towards a scientific imagination.

⁵⁸ Wagner, *Beethoven*, 75.

⁵⁹ *Ibid.*, 163.

[Example 3 near here]

Finally, the discrepancy between Liszt's and Wagner's evocations of bells raises the question of what might be common among them, and whether there may be an epistemic space within which to consider sonic resonance itself in relation to discourses of the sublime. The emphatic rhythmic regularity of both composers' scores is telling in this respect. Repeated patterns are basic to the cognitive grasp of complex or loud sound masses, as noted earlier, and Wagner's four-note ostinato sits alongside Liszt's unceasing quavers in this sense. But temporal regularity is also the result of a repeated process, that is, the field of periodic oscillations that defines the sonic. In repeated action, time does not pass but is transformed into pure frequency, i.e. regulated impulses, almost as an atemporal form of processing.

Within the realm of media theory, then, pitch itself is a rhythmic concept. Building on Stockhausen's claim from 1956 that 'pitch may be understood as the microtime equivalent of rhythm', Wolfgang Ernst sees ordered temporality as the basis of pitch first and foremost:

There is a countable dimension within each tone. Pitch is nothing but a cognitive metaphor for frequencies; each tone in itself is a periodic time event ... Rhythm follows the same proportions as harmonies, only below the hearing threshold.⁶⁰

For this reason, Ernst argues, the concept of sonic resonance has a morphological kinship with our experience of existence. Drawing on Heideggerian concepts, he outlines this sonic dynamism as more than metaphorical, albeit predicated on the periodicity of natural resonance:

If the experience of being is not a static one (ontologic), but rather processual (being-in-time), then the definition of existence as 'Durchstimmung' (Heidegger) recalls sonic resonance. ... Heidegger's use of terms from the sonosphere does *not* refer to explicit acoustics (as physical sound event) or to music as conceptual art form in culture, but rather to the implicit, epistemological meaning of sound as vibrating space.⁶¹

⁶⁰ Wolfgang Ernst, *Sonic Time Machine* (Amsterdam: Amsterdam University Press, 2016), 32. Stockhausen's remark is taken from the essay '... wie die Zeit vergeht', *Die Reihe*, 3 (1956), 13–42; Eng. trans. Cornelius Cardew, '...How Time Passes', *Die Reihe*, 3 (1959), 10–40.

⁶¹ *Ibid.*, 38.

This is the sense in which I would like to identify a panoramic perspective on bells and cannon as discursively sublime. At a narrative level, it recalls a dangerous environment held in abeyance (a non-periodic auditory environment sonified) and a fixed survey of acoustically diffused fields of conflict. At a more theoretical level, the bells tolling overhead, or vibrations of bullets or cannon shot, bear an epistemological relation to the finitude of existence beyond the threat to life; for both are dynamic and will die out once oscillations cease. ‘Being’ in this Heideggerian sense, is defined by the experience of finality, where visual representations of continuous sine waves are deceptive to the extent that they mask an intrinsic temporal character, the natural auditory decay of sound.⁶² Bell vibrations are non-periodic, of course, so their function as a mirror of finite time, the morphological kinship between sonic resonance and existence as ‘processual (being-in-time)’ that Ernst posits, can only be indicated symbolically, by rhythmic regularity, that is, an alternative regulatory frame achieved by aestheticising lived experience.

Close

Earlier, I remarked that bells, as a signal technology, serve as a marker of time. Hence, they also serve to mark the end of time. On Cosima’s orders, Wagner’s funeral cortege along the Grand Canal in Venice had no music in 1883, and the silence was accompanied only by the tolling of a bell.⁶³ Similarly, Liszt’s poetic benediction to Wagner, *Am Grabe Richard Wagners*, written the same day he learned of the composer’s death, and whose close is given as Example 4, appropriates the Monsalvet bells of *Parsifal* in an explicit echo effect.

[Example 4 near here]

Even here, Liszt evokes the memory of who is gone as well as the acoustic space, whose fading vibrations model the dynamism of life, where vanishing resonance finds its complement in the life lost.

The use of simple rhythmic patterning appears to allow for this aesthetic rendering of vast spaces and violent sounds. Perhaps for this reason, Wagner drew on

⁶² For a critique of the temporality of resonance, see Ernst, *Sonic Time Machine*, ch. 7.

⁶³ Reported in John Barker, *Wagner and Venice* (Rochester NY: University of Rochester Press, 2008), 58.

moving sound masses to evoke fearsome magnitudes, as we have seen. I would close only by suggesting in this context that bells, as unconverted cannon, can be devices of sublime proprioception; the metaphorical tower, a panopticon of 'safe' perception. Together, their combination enables that violent sound effect, whose proximity to our sense of a finite self, we might reasonably call sublime. Here, then, the sound effect – of which there are many in Wagner's oeuvre – serves as a critical bridge between what Wagner vaunted as music's sublime nature and external appearance, categories that would prove considerably more permeable than he allowed in 1870.