Portfolio of Original Compositions and Critical Writing



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Graphical Ekphrasis in Contemporary Music

Thomas Metcalf

Abstract

This thesis is, primarily, a treatise supporting a new approach to ekphrastic frameworks within contemporary music. Deriving from the Greek for 'description' [ἔκφρασις], ekphrasis traditionally relates to descriptions of art works as literary devices, with Keats' *Ode on a Grecian Urn* (1819) being a well-known example. Through a re-evaluation and extension of Siglind Bruhn's seminal work on ekphrasis within a musical context, I suggest that the construction of compositional grammars deriving from distinctly visual stimuli allows for a deeply embedded poetic and formal connection between the two media, which I deem a *graphical ekphrasis*. To demonstrate this concept, three case studies are used which exhibit a variety of compositional methods and graphical sources. The first two studies adopt a largely work-centric focus, taking score analysis as the key interrogative method, supported by composer testimony or writings. The final case study explores the place of graphical ekphrasis in my own music, highlighting the potential of the rhetorical model and compositional method. Finally, an argument is proposed for the ways in which this concept may be developed, focusing on the construction of a composite framework for 'transmedial' aesthetics which can cut across both historical periodisation and disciplinary boundaries.

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1. From Musical Ekphrasis to Graphical Ekphrasis

The concept of ekphrasis is defined by Michael Squire as 'refer[ring] to the literary and rhetorical trope of summoning up – through words – an impression of a visual stimulus, object, or scene'.[1] Early examples include Homer's description of the shield of Achilles in the *Iliad*, with a more modern, well-known example being Keats' *Ode on a Grecian Urn* (1819). Ekphrasis is a concept bound up with the representation of one medium in another, and subsequent research has expanded study to incorporate other forms of art, including music. It is commonplace to see musical works which take their creative source from works of art or poetry, e.g., Mussorgsky's *Pictures at an Exhibition* (1874), but at what point does this become ekphrastic? The codification of an ekphrastic process in music has, perhaps, been overshadowed by the towering aesthetic concept of 19th-century programme music, especially when one considers the prevalence of scholarship on this topic versus ekphrasis. The central argument of this thesis is that, through an extension of existing ekphrastic frameworks within musicological discourse, one may begin to create more deeply embedded relationships between a musical work and its ekphrastic source material, which provides holistic connections between composition, analysis, aesthetics, and rhetoric. As a composer myself, the application of such an enquiry to contemporary music allows for theoretical exploration and critical reflection of my own creative practice (although this does not preclude earlier musics) with the wider implications of this research outlined in Chapter 5.

Siglind Bruhn is the central scholar working on the concept of 'musical ekphrasis'. Her publications, beginning with *Musical Ekphrasis* (2000), painstakingly chart both the origins of ekphrastic theory, and its subsequent expansion to musical thought. This study will draw out only

[1] M. Squire, 'Ekphrasis', *Oxford Classical Dictionary*, Oxford University Press, 2015. Accessed 28 April 2021 [https://ezproxy-prd.bodleian.ox.ac.uk:2981/classics/view/10.1093/acrefore/9780199381135.001.0001/acrefore-9780199381135-e-2365].

the salient elements of Bruhn's texts, rather than providing a history and taxonomy of ekphrasis in a general sense since she does this extensively in her work. This chapter will highlight key terms and their use in Bruhn's texts, problematising certain concepts to allow for a shift towards my own notion of *graphical ekphrasis* as an expansion of the rhetorical exercise of musical ekphrasis – one where compositional method and ekphrastic subject are more intimately linked. This concept will be explored in three case studies, which act as applications of this theoretical enquiry.

1.i. Transmedialisation

One of Bruhn's first reconsiderations of ekphrasis is in expanding its definition to encompass *any* medium (rather than just words), defining it as 'the representation in one medium of a text created in another medium'.[2] In a subsequent volume, *Sonic Transformations of Literary Texts*, Bruhn alludes to the importance of semiology, when defining musical ekphrasis as 'the musical representation of a text created in a non-musical sign system'.[3] Bruhn also introduces new terminology with which to describe the act of ekphrasis itself: *transmedialisation* – this term will be used herein. Transmedialisation [trans = across, medial = medium],[4] can exist as 'mixed' and 'unmixed', with Bruhn commenting that the latter implies an ekphrastic 'purity' within a musical context:

> The purest cases of musical ekphrasis are unmixed transmedialisation: compositions in which the responding medium does not so much set the literary work to music – as is the case in standard ways of transforming a poem into song or a drama into opera – but rather reflects or comments on aspects of the source text without including the primary medium, i.e. the word.[5]

This foregrounds musical ekphrasis as a rhetorical exercise, not a form of overt communication. Considerations of transmedialisation should not preclude aspects of text within ekphrastic music,

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[2] S. Bruhn, *Musical Ekphrasis*, Hillsdale, Pendragon Press, 2000, p. 8.
[3] S. Bruhn, (ed.), *Sonic Transformations of Literary Texts: From Program Music to Musical Ekphrasis*, Hillsdale, Pendragon Press, 2008, p. 8.
[4] The semantic rationale behind this term is detailed on p. 51.
[5] S. Bruhn, Sonic *Transformations of Literary Texts,* p. 9.

however, as text within music can help to foreground the ekphrastic process and thus its effectiveness in transmedialising the text or image in the same way that suggestive textual insertions in scores do. For example, the final movement of Luigi Dallapiccola's (1904-1975) *Sicut Umbra* (1970), entitled '*Epitafio Ideal de un Marinero'* ('Ideal Epitaph for a Sailor'), incorporates the shapes of constellations as both musical motif and visual decoration the score. An ekphrastic relationship is alluded to, between music and text, through the line '*Llueve tu muerte de una estrella*' ('Your death rains from a star').[6]
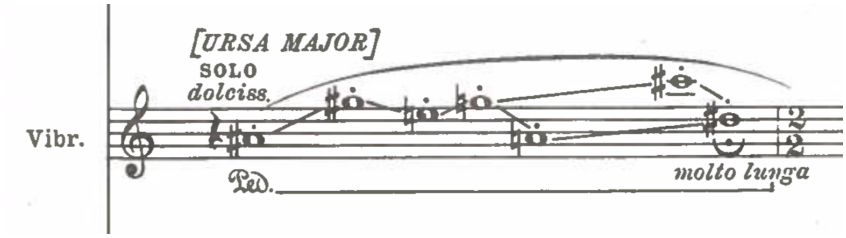


Figure 1. Luigi Dallapiccola, Sicut Umbra*, bar 151 (vibraphone).*

1.ii. Depiction and Reference

The construction of musical meaning (i.e. the interaction of musical and non-musical sign-systems) can be achieved through the use of two categories: 'depiction' and 'reference'. Bruhn defines her usage of these terms below:

> I wish to argue that what and how music communicates about any extra-musical stimulus does indeed fall into the two categories that can be seen as analogous with those pertinent in the context of painting and poetry: depiction and reference. I use *depiction* by musical means as encompassing not only instances of mimicry … but also sensual impressions of hues, shapes, and spatiality. Correspondingly, *reference* by musical means … will be understood as relying on cultural and historical conventions.[7]

[6] For more on this relationship, see T. Metcalf, 'Graphical Ekphrasis: Translating Graphical Spaces into Music', *Question*, Issue 5, AHRC, 2020, pp. 78–91.
[7] S. Bruhn., *Musical Ekphrasis*, p. 11.

It is clear that depiction is pertinent to the formal aspects of an extra-musical source; in essence allowing the music to 'mimic' it. In this category, one may designate musical structures, and relationships *between* musical parameters as preserving the minutia of relationships that make the source work identifiable, and thus the ekphrasis clear. Contrastingly, 'reference' invokes an aspect of style that situates the work in a cultural or historical convention; it is not the relationship of materials that aids ekphrasis, but rather their presentation through a stylistic lens. This concerns aspects of instrumentation, musical tropes, and the contextualisation of the 'depiction' within a wider musical context.

Extending Bruhn's terminology, one could see these terms as analogous to two central aspects of meaning-making in wider semiotic systems: metaphor and metonymy. Taking a definition offered by Renate Bartsch, this connection becomes clear:

> Metaphor is based on perspective change and looking for *similarity under the new perspective*; metonymy is based on perspective change and contiguity relationships, *such as relationships of part-whole*, cause-effect, means-end, action-result, instrument-action.[8]

In this way, metaphor is embedded in reference, and metonymy in depiction. To achieve similarity under the new musical perspective, composers may use a shared cultural convention in order to communicate a broad situation in the metaphorical realm, e.g. the rhythmic rocking of the waves in Britten's 'Midnight' from *Four Sea Interludes* (1945) or in Ravel's *Gaspard de la Nuit* (1908) (which Bruhn analyses in this respect). The idea of communication through a shared musical perception relates to Jeffrey Kallberg's notion of a 'generic contract' traced in the music of Chopin, where he states:

[8] R. Bartsch, 'Generating Polysemy: Metaphor and Metonymy', in R. Dirven & Ralf Pörings (ed.), *Metaphor and Metonymy in Comparison and Contrast*, Berlin, Mouton de Gruyter, 2002, p. 55. Italics mine.

> [A] kind of 'generic contact' develops between composer and listener: the composer agrees to use some of the conventions, patterns, and gestures of a genre, and the listener consents to interpret some aspects of the piece in a way conditioned by this genre.[9]

Given that musical ekphrasis is not seen as a widely recognised genre, one could be forgiven in questioning the difference between ekphrases and so-called 'programme music', since both use the category of 'reference' to achieve the communication of an extra-musical idea. The divergence of the two forms can be understood through the prioritisation of depiction. The emulation of *specific* characteristics of the source work (its form, shapes etc.) at once deny the musical work a wider interpretive field, whilst also creating a specificity that more robustly renders the extra-musical subject. For example, there is a difference between a musical expression of a 'river' and 'the River Thames'. In this way, depiction relies on relationships of part-whole amongst a shift in perspective, which in this case is a general perspective versus a specific one. It is necessary to maintain a balance of these two characteristics in order to create an effective ekphrasis of a subject matter; too little depiction and the ekphrasis is too general, too little reference and the ekphrasis is too abstract to be clearly communicated.

1.iii. Programme Music versus Musical Ekphrasis

One of the largest tensions present within this theory is between 'programme music' and 'musical ekphrasis'. Bruhn, in the introduction to *Musical Ekphrasis*, places this at the forefront of the conceptual framework, describing Ravel's *Gaspard de la Nuit* as 'no means a matter of a vaguely impressionistic 'program', but a case of transformation of message – in content and form, imagery and suggested symbolic signification – from one medium to another'.[10] Here, Bruhn foregrounds the importance of formal and semiotic aspects of musical transmedialisation in separating it from programme music (despite them both carrying out this process). In a somewhat problematic

[9] J. Kallberg, 'The Rhetoric of Genre: Chopin's Nocturne in G Minor', *19th Century Music*, 11(3), 1988, p. 243.
[10] S. Bruhn, *Musical Ekphrasis,* p. xvi.

distinction, Bruhn clearly delineates the difference between the two musical genres in stating that 'programme music narrates or paints, suggests or represents scenes or stories … that may or may not exist out there but enter the music from the composer's *own* mind', whereas 'musical ekphrasis, by contrast narrates or paints a fictional reality created by an artist *other than* the composer of the music'.[11] Setting aside the notion that composers could not be artists of their own ekphrastic subjects, this places an uneasy emphasis on the ontology of the extra-musical idea. If one were to remove this tension, the conclusion is reached that the *processes* of musical ekphrasis and programme music are very similar due to the dual notion of depiction and reference. This links back to the importance of form and semiology, and the specificity of the ekphrastic transmedialisation (i.e., the notion that a musical composition is about a *specific* work of art (rather than general scene or story) rests upon an acknowledgement of integral features of the source image (e.g. colour, space, etc.)).

Bruhn's recent analysis of Marta Ptaszyńska's *Concerto for Marimba and Orchestra* (1985) demonstrates the pitfalls of adopting an approach that is heavily favoured towards the category of reference. The second movement is claimed to be an ekphrasis of Max Ernst's *The Eye of Silence* (1943), justified through slowly moving and expanding harmony – 'the music's time seems to stand still, just as it does in Ernst's painting' – creating an 'emotional trance' that is analogous to looking at the painting for a long time.[12] The issue here is that no real formal features or symbolic signification have been highlighted and, as such, this could be a description of any piece with a languorous harmonic rhythm that bears no similarity of depiction to Ernst's – without the movement's title, one would not make this link. The third movement is described as an 'allusion' to *Thorn Trees* (1945) by Graham Sutherland, but other than so-called 'spiky' intervals in the

[11] Ibid., p. 29.
[12] S. Bruhn, 'Musical Ekphrasis: The Evolution of the Concept and the Breadth of its Application', in E. Sheinberg & W. P. Dougherty (ed.), *The Routledge Handbook to Music Signification*, London, Routledge, 2020, p. 353.

marimba,[13] there is nothing specific about the work of art inherent. Indeed, Bruhn argues that there is actually more of an allusion to Sutherland's *Crucifixion* (1946) through the use of 'seven' numerology (prolific in biblical texts and imagery), which is then used as a contextual justification for features of the work that are meant to represent *Thorn Trees*. The use of the number seven within musical works is well established,[14] now almost becoming a trope itself – it provides a strong referential link to works inspired by biblical and liturgical extra-musical sources. The problem in Bruhn's reading is that there is an absence of depiction, which renders the ekphrasis unclear – alluded to in any meaningful way only through the title of the movements in Ptaszyńska's work.

Peter Dayan, writing on the connections between music, poetry, and art highlights the notion of the 'interart aesthetic', complete with its own set of five laws. This is defined as '[t]he description of each art as if it were one of the others'[15] with those who participate in its discourse known as 'intermedialists'.[16] The second and fifth of Dayan's laws are pertinent to this study:

> The second law … is that between art in any two different media (for example, poetry and music), any equivalence must always be *incalculable*. There can be no direct translation, and no unproblematic collaboration. Poetic form, for example, cannot gain any value by imitating musical form; conversely, a piece of music ceases to be music if it aims to model its meaning on that of words.[17]
>
> The fifth law is this: the only way to convey the incalculable relations that pertain between works, or between media, is to describe work in one medium as if it were operating in another -

[13] Ibid., p. 355.
[14] For example, Messiaen describes the number seven as 'the perfect number' in the preface to his *Quatuor pour la fin du temps* (1941). This piece has seven numbered movements (plus an eighth 'Intermède'), with one titled 'Danse de la fureur, pour les sept trompettes'. Indeed, David Rumsey posits connections between the number seven and works of Bach in his article, 'Bach and Numerology: 'Dry Mathematical Stuff'?, *The Sydney Society of Literature and Aesthetics*, Vol. 7, 143-165, 1997. Seven numerology exists also in a non-biblical context, for example in Schoenberg's *Pierrot Lunaire*, through the use of 'lucky' numbers 3 and 7 – see C. Sterne, 'Pythagoras and Pierrot: An Approach to Schoenberg's Use of Numerology in the Construction of "Pierrot Lunaire"', *Perspectives of New Music*, Vol. 21(1/2), 1982-1983, pp. 506-534.
[15] P. Dayan, *Art as Music, Music as Poetry, Poetry as Art: From Whistler to Stravinsky and Beyond,* Farnham, Ashgate, 2011, p. 1.
[16] Ibid., p. 2.
[17] Ibid.

> as if all the arts worked in the same way. Art as poetry, poetry as music, music as art and so on, round all possible permutations. That is the interart analogy.[18]

Dayan's metaphorical concept of the 'interart' helps to further distinguish the role and function of ekphrasis, but also present problems with ekphrastic analyses. It is clear that Dayan is engaged in a semantic framework; the description of one art as another in words, rather than in another medium. His study highlights the intermedialist notion of the equivalence of artistic enquiry, and the historical idea of the 'great work' or masterpiece which can be described in any and all artistic language – a work that resists analysis and is unique (as suggested in the second law). Dayan uses Stravinsky's 'versification' of musical ideas as an example of this, using the example of 'Variation de Calliope' from *Apollon Musagète* (1928, rev. 1947).

In 'Variation de Calliope', a quotation from Nicolas Boileau-Despréaux's *L'Art poétique* (1674) is used as a subtitle which instructs the reader how to construct a French alexandrine.[19] Maureen Carr states, 'Stravinsky modelled his initial musical setting of the first two measures suggested by Boileau's text'.[20] Carr justifies this through the use of the caesura (characteristic of a hemistich) before and after two groups of six notes following the stresses of the alexandrine tétramètre (which is the meter in the Boileau excerpt). However, Dayan resists this sort of analysis, claiming that a subsequent cello passage of bars 25-37, 'vigorously resists any kind of formal scansion' with respect to alexandrines. He concludes that '[a]s ever, music does not imitate, resemble translate, or accompany poetry: it actually *is* poetry'.[21] Through Stravinsky's versification, poetry in music is established as an interart analogy without what might be seen as a parasitic, or imitative

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[18] Ibid.

[19] Ibid., p. 122:
'Que toujours dans vos vers le sens coupant les mots
Suspende l'hémistiche et marque le repos.'
[In your verses, let the sense, always separating the words,
Suspend the hemistitch and mark the point of rest.]

[20] M. Carr, *Multiple Masks: Neoclassicism in Stravinsky's Works on Greek Subjects*, Lincoln, University of Nebraska Press, 2002, p. 120.

[21] P. Dayan, op. cit., p. 123.

connotation – it is a poetic *process* within music which, in the case of 'Variation de Calliope' supports the dramatic narrative.[22] Dayan summarises that, 'Stravinsky is perhaps the greatest master of all in the art of suggesting essential connections between music and poetry, then deftly demonstrating that all such connections in his music are strictly inaccessible to any kind of rational intellectual activity'.[23]

Ekphrasis, on the other hand, is fundamentally linked to the concept of transmedialisation, the expression of an artistic text across differing media – namely, there must be an analysis of one text to recreate it in another form. Rather than being an overarching statement on artistic aesthetics, ekphrasis functions more as a rhetorical exercise to elucidate meaning from specific artistic artifacts – we could call those who engage in this practice 'transmedialists'. Whereas the interart process uses the universality of artistic media in an intermedial expression (seen in Stravinsky's poetic process in music, above) ekphrasis uses the specificity of the artistic text in intermedial expression. It is cogent to assume that the interart resists Bruhn's notion of ekphrastic depiction, in lieu of a prioritisation of intermedial reference.

My contention is that much musical ekphrasis sits uneasily between the interartistic and the ekphrastic. As shown in Bruhn's analysis of Ptaszyńska's work, the processes very much read as analogous to more general painterly techniques, rather than the Ernst or Sutherland it claims to depict. As Lucile Desblanche notes, '[Dayan's laws] are useful to identify whether translation across different artistic media occurs, or only occurs partially in spite of strong connections between two works. A connection or an association does not necessarily lead to a translation'.[24] One could read 'translation' as 'ekphrasis'; indeed, 'translation' is discounted in Bruhn's terminology because of its linguistic associations.

[22] See M. Carr., op. cit., pp. 120-121.
[23] P. Dayan, op. cit., pp. 119-120.
[24] L. Desblanche, *Music and Translation: New Mediations in the Digital Age*, London, Palgrave MacMillan, 2019, p. 111.

1.iv. Composer as Critic and the Case for Formalism

The representation of one text through another is not reliant on, or justified through, artistic intention; it is through the maintenance of symbolic and formal aspects across media: the depiction of the extra-musical source. Indeed, as Roger Savage notes, 'ekphrasis justifies paraphrasing meanings that are conveyed through musical devices. […] In place of an interpretation aimed at divining the composer's intentions, ekphrastic speculation locates the work's meaning in a general communicative economy of circulating signs'.[25] Here we might read 'composer' as 'artist' too. The ascription of specific ekphrastic meaning to very general musical devices, i.e. reading the composer's ekphrasis as complete and justified, denies the potential for other significations despite so many being present, due to the lack of depiction.

Arguably, this transmedial process is something that cannot be purely sensual; it requires a dialogue between composer and source work that is akin to a more formal analysis. The composer must know what to maintain in order to allow the work to have its semiotic relationship as a musically ekphrastic response. Writing on post-structural approaches to art, Robin Marriner highlights the important aspect of criticism in the construction of meaning:

> The notions of translation and interpretation both assume the possibility of recourse to an object understood to be independent of, or anterior to, the operations in question … [criticism] has of necessity a performative aspect. Criticism constructs and puts into place those relations without which the object lacks its specific identity.[26]

It is this 'specific identity' that a transmedialisation rests upon; it constructs the semiotic link between works. Criticism, in this sense, is exemplified in those processes put in place by the composer in order to construct the transmedialisation, be they harmonic, timbral, textural,

[25] R. Savage, *Hermeneutics and Music Criticism*, New York, Routledge, 2009, pp. 74-75.
[26] R. Marriner, 'Derrida and the Parergon', in P. Smith & C. Wilde (ed.), *A Companion to Art Theory*, Oxford, Blackwell, 2002, pp. 355-356.

rhythmic, etc. This then links a manipulation of musical parameter to the representation of some extra-musical parameter, a connection of meaning: signifier and signified. In such a way, an analysis of the ekphrastic composition performs a similar critical function in tracing the transmedial process and aesthetic.

One might argue, however, that the mediation process of the composer creates a further layer of deferral of meaning; one composer's interpretation of a text may differ from a person listening to their ekphrastic response to it. This, in part, explains the non-specific nature of Bruhn's commentary on her case studies, which is often filled with descriptive and eccentric terminology that has little analytical grounding – it alleviates the instability of the transmedialisation process by adopting a viewpoint of aesthetic alignment between composer and artist that may or may not be present.

1.v. The Decentralisation of the Artwork

This is the problem of musical ekphrasis: the reliance of ekphrastic theory on a specific 'artwork', which as Bruhn reminds us, is *not* from the mind of the composer. What is being proposed in this thesis is a decentralisation of the ekphrastic subject, to incorporate any visual or textual representation that can retain and enact its specific identity. In this sense, the ekphrastic subject still exists, but lacks an endemic artistic intention. As such, the actual *process* of transmedialisation and, therefore, ekphrasis is much clearer to trace. This is the shift from musical ekphrasis to *graphical ekphrasis*. This is not to preclude any work of art from a graphical ekphrasis, but it puts at the core of its method an importance on the graphical, spatial nature of the source image – in the case of a painting, its specific spatial layout might constitute its identity more than colour, for example. In such a way, this creates an innate hermeneutic mapping from represented space to musical material. This is an approach to musical ekphrasis that is strongly formalist and more

inclusive of transmedial experimentation; removing some of the more obstructive aspects of Bruhn's own critical framework (e.g. ontology of the 'scene' or image), whilst strengthening others (the notion of 'depiction') to provide more robust analytical insights to ekphrastic compositions.

Graphical ekphrasis removes the specificity of shared contextual understanding in favour of one which relies on much more basic understandings of visual representations (be they linear, geometric, etc.). As Bruhn points out, in a piece such as John McCabe's (1939-2015) *The Chagall Windows* (1974), 'the artist, the ekphrastically transmedialising composer, and the appreciator are all assumed to share in the same cultural background, which includes the knowledge of the stories that inform both art works'.[27] In short, the piece requires a prioritisation of cultural and contextual reference that is very specific. Contrastingly, graphical ekphrasis operates on a more general level of reference, but a much higher level of depiction, such that (as will be shown in the case studies) reference, and therefore metaphor, will emerge holistically through metonymical relationships – binding processes of reference to processes of depiction. The interconnectedness of the two, therefore, creates a stronger ekphrasis of the source.

A key distinction to be made is on the role of graphic notation within graphical ekphrasis. Bruhn makes reference to this system, providing distance from musical ekphrasis through its existence as a 'non-specific analogy of sign and intended contents':

> The most obvious examples of music integrating a strong visual element can be found in compositions written in graphic notation. This system, by which a composer specifies or suggests performance ideas developed from the verbal directions found in earlier score, which were now expanded and … replaced by imaginative symbols that intended to activate the performer's creative participations. … This notational practice moved more and more into the area of the non-specific analogy of sign and intended contents. … [a]nd while an explicitly graphic notation of music that claims to do without any kind of 'alphabet' or transliteration of clearly delineated phenomena takes the idea into often interesting territory, I would hesitate to count such scores among the 'integrations of music and picture'.[28]

[27] S. Bruhn, *Musical Ekphrasis*, p. 74.
[28] Ibid., p. 39.

A crucial point is raised through this commentary on both the type and functionality of graphic notation. Bruhn's categorisation of 'graphic notation', arguably, invokes the genre associated with composers such as Cornelius Cardew and Sylvano Bussotti, where the performer has a strong role in the creative process. These scores are indeed 'non-specific' in their sign system, a symptom of their musical goal, which has associations with other performative modalities such as improvisation. It is clear that one could not deem a so-called 'fully graphic' score as an ekphrasis of the visual notation or image, since there lacks a transmedial process of codification and generation through a musical grammar that maintains the aesthetic aspects needed for such an operation, i.e. preservation of form, image, message etc. This is confirmed when considering the singular aspect of the realisation of graphic scores, which often produce varied results in each iteration – more so than scores notated using staff notation, at least. In this way, the transmedialisation varies each time, which supports Bruhn's assessment as incompatible with a stable integration of music and picture.

However, as Andrea Valle points out, music notation can be understood as a 'mnemotechnical entity [which] deposits knowledge synthetically, and this happens as a consequence of its being a sign'.[29] Valle argues that it is because of this mnemotechnical aspect that notation's 'dynamic and operative' qualities are emphasised in its general role as *ars signandi*.[30] This is extendible to notions of ekphrasis, in the existence of music that uses both graphic and staff notation in a hybrid fashion. In one way, the change of notational modality enacts an operative visual shift for the performer within the score that can be used to support a musical metaphor. Moreover, this is audible as a result of notational modalities resulting in performative ones in notation's function as instructive sign. This is pertinent to graphical ekphrasis since, through both the decentralisation of the artwork (replaced with the *ars signandi*) and the innately formalist aspects of heightened

[29] A. Valle, *Contemporary Music Notation: Semiotic and Aesthetic Aspects*, Berlin, De Sono Associazione per la Musica & Logos Verlag Berlin, 2018, p. 188.
[30] Ibid.

ekphrastic depiction, the ekphrasis of the graphic can be manifested at multiple levels where the use of graphic notation might be seen as the 'unmediated' presentation, and staff notation as 'mediated'. Through the polarisation of the two, notational systems can be used as a means of aesthetic and metaphorical articulation which supports the ekphrasis of the graphic. This ensures the notation is mnemotechnical (i.e. aiding memory) but also suggests a means of aiding an ekphrasis.

The following case studies demonstrate different aspects of graphical ekphrasis at varied levels. The first case study, an analysis of Cornelius Cardew's (1936-1981) *Bun No. 2* (1964), alongside the composer's *Treatise Handbook* (1971), will demonstrate how basic concepts such as 'perfect' and 'imperfect' geometric representations can inform an ekphrasis of sections of his graphic score, *Treatise* (1963-1967). Following this, a selection of Kenneth Hesketh's (b. 1968) recent music (2012-2020) will be analysed with respect to graphical ekphrasis, which invites a more diverse range of 'referential' aspects which emerge as a direct result of the ekphrastic compositional process. This is also an area which will begin to use notational aspects as a means of extra-musical communication: a clear way of communicating meaning by invoking the notion of the 'generic contract' through the 'internal' and 'external' aspects of the work. The final case study will provide a critical reflection upon a selection of my own works, centred on the concept of visual pixelation. I propose that, through the inclusion of an iterative visual process of pixelation, one may find novel musical teleologies that communicate an ekphrasis of the graphical spaces, as well as the movement *between* spaces. In the same way that Bruhn describes transmedialisation involving three media types as 'dual ekphrasis',[31] pixelation that invokes temporal or teleological constructs could be said to be a 'dynamic ekphrasis'.

[31] S. Bruhn, *Musical Ekphrasis*, p. 49.

This thesis will conclude by proposing the utility of graphical ekphrasis as both a rhetorical and analytical tool that can effectively communicate extra-musical source material to listeners and performers. It will show that transmedialisation in music can happen on a variety of differing levels, each with their own ideological goals, extents, and functions. As such, the thesis proposes that graphical ekphrasis should be a hermeneutic branch of what could be described as 'transmedial aesthetics', or the 'genre' of transmedial music.

2. 'A Stone Soaked in Milk': Cornelius Cardew's Graphical Camouflage in *Bun No. 2*

Cornelius Cardew's *Bun No.* 2 provides a unique opportunity to reconcile the composer's indeterminate graphic score, *Treatise,* with a determinate orchestral work which uses staff notation. It represents an amalgamation of Cardew's approach to two notational systems that, due to their concurrence of use in his œuvre, can inform our understanding of how graphic scores can be used in determinate compositional processes, and vice-versa. In this way, it provides an example of graphical ekphrasis that navigates the tension between graphic score as 'non-specific analogy' by treating the score not as an intended performance, or realisation, but as an analysis of the graphic symbols (and their intended symbolic content), which creates musical analogies and therefore can provide a transmedialisation of the source.

2.i. Situating *Bun No. 2*

As stated in the *Treatise Handbook* which describes the process of writing *Treatise* and its early performances, Cardew states that *Bun No. 2* 'is based on pp. 45-51 (middle) of *Treatise*. In a way it represents an analysis of that passage'.[32] No further information is given as to how this 'analysis' is carried out, but the use of terminology of 'analysis' rather than 'interpretation' (or similar) is of note: implying the identification, or codification, of formal or structural processes. This enigmatic process receives only cursory mentions in the recent scholarship on Cardew. Tony Harris mentions that both *Bun No. 2* and *Volo Solo* (1965) are 'composed realisations' of *Treatise*.[33] Whilst this is certainly the case, *Volo Solo* retains a higher level of indeterminacy, as can be seen with the absence of any sort of metre, and the fact that the piece is scored for 'any solo instrument'.

[32] C. Cardew, 'Bun No. 2', in *Treatise Handbook*, London, Edition Peters, 1971, back cover.
[33] T. Harris, *The Legacy of Cornelius Cardew*, London, Routledge, 2016, p. 45.

Similarly, Virginia Anderson, writing specifically on performer choice in *Treatise*, couples these two pieces together, describing them as 'written realisations of sections of *Treatise*'.[34] Whilst both pieces derive their source material from *Treatise*, the only fully determinate example is *Bun No. 2*. The significance of this is that a *fully* notated and descriptive score, unlike *Volo Solo*, can be scrutinised in the fullest possible terms of its process of transmedialisation. Cardew's biographer, John Tilbury, contributes the most to this discussion, identifying a couple of interpretations of the transmedial process, but stops short of providing a comprehensive analysis of any full passage.[35]

This chapter will interrogate Cardew's 'analysis' of *Treatise* in the transformation from an indeterminate graphic score to a determinate score for chamber orchestra. It will show that Cardew's symbolic synthesis, through his notion of 'camouflage', could become a more mainstream and fruitful stimulus for determinate composition; perhaps extending to implications of engagement and comprehensibility in non-specialist audiences, or even utilised in musical education since the process of transmedialisation is linked to simple geometric concepts. This, therefore, widens graphical ekphrasis from merely a rhetorical exercise, to something with more diverse musical applications.

Much writing on Cardew's life and music is often compartmentalised into distinct periods, with Harris describing the events of 1974, including the publication of Cardew's polemic *Stockhausen Serves Imperialism*, as a 'departure point' for the composer.[36] Events prior to this from the late sixties and early seventies, including the formation of the Scratch Orchestra (complete with its

[34] V. Anderson, '"Well, It's a Vertebrate ...": Performer Choice in Cardew's Treatise', *Journal of Musicological Research*, Vol. 25(3-4), 2006, p. 297.
[35] J. Tilbury, *Cornelius Cardew (1936-1981): A Life Unfinished*, Essex, Copula, pp. 256-258.
[36] T. Harris, op. cit., p. 9.

own 'constitution'),[37] the Morley College classes (1968-1973), and works such as *The Great Learning* (1968-1972) all begin to define the composer's artistic position in social and political terms – perhaps suggesting a more gradual transition in social and musical philosophy than Harris outlines. This enquiry is not primarily concerned with these matters; rather, it seeks to present an analytical exploration of *how* graphic notation may be realised in a compositionally determinate way.

Bun No. 2 came ten years before Harris's 'point of departure', and hence it is necessary to examine what compositional philosophy was held by Cardew during this period in order to provide the most appropriate context for the analysis. As stated in the score, the piece was commissioned by Mauricio Kagel (1931-2008) for a concert in Brussels in 1964. Kagel was, like Cardew, known for his social connection to music, prolifically writing musical theatre works, such as his *Staatstheater* (1970) which criticised and satirised the institution of opera. For an example contemporaneous with *Bun No. 2*, take Kagel's *Match* from 1964, scored for two cellist 'players' and a percussionist 'umpire', which Paul Griffiths describes as a 'calculated absurdity' due to the extreme difficulty of the cello parts.[38] Indeed, one could suggest something equally absurd in Cardew's *Memories of You* (1964) for solo piano, in which the score 'gives the location of a sound relative to a grand piano',[39] rather than any instruction of how to play the instrument. It would appear that Cardew, during this period, was writing overtly experimental works (such as *Memories of You* and *Treatise*) which challenged notation and performance orthodoxies. Arguably, however, there exists a duality within his output when considering pieces such as *Three Winter Potatoes* (1961-65), which feels like a homage to Karlheinz Stockhausen's (1928-2007) ultra-modernist *Klavierstücke* of the mid-1950s

[37] See C. Cardew, 'A Scratch Orchestra: Draft Constitution', *Musical Times*, Vol. 110(1516), June 1969, pp. 617 & 619.
[38] P. Griffiths, *Modern Music and After*, Oxford, OUP, 2011, p. 198.
[39] C. Cardew, 'Memories of You', in *Four Works*, Universal Edition, London, 1966, p. 30.

(Cardew having worked as his assistant from 1958-1960). This aesthetic duality could be deemed to be at the heart of *Bun No. 2*.

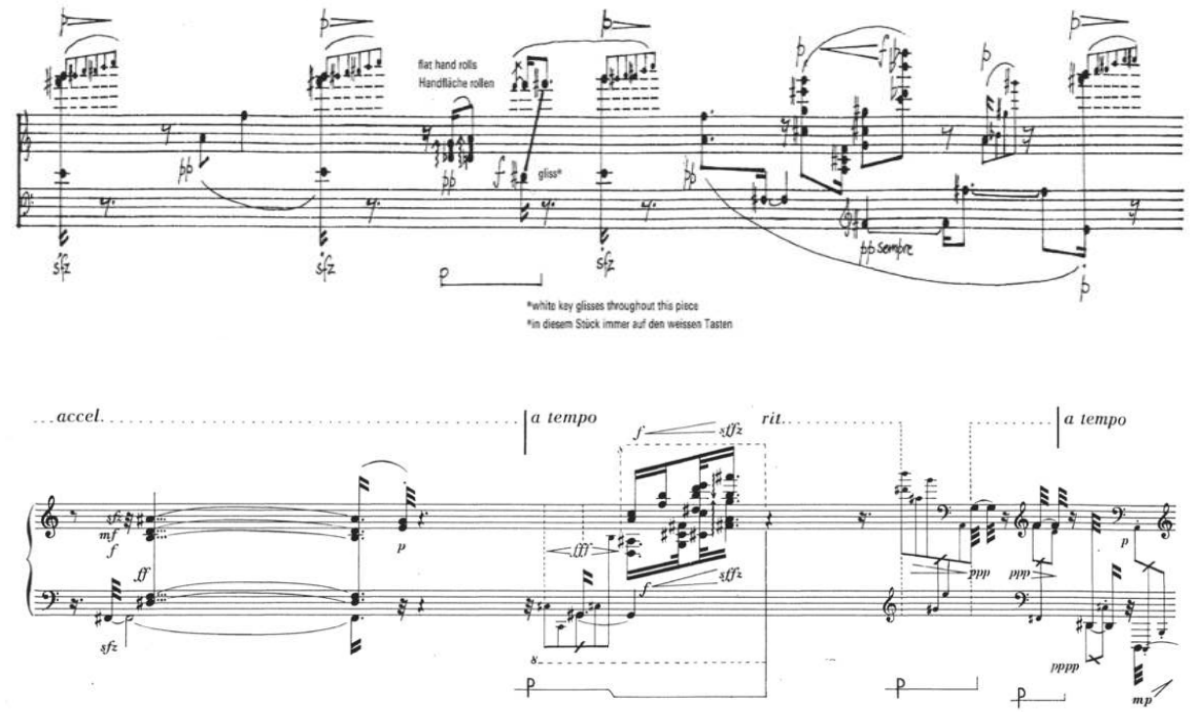


Figure 2. The opening of Cardew's Three Winter Potatoes *(above) and the first half of page 3 of Stockhausen's* Klavierstück V *(1954) (below).*

These contrasting approaches can be reconciled when considering Cardew's writing in a preface to *Four Works* (1966),[40] in which he states:

> [T]he pieces also need *camouflage* to protect them from hostile forces in the early days of their life. One kind of protection is provided by the novelty and uniqueness of the notations … but a more positive kind of camouflage is needed; something to persuade the watchful custodians of our musical garden that these tender young emergent plants bear more resemblance to flowers or vegetables than to weeds. So as seeds, besides containing a growth mechanism oriented towards the future, they also bear hereditary characteristics linking them with the past … 'Solo with Accompaniment' and 'Memories of You' are more aggressive, tougher simpler in conception and consequently stand in less need of such camouflage.[41]

[40] This is an eclectic collection of differently scored pieces comprising of *Autumn 60, Materials, Solo with Accompaniment,* and *Memories of You*.

[41] C. Cardew, 'Introduction', in *Four Works*, p. 4. Italics mine.

Here, Cardew demonstrates that the notion of 'style' is one of symbiosis. The idea of 'camouflage' suggests that there is a need to protect the avant-garde from those in positions of traditional musical power. *Memories of You*, a totally graphic work, is less in need of camouflage not only because of the 'novel notations', but also because it does not engage with traditional musical semiotics; there is no (apparent) pitch, no harmony, no rhythm.

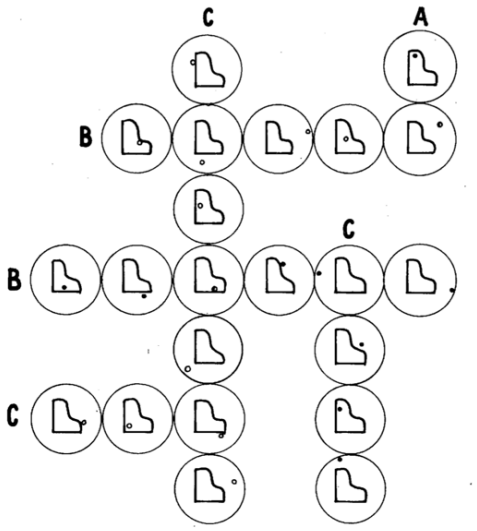


Figure 3. The score for Cardew's Memories of You.

Similarly, Cardew explains that, in his mixed ensemble piece *Material* (1964), 'the rhythmic pulsation and development of the rubato idea provide a similar handhold'. The stance is clear that new musical expressions must, in some way, be stylistically hereditary in order to create a meaningful coherence in the 'watchful custodians' that listen to them, and thus forge an acceptance. In this way, it is unsurprising that *Material* is an arrangement of Cardew's *Third Orchestral Piece* (1960) and that *Three Winter Potatoes* contains elements from *Material* and *Octet '61* (1961):[42] the material must cautiously establish itself. It is this heredity and camouflage that is so fascinating in *Bun No. 2*, which can be seen as the only comprehensive example of reconciling

[42] J. Tilbury, op. cit., p. 130.

Cardew's experimentalism with his modernist output, in the form of the transcription of a graphic score into a fully determinate score. As will be demonstrated, traditional ideas of musical development (e.g. repetition, variation, harmony) are controlled by the graphics of *Treatise*, which allows for a transmedial reading. In this way, the graphic becomes expressed in the modernist language of the music. It is there, but codified in terms of 'hereditary' musical systems: it is camouflaged. Moreover, Cardew also states that 'their best guarantee for survival would be a completely self-contained, closed logical system for each piece'.[43] It could be that Bun No. 2 represents this in its nature as a determinate score in staff notation.

2.ii. Understanding *Bun No. 2*

Structure

Bun No. 2 is a piece for chamber orchestra, lasting around eleven minutes, comprising two types of section: 'RICHTIG' (correct) and 'FALSCH' (false). As stated in the preface to the score, the piece should, if possible, be performed twice (non-consecutively). In the first performance, only the parts marked RICHTIG should be played. In the second, all material is played. The RICHTIG and FALSCH sections are deployed alternately, as seen in Figure 4. Importantly for the purposes of this study, Cardew states 'with the exception of the passages marked FALSCH (2) and FALSCH (3) the piece is based on pp. 45-51 (middle) of Treatise'. In the context of 'camouflage', the general (although not total) equation of RICHTIG with *Treatise*, the graphical material, rings true: the 'analysis' of *Treatise* is the 'correct' material. The inclusion of FALSCH (1) in this process could be to further hide the discrepancy between the sections, and allow the piece to camouflage better by merging the two types of material.

[43] C. Cardew, op. cit., 1966, p. 4.

Section	Bars
FALSCH (1)	1-9 [9]
RICHTIG (1)	10-46 [37]
FALSCH (2)	47-63 [17]
RICHTIG (2)	64-77 [14]
FALSCH (3)	78-91 [14]
RICHTIG (3)	92-124 [33]

Figure 4. The basic structure of Bun No. 2.

Returning to *Three Winter Potatoes*, one can see a similar approach to flexibility of form. The second piece of the set is, in Cardew's words, 'cyclic', meaning that 'any barline may be used as the starting point, and the end may be joined to the beginning' (again showing strong echoes of Stockhausen's *Klavierstücke*).[44] Indeed, *Three Winter Potatoes,* as a title, may be a link to this aesthetic situation of camouflage through the continued use of vegetal language; its camouflage achieved through its mobile form.

Whilst *Bun No. 2* is much more determinate with regards to structure, it nonetheless represents the mobility of form that was prevalent in music contemporary music of the period (Boulez, Stockhausen, Cage, etc.). Indeed, one could argue that through utilising this device in *Bun No. 2*, and separating material types (dependent on process), Cardew is applying camouflage on a macro-level through structure, as well as on a micro-level through derivation of musical materials through graphics. In other words, Cardew's depiction of his own graphic score is achieved through a referential cultural context of modernist contemporary music.

[44] C. Cardew, *Three Winter Potatoes*, London, Universal Edition, 1966, p. 12.

Analytical approaches in Treatise Handbook

As well as musical context, it is important to also understand Cardew's graphical philosophy by examining parts of *Treatise Handbook*. Compiled after *Treatise*, at the request of his publisher, the *Handbook* is a diary charting of the process of composing *Treatise*. It reads as a (sometimes contradictory) stream of consciousness that allows an understanding of certain aspects of graphical–musical translation. Most important for this study will be passages from around 1963-1964, which encompass the composition of *Bun No. 2*. These excerpts allow for an application of particular thought–processes when analysing the score that will best represent Cardew's compositional logic, which can then be extrapolated into further considerations of graphical translation.

Beginning in July 1963, one can see two illuminating statements that appear to be in tension with the later, more overtly political, Cardew of the 1970s. Cardew stresses the control of the musical score, and the construction of logics, stating, '[t]he score must *govern* the music. It must have authority, and not merely be an arbitrary jumping-off point for improvisation, with no internal consistency'.[45] These 'internal consistencies' in *Treatise* are surely important in a process of translation across different notational systems; from indeterminate to determinate. Whilst not going as far as to criticise improvisation (indeed, this was a huge part of Cardew's socio-musical philosophy), it nonetheless hints at the analytical approach that should be taken to *Treatise*. This approach can be seen in the following entry:

> Just as the perfect geometrical forms are subjected in the score to destruction and distortion, corresponding perfect forms can be sought in sound (octaves and simultaneous attacks are two leads that spring to mind) and these destroyed or distorted. (E.g. a circle with an opening might be read as an open fifth with major and minor thirds trilling).[46]

[45] C. Cardew, *Treatise Handbook*, London, Edition Peters, 1971, p. iv. Italics in original.
[46] Ibid. Italics in original.

This clearly shows the beginnings of a basic approach to how the symbols of *Treatise* may be represented in a more determinate manner: through the concept of *geometry* as well as *distortion* being linked to similar ideas in music e.g. 'perfection' as an aligned musical gesture of an octave (i.e. the same pitch class)[47] or simultaneous attack (i.e. the same rhythm), with 'distortion' representing bi–modal triads which are not stable (trills). This process of transmedialisation can be approached in a rich variety of ways other than those explicitly outlined by Cardew, as will be shown. Indeed, the idea of the triad continues in a later passage from October 1963, where Cardew links the degree of distortion to the manipulation of a triad:

> (What makes this live is the distortion of the 'any' chord. The way in which it has been derived from the triad. 'Any chord' is nothing particular, but if it bears the marks of a distortion then it has that character. This makes work on Treatise alive – the various interfering forces distorting and changing everything. The way the elements act on each other – it is like chemical processes: Acid bites, circles roll and drag, and bend the stave-lines of 'musical space'.)[48]

As will be seen, triads feature heavily in *Bun No. 2*, and thus it is possible to situate the harmony as a result of 'distorted' graphical processes; or the relation of perfection to imperfection, in geometric terms.

December 1963 marks an extensive passage in the *Handbook* in which Cardew attempts to apply musical parameters to 'enclosed spaces' and thus categorise them:

> A practical attempt. Take the enclosed spaces and divide them into the following categories: triangles, circles, circle derivatives (not very many), squares, square derivatives (horizontal and vertical rectangles), irregular enclosures. Musical categories can be matched up with these: triads, trills, irregular tremolos, periodicities, deviating periodicities, clusters that disintegrate in the direction of whatever shape is closest. Dynamics for all shapes can be determined thus: horizontal dimension gives the degree of loudness; vertical dimension gives the degree of dynamic contrast (this works well with most figures especially circles, because the lower the dynamic the lower the contrast. Vertical rectangles will present problems, as they demand low dynamics with high degree of contrast.)[49]

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[47] Assuming octave equivalence.

[48] C. Cardew, *Treatise Handbook*, p. v.

[49] Ibid., p. vi.

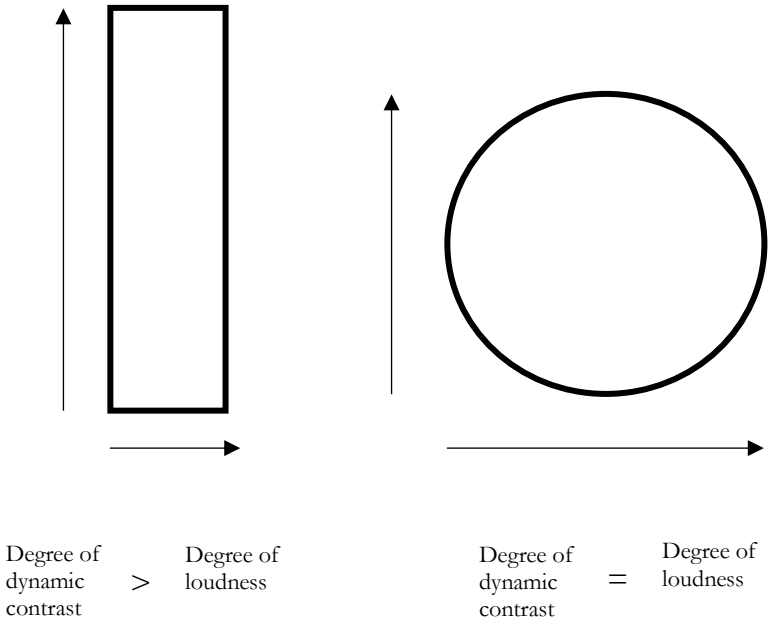


Figure 5. A visual example of how dynamics may be represented using geometric shapes, according to Cardew.

The specific approach that Cardew shows here further stresses the analytical implications of graphical scores to be realised determinately using staff notation. It shows an interpretation that enhances internal logics, and makes these 'enclosed spaces' into symbols that have functional properties. 'Distortion', here, is eschewed in favour of 'derivatives', similarly linking properties of geometric shapes together, but adapting the semantics to, perhaps, imply more self-similarity across the family of shapes in their symbolic musical function.

It is important to highlight that, perhaps obviously, this is Cardew's interpretation of his own graphic score. As a 'handbook' it is presented to offer possibilities, rather than curtail them as to a singular reading, but ones that must be done to maintain the 'logics' (highlighted in the July 1963 entry). This 'interpretation' is a codified one, that becomes an 'analysis' when it is fixed in determinate staff notation as seen in *Bun No. 2*:

> (To a person who thinks the piece is a code to which a key is missing, what I am doing will look like providing a key. Actually, I am simply interpreting. The piece is an abstract work of design, to which meanings have to be attached such that the design holds good.)[50]

This resonates with the notion of composer as 'critic' in the synonymous function of criticism and analysis with respect to interpretation of a set of graphical symbols manifested in *Treatise*. There are surely multiplicities of interpretation, but the identification of one (rather than many) allows for the depictive aspect of graphical ekphrasis to be manifested.

Two mentions of *Bun No. 2* appear in the *Handbook*, dating from September and November of 1964. The first is a quote from Austrian philosopher Robert Musil's modernist novel *The Man Without Qualities* (1930), taken from the first book, entitled 'A Sort of Introduction'. There is a semantic, and conceptual link here: *Bun No. 2* is an 'introduction' to graphical transformations derived from *Treatise*, which is in itself an 'introduction' to the possibilities of improvisation through graphic scores on a hereto never before seen scale:

> Bun for Orchestra: '… for all those who give up halfway, the fainthearted, the soft, those who comfort their souls with flummery *about* the soul and who feed it – because the intellect allegedly gives it stones instead of bread – on religious, philosophic and fictitious emotions, which are like buns soaked in milk.' (Musil)
>
> The bun is a *stone* soaked in milk.[51]

This image is at once poetic, yet revealing. Cardew already aligns himself with the analytical and scientific mind portrayed in Musil's novel (centred on a mathematician) but furthermore, he is making an *aesthetic* statement on the process in the work. The non-absorptive qualities of stone, here marked as the 'intellect', are situated in the 'milk' which is 'religious, philosophic, and fictitious'. One interpretation could be that the analytical processes that Cardew applies to his graphical translations are situated within more intuitive compositional methods; the *Bun* takes on

[50] Ibid.
[51] Ibid., p. vii. Italics in original.

both characteristics. This reading could be consolidated by considering the formal structure of *Bun No. 2*, which exclusively contains musical sections marked as RICHTIG and FALSCH, with the former being linked to the analysis of *Treatise* (stone), and the latter being excluded from the first (of two) performances (milk), as discussed earlier. Moreover, the use of a literary text would further seem to imply ekphrastic qualities in this piece, whereby the graphical depiction is a means to the literary, ekphrastic end.

The final consideration from *Handbook* will examine Cardew's motivation to apply this process of graphical translation to *Bun No. 2*. Writing in November 1964, most likely as a retrospective of writing *Bun No. 2*, Cardew states:

> Making [an] orchestra transcription of Treatise (for instance) is not undertaken for the sake of public recognition, but simply surrendering to the *vulgar desire* to hear what I imagine.[52]

It is interesting that Cardew had a specific interpretation in mind for these pages of *Treatise*, rather than allowing for the more free, improvisatory attitude that would come to define the Scratch Orchestra in 1969, as well as subsequent projects. This is cogent with the strong analytical tendencies that have been shown throughout *Handbook* which stress the 'authority' of the score, and can perhaps further strengthen the poetic analogy discussed above. The 'vulgar desire' can surely be equated with Musil's 'milk' of religion, philosophy, and fictitious emotion. It doubly shows the analytical tendencies squared with the intuitive, or more personal, desire to fix a specific interpretation of an indeterminate graphic score.

[52] Ibid. Italics mine.

2.iii. Analysing *Bun No. 2*

There is not adequate scope for a full analysis of *Bun No. 2*. However, a thorough examination of a continuous passage (from bars 1-27) will be offered to foreground a consistent analytical method. Therefore, this section will demonstrate key features of Cardew's symbolic system of graphical-musical transmedialisation, and inform an understanding as to how to approach the piece as a whole. Thus, this analysis will provide a grounding for wider explorations of ekphrastic responses to graphic scores.

Initial orientation in the graphical space: RICHTIG (1)

Due to the covert nature of translation from *Treatise* to *Bun No. 2* (Cardew gave no details of his process other than outlining which pages he used), it is necessary to approach this analysis in an unusual fashion. There are some symbols in the pages of *Treatise* that are more 'obvious' to find than others. For example, on page 46, there is a use of staff notation outlining two tritones using a bass clef (G-D♭-G). This allows one to locate this phrase in passages of the notated score, which then allows for situation in the graphical space of *Treatise*, and thus *Bun No. 2*. After all, Cardew highlighted that pages of *Treatise* are to be read left to right, and thus a linear progression of time can be assumed that would befit a determinate orchestral score, despite his insistence that 'space does not correspond to time' in a strictly proportional sense.[53]

[53] Ibid., p. iv.

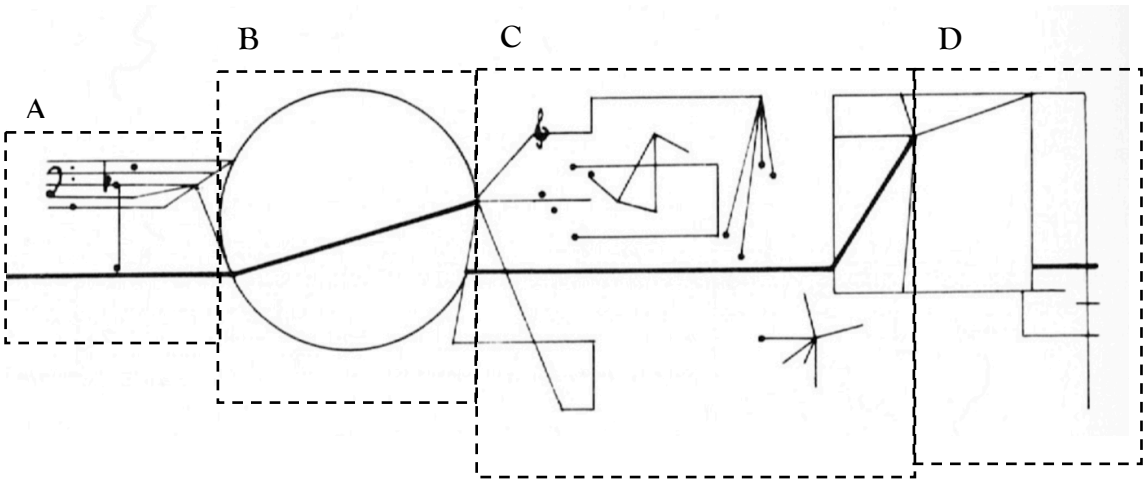


Figure 6. The second half of page 46 of Treatise *(dotted lines and letters are added by author).*

There is no doubt that this graphic in *Treatise* (marked as **A**) is representative of bar 10 of *Bun No. 2*, where the contrabassoon plays the specified notes in a solo which marks the beginning of RICHTIG(1). The rhythms are approximated spatially: a longer first note and shorter latter two. The stem of the D♭, which stretches off the stave, aligns rhythmically with the piano cluster in a lower register than the contrabassoon, thus representing the high-low axis of pitch that a traditional stave implies.
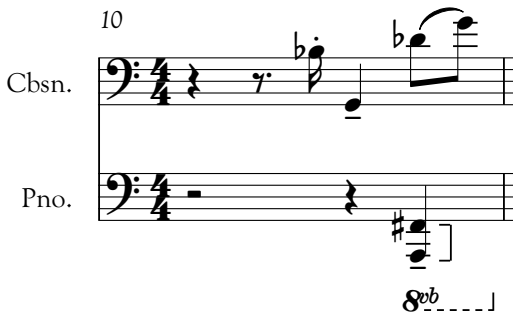


Figure 7. Cardew, Bun No. 2*, bar. 10 (contrabassoon and piano).*

From this assertion, one can identify two key formal characteristics pertinent to this graphical analysis. This is, that RICHTIG sections need not start at the left-hand side of *Treatise* pages,

meaning they are not strictly aligned; also, that RICHTIG sections may span multiple *Treatise* pages.

Bars 11-14 (B)

Now that there is an orientation point, one may work forwards (or backwards) in identifying musical features that correspond to graphical symbols. Take the section marked **B** in Figure 6. Two elements feature: a complete circle (with a slightly flattened right side), and an inclined centre line. From the discussion of the *Handbook* we can already begin to look for certain characteristics that represent the 'perfection' of the circle, and from the situation of immediately preceding pitch material in bar 10 in a standard 'high-low' presentation, we can equate the incline with a rising pitch. These two elements are represented in the music of bars 11-15. Looking at the upper woodwind and the brass, one can observe brief sectional homophony with co-ordinated attacks. This is one of the ways in which Cardew suggested that circles may be represented: 'simultaneous attacks' to reflect the perfection of the shape. Moreover, the durations of the upper woodwind attack and the brass attacks are identical, offset by a quaver, showing that the circle is not necessarily represented as a tutti orchestral gesture, but that the circle is being represented independently within both sections through simultaneous attacks (Figure 8). Perhaps the flattening of the circle could represent this sectional independence through the slight imperfection of the shape.

The latter brass music alludes to another of the characteristics highlighted in the *Handbook*: dynamic level and contrast determined by the height and width of the shape as demonstrated in Figure 5. In this case, a circle has equal height and width. Judging the physical size of the image relative to other materials on the page, it is a large space. As such, the music will have substantial levels of dynamics with a high level of dynamic contrast. This can be seen below with both the

combination of *forte* woodwind, *piano* brass, and then particularly by the subsequent *fortepiano* swells in the brass.
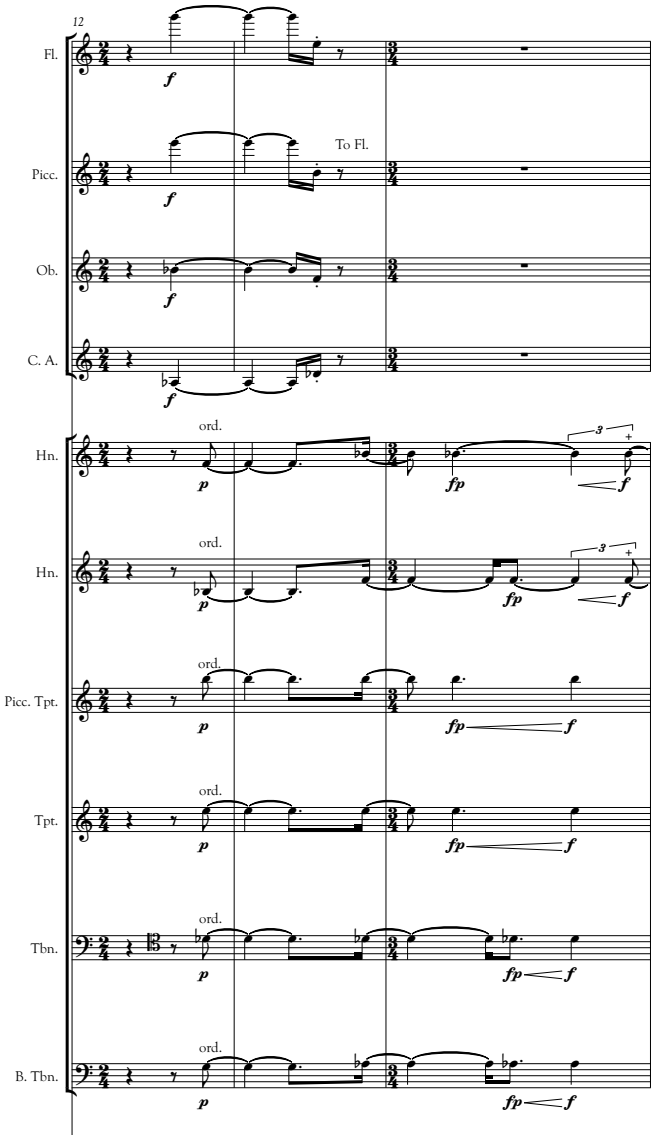


Figure 8. Bun. No. 2, *bars 12-14 (upper woodwind and brass).*

Here, the brass harmony is related to the idea of perfection and imperfection. Throughout this piece, major and minor triads dominate harmonic fields, and thus distortion of these triads can act as a modifier that can be related to a graphical symbol. Within this graphical analytical framework, it is cogent to read the brass music in bar 12 as constituting two minor triads, shown

in Figure 9. The second attack, in bar 13, changes the spacings of the B-flat minor chord (implying consistency, or harmonic stability), but crucially alters the E minor triad by a semitone, resulting in the following two triads (Figure 10):

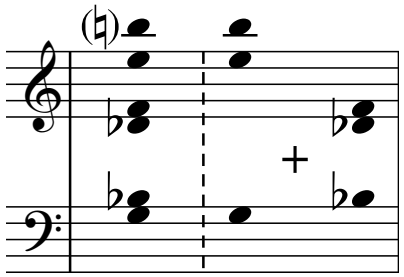


Figure 9. Bun No. 2*, bar. 12, brass harmony.*

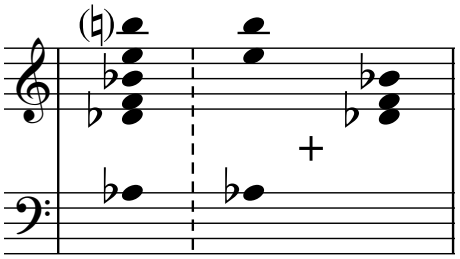


Figure 10. Bun No. 2*, bar 13, brass harmony showing a distorted triad.*

Following the logic of reading from left to right, the alteration from G to A-flat could be representative of the imperfection in the lower right part of the circle, especially considering it is the lowest pitch that was altered. As such, the distortion of the E minor triad is reflected in the distortion of the circle. As has already been established, the woodwind and brass are representing the same shape but in their individual sections. Therefore, certain levels of sectional independence are retained. Whilst the brass express the symbol in a multitude of ways, the woodwind do not strictly follow suit; to do so would surely result in banality through plain repetition. Rather, this approach, in which the symbol can govern any number of aspects, allows the composer to create

effective orchestral textures, allowing for balance as well as idiomatic writing (as seen in the *fortepiano* brass swells).

The rising centre line, described as the 'lifeline' by Cardew,[54] is represented in a more orthodox way. It is first important to note that the idea of the lifeline, the thick central line that runs throughout nearly all of *Treatise*, is not to represent a single continuous variable, although it has been previously performed as such, representing a 'continuous sound'.[55] Indeed, in her discussion of the philosophy of music in Cardew and Wittgenstein, Magda Polo Pujadas describes the lifeline as the 'horizon of logic' or a 'point of reference'.[56] In essence, it represents some sort of focus that can determine musical material. It can come in and out of focus, judged often on its distortion, rather than its omnipresence. The inclined lifeline on page 46 is represented in the violins and violas in bar 11, where an eight-part rising glissando takes place, much like the treatment of 'ruled surfaces' in Iannis Xenakis' (1922-2001) *Metastasis* (1954). The harmony is similarly triadic, with a final attack on a diminished E minor triad (Figure 11). Indeed, the background nature of the lifeline could be represented through the *piano* dynamic and the use of mutes, contrasting with the *forte* woodwind and brass, which represents the circle that the lifeline is contained by. Thus, the *interaction* of graphical images, as well as the images themselves, can inform textures and orchestral balance.

[54] Ibid., p. ix.
[55] Ibid.
[56] M. P. Pujadas, 'Philosophy of Music: Wittgenstein and Cardew', *Revista Portuguesa De Filosofia,* Vol. 74(4), 2018, p. 1431.

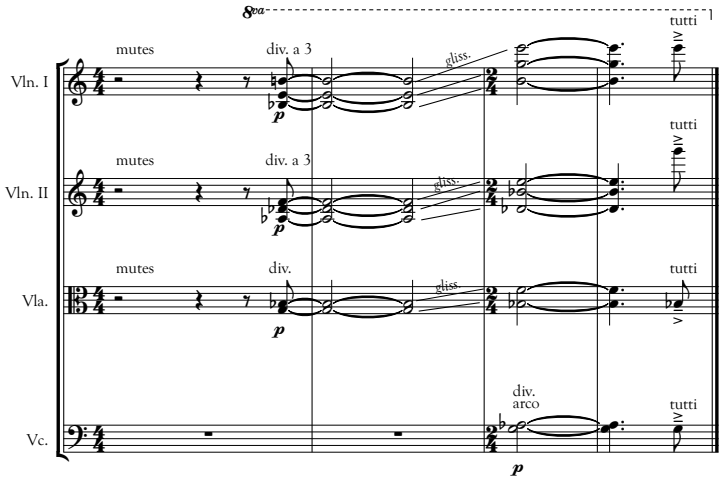


Figure 11. Bun No. 2, *bar 10-13 (violins, viola, cello).*

Bars 15–20 (C)

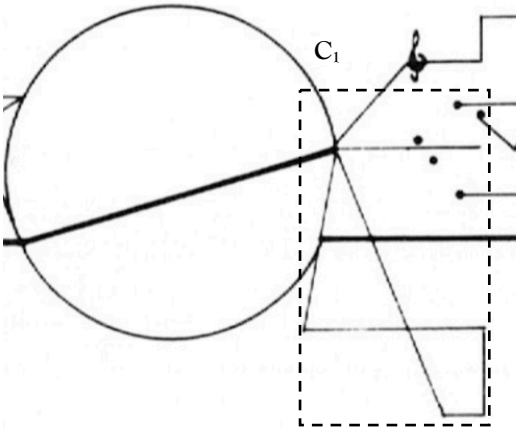


Figure 12. Treatise, *sub-section C1*

Section **C** introduces many more graphical elements, including dots, lines, triangles, and a treble clef. There is a continuation of the material from section **B**, with the horn notes in bar 15 representing the end of the circle material through not only a reduced sectional texture, but also the extension of the B♭/F dyad where it becomes the only sound. This would identify the horns in bar 15 with the thinner line emanating from the lifeline (marked above as **C1**). This can be

verified by observing the proceeding attacks in the woodwind and strings that overlap with the dyad. A harmonic analysis can demonstrate that the situation of the dots from the central line do not determine register, but *degree of distortion* in the harmony.
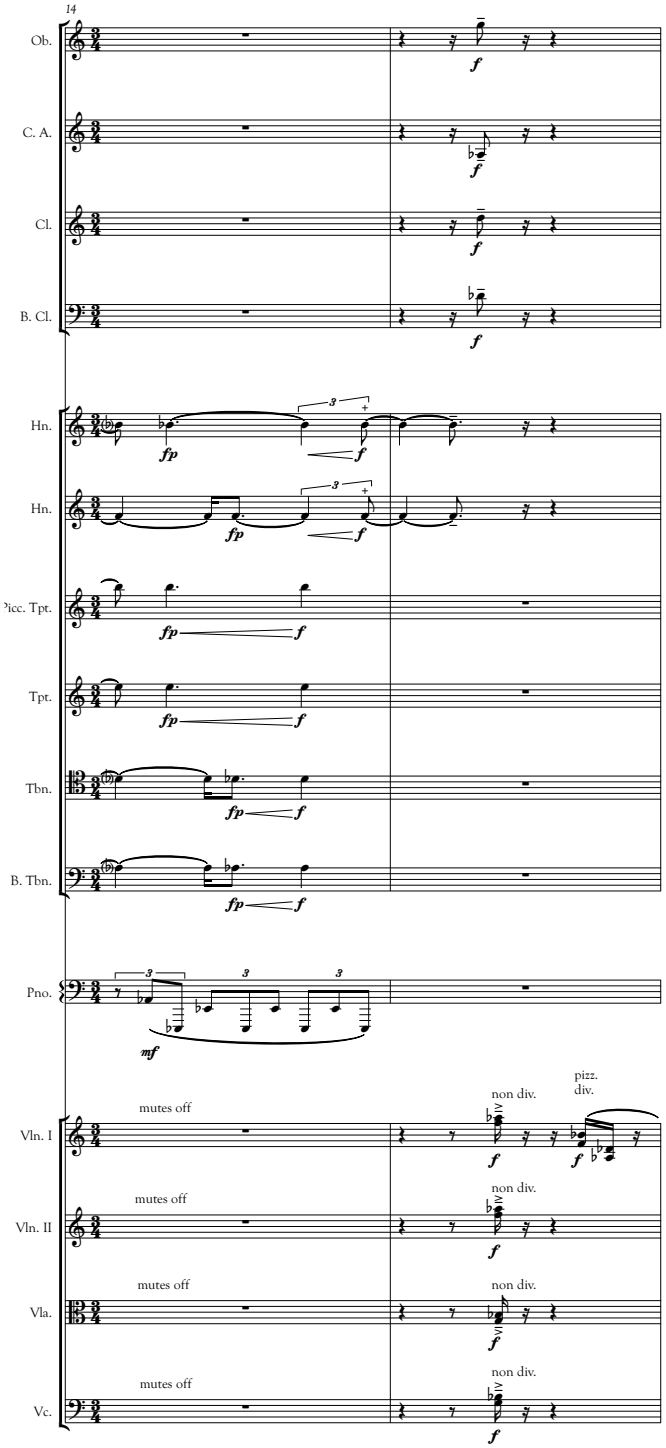


Figure 13. Bun No. 2*, bars 14-15*.

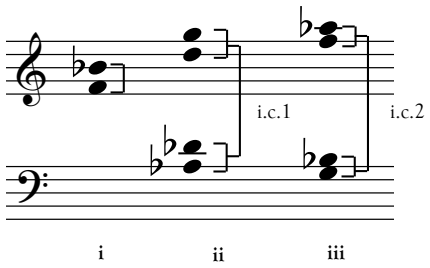


Figure 14. Bun No. 2, '*distorted*' *harmony in bars 14-15.*

The concern is not necessarily with maintaining the interval of a fourth (or interval class (i.c.) 5), but with the degree of divergence from the original harmony. The initial dyad (shown in Figure 14) could be thought of as the graphic line. The two dyads in chord **ii** thus represent the dot above that is nearest this line. The movement away from the line is represented through a distortion in the addition of a transposition of i.c. 1. Similarly, chord iii represents a dot further away from the line than in ii, and this is represented through modification of intervals to i.c. 3, themselves offset by i.c. 2, but still kept as a pair of dyads. Similarity can also be implied through the maintenance of the original pitches (B♭ and F) as the inner voices in chord **iii**, creating the i.c. 5 from chord **i**. It could further be argued that the expansion of register in bars 15-18 is representative of the diverging lines in $\mathbf{C_1}$, further implying the use of general registral mapping through graphics.
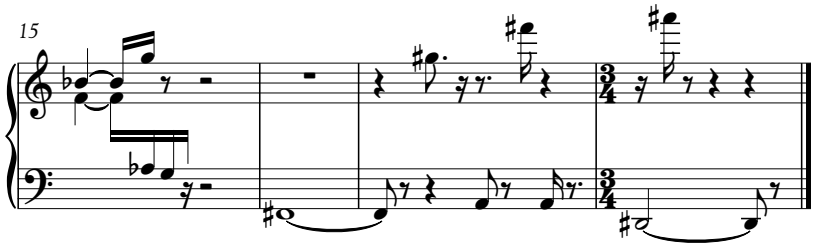


Figure 15. Bun No. 2, *bars 15-18 (reduction), showing the progression of highest and lowest pitch, which represents the diverging lines of the graphic.*

Cardew theorises the distinction between 'events' and 'happenings' in relation to dots and dashes in an early entry into the *Handbook*.

> The dot-dash relationship of events and happenings. Events: something short, compact, homogenous that we experience as complete (though we may only experience a part of it in fact) and so as one thing. Happenings: something that continues, the end is not legible in the beginning. Two sets of parameters: events parameters and happening parameters. [57]

It could be extrapolated that the 'dots' that proliferate this section are 'events'. When considering bar 15, this makes sense: they are short, compact, homogenous attacks in a sparse texture (Figure 13). This 'completeness' is alluded to with the termination of the horn note in line with the woodwind and string chords.

The graphic seen in the middle of section **C**, here marked as **C_2** is constructed of two parts: an angular line emanating from a dot, and a triangle that hangs from the ascending part of the line, as seen below:

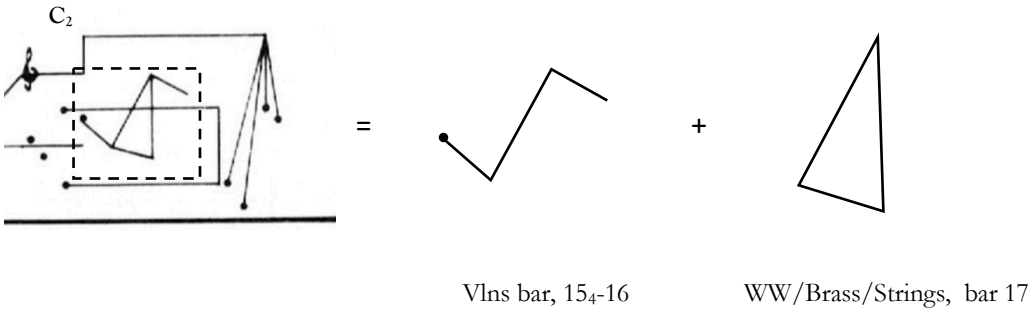


Figure 16. Deconstruction of graphic in Treatise *sub-section C_2, related to orchestral section.*

[57] C. Cardew, *Handbook*, p. iii.

The line acts as a musical contour (using an 'up:high–down:low' orientation) for the violins in bar 15-16, whose entry is highlighted through the use of pizzicato, heightening the short 'dot' characteristic, whilst the triangle applies its perfect geometric properties to the orchestral texture, resulting in homophony in the immediately preceding music of bar 17 (Figure 17).[58] At once, there is both a registral modulator and a textural modulator derived from a single graphic entity. The additional notes in the trumpets, tenor trombone, bass clarinet, and cor anglais could be representative of the falling line in the latter part of the **C**$_2$ graphic, which acts as an imitation of the violin writing in bar 16.

The upper part of the graphic in section **C**, marked as **C**$_3$ (Figure 18), shows similar registral mapping, with the treble clef hinting at where the line may be represented in pitch space. This shape is suggested in the flutes, oboe and clarinet parts from bar 17-18, where there is a co-ordinated jump upwards (reflecting the triangle modulator) to extreme registers for each instrument. The figure on the right of **C**$_3$, a kind of 'constellation' image (Figure 19), unseats the triangle and results in four 'fall-offs' at semiquaver intervals, represented by grace notes; one for each line of the graphic, thus reflecting the left to right reading of *Treatise*. These constellation figures occur throughout pages 46-51 of *Treatise* and this reading could be expanded to subsequent grace note passages.

[58] See p. vi of *Handbook* for a thorough description of how triangle shapes might be translated. In this case, however, due to the harmony and situation of the graphic, it seems that the triangle functions as an element of 'perfection' rather than a modulator of triadic harmony, which isn't pronounced in this passage.
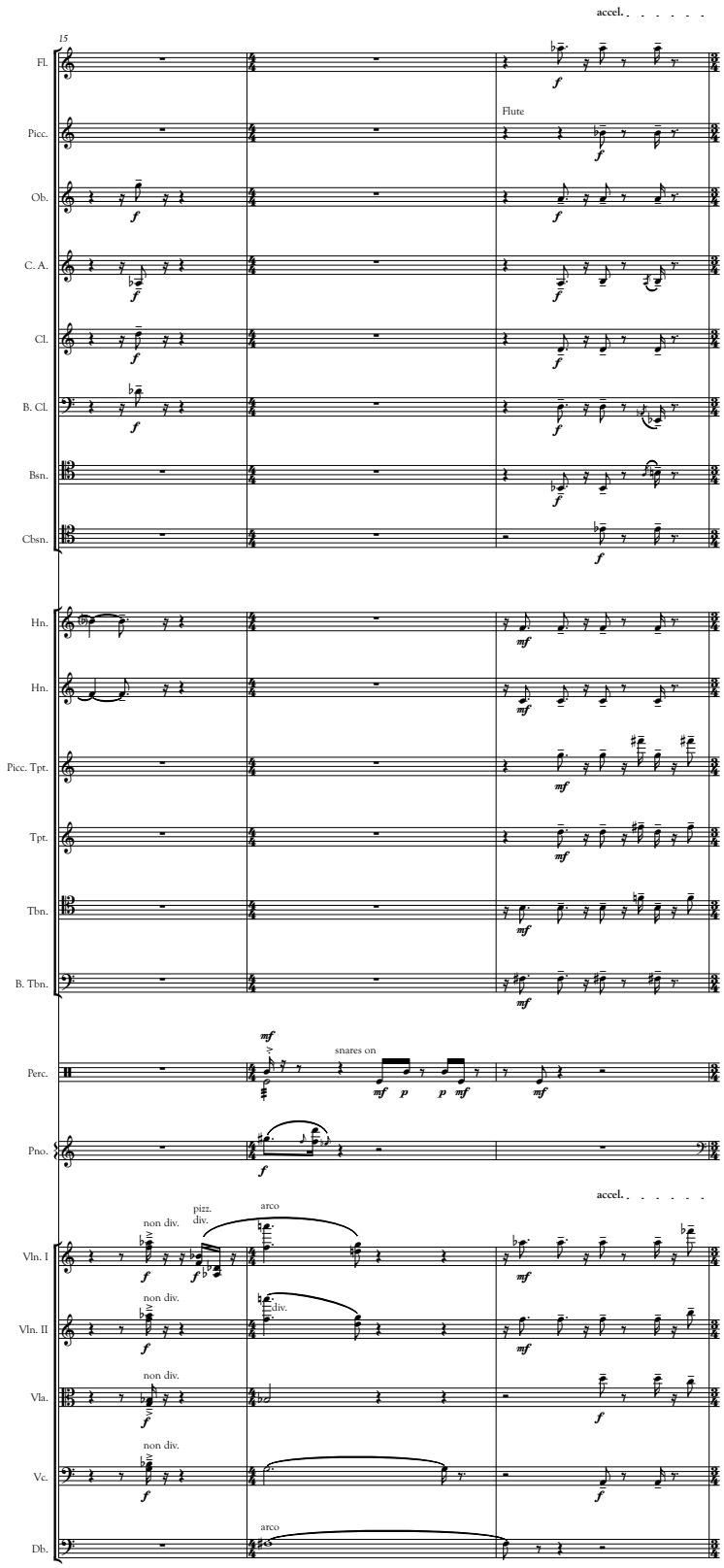


Figure 17. Bun No. 2, *bars 15-17.*

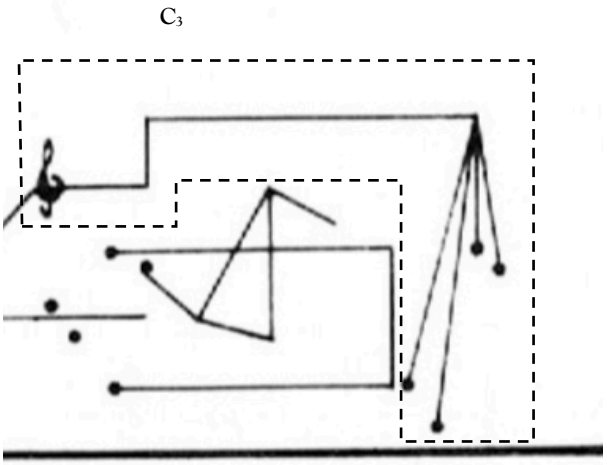


Figure 18. Treatise, *sub-section C3*.
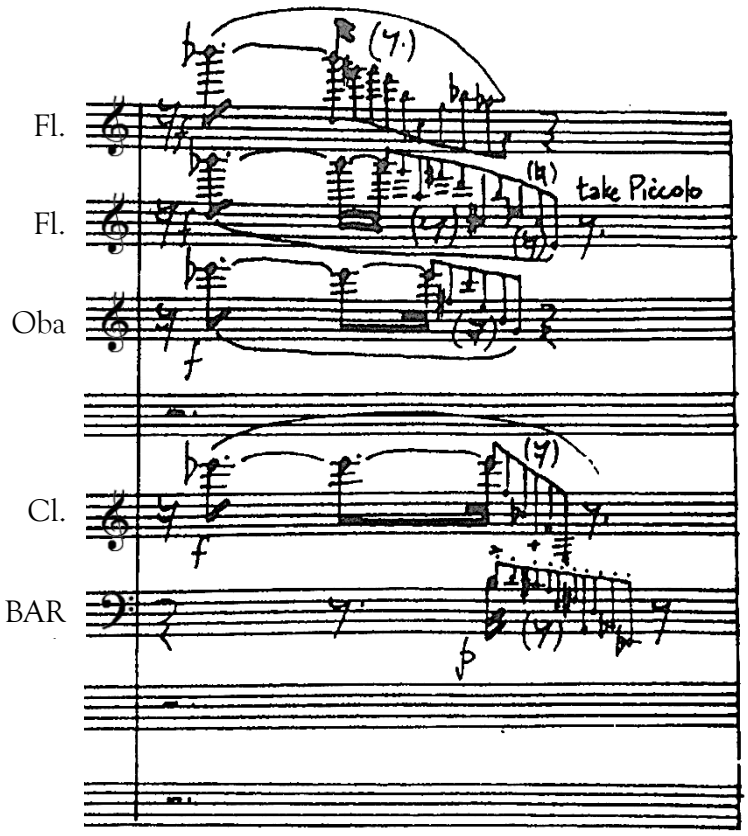


Figure 19. Bun No.2, *bar 18 (woodwind)*.

Whilst the bass clarinet plays the same gesture, this can be considered an *intuitive* response (rather than a specific translation dictated by the score) due to the insertion of a treble clef within the graphic, combined with the fact that the bass clarinet does not form part of the initial attack, i.e. was not part of the preceding line in the graphic. Furthermore, its *piano* dynamic does not match up with the *forte* dynamic of the upper woodwind; it acts as an echo of the gesture that relates to a specific desire in orchestration, or timbral balance.

The final part of section **C** can be identified through the similar glissando gesture which represents the lifeline's incline, which is played by the double bass in a high register. The imitative pizzicato glissandi gestures in the second double bass and violin could allude to the 'imperfect', or 'distorted' rectangle shape (Cardew called rectangles 'square derivatives') that the lifeline is situated in. The subsequent tutti pause clearly marks the absence of the lifeline, whilst also marking the end of a musical section. However, there is another function to the absence of the lifeline, shown at the start of section **D**.

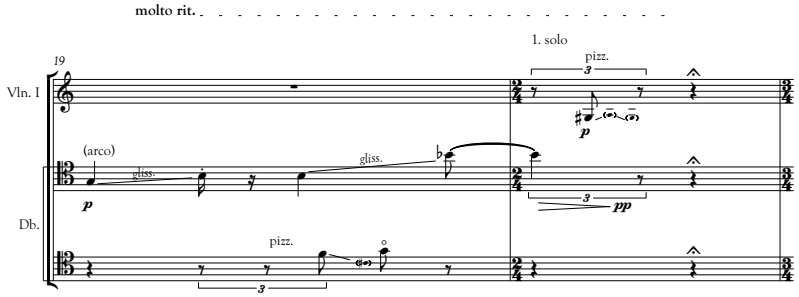


Figure 20. Bun No. 2., bars 19-20 (violin 1, double bass)

Bars 21–27 (D)

The opening of section **D** represents a continued absence of the lifeline, which is demonstrated through the most static harmony in the entire piece, seen in bars 21-26 (Figure 21). The somewhat

jarring shift in harmony, texture, and instrumentation collectively mark this as a new musical section, as does the new metronome mark. If one interprets the lifeline as a stream of consciousness or thought, then its absence would imply a shift or departure from that thought process: a parenthesis. It may also be read as a prolongation of an idea, as if one is stuck, suggested graphically through the contained space of the square derivatives. This static harmony is shown in the electric organ, which holds a single chord (B♭ and F triads, linking back to the dyads at the beginning of section **C** at bar 15) for the entire section. The other material, in the woodwind, is constructed around the number three, creating small motifs that repeat in polyrhythm at either a *piano* or *pianissimo* dynamic. Indeed, the number three is depicted on page 45 of *Treatise*, and Cardew has spoken about how numbers link to repetition (and pauses).[59] This highlights the potential for a parenthetical, or non-linear, interpretation of the section.
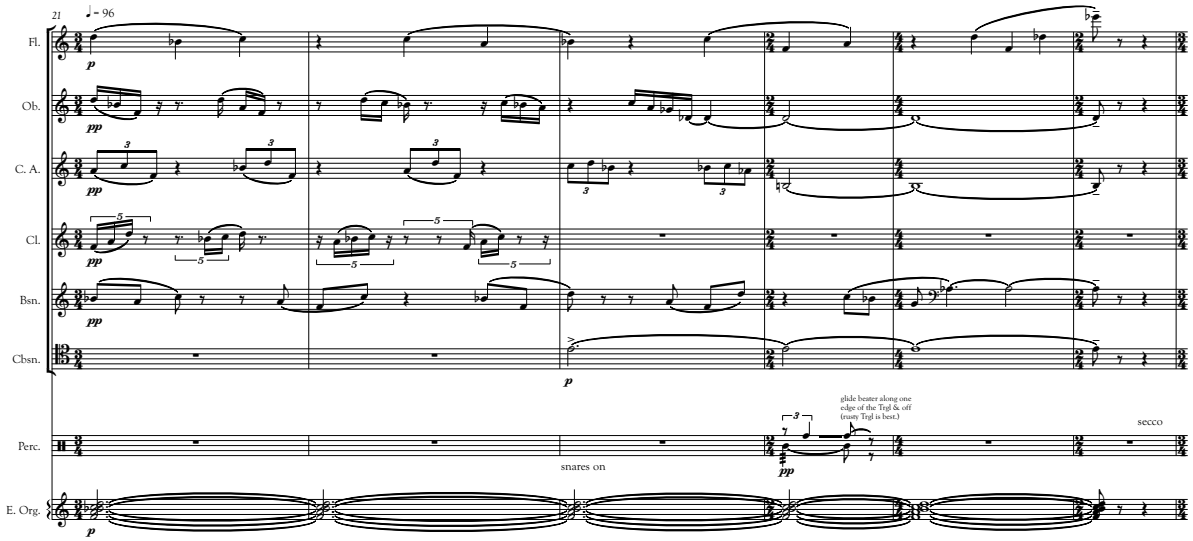


Figure 21. Bun No. 2, *bars 21-26 (woodwind, percussion, organ).*

[59] C. Cardew, *Handbook*, p. x.

The musical effect is quasi-minimalistic, strongly contrasting with the preceding music. The contrabassoon, which initiated the beginning of section **A** (and the whole RICHTIG(1) section), is disruptive, introducing a non-harmony note: E. Following this addition, groups of three begin to change into fours, and the harmony diverges from the static B♭/F chord, after which the section abruptly ends, signified by a return to the previous tempo and the reintroduction of a more diverse harmonic and motivic soundscape. Thus, the lifeline is returned and the music continues as if from bar 20, especially when considering the similar use of drum roll and pizzicato strings in bars 20 and 27, and their complete absence in bars 21-26.

Bars 1–9, FALSCH (1)

As mentioned earlier, despite FALSCH sections being excluded in the first performance of *Bun No.2*, FALSCH(1) is specified as using *Treatise* material, and thus can be included in the current analysis.

Section	FALSCH(1)								
Treatise Page	45							46	
Bar	1	2	3	4	5	6	7	8	9

Figure 22. Structure of FALSCH(1) in Bun No. 2.

The immediate difference when observing page 45 of *Treatise* is the appearance of five 'stave'-like graphics of differing widths and varied position on the page. As in RICHTIG(1), the use of a stave with a clef gave a specific indication of where the musical action may take place. In FALSCH(1), it could be argued that the presence of stave lines themselves, combined with the relative positioning of those lines, creates a registral plan for the page. This is shown below

through the analysis of sustained pitches (i.e. that last two beats or longer), which matches up with the positioning of the staves on page 45 of *Treatise*.

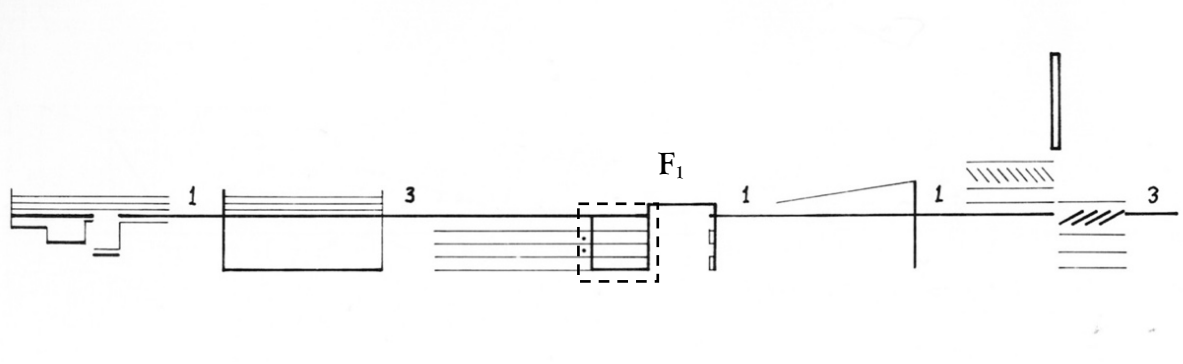


Figure 23. Treatise *page 45*.

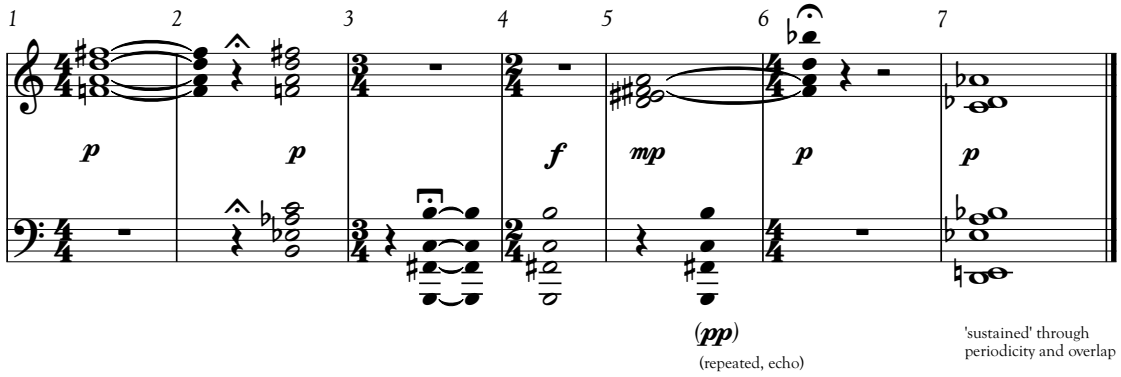


Figure 24. Bun No. 2*, bars 1-7, sustained pitches.*

If one were to begin at the left-hand side of the page, a pitch–time reading could be applied to make sense of the opening material. The static brass material represents the upper stave lines, whilst the high double bass writing matches the shape of the descending bold line. The addition of a dotted line in the double basses to indicate voice leading further matches with the graphic. The numbers in *Treatise*, often thought of as pauses or repeats, are not clear in this passage. One could read the numbers of page 45 as pauses, but this does not make for a consistent reading. It could be argued that, if treated literally in a notated score, this would allow for too easy a tracing of the process, which may affect the camouflage of the piece, thus allowing for accusations of

novelty over substance. The proliferation of pauses within this piece, however, could be a gesture of the interruption of the numbers in *Treatise*, applied to the entirety of *Bun No. 2*.
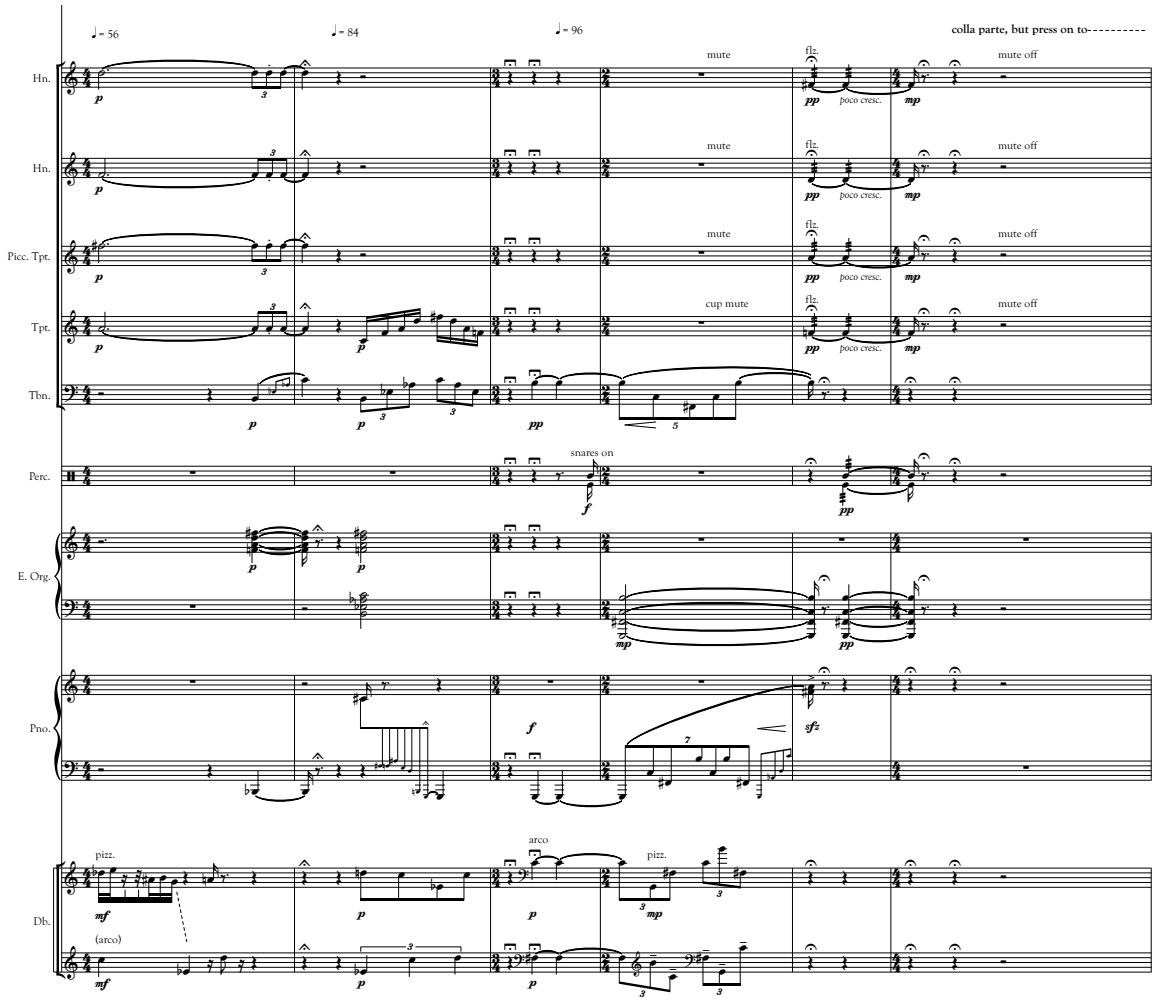


Figure 25. Bun No. 2, *bars 1-6 (excl. woodwind)*

One particularly interesting feature of this passage is the association of musical symmetry to symmetrical graphics, of which there are only two on page 45. The right-hand rectangle, as will be shown later, acts as a dynamic modifier with no position on a stave line. The other is the box with bold lines, marked as $\mathbf{F_1}$ in Figure 23. Reading from left to right, this box exists as part of the stave graphic. The use of bold lines, which signifies the lifeline, implies an important gesture, heralded by two dots which are surely representative of the *forte* percussion attack in bar 3. When

observing this passage, the stave lines mark out specific, registrally fixed pitches, seen in bar 3 in the tenor trombone, piano, and double basses. As the bottom line becomes bold, and the 'perfect' shape is created, all of these instruments play arpeggios of the four pitches, further reflecting the 'bound' of the pitch that the stave implies. These arpeggios are notable for their construction, which compound the geometric perfection. Taking the double basses, one can observe that the second player has the first's material in retrograde (or vice-versa), which implies the creation of a symmetry. This is the first instance of the double basses playing in rhythmic unison, and sharing all the notes of the phrase. Whilst not as clear, the musical contours of the tenor trombone and piano are mirror images of one another (Figure 26).

A particularly difficult passage to interpret is the far-right hand side of page 46 of *Treatise*, here represented in bars 5-7 (Figure 27).

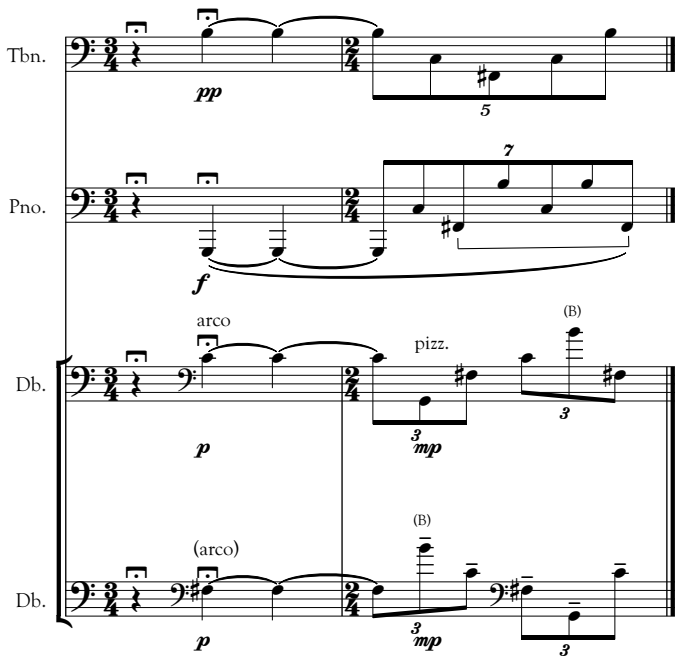


Figure 26. Bun No. 2, *bars 3-4 (trombone, piano, double bass), symmetry and registral fixture.*
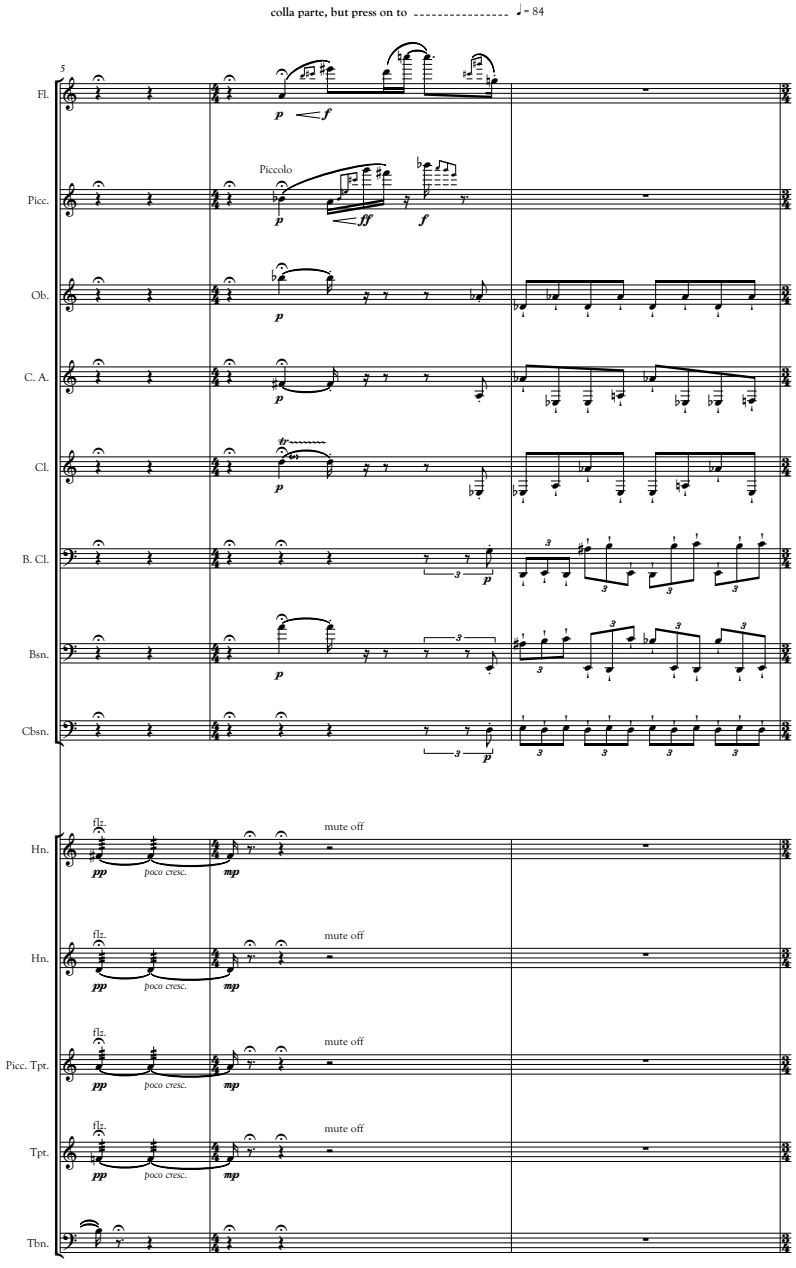
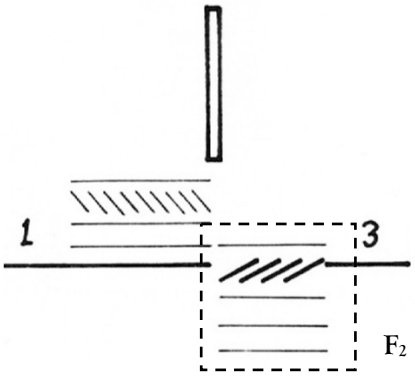




Figure 27. Treatise, *far right side of page 45 (above);* Bun No. 2*, bars 5-7 (woodwind and brass) (below).*

The use of graphics which resemble tremolo markings on a stave are represented as flutter-tongue in the brass. The situation of this graphic next to a rectangle creates a dynamic modifier. Taking Cardew's logic of dynamic contrast in geometric shapes (Figure 5) we can see that, due to the narrow width and tall height, there is a low dynamic level with a high level of contrast: ***pp*** to ***mp***, which is supported by the use of mutes. There is an awkwardness in this interpretation, with Cardew acknowledging the difficulty of realising these kinds of shapes, '[v]ertical rectangles will present problems, as they demand low dynamics with high degree of contrast'.[60] One could assume that contrast is proportional to the starting dynamic, or perhaps that a high contrast can be achieved over a short space of time, as opposed to a longer crescendo which would create a more gradual contrast.

The distortion of the lifeline in bar 7, marked as $\mathbf{F_2}$, performs a similar function to when it was absent in bar 22-26 through the creation of periodicity and static harmony. The distorted shape of the lifeline, now in a tremolo style, is reflected in the musical contouring of this passage, with each repeated quaver gesture generally ascending, but also in the staccatissimo articulation. Indeed, when one considers what a tremolo is, a repetition of attack, this could be seen as a drawn-out reflection of that gesture, which has disrupted the flow of the music. The number three may behave as a metric modifier, creating triplets which are heard clearly against quavers, thus making this 3:2 polyrhythm audibly clear through repetition. Both pitch and rhythm are controlled by symbols that take a creative interpretation to translation, and ones that are not explicitly stated in the *Handbook*, which shows the rich possibilities of combining logical systems with intuition.

The final example to examine, which links neatly to bar 10 and the beginning of RICHTIG(1), is the beginning of page 46 of *Treatise*, here represented by bars 8-9 (Figure 28).

[60] C. Cardew, *Handbook*, p. vi.
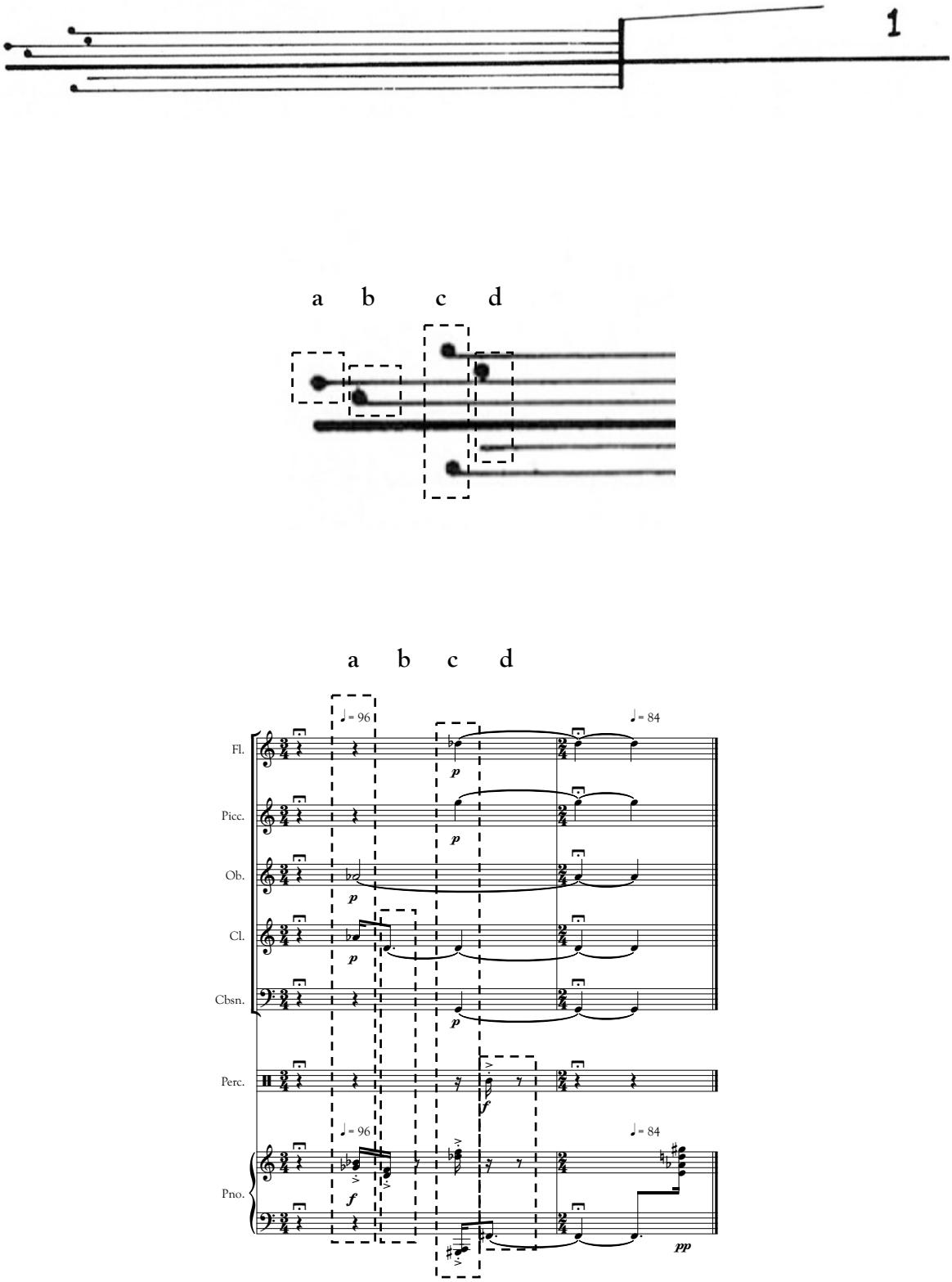


Figure 28. Treatise, *beginning of page 46;* Bun No. 2, *bars 8-9 (woodwind, percussion, piano).*

Here, dots and lines are characterised into two gestures. The dots provide the rhythm, approximated spatially with respect to the graphic, which is accented by the percussion and piano, playing *forte* accented staccato semiquavers. The lines are represented by instruments that can effectively sustain at a low dynamic, here chosen to be woodwind. The woodwind entries are aligned with the piano until the graphic regularity is interrupted by a dot that is disconnected from its line (marked as **d**). At this point, the percussion assumes the role of the piano, whilst the piano joins the woodwind in playing a held sonority (played *forte* to allow for the decay over the pause). Pitch orientation is also maintained in this passage, with the lower dots representing lower pitches and vice versa. The final piano chord in this passage may represent the linear incline before the '1' of the graphic, especially if one understands the tutti rest of bar 10 as a 'pause' (which is the usual implication of numbers in *Treatise*). The contrabassoon entry in bar 10 signals that RICHTIG(1) has begun, and thus ends FALSCH(1).

2.iv. The Implications of Graphical Camouflage in *Bun No. 2*

Having analysed the opening of *Bun No. 2*, this section will consider the implications of how the idea of a 'graphical camouflage' can feed into an understanding of this unique ekphrastic experiment. Indeed, the very notion of camouflage raises the thorny notion of the analytical deduction of ekphrasis versus the composer's gesture of it (as seen in Chapter 1 with Bruhn's reading of Ptaszynska's work). Cardew's convoluted construction of *Bun No. 2* using confounding ideas of the RICHTIG and FALSH sections, as well as allusions to the role of *Treatise*, shrouds the piece in layers of ambiguity. Combining this with the literary Musil references adds a further ekphrastic layer which, in the present reading, acts as a 'justification' of the graphic process and thus aids the camouflage. A graphically ekphrastic reading of *Bun No. 2* is only possible due to the amount of geometric compositional grammars provided by the composer in *Handbook* as well as the linkage to *Treatise* in the score preface, but in stopping short of specifically addressing this

work, Cardew provides an interpretive space to expand and extrapolate his frameworks. It is likely due to Cardew's conception of camouflage that we are not furnished with a more formalist treatise on the connection between graphics and music.

Tilbury describes the works of the mid-1960s as Cardew's 'swansong to the avant-garde' that centred on the need for patronage, recognition, and favours.[61] It is here where the idea of a camouflage can be understood socially, alongside the ways in which it is achieved musically through graphical translation. The ability to be experimental, whilst at the same time appeasing the establishment, proves a difficult balance to strike. Indeed, it might be that *Bun No. 2* represents, to Cardew, a failure in this regard. Tilbury writes that Cardew refused to bow after a performance on December 12th, 1964, due to 'considerable embarrassment'.[62] Arguably, this was a turning-point in Cardew's musical philosophy: graphic notation and traditional staff notation could not be reconciled, and it thusly showed the limitations of contemporary music notation (or at least the inflexibility of it). It is not surprising that there is no further example of such an experiment in graphical translation as *Bun No. 2*. *Bun No. 1*, completed subsequently in 1965 as part of an orchestration course by Petrassi in Rome, did not have any of these graphical tendencies.

The irony of *Bun No. 2* is that it was Cardew himself who was the 'hostile force' that the camouflage was meant to protect from. The translation of *Treatise* into a determinate, singular interpretation clearly proved musically and cognitively unsatisfactory to Cardew. Developments from the late 1960s onwards would seek to define Cardew in more absolute terms, relating to political issues (his conversion to Maoism), and the shift to a more social view of music (centred on improvisation and participation) as well as the denial of the authorial supremacy of the

[61] J. Tilbury, op. cit., p. 277.
[62] Ibid. p. 258.

'artwork'. Arguably, these movements would mean that Cardew's music was less in 'need' of camouflage due to its clear function, utility, and intended audience (e.g. *Song of the Communist Youth Union of Britain* (1979)).[63]

It is worth reiterating that the analysis carried out in this chapter is intended to emulate the thought-processes of Cardew during this compositional period that *Bun No. 2* was situated in, thereby establishing the notion of transmedialisation and the ekphrastic lens. It does not exclude any other analysis of the passage, nor does it claim to be an authoritative reading of the *Treatise* pages. Rather, it hopes to show how one could approach a musical analysis through graphical representations, incorporating logics of geometry and spatial design which find parallels in musical material. This could lead to wider discussions of the possible interactions between graphical ekphrasis and educational tools in analysis and, particularly, composition.

2.v. Potential applications to compositional pedagogy

Whilst it may have been a disappointment to Cardew, *Bun No. 2's* graphical camouflage holds great importance in developing an understanding of how one may synthesise two notational texts. The codification of musical gestures or modifications through universally understood visual ideas of geometric perfection and imperfection allows for bridges to be built across initiated and uninitiated audiences and practitioners. Xenakis, one of the pioneers of using pitch-time spaces (amongst other more sophisticated stochastic processes) as a means of realising graphics, created the UPIC[64] system as a compositional tool that reflected his architectural affinities, but it was soon able to engage the public (particularly children) into the simplest form of his compositional philosophy: drawing sounds. In essence, this was a system in which a person's drawing was

[63] For a more in-depth discussion of the style of Cardew's later music (and repudiation of his earlier works) see T. Harris, op. cit., p. 116-119
[64] Unité Polyagogique Informatique CEMAMu.

encoded into sound, read from left-to-right. An example from one of Xenakis's scores drawn using the UPIC is seen below:

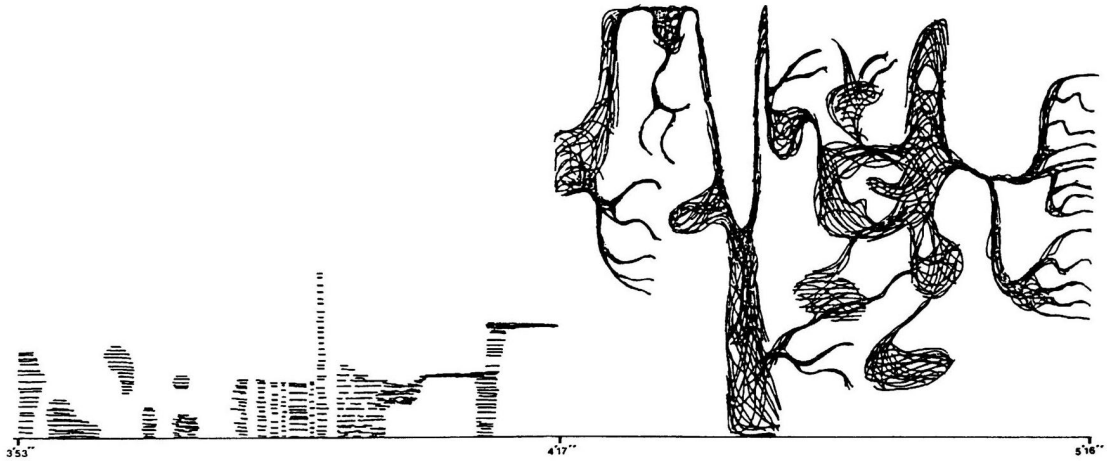


Figure 29. Xenakis, Mycenae Alpha *(1978)*, excerpt.

Rodolph Bourotte and Sharon Kanach have extended this work into the *UPISketch*: an application (on computer, tablet, or smartphone) that aims to modernise Xenakis's UPIC. The application has been available since June 2018, and is now on its second iteration, the *UPISketch 2.0*.

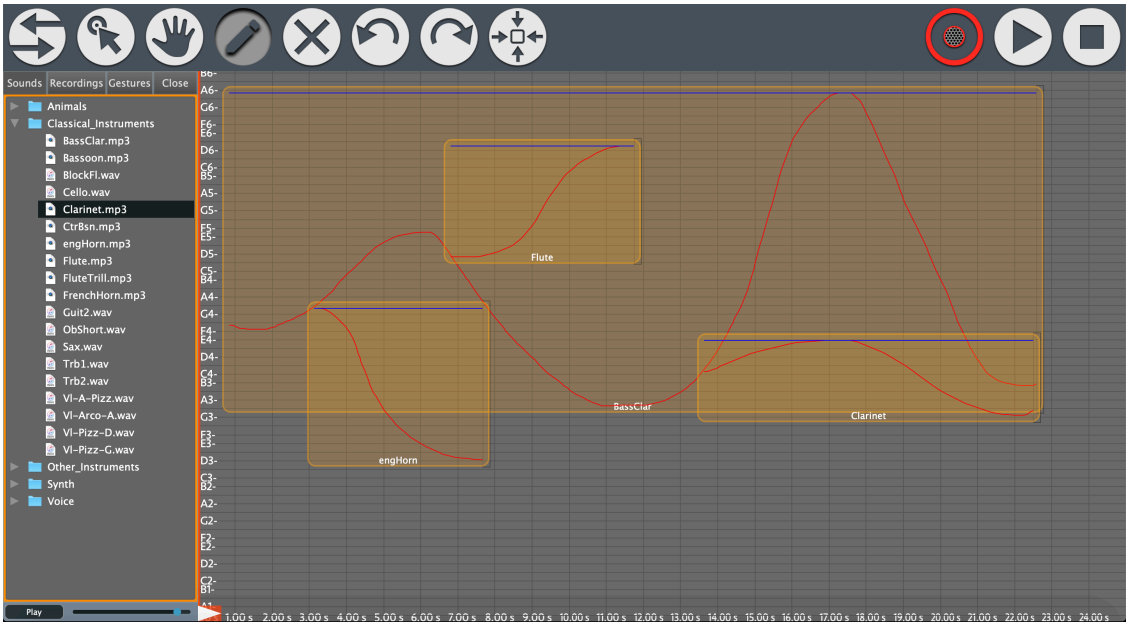


Figure 30. A screenshot from UPISketch 2.0 *demonstrating overlaid curves.*

Bourotte and Kanach have held pedagogical workshops in music composition with children, as well as exporting the technology to European and American colleges. The impact of the *UPISketch* is summarised at the end of their article:

> What we can ascertain is that by introducing the act of composing music to random yet willing participants, demystifying music making through the simple act of drawing and making it fun, all while valorising such creation through Xenakis's example has already contributed to at least generating new potential audiences for new music, however modestly in these very early stages … In all cases, without exception, no one said 'I can't do this'; all participants left feeling newly enabled. There was, admittedly, a significant number of people asking, 'Can we make normal music with it?'[65]

It seems that the ideas put forward by Cardew, codified in *Bun No. 2* and *Handbook*, could find a similar outlet in musical education. One need only look to the improvisation classes at Morley College or the Scratch Orchestra to see that Cardew was invested in musical education and participation, albeit from a political angle. It is arguable that Cardew's logical approach to realising graphics would allow for the creation of so-called 'normal music' in the absence of a need for specialist software that imposes restrictions. A graphic approach to music composition could provide structure and content to composers who have even a basic grasp of staff notation, whilst also moving away from simple pitch-time dichotomies. Whilst discussing the implications of music literacy on children, Michel Hogenes states that '[g]raphical notation of music is a form of *iconic* representation. The use of traditional staff notation is a form of *symbolic* representation'.[66] By equating iconic representations with symbolic ones more explicitly, this conceptual gap may be be bridged quicker. It can be seen that this equation of concepts, or similarity under the new perspective, shares elements of an ekphrastic approach to composition. It provides a way of introducing concepts of formal musical construction to their visual, more widely understood, geometric counterparts. Further work should be carried out into the use of graphical stimuli in

[65] R. Bourotte & S. Kanach, 'UPISketch: The UPIC Idea and its Current Applications for Initiating New Audiences to Music', *Organised Sound*, Vol. 24(3), December 2019, p. 259.
[66] M. Hogenes et al., 'Music Composition in the Music Curriculum', *US-China Education Review A*, Vol. 4(3), March 2014, p. 152.

musical education in order to fully understand the potential of such a method. Indeed, such enquiries should take into account existing educational resources on *Treatise*, such as the Block Museum of Art's *Treatise: An Animated Analysis* (2002).

Through an understanding of how one can approach the translation of graphic symbols into determinately notated staff music, which can then be applied to pedagogy and accessibility, the potential of a graphical ekphrasis can begin to be more fully explored. It is hoped that this will begin to expand the scope of both historical and contemporary composition, providing a fruitful understanding of how logical systems can be constructed by specialists and non-specialists alike to create coherent and engaging music.

3. Graphical Ekphrasis in the Music of Kenneth Hesketh

Having explored how a graphic score can be transmedialised through graphical ekphrasis, the next case study will turn to more recent examples, namely through the work of Kenneth Hesketh. This chapter will explore the graphical impetus in four recent works of Hesketh: *Forms Entangled, Shapes Collided* (2012), *Inscription/Transformation* (2015), *Uncoiling the River* (2018), and *Viae* (2020).[67] It will demonstrate his initial experiments in graphical-hybrid forms, before moving to a discussion of one of the central poetic and functional preoccupations of his work: the labyrinth. Through these analyses, a type of graphical ekphrasis will be demonstrated that uses ekphrastic depiction of *referential* visual images (that is, not abstract as in *Bun No. 2*) in both conception and execution of musical process, with structural provisions to allow for effective metaphorical communication to listeners.

3.i. The Extra-Musical Process in Hesketh's Earlier Work

The use of extra-musical generators in Hesketh's music is wide-ranging. In earlier pieces, like *At God Speeded Summer's End* (2001), a Dylan Thomas text is 'set' without being sung, generating speech-inflected rhythms, poetic 'blurred aural images', and a structure that is influenced by that of the poem.[68] Indeed, this sort of piece would surely fall under a musical ekphrasis in Bruhn's framework, through the transmedialisation of both poetic structure and rhythmic speech content.

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[67] I first became familiar with Hesketh's music during a talk given at the Faculty of Music, Oxford, on 4th November 2019 entitled, '*Alike Dissolving' – Forces of Polarity, Tension and Order in Recent Works*. I noted that his music used graphics as an important creative impetus, and subsequently met with him on 9th December 2019 to discuss these ideas further. Hesketh provided me with access to scores of all the works analysed in this chapter, as well as allowing me access to 81 sketch images sent over through email correspondence. I carried out my own analysis of works with respect to sketches, focusing particularly on aspects of graphical ekphrasis. Apart from a subsequent meeting on 22nd May 2020 to clarify some aspects of the sketches, the commentary presented here is my own, with no further input from the composer.

[68] C. Potter & K. Hesketh, 'Unreliable machines: an interview with Kenneth Hesketh', *Musical Times*, Vol. 149(1905), Winter 2008, p. 18.

Similarly, multimodal projects, such as *Ein Lichtspiel* (2006), use a visual input (in this case a László Moholy-Nagy film from 1930) as a compositional input to create an 'abstract ballet'.[69]

The most prolific feature that infuses Hesketh's work of this period is the 'unreliable machine':

> For me, 'unreliable machines' is both musical concept and humanist statement. In technical terms, I originally worked with short fragments/cells of mechanistic material (reasonably regular in rhythmic profile *so as to be recognised* (if obliquely)) which would be imbedded in subsequent phrases, always in different positions from the original while new material would freely proliferate … In the last eight years or so, this has changed in that the original seeds that initiate such generative processes are unstable from the beginning and are no longer based around short cells, but more on behaviours exhibited by certain types of complexes of material.[70]

The combination of external generators that produce these 'complexes of material', which are subsumed into the mechanistic process writ large, can give us an understanding as to the creative efficacy of such processes. Moreover, this concept highlights a concern with listener perception: it is clearly important to the composer that this is as much a comprehensible sonic process as one of abstract generation. This notion of comprehensibility should be considered when exploring a graphical impetus; visually this may be clear in sketches (and sometimes scores) but can be difficult to understand aurally. What will become clear, however, is how the use of graphical inputs creates a dialectical tension that is audible within the music; the specific input may not be comprehensible, but its musical gesture is clear in articulating both the 'internal' and the 'external' in Hesketh's compositional processes.

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[69] Ibid., p. 20.
[70] C. Potter & K. Hesketh, '5 Questions to Kenneth Hesketh (composer) on his 50th Birthday', *I Care If You Listen*, July 2018. Accessible at: https://www.icareifyoulisten.com/2018/07/5-questions-kenneth-hesketh-composer-50th-birthday/.

3.ii. The Signifying Graphic: *Forms Entangled, Shapes Collided* (2012)

Forms Entangled, Shapes Collided is a work for mixed quintet (alto flute, bass clarinet, percussion, violin, violoncello) in six movements, written in collaboration with choreographer Sharon Watson. According to Hesketh this piece is influenced by aspects of 'evolutionary biology – mutation, copying errors, small cellular division, heredity, high and low fidelity'.[71] The graphical impetus within this piece resonates with these influences, particularly mutation, in its existence as a hybrid of determinate and indeterminate notation. An example of this is given in bars 87-91, where a freely-drawn line is inserted into the cello part, instructing the performer to 'execute a harmonic glissando tremolando, following the suggested contour above the notated pitch'. Roberto Gerhard's *Libra* (1968) provides an earlier example of this indeterminate inclusion in determinate music.

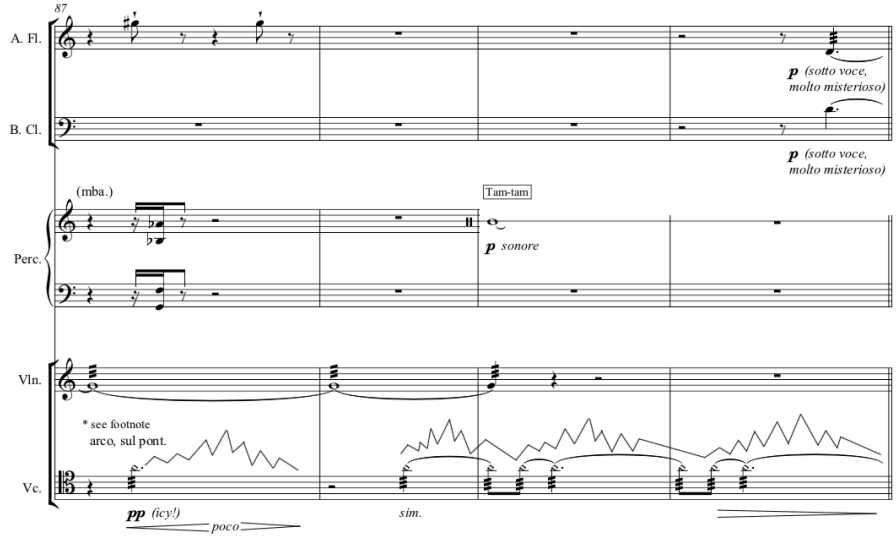


Figure 31. Kenneth Hesketh, Forms Entangled, Shapes Collided*, bars 87-91.*

[71] K. Hesketh, 'Forms Entangled, Shapes Collided', *RCM Research Online*, 2012. Accessible at: http://researchonline.rcm.ac.uk/205/

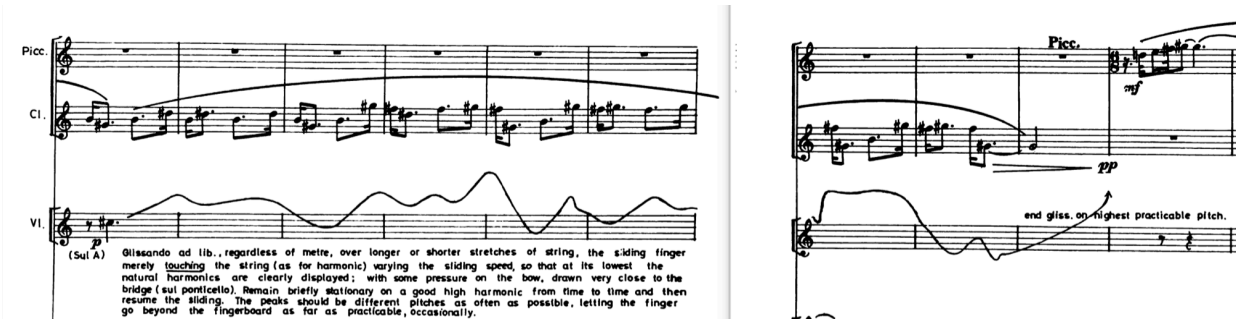


Figure 32. Roberto Gerhard, Libra*, rehearsal mark 55.*

The juxtaposition of these elements belies the idea of fidelity and mutation in the context of the surrounding music. Rather than feeling improvisatory, as may be intended, the sonic effect is one of transformation; the external graphical notation is reliant on the coherence of the internal music to create this contrast. This is especially true when considering that these passages are bridges between movements I, II and VI, which in themselves are *attacca*. The graphical gestures act as structural signifiers, given heightened presence in the sparse texture which contrasts with the rhythmically dense and energetic preceding music; a demonstration of the possibilities of Valle's *ars signandi*. The second appearance, in bars 142-148, is presented in a similarly static texture, and now places the graphic in the alto flute at a higher dynamic level. It is notable that the graphic in this passage is steeper and more jagged, which implies more variation (reflected by the extended dynamic range: ***mf-fff***), as well as the creation of dialogues with other instruments, e.g. the 'brilliante' interjections of the bongos at peaks of the graphic, which tends towards the idea of assimilation. The final appearance of this technique comes much later, in bars 446-454, played by the violin. The ensemble is more rhythmic, but arguably still 'static' in that rhythmic patterns repeat regularly (more so than anywhere else in the piece), creating a stable backdrop on which to foreground the graphical material. The termination of graphical material in bar 543 signifies a change in the regularity of rhythmic groupings, which proceeds to movement VI. It is clear that Hesketh uses the graphic in this instance as a disruptive force, bringing stasis to a piece so concerned with energy and constantly evolving rhythmic drive.
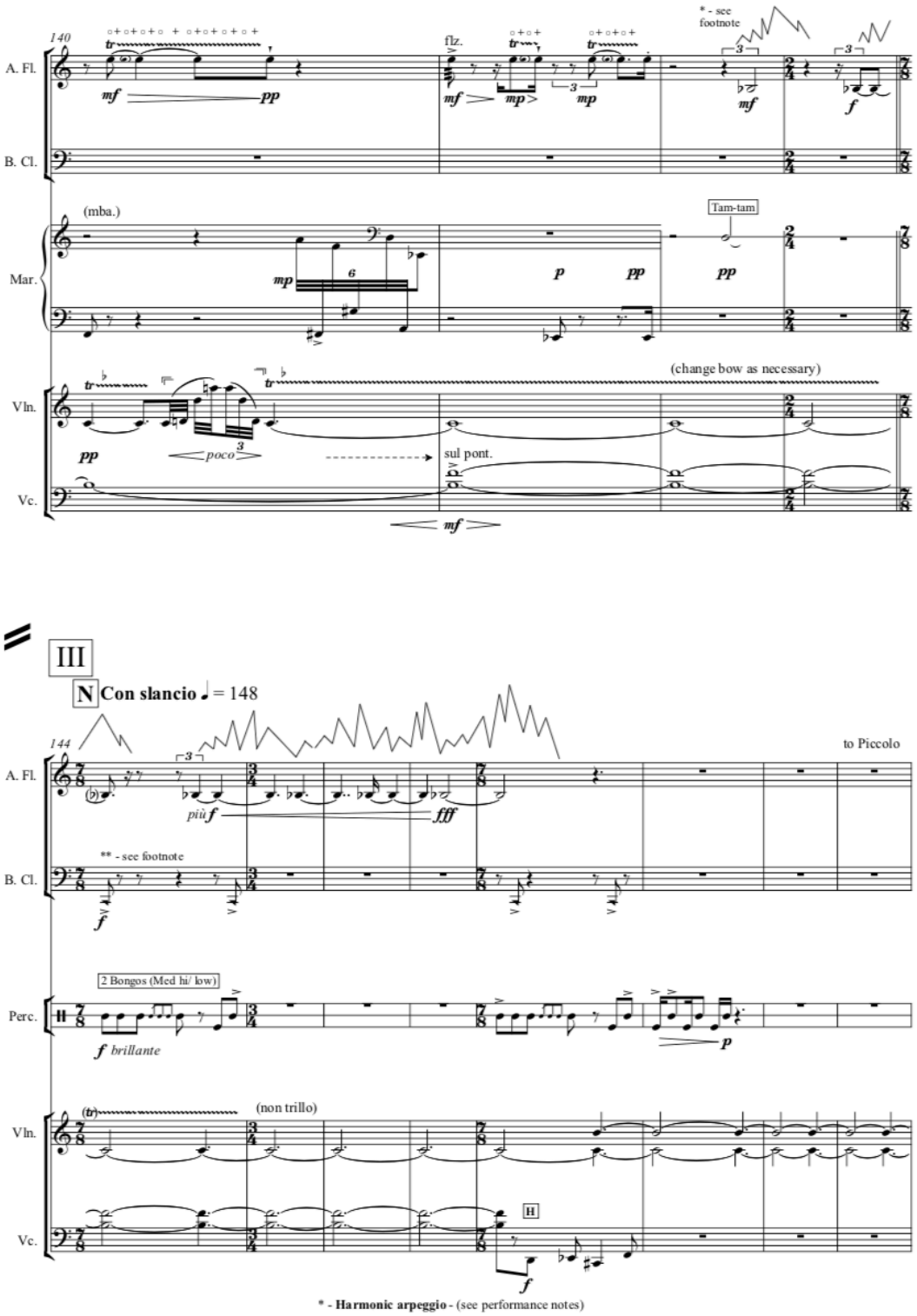


Figure 33. Hesketh, Forms Entangled, Shapes Collided*, bars 140-151.*
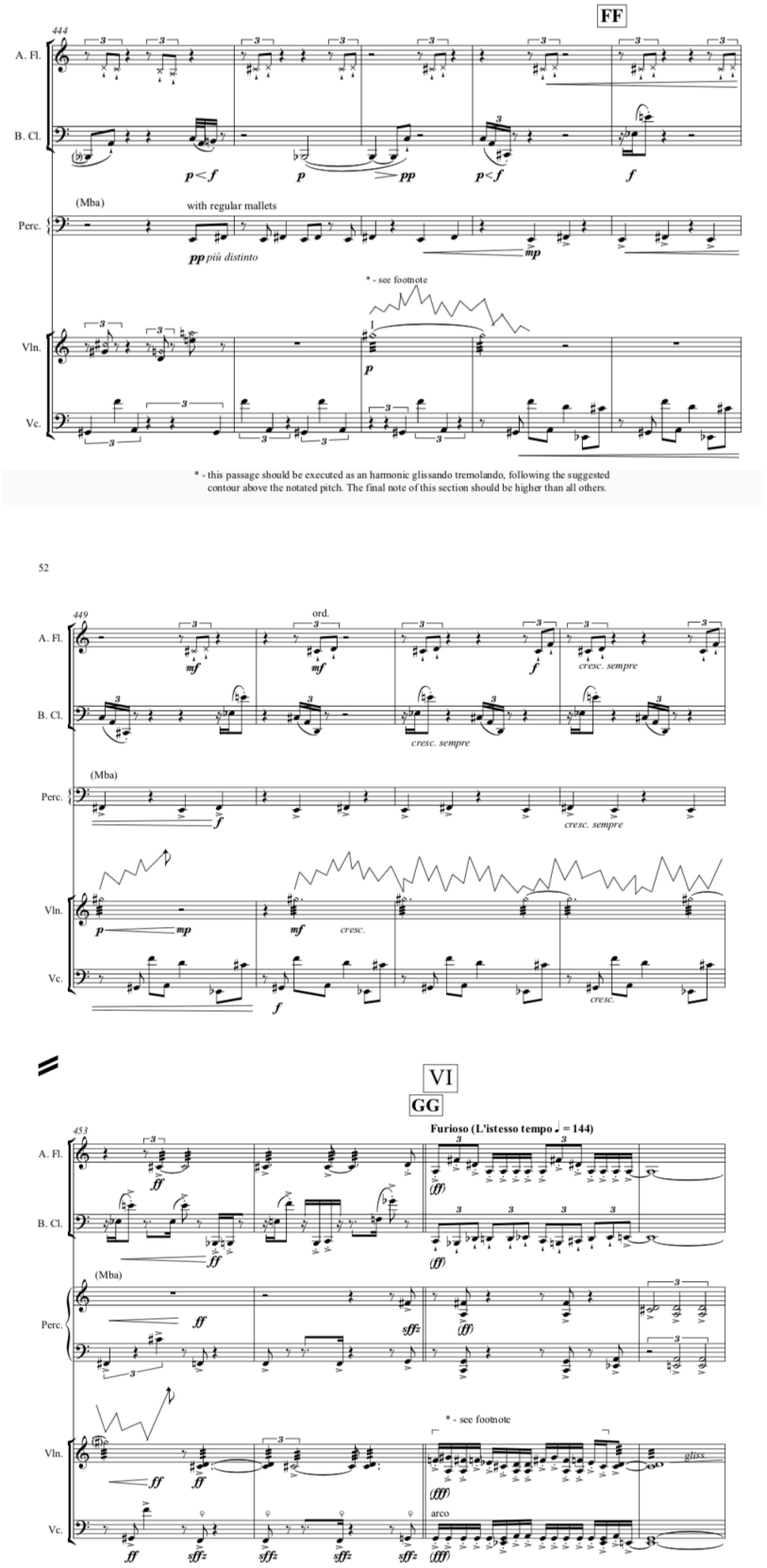


Figure 34. Hesketh, Forms Entangled, Shapes Collided*, bars 444-456.*

The graphical material in *Forms Entangled* can be seen, in its own context, as the point of mutation: a parenthetic moment in which something musically incomprehensible (i.e. highly contrasting in gesture) takes place that affects subsequent developments of the material. A loose counterpoint to this idea can be seen in the contouring of pitch elements, seen in the composer's sketches for this piece. Rather than being indeterminate, it more closely resembles the proliferation of a form, especially considering its overt use in the score. This is a process that finds more explicit usage in *Inscription/Transformation* (2015) and *Viae* (2020), but it is notable to see tentative steps towards graphical contouring as an organising feature of larger-scale musical materials – something used to articulate a graphical ekphrasis.
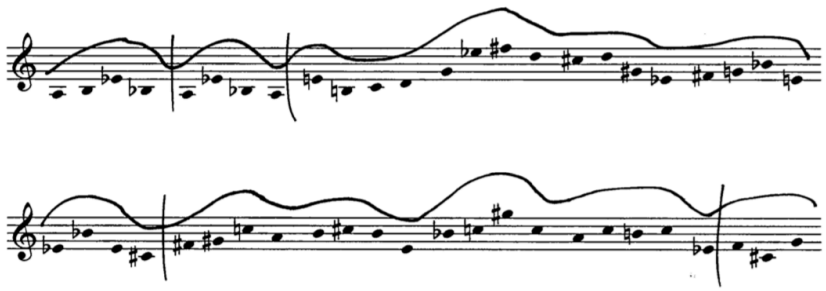


Figure 35. An example of pitch contouring in sketches for Forms Entangled, Shapes Collided.

Another contemporary example exploiting this context-driven graphical tension can be seen in Martyn Harry's (b. 1964) String Quartet No. 3*, Borderline* (2018), a political piece that explores the tension of Brexit through the use of the Irish border as graphical input. This input is more penetrative, informing nearly all aspects of the work's composition, mostly in a determinate fashion (utilising pitch-time spaces and chord multiplication etc.). However, much like Hesketh, Harry inserts graphics (sections of the Irish border) into the score, creating a hybrid of indeterminate and determinate notation (Figure 36).

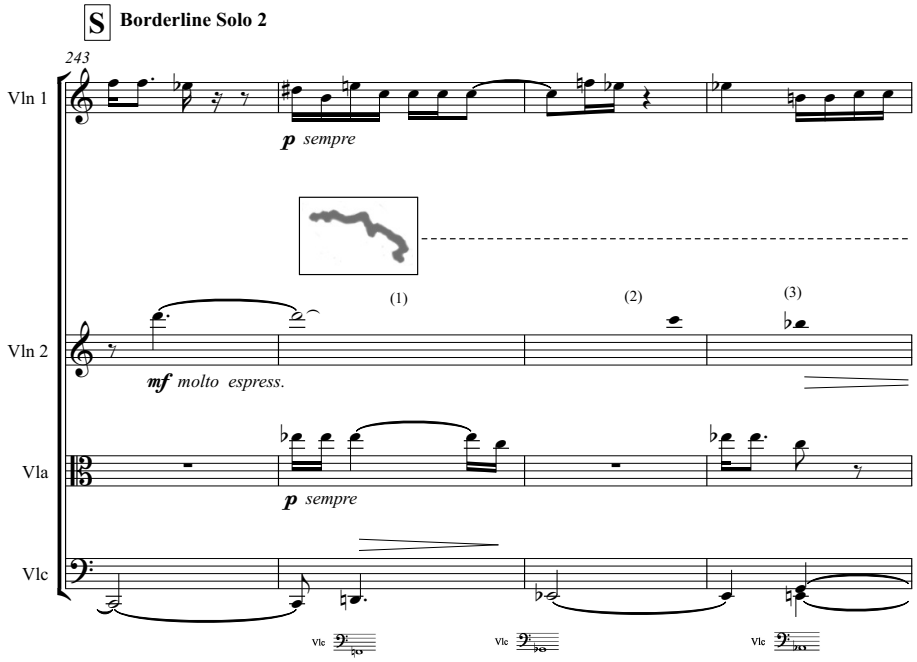


Figure 36. Martyn Harry, String Quartet No. 3, 'Borderline', *bars 243-246.*

Framed as 'Borderline Solo' or 'Duet', these passages utilise the glissandi available to string instruments as a sonic signifier of change, or tension. The inclusion of these microtonal inflections contrasts with the 12-tone music that informs the entire work. Unlike Hesketh, Harry uses referential pitches to control the trajectory of the performer, since these glissandi are easier to control, modulating pitch linearly and slowly, rather than through a filtered harmonic series. Framed poetically, these graphical insertions mark the only element of the work that presents the graphic overtly in the score and thus, it could be argued, are more 'true' or 'direct' than other iterations which are hidden by the mediations of the composer. Harry describes these sections as sounding 'like distant air-raid sirens',[72] strengthening the metaphor of conflict through the use of indeterminate glissando figures, whilst also providing another sonic manifestation of the border itself; a graphical ekphrasis. Whereas Hesketh's graphical hybrid can be seen as mutative, Harry's can be seen as a rupture, or breakdown, both musically – through the relegation of compositional

[72] M. Harry, 'String Quartet No. 3, *Borderline*', Oxford, Oxford University Research Archive, 2019. The full score can be viewed here: https://ora.ox.ac.uk/objects/uuid:cf1d01c7-8834-428a-97d0-71c971ad0c9a.

control and inclusion of microtones – but also poetically, in the breakdown of diplomacy which leads to war through the sonic signifier of an air-raid siren.

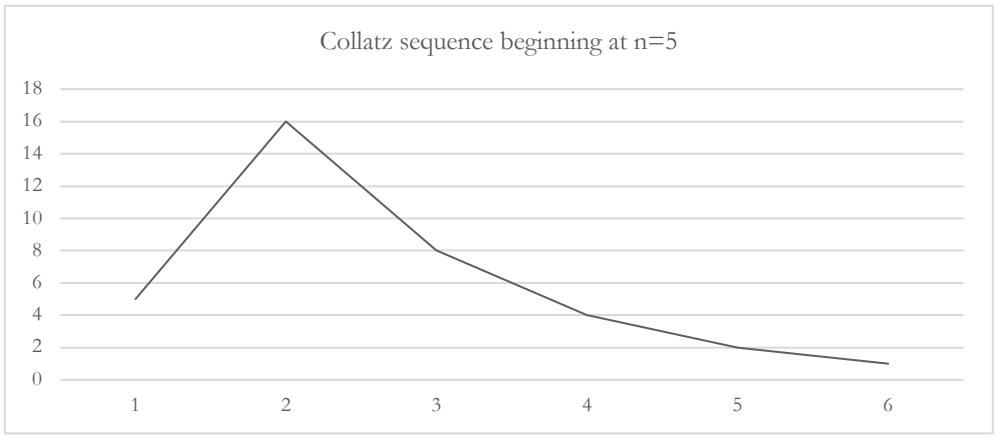
3.iii. Graphic as Extension of Numerology: *Inscription/Transformation* (2015)

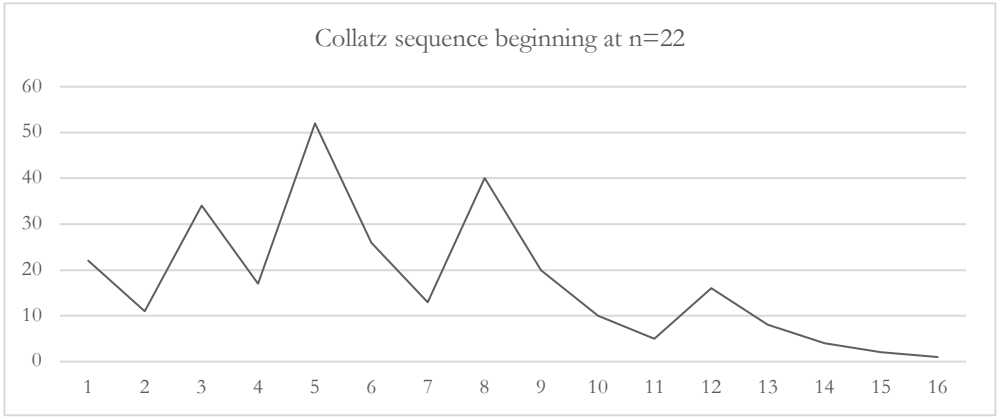
Inscription/Transformation is a work for solo violin and orchestra, dedicated to the memory of both Henri Dutilleux (Hesketh's former teacher), and the composer's grandmother. Its main technical premise is the use of numerical sequences that result from the Collatz conjecture.[73] The use of this mathematical construct is significant as it is one of convergence (or termination) and repetition; the sequence will always eventually yield an infinite cycle of 4-2-1-4-2-1 (since 1(3+1) = 4; 4/2=2; 2/2=1 etc.) – similarly echoed by the score's subtitle, 'as I am now, so you will be'. Hesketh cites a re-evaluation of his concept of the 'unreliable machine' in works dating from 2012-2017 onwards, stating that:

> The idea of the unreliable machine has morphed into a wider concept concerning the inevitable failure of the somatic self, as well as the progression of that failure.[74]

The use of Collatz sequences in *Inscription/Transformation* fits with this idea of 'inevitable failure'. Indeed, it could be extended to encompass the mutative, transformational use of graphical insertions in *Forms Entangled*, particularly from the idea of 'progression', and the increasing use of software-assisted composition in Hesketh's recent music (*OpenMusic*, *LMusix,* etc.). The Collatz sequence is a numerological construct that may be represented graphically. Hesketh uses the death date of Dutilleux (22/5/2013) to generate three Collatz sequences, represented graphically below:

[73] Also known as the Hailstone conjecture. Choose any number, n. If n is odd, multiply by 3 and add 1. If even, divide by two.
[74] C. Morris & K. Hesketh, 'Kenneth Hesketh at 50 Interview', *Composition:Today*, 11 July 2018, http://www.compositiontoday.com/interviews/kenneth_hesketh.asp.





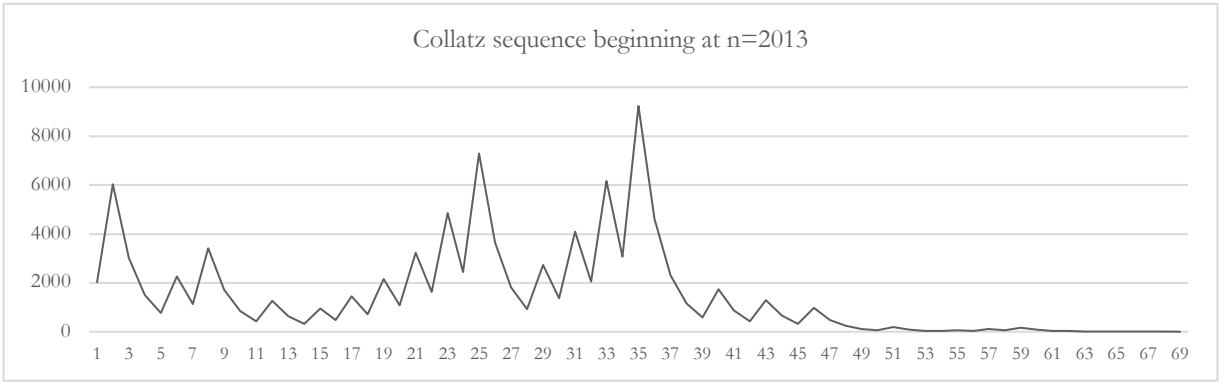


Figure 37. Graphical representations of Collatz sequences, using n=5 (top), n=22 (middle), and n=2013 (bottom).

This creates three graphical representations that indicate differing levels of volatility. The use of multiple data sets allows for the layering of one graph on another, or simultaneous use of the graphics. This is shown in Figure 38, taken from the composer's sketches.

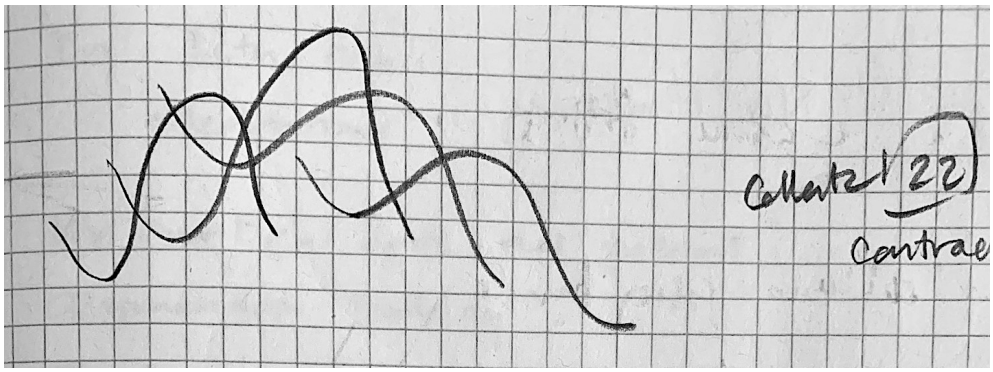


Figure 38. Overlaid curves in Hesketh's sketches for Inscription/Transformation.

Hesketh's approach to this data, however, is more flexible: he uses its numerical elements to generate pitch and harmony and the graphical element to determine rhythmic profiles of orchestral groups as well as melodic and harmonic contours. In an extension from *Forms Collided*, the generation of contours is now derivable from the graphs, which could be thought of as three broader representations of entropy – low, medium, high – rather than accurate 'point-to-point' *sonifications* of the data within the graph itself; essentially taking shape over content.[75] Figures 39 and 40 show examples from Hesketh's sketches in which contrasting contours, using high (n=2013) and (low n=5) graphs, are visible.

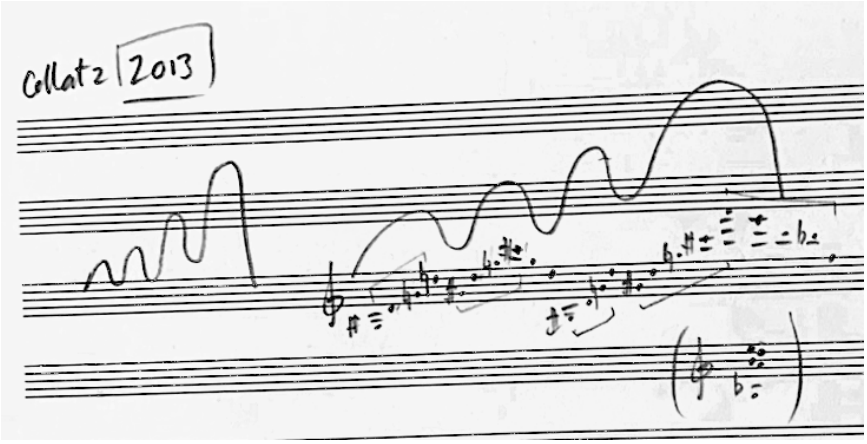


Figure 39. Contouring of a pitch set using a Collatz curve [2013].

[75] For more on the combination of 12-tone composition and data sonification, see T. Metcalf, **'**Graphical Data Sets as Compositional Structure: Sonification of Colour Graphs in "RGB" for clarinet and piano', *Leonardo*, 54(3), June 2021, pp. 329-336.
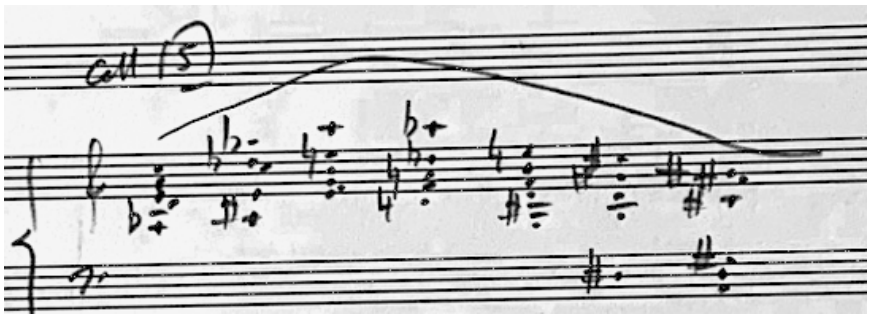


Figure 40. Contouring of pitch sets using a contrasting Collatz curve [5].

The use of what Hesketh deems 'axial symmetries' in his concept sketches (inversions about a central pitch) demonstrates how the curves can be used both for pitch generation and for contouring. The incorporation of 'unreliable machine' gestures can highlight and saturate the contouring of the curve.

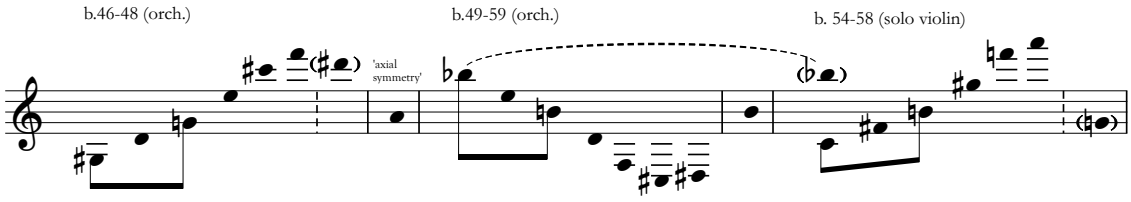


Figure 41. Hesketh, Inscription/Transformation*, harmonic analysis of bars 46-59.*

From bar 43, the solo violin plays a pedal A (the axial symmetry pitch) that bridges into a passage of reduced orchestration from bars 46-48. All material in this passage utilises imitative gestures following the vibraphone and violin II, which play repeated material of differing lengths (2 and 3 beats respectively). Violin II more closely resembles the Collatz contour and is distinguished through use of pizzicato, which is reflected echoed in the other string parts (oscillating up and down), whilst the vibraphone and harp play generally ascending material using the specified pitch-set seen in Figure 39. This suggests the presence of multiple contours, or an overlaying of graphics, on a micro-level (in individual parts), through the filter of a pitch set (present in all

parts), to become reflected through an axial symmetry determined by the solo violin. The use of multiple graphical contours is a way to navigate the static harmonic rhythm (which is dually reflected in the violin pedal), providing rhythmic variety whilst also creating a tension which is resolved at bar 49.

Disruptive elements are introduced in the vibraphone, whose repeated group is interrupted by the axial symmetry pitch (A) at the start of bar 48 (Figure 41); this coincides with the peak of the curve in violin II and the harp, like the interjections seen in *Forms Entangled*. Similar disruptions can be seen in the first clarinet, which moves from echoed doubling patterns of violin II, and antiphony with the second clarinet, to a passage which pushes outside the harmonic boundary and becomes independent. The reinstatement of the axial symmetry pitch in bar 48, reinforced by the celeste in three octaves, signals a harmonic shift into bar 49, where the pitch set is inverted about A, as seen above. The graphic of the oscillating, yet ascending, curve is now mirrored to create a set of motifs which are contoured by a descending part of the curve (Figures 43 and 44).

Indeed, from bar 49, the idea of a failing machine is sustained through the use of shorter, repeated phrases articulated by the solo violin, playing 'grinding' dyads. These dyads are made up of the pitches that are not shared between the harmonic groups before and after symmetrical rotation (as indicated by the beamings in Figure 41). Furthermore, the solo violin moves through harmonic groups independently of the orchestra, reflecting an axial symmetry around B, but does this with a delay. The retention of the B-flat, at the same time as the introduction of C in the 'grinding' dyad of bar 54, marks the collision of two pitch sets and is resolved in bar 58, when the B-flat becomes a B-natural (Figure 45). The volatility, periodicity, and symmetry of the curves also serves as an impetus for termination; the use of variation and glitch is implicit in Hesketh's unreliable machines and heightens the notion of 'failure' through an ekphrasis of the graphical inputs.
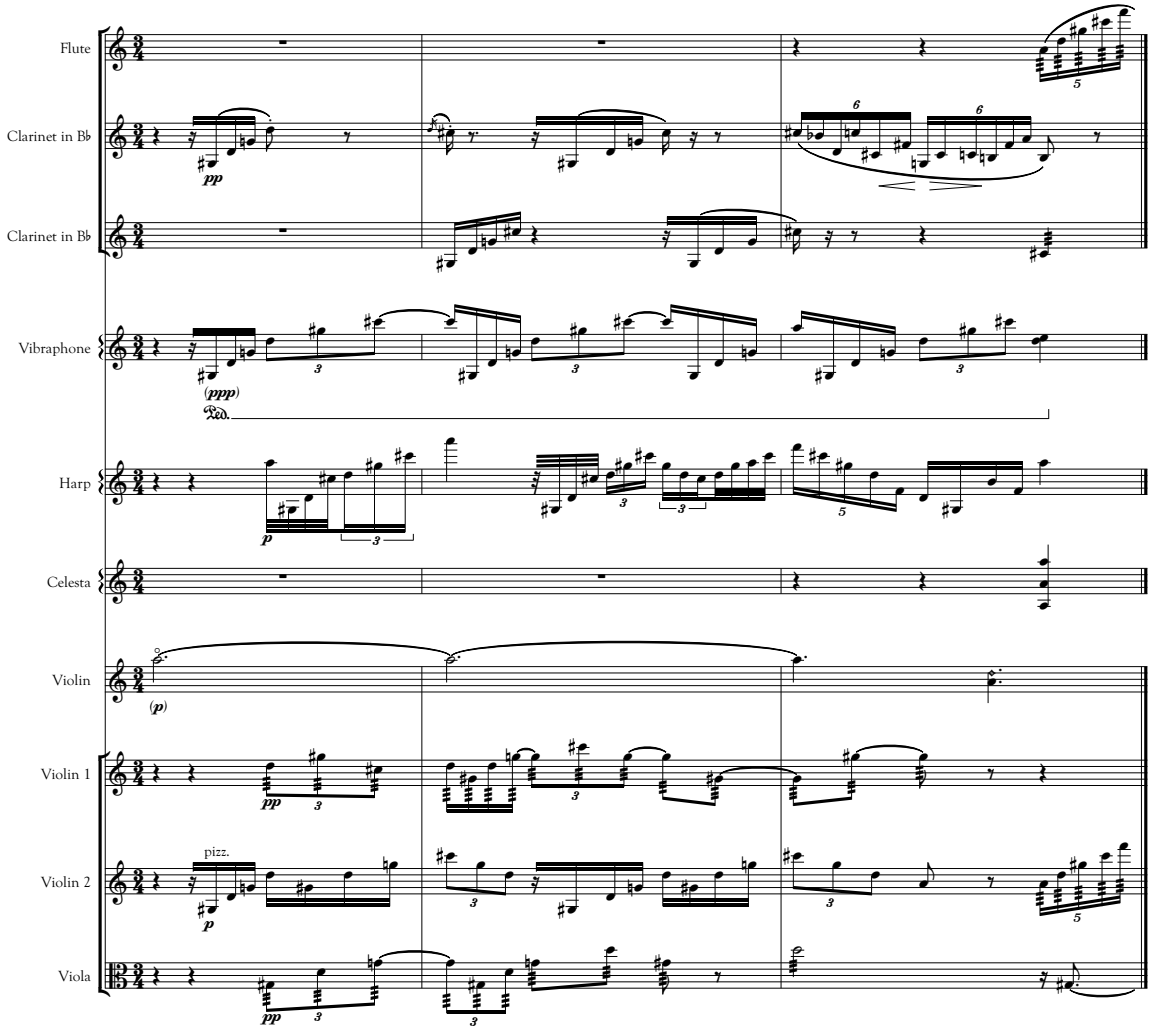


Figure 42. Hesketh, Inscription/Transformation, *bars 46-48 (reduction).*

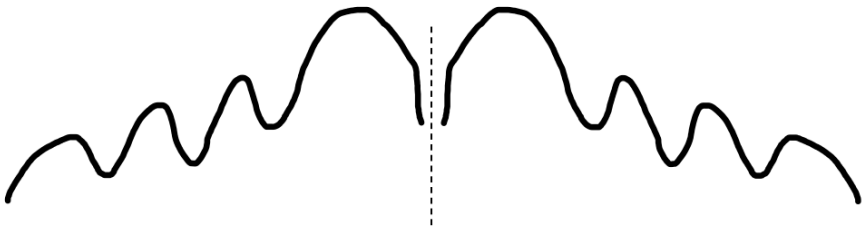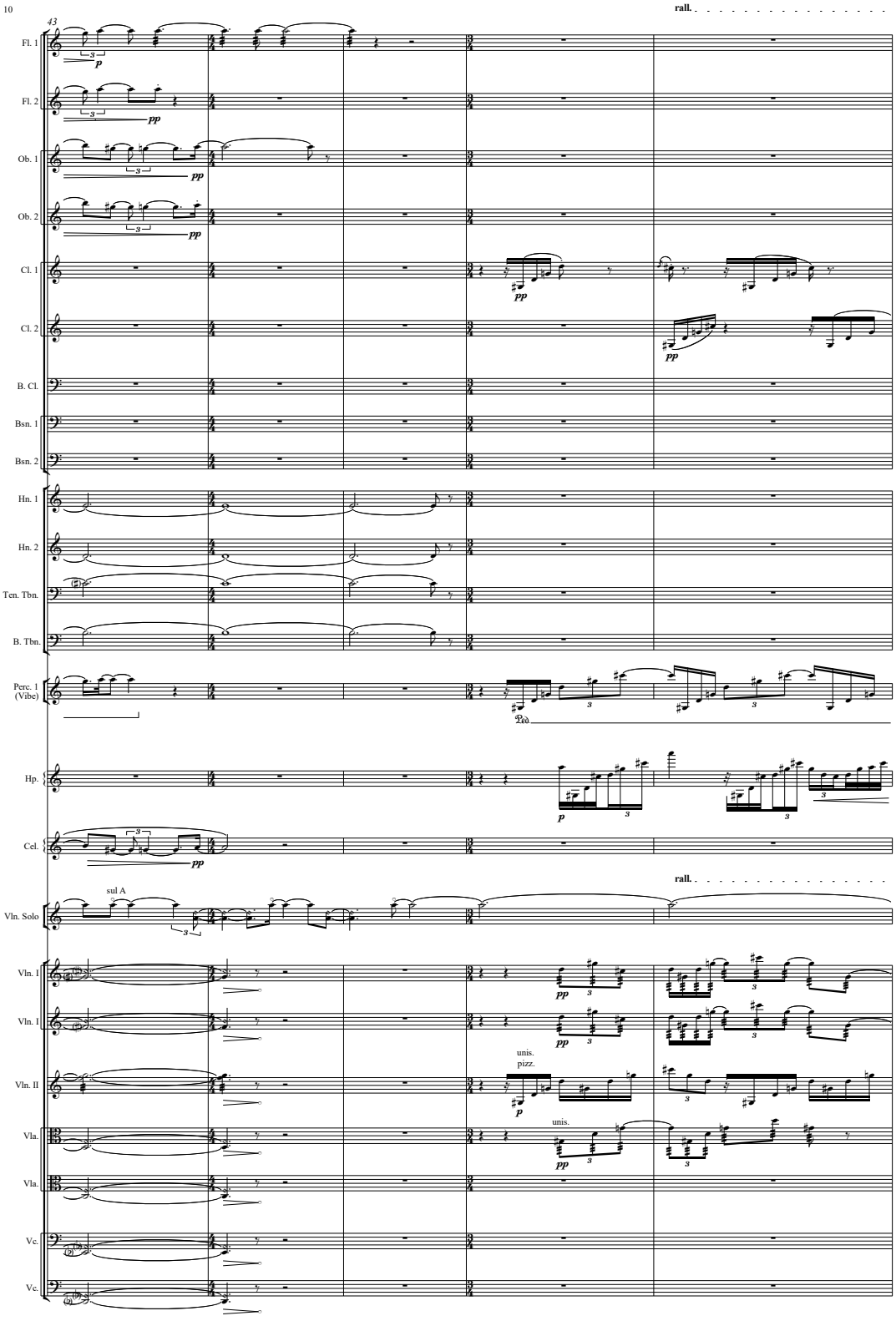


Figure 43. Graphic representation of pitch contouring in bars 46-52 of Inscription/Transformation


10
43
rall.
Fl. 1
Fl. 2
Ob. 1
Ob. 2
Cl. 1
Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
Hn. 1
Hn. 2
Ten. Tbn.
B. Tbn.
Perc. 1 (Vibe)
Hp.
Cel.
rall.
sul A
Vln. Solo
Vln. I
Vln. I
Vln. II
unis.
pizz.
Vla.
unis.
Vla.
Vc.
Vc.
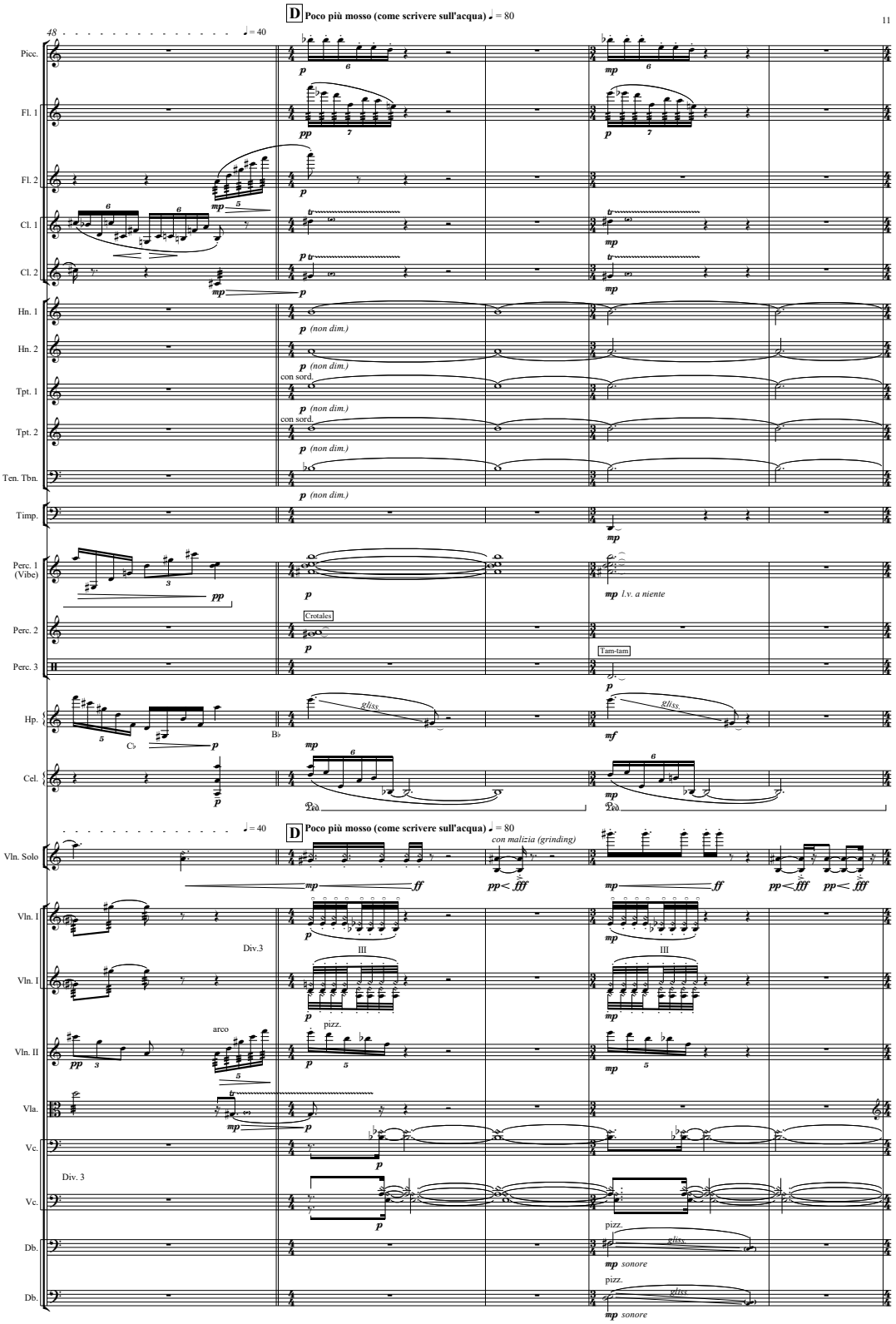


Figure 44. Kenneth Hesketh, Inscription/Transformation, bars 43-52.
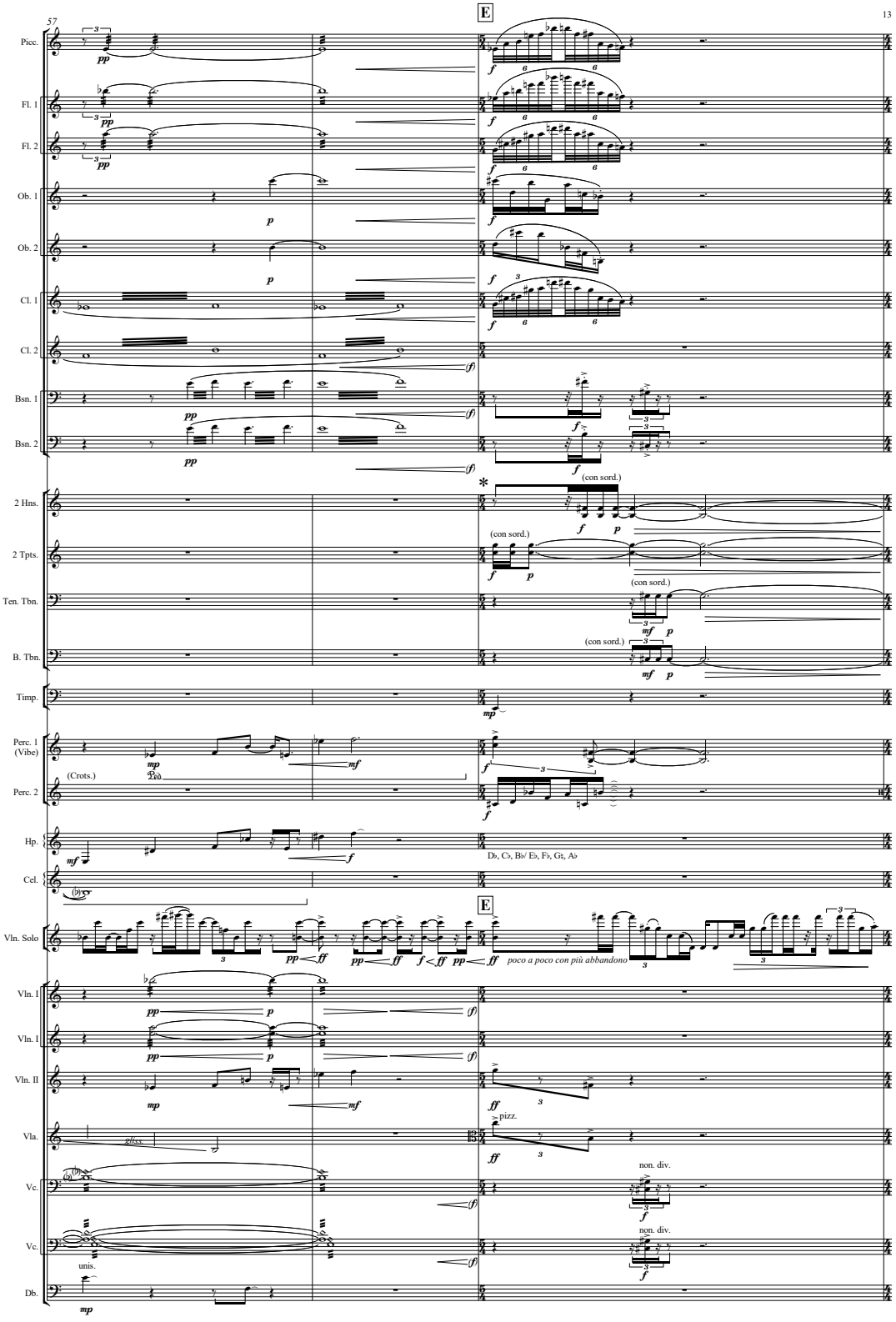


Figure 45. Hesketh, Inscription/Transformation, *bars 57-69.*

Hesketh also uses curves to determine orchestral rhythmic groupings. Each peak of a curve represents another pulse within the section, and at bar 135 this occurs at three levels. An illuminating sketch is shown in Figure 46. This process, unlike the approach to pitch, is quite approximate, dividing bars spatially to determine the point at which the attack is repeated, and the use of graphics is also more generalised, suggesting a 'high'/'low' energy graph rather than being suffused with the numerical data itself. This process is present at the micro-level too, with the rhythms of the 'machines', or seed material, of bars 46-48 and 63-71 being derived from similar approximations of curves. It is clear in Figure 46 that the high energy graph (or n=2013) is in the woodwinds, although the division of the bar into manageable units introduces further imprecision and redundancy. This could be seen as another example of mechanistic failure; an excess of information that cannot be processed as neatly as the lower energy graphs, seen in the internal homophony of the brass and string sections.

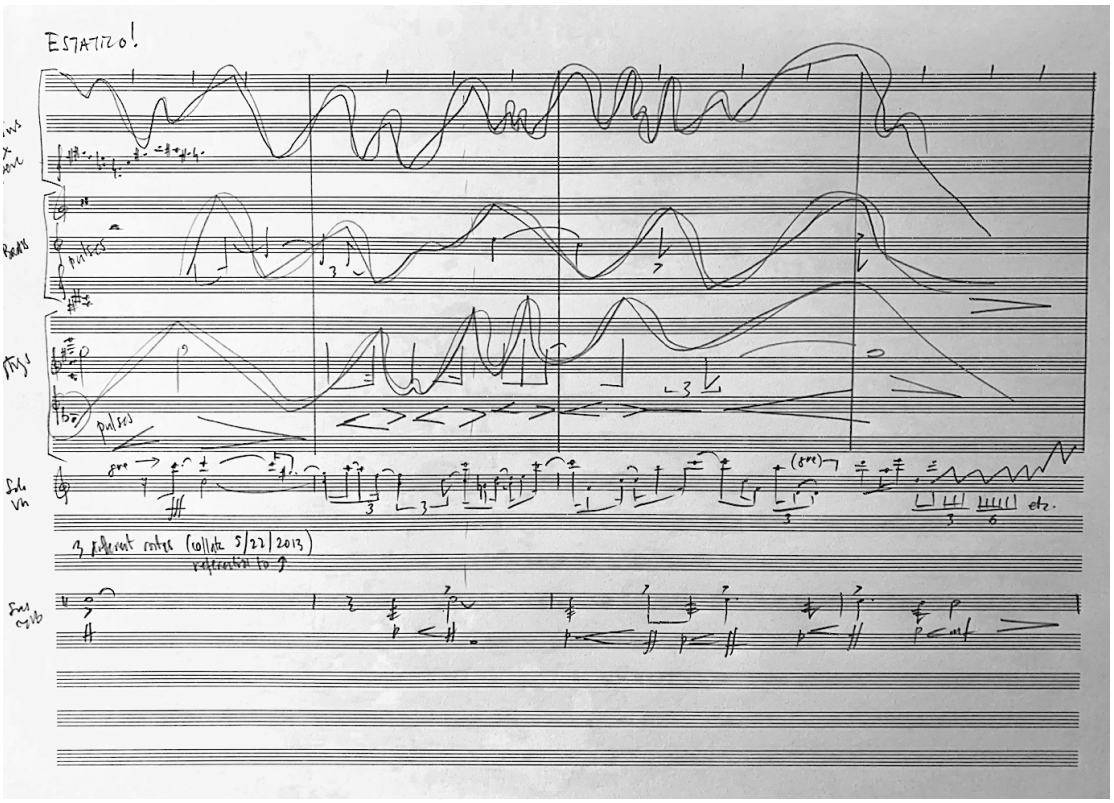


Figure 46. Sketch version of bars 135-158 in Inscription/Transformation.
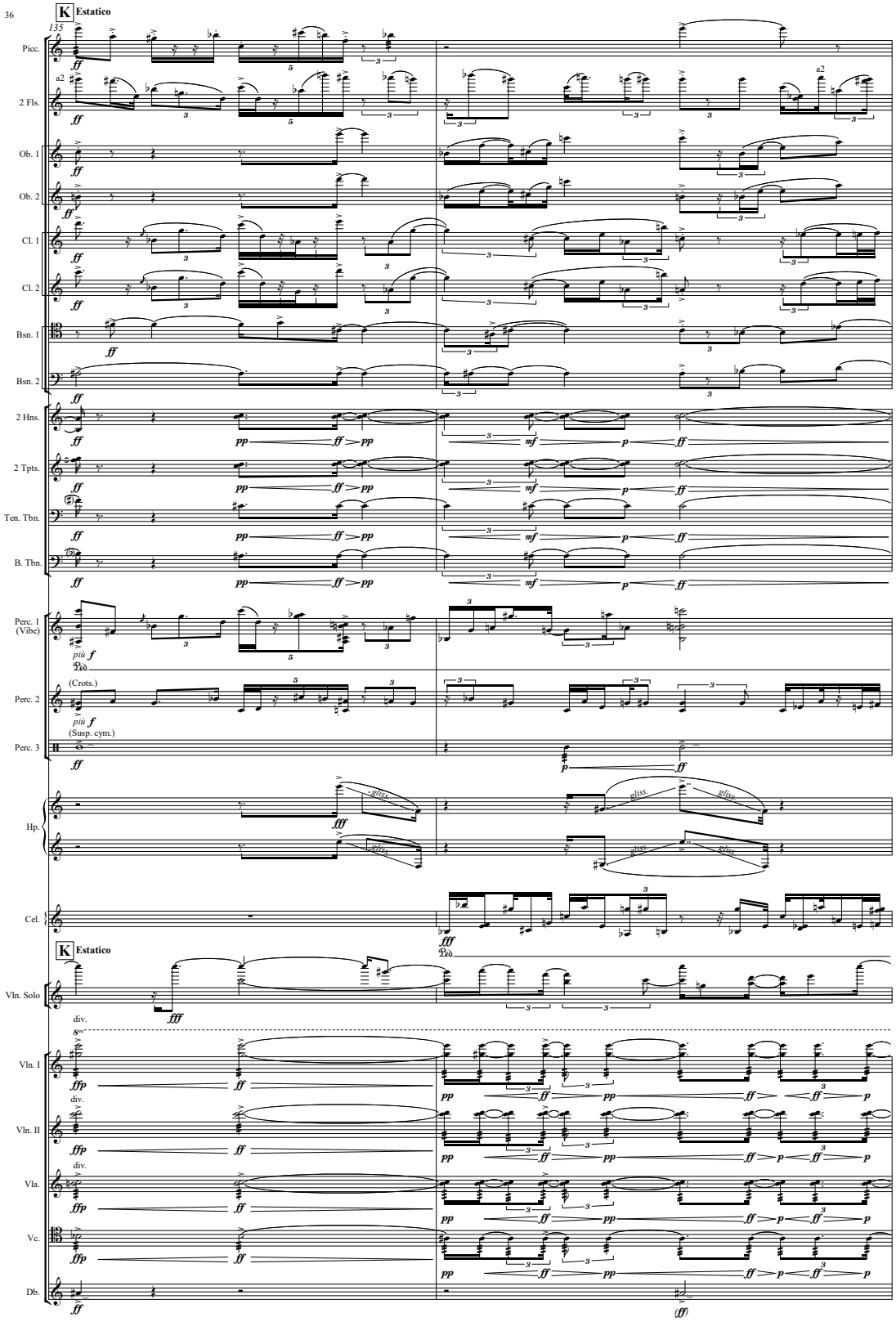


Figure 47. Hesketh, Inscription/Transformation, *bars 135-136.*

At the opening of the work, the brass play sparingly, quiet and static until they become more agitated at bar 59, but even then they play repeated chords rather than melodic lines. This changes at bar 67, where the brass become more foregrounded, with an imitation of the approximated curve rhythm heard initially in strings and vibraphone at bar 63. The composer's sketches mark this harmonic sequence (bars 67-69) as 'Coll[atz] 5' (see Figure 40). In later appearances of the brass material, however, it becomes clear that more than one graph is being used. The harmonic contour here is representative of a low energy graph, or Collatz 5, but the rhythmic and gestural suggestion (the strict homophony and ***ff*** dynamic) is one of much higher energy. Again, it would seem that the graph is being detached from its numeric source and its general shape prioritised.
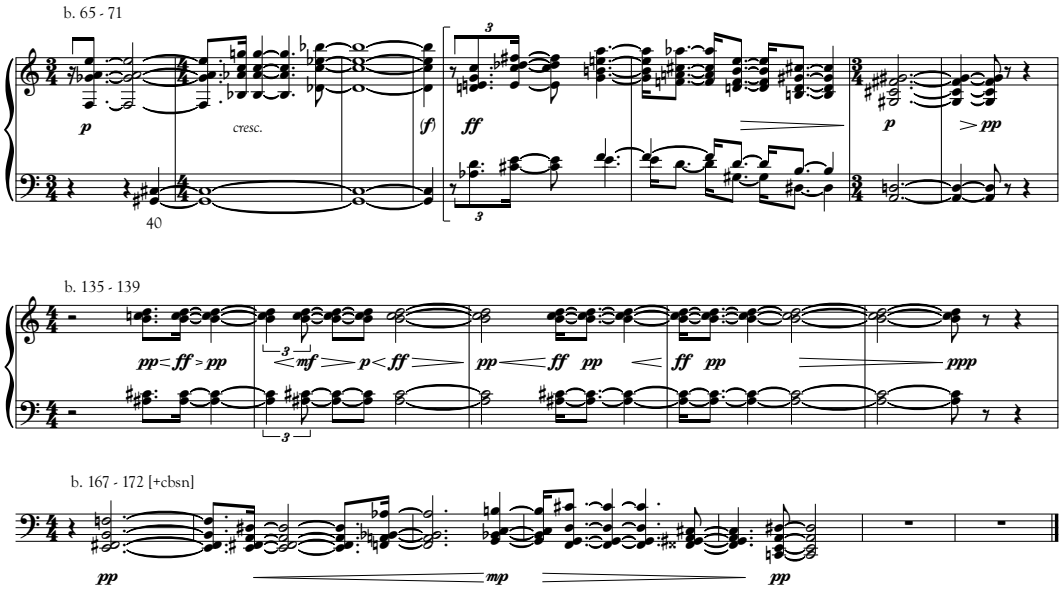


Figure 48. Hesketh, Inscription/Transformation, *reduction of brass 'choral textures'.*

A further example of graphic contouring can be seen in bars 135-139. From a harmonic perspective, this has zero energy: it is a constant sonority. From a dynamic perspective, however, there is a constant flux: an implication of high energy. Mapping the dynamic levels across this passage at the unit of a semiquaver (taking ***ppp***=0, ***ff***=6) yields the graph shown in Figure 49.

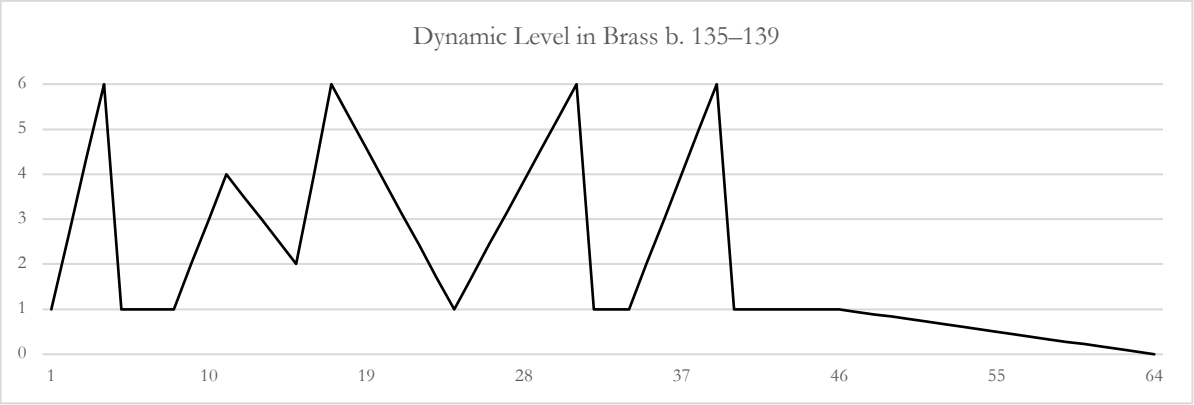


Figure 49. Graphical representation of dynamic levels in the brass section from bars 135-139 of Inscription/Transformation.

This graph is similar to both n=22 and n=2013 in shape, but the rapid alternation between extreme values suggests a wider data range, hinting that it is the latter. There is a combination of zero energy and high energy operating across different parameters. The use of multiple musical parameters enables Hesketh to use his graphical contouring process to fulfil traditional notions of 'rates of change' in compositional design.

The ekphrastic reading of *Inscription/Transformation* relies on the notion of the decentralisation of the artwork, one of the tenets of graphical ekphrasis highlighted in Chapter 1. This piece is an expression of mechanistic failure, one which uses representations of failure derived from the Collatz conjecture as its transmedial input, i.e. a *specific* yet non-artistic concept. As such, the graphical ekphrasis of Collatz curves, as well as referential or cultural notions of failure (e.g. the 'grinding' dyad), results in a transmedialisation of the numerological concept as well as its characterisation of entropic curves, and thus an ekphrasis of its terminal nature.

3.iv. Traversing the Labyrinth

For Hesketh, the labyrinth is the culmination and consolidation of the graphical impetus that began in *Forms Entangled*. A useful contrast that illuminates Hesketh's specifically ekphrastic form

of graphical composition is found in another contemporary exponent of the labyrinth: Harrison Birtwistle (b. 1934). In his discussion of the labyrinth within modernity – initially in Monteverdi, but then in complex urban spaces of the 20th century – Julian Johnson addresses Birtwistle's *poetic* usage of the labyrinth as a significant feature of his music. After discussing its significance in Birtwistle's musical 'staging', Johnson makes the important distinction that 'Birtwistle's metaphor originates from the musical process, *not* from any concern with representation'.[76] In Hesketh's case, the derivation of musical materials from specific elements of particular labyrinth types, using graphical representations, can create music which acts as a more empirical and specific elucidation of a labyrinth; the musical ekphrasis is scaffolded by the graphical ekphrasis of the constituent materials. Through a combination of these ekphrastic notions, the musical dialectic of 'internal and 'external' is more focused in a shared musical representation, both as formal process and sonic affect. Birtwistle's music is *labyrinthine* in conception, but the generative process in the music does not utilise the specific attributes and shapes of specific labyrinth formations: it is a metaphor of convolution, myth, and modernity rather than a method.[77]

Uncoiling The River and *Viae* are not the first pieces in which Hesketh has explored the labyrinth approach (see Hesketh's 'metaphor of the labyrinth' in *In Ictu Oculi* (2017)[78]) but they do showcase notable extensions to specific processes already explored, and better demonstrate the ekphratic notion of graphical composition. First, however, it may be useful to explain that a labyrinth is the complete representation of a pathway that has several smaller elements and, crucially, it is different from a maze in that a labyrinth has a singular path; there are no dead-ends. The most fundamental element of a labyrinth is its path order. In the Chartres Cathedral labyrinth (Figure 50), a set of

[76] J. Johnson, *Out of Time: Music and the Making of Modernity* (Oxford: Oxford University Press, 2015), p. 135.
[77] For more on the contextual and poetic in Birtwistle's process, see M. Hall, 'The Sanctity of Context: Birtwistle's Recent Music', *Musical Times*, Vol. 129(1739), January 1988, pp. 14-16.
[78] K. Hesketh, programme note, *In Ictu Oculi*, London, Cecilian Music, 2017.

twelve concentric circles delineating eleven lanes which forms the path one would take to the centre.



Figure 50. An annotated diagram of the Chartres labyrinth, showing path order.

Numbering each concentric circle, the path order can be generated by noting which circle one is in at each turn. Starting from outside (0), the labyrinth is entered and the first movement is in circle five, before turning to move in circle six, then eleven, and so on to give a path order of: **(0)** | 5 | 6 | 11 | 10 | 9 | 8 | 7 | 8 | 9 | 10 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 2 | 3 | 4 | 5 | 4 | 3 | 2 | 1 | 6 | 7 | **12.**

Creatively, this is a useful construct since there are self-contained palindromes of differing sizes which can be exploited and, for Hesketh, this provides an extension of the musical numerology seen in *Inscription/Transformation*. More interesting is the transformation from path order to

meander. A meander is a graphical representation of this path order that shows the basic structure of the path; it constructs the simplest representation of the space that the path order represents. This is sometimes called 'Ariadne's Thread', and it gives a directional representation of the path order (see Figure 52).

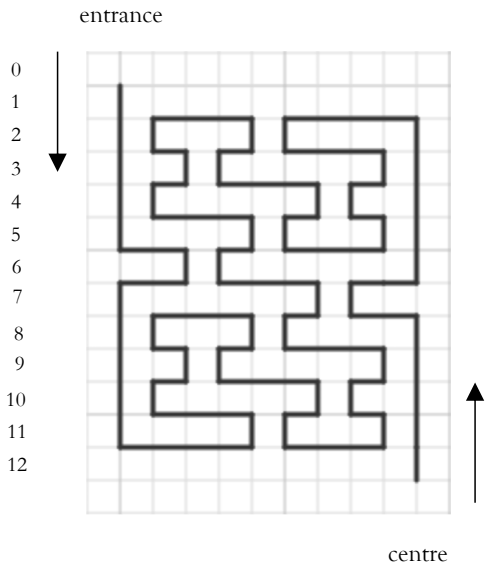


Figure 52. The meander of the Chartres labyrinth.

The use of recursive seeds, or meanders, in labyrinthian compositional methodology is similar to composition using Lindenmeyer systems (L-systems). L-systems were originally used to model biological phenomena, such as the growth of bacteria, however they now encompass a method of generating self-similar fractal-like forms. They do this through a formal grammar which uses 'variables', 'constants', 'axioms' and 'rules'. The simplest example given by their inventor, Aristid Lindenmeyer, used to model algae growth is given below:

variables : A, B
constants : none
axiom : A
rules : (A → AB), (B → A)

which produces:

n = 0 : A
n = 1 : AB
n = 2 : ABA
n = 3 : ABAAB
n = 4 : ABAABABA
n = 5 : ABAABABAABAAB
n = 6 : ABAABABAABAABABAABABA
n = 7 : ABAABABAABAABABAABABAABAABABAABAAB

The rule-based approach of L-systems is comparable with the formalism of graphical composition, more strictly aligned with ideas of algorithmic composition.[79] In Hesketh's work *Knotted Tongues* (2012, rev. 2014), material is generated using *LMusix*, an algorithmic composition software that automates the L-system process and applies it to multiple musical parameters. This provides another precursor to the labyrinth structures and highlights Hesketh's preference for self-similarity and iteration (often mediated by variable inputs) within his general philosophy of the entropic 'unreliable machine'.

3.v. *Uncoiling the River* (2018)

Uncoiling the River is a piece for piano and orchestra written for pianist Clare Hammond, premiered in 2018. It is a large-scale work which employs numerous labyrinthian processes. I will focus on two aspects of graphical ekphrasis within the piece: rhythmic sub-structure, and the combination of labyrinth and *Kolam* (an art form found on the Indian subcontinent) as a performative 'ideogram'. Rhythmic substructure in *Uncoiling* is derived from labyrinths. A labyrinth's substructure can be explained by the traversing of the space in quadrants. The simple way to do

[79] The applications of L-systems to musical composition have been explored further in S. Mason & M. Saffle, 'L–Systems, Melodies and Musical Structure', *Leonardo Music Journal*, Vol. 4, 1994, pp. 31-38.

this is to follow the path of the labyrinth and determine whether by each turn, the space traversed is contained to one or two quadrants. In the Chartres example (where quadrants are clearly pronounced), this would yield the following substructure, notated in terms of 'quarter' (•) or 'half (–), which creates a palindromic system of shorts and longs. It is, essentially, an analysis of a graphic which generates further compositional elements.

•• | – – | •• |– • – • –| •• |– • – • – | •• | – • – • – | •• | – – |••

Here, we see similarities with the approach of Cardew in *Bun No. 2*, where the graphic is analysed (and criticised) as part of the transmedial process – this is a fundamental aspect of graphical ekphrasis. Hesketh's use of these substructures is flexible and, to avoid homogenous rhythmic design, he deploys a proportional approach to attacks and phrasing. In bars 465-480, for example, the orchestral texture is vastly reduced, and a rhythmic line is introduced in the solo 1st violin that is imitated and subsequently varied in the 2nd violin, piccolo, and flute (all solo) (Figure 53). From bar 480 this process is repeated, with the first oboe having the initial rhythmic strand. As in *Forms Entangled, Uncoiling the River* uses stark musical signifiers to indicate structural changes and to highlight the genotype of the proceeding material. Unlike in *Forms Entangled*, this is not through the *ars signandi* of notation, but through the use of timbral extremities as well as exploitation of the concertante structure of the piece. These moments consist of a repeated note, or notes, played aggressively loud (***sfff***) by the piano (Figure 54).
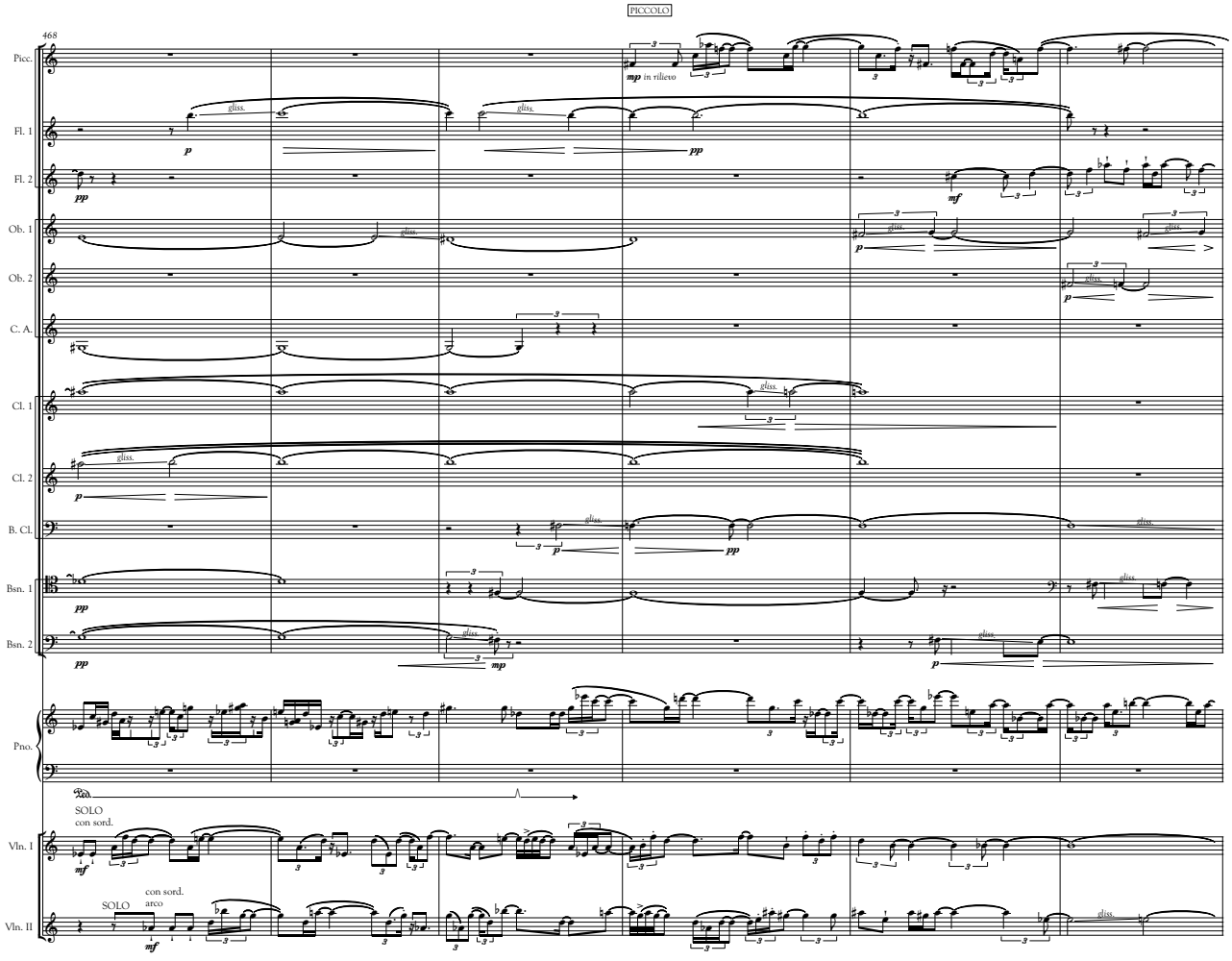


Figure 53. Hesketh, Uncoiling The River*, bars 468-473 (reduction).*
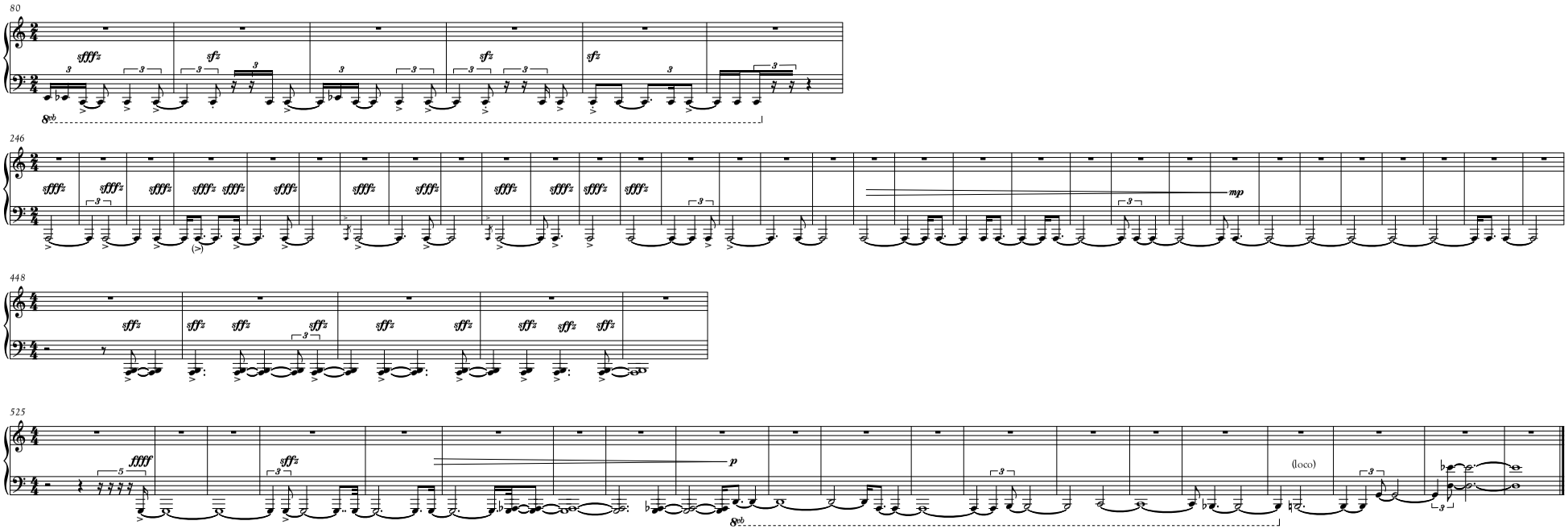


Figure 54. Hesketh, Uncoiling the *River, rhythmic 'solos' (piano).*
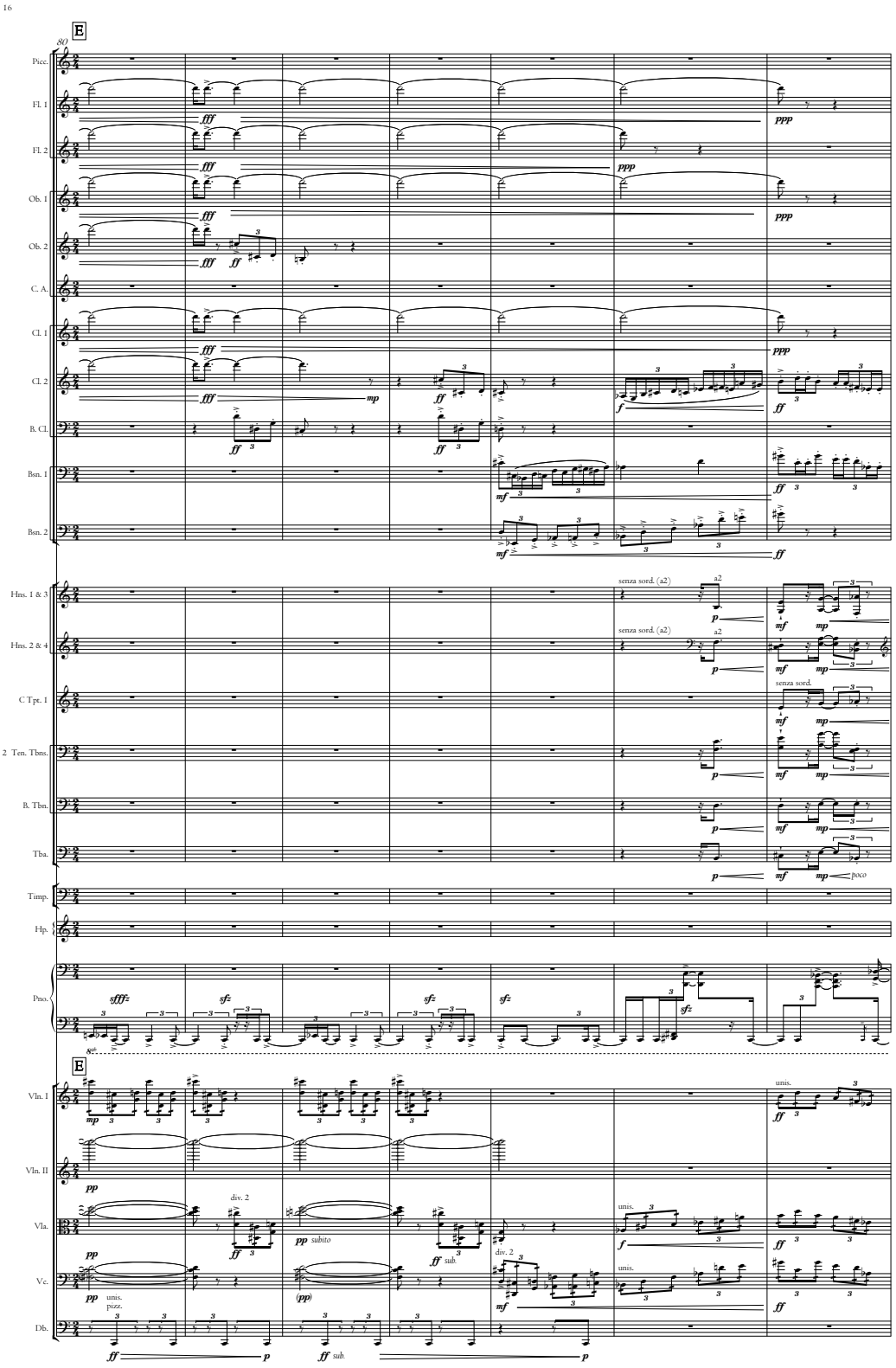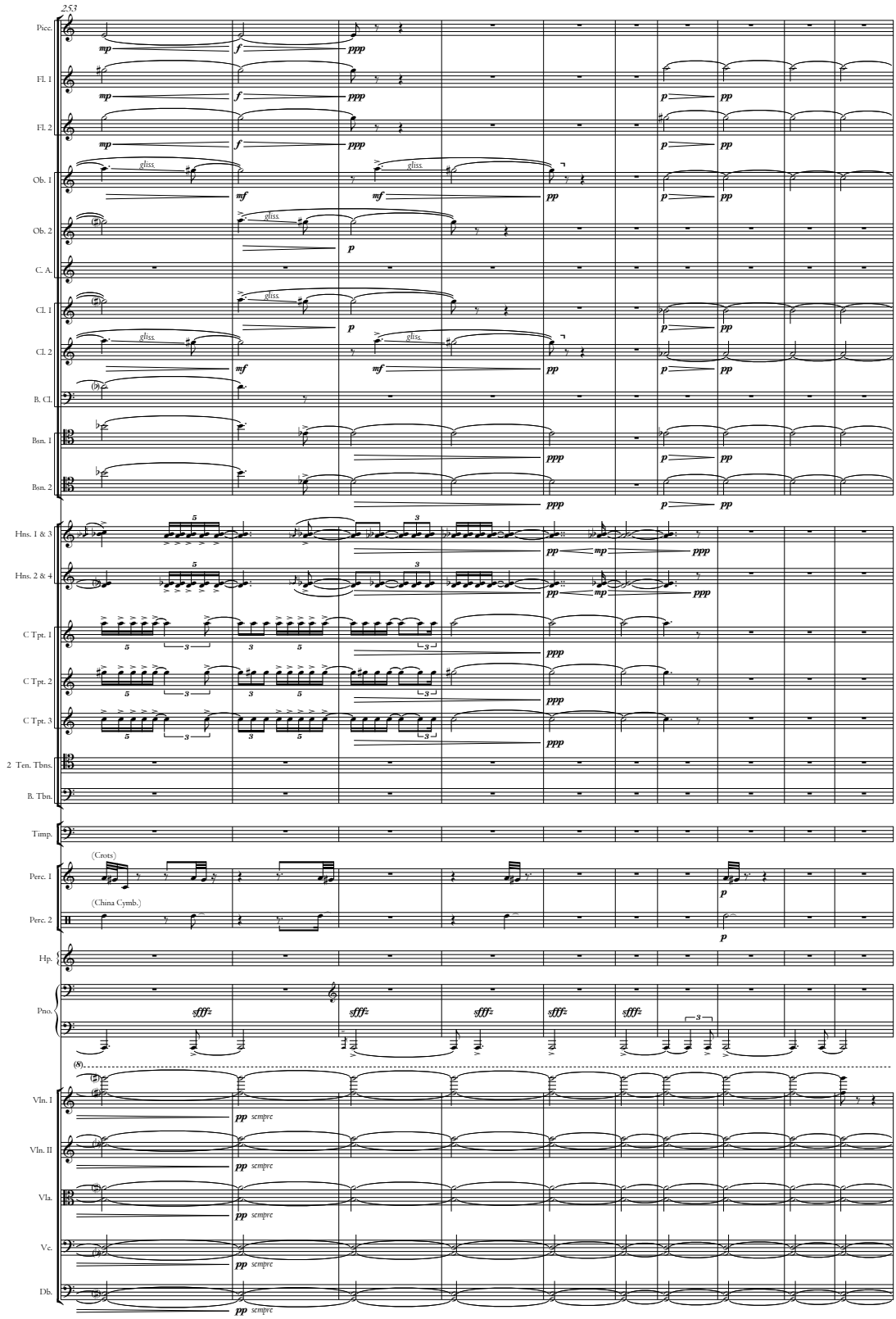


Figure 55. Hesketh, Uncoiling The River*, bars 80-86.*


2.53
Picc.
Fl. 1
Fl. 2
Ob. 1
Ob. 2
C. A.
Cl. 1
Cl. 2
B. Cl.
Bsn. 1
Bsn. 2
Hns. 1 & 3
Hns. 2 & 4
C Tpt. 1
C Tpt. 2
C Tpt. 3
2 Ten. Tbns.
B. Tbn.
Timp.
Perc. 1
Perc. 2
Hp.
Pno.
Vln. I
Vln. II
Vla.
Vc.
Db.
(Crots)
(China Cymb.)
gliss.
sempre
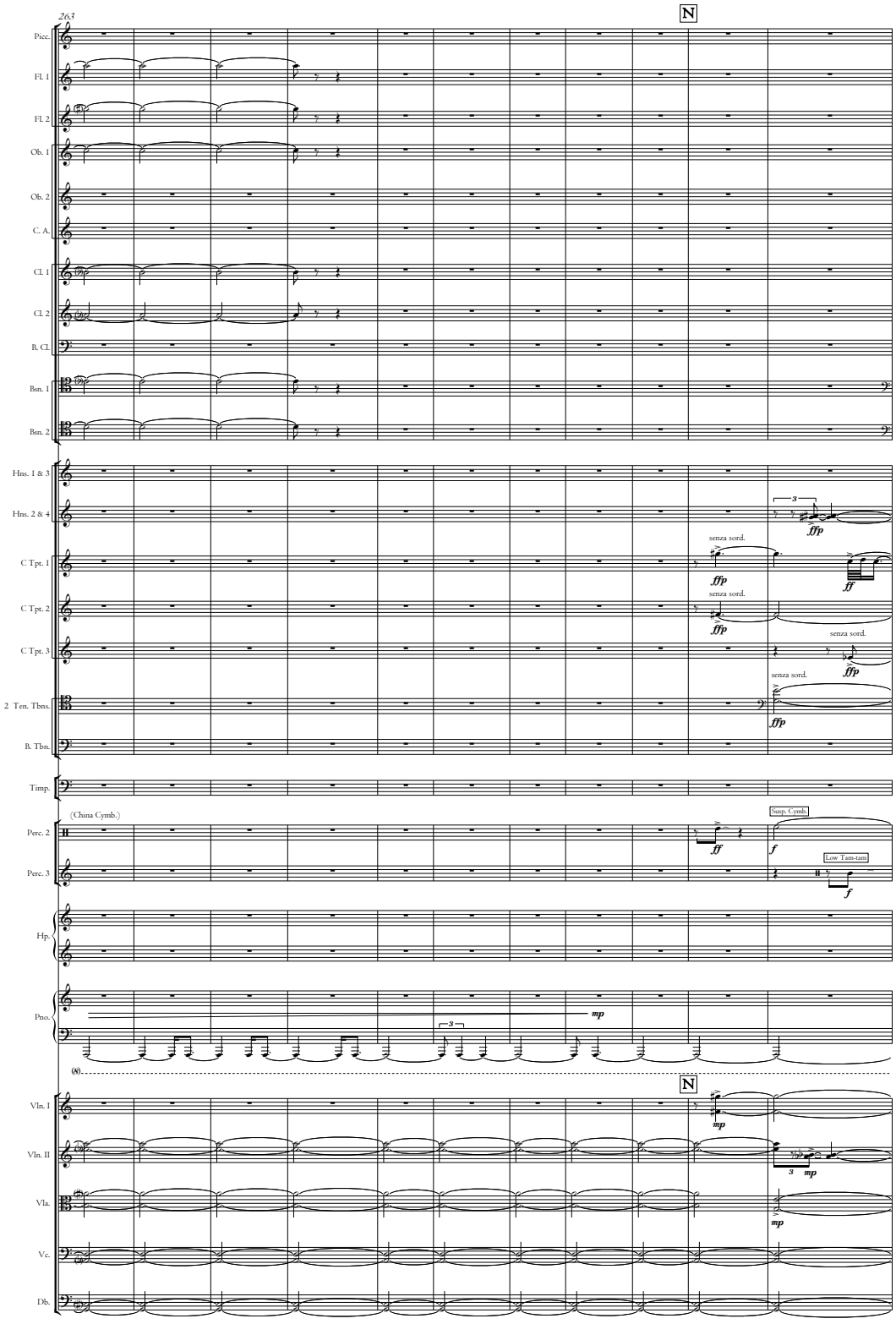


Figure 56. Hesketh, Uncoiling The River*, bars 253-273.*

These moments of transition, aurally stark and clear, bring the music's rhythmic substructures to the foreground. The dense piano writing that suffuses most of the piece is here massively scaled back to communicate one of the most fundamental aspects of the whole piece: the labyrinth substructures.

A further element in this piece is the *Kolam*, a form of art found on the Indian subcontinent, usually practised by women, that is created by connecting dots with lines using prescribed shapes. The inclusion of a musical *Kolam* in this piece celebrates the birth of Clare Hammond's daughter, Emme. The *Kolam*, unlike the labyrinth, is a more performative graphical feature of the work. The performance notes of the score specify how desk bells should be laid out 'to achieve not only the correct pitches but the shape [which] represents a combination of a single labyrinth meander superimposed by a 9-point Kolam'.[80] This is shown in Figure 57 as a sketch (formally realised as a gift for Hammond) and is presented musically in the score from bars 685-699.

This gesture is reminiscent of *Cassiopeia* (1971) for percussion and orchestra by Toru Takemitsu (1930-1996), in which the players are laid out in the 'W' shape of the Cassiopeia constellation, surrounded by brass and, what Peter Burt describes as string 'nebulae'.[81] Part of his 'constellation series', this piece acknowledges the visual aspect of the extra-musical input. Whilst other pieces, such as *Asterism* (1969) and *Orion* (1984) are more poetic in their adaptation of the source material, *Cassiopeia* marks a physical consideration in Takemitsu's music, echoing the notion of visual or spatial embodiment found in approaches to determinate graphical composition. Indeed, Burt goes on to suggest that this 'form[s] the template for a spatial redistribution of the orchestral apparatus of the kind which was becoming almost *de rigueur* in Takemitsu's work at this period'.[82]

[80] K. Hesketh, 'Performance Notes', *Uncoiling The River*, 2019.
[81] P. Burt, *The Music of Toru Takemitsu*, Cambridge, CUP, 2001, p. 147.
[82] Ibid.

Moreover, the embodiment of graphical sources in a performative context produces a communicative signal to the audience in the physicality of instrumental setup. This is something intended by Hesketh through the instrumental layout, but also through the inclusion of the Kolam ideogram in the score and programme note (connecting the two). The inclusion of graphics within the score itself similarly situates this work with that of Pascal Dusapin (b. 1955): scores such as *Quad* (1996), *Loop* (1996), and *Cascando* (1997) have abstract images inserted into the score prefaces (Figure 58).

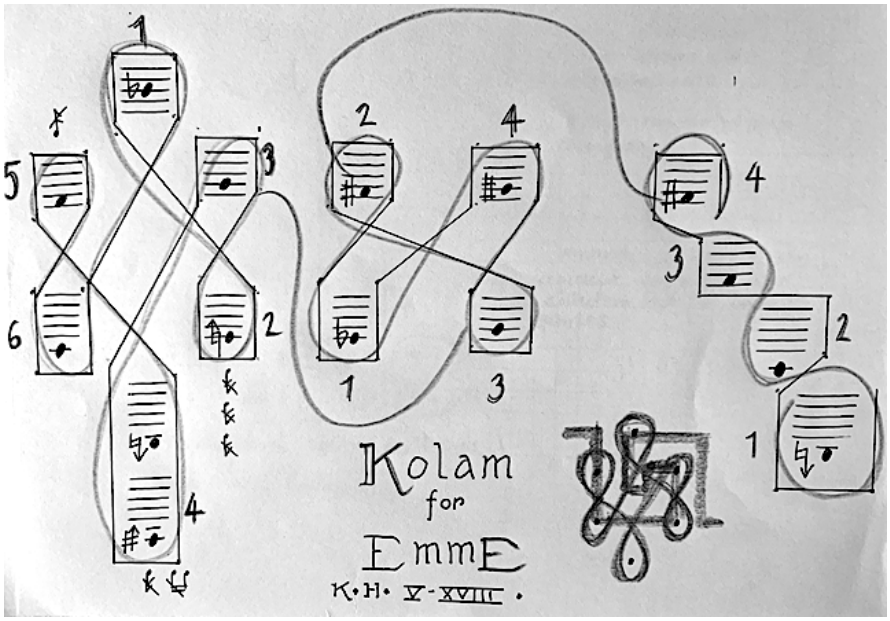


Figure 57. Hesketh, Kolam for Emme.

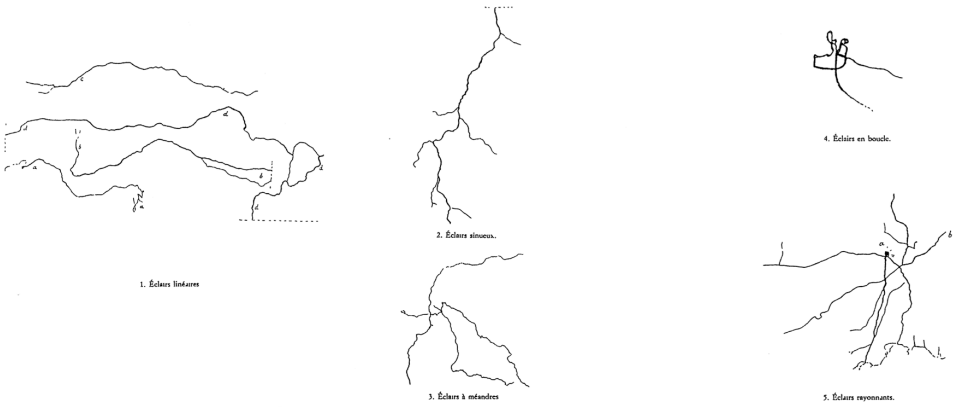


Figure 58. Graphic illustrations in the score of Pascal Dusapin's Quad.

Coincidentally also echoing Borges, Dusapin has described these abstract images as 'false trails', with Sidney Richardson suggesting that the image 'always relates back to the sonic environment of the work with which it is paired in some way'.[83] In this way, they are indicative of musical ekphrasis, containing the transmedialisation of visual to aural, but the ability to consider the elucidation of the space as graphically ekphratic is more complex. Dusapin explains that, 'there are images, but always of *processes*. They are always images of forms',[84] which suggests that the images are dynamic, constantly evolving representation of ongoing processes in the work. Rather than a static set of inputs, the image is the musical process itself; they appear too entwined to separate.

Uncoiling the River also utilises graphical procedures to articulate the dialectical tension between 'internal' and 'external' of the work. The signifying moments (notably residing with the soloist) such as the repeated low piano notes, or the inclusion of the Kolam desk bells, draw the listener's attention to moments that at first seem to exist 'outside' the work but are subsequently subsumed into it. This creates an accessible structural cohesion, the strength of the gestures enabling listeners to engage with the intricate structures of the music. The 'external' is aided by the use of a concerto form, which already creates a musical dialectic (solo versus orchestra) that can further elicit notions of procedural polarity, e.g. how the piano clearly conveys the rhythmic sub-structure (something mostly obscured in the piece).

This reading, from the point of the listener, can be situated in Jean-Jacques Nattiez's notion of *inductive poietics*, which is defined as 'proceed[ing] from an analysis of the neutral level to drawing conclusions about the poetic … we find it hard to believe that "the composer had not thought of

[83] S. Richardson, *Form and Exhaustion in Pascal Dusapin's Quad–In Memoriam Gilles Deleuze*, PhD Thesis, 2018, p. 192.
[84] S. Richardson, 'Reflections on Form: An Interview with Pascal Dusapin', *Tempo*, 72(283), 2013, p.35. Italics mine.

them'".[85] The recurring structural elements of the music, combined with performative signals and extra-musical hermeneutics (programme notes, etc.), will begin to suggest a musical meaning: the depiction of the graphic within its referential context (the labyrinth) – thus, communicating the ekphrasis. As the analyst, whose methodology relies on scores, sketches, and composer testimony, I rely on Nattiez's *external poietics*: '[the] musicologist takes a poietic document – letters, plans, sketches – as his or her point of departure, and analyses the work in light of this information'.[86] The way with which to reconcile these analyses, or evaluate the ekphrastic effectiveness of the compositional processes in communicating musical meaning, would be to collect information from listeners (this is Nattiez's fifth 'analytical situation').[87]

3.vi. *Viae* (2020)

The idea of the graphic contour as musical contour finds its most encompassing use in *Viae* (2020). *Viae* (Pathways) is a work for oboe and chamber orchestra which explores the idea of interlocking labyrinthian processes. Here, the graphical contour is a transformation of the labyrinth graphic. To generate oboe lines, and orchestral textures, Hesketh unfurls the meanders

[85] J-J. Nattiez, *Music and Discourse: Toward a Semiology of Music*, tr. Carolyn Abbate, Princeton, Princeton University Press, 1990, pp.140-141.
[86] Ibid., p. 141.
[87] An attempt at carrying out this 'listener-centric' ekphrastic evaluation was carried out in May 2021, in a research project led by myself through The Oxford Research Centre in the Humanities entitled '*Pixelating the River: Engagement with Contemporary Music through Graphical Inputs*'. The project, begun in April 2020, attempted to create a series of materials accessible to specialists and non-specialists alike which introduced ideas of graphical ekphrasis. This culminated in an online concert by the Kreutzer Quartet featuring Anne Boyd's *String Quartet No. 2 'Play on the Water'* (1973) and my own *Pixelating the River* (2020), featuring an illustrative programme which gave background on both works and their ekphrastic processes. Included in this was a survey which asked questions about listening experience and musical education. Whilst the number of responses received was low (7), the results showed that all participants found the digital programme helpful (whether 'somewhat', 'very', or 'extremely') in understanding the music of the concert, with only one participant saying that the musical processes within the works were not made easier to understand through the connection of a visual source to the music. It could be said that through the presentation of analysis within a programme, an element of Nattiez's *inductive esthesics* can be used to support the proposed *inductive poietics* referenced above, with the former defined as when 'a musicologist bases his or her statement on an analysis of the work, then describes what he or she thinks is the listener's perception of that passage' (p. 142). The project page can be found here: https://www.torch.ox.ac.uk/the-pixelated-river-engagement-with-contemporary-music-through-graphical-ekphrasis#/, and the concert here: https://www.youtube.com/watch?v=fad1WNoBRkA.

of labyrinths, converting a graphical representation into a simple linear temporal space. Figure 59 shows an example of this unfurling process derived from the composer's sketches.

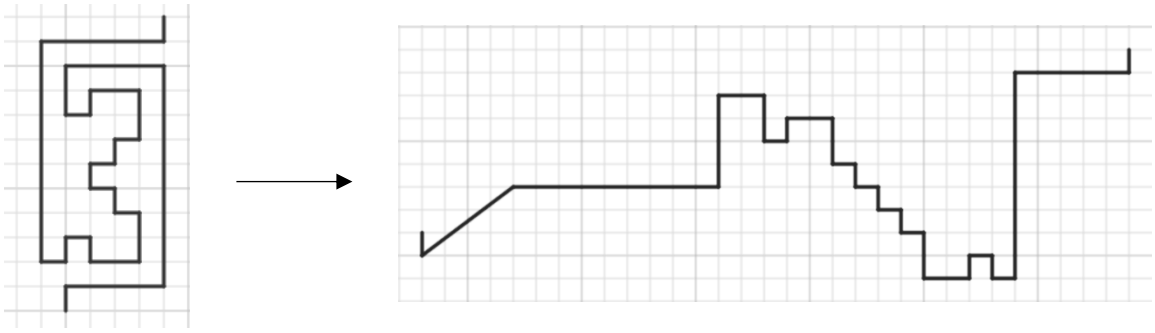


Figure 59. An unfurled labyrinth meander.

This creates a method similar to *Inscription/Transformation*, with pitch elements approximately contoured to match the shape of the graphic but within the context of the harmonic language. *Viae* introduces two extensions to this process, involving modification of the graphic and timbral mapping. The former extension can be seen in the composer's sketches, corresponding to bars 229-233 in the full score. The unfurled labyrinth graphic is overlaid on itself twice, resulting in an exaggerated profile. To generate the contour, the composer followed any of the three pathways generated from this process, switching between them at will (see Figure 60). As a result, the contouring process becomes more fluid and less homogenous. It is worth reiterating that these are not serial pitch sets; in following the contour, Hesketh can omit pitches yet still preserve the graphical input's shape, as in this passage. It represents a move towards a non-linear (or layered) treatment of the graphical process, focusing on the micro-construction of each contour from point-to-point. Hesketh also alludes to this multiplicity through the surrounding musical textures. Intensely imitative divisi writing in the strings and woodwinds surrounds the oboe line, representing the graphical impetus in a more overtly sonic way: the overlapping or superimposition of a shape. This is reinforced through similar dynamics and articulation so that these gestures can be heard as imitative.

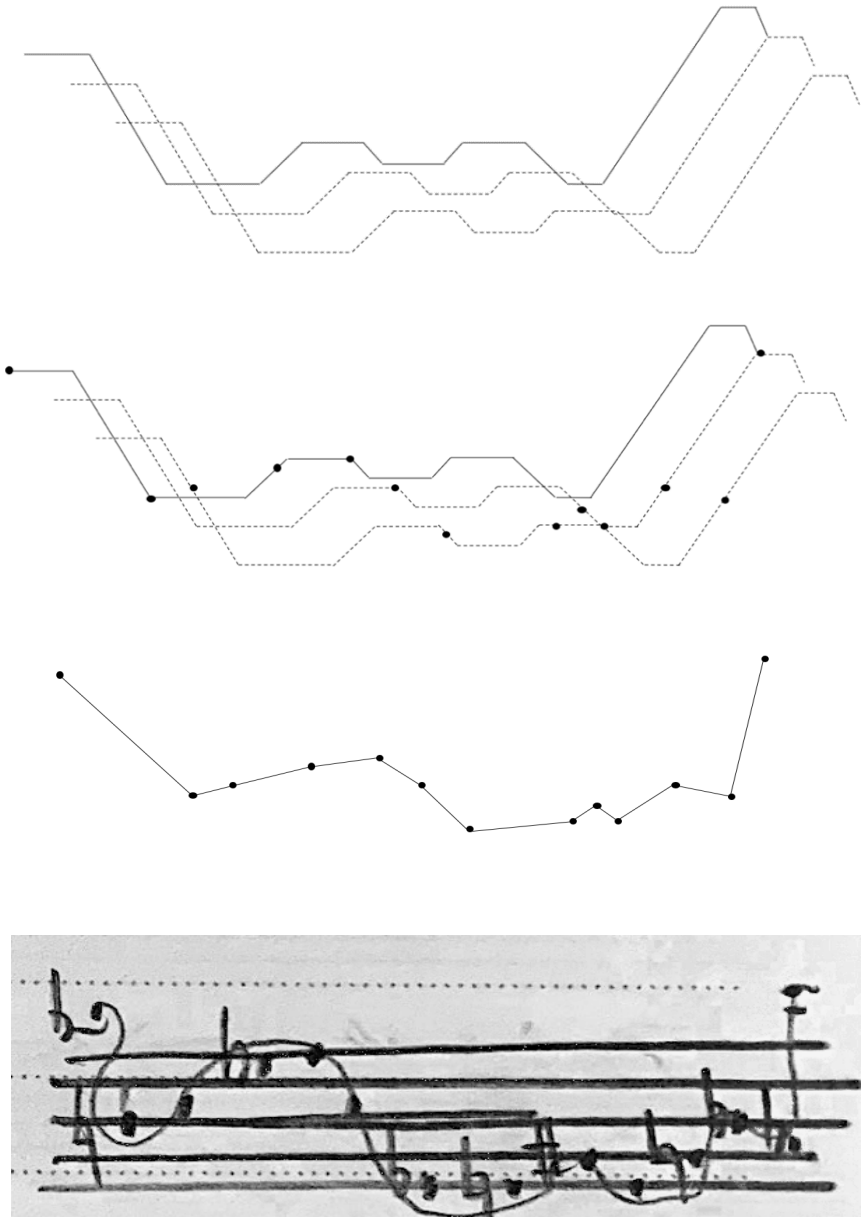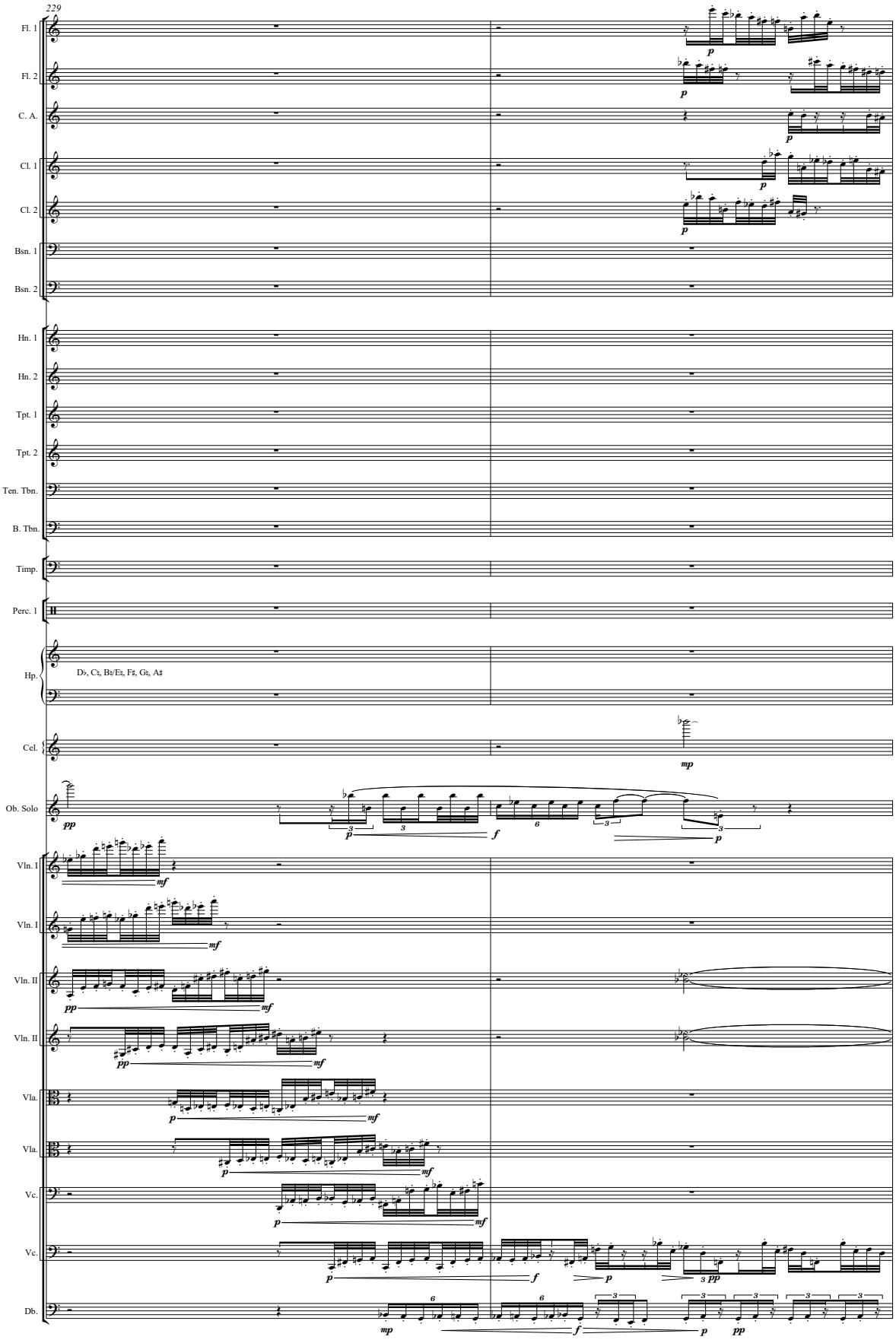


Figure 60. The process of generating meander contours from multiple graphical layers.


229
Fl. 1
Fl. 2
C. A.
Cl. 1
Cl. 2
Bsn. 1
Bsn. 2
Hn. 1
Hn. 2
Tpt. 1
Tpt. 2
Ten. Tbn.
B. Tbn.
Timp.
Perc. 1
Hp.
D♭, C♮, B♭/E♭, F♯, G♮, A♯
Cel.
Ob. Solo
Vln. I
Vln. I
Vln. II
Vln. II
Vla.
Vla.
Vc.
Vc.
Db.
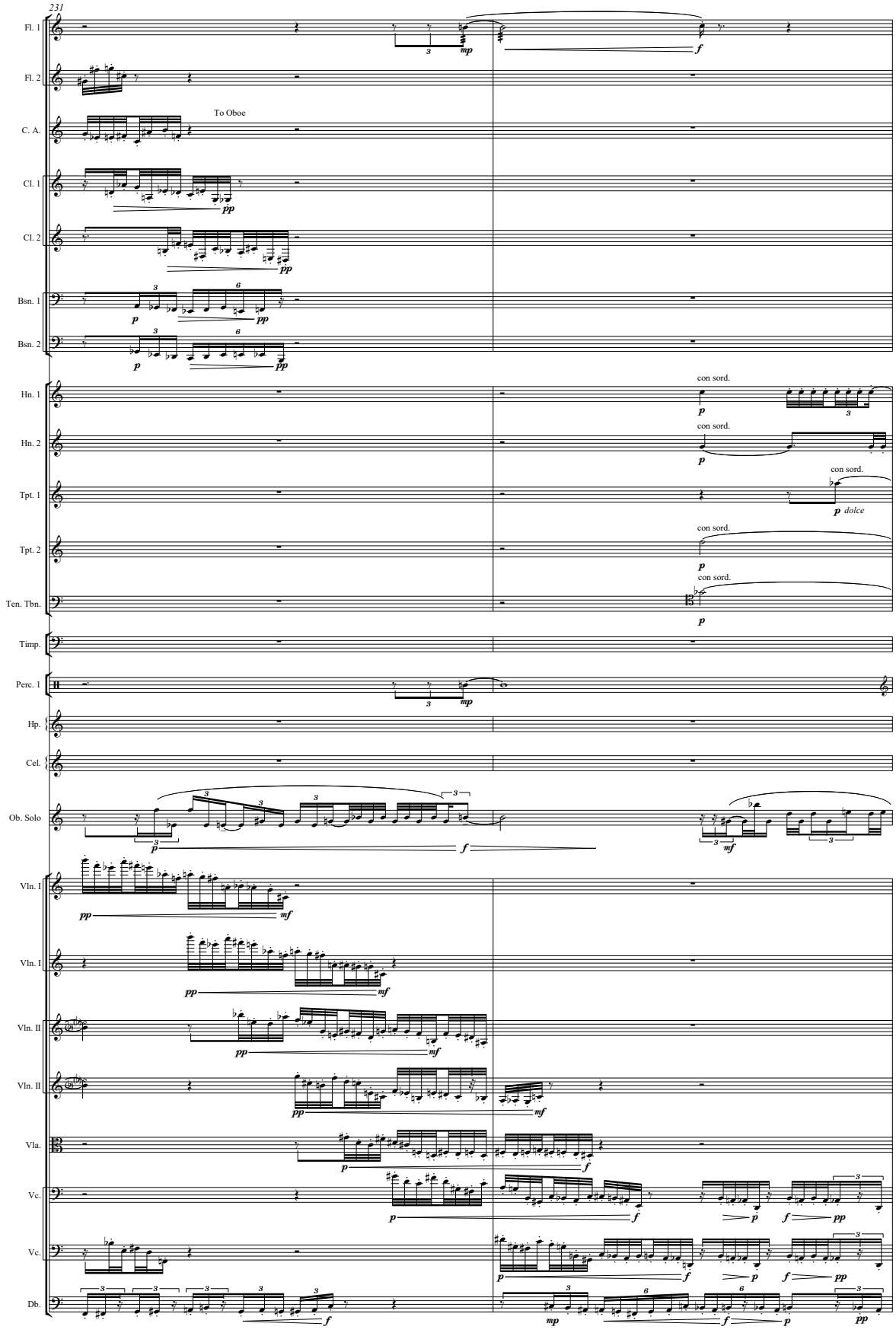


Figure 61. Hesketh, Viae*, bars 229-232.*

Hesketh also links graphical contours to timbral mappings. This is a more mediated process, but nonetheless one which compounds the use of the labyrinth and consolidates the sense of a graphical ekphrasis. The sketch in Figure 62 corresponds to bars 256-275. Unlike contours seen so far, this one does not relate to vertical pitch arrangements but to the disorder of a homorhythmic texture. For example, the percussion in bar 257 play a striking homorhythmic passage utilising even beat divisions of 3-4-5-6, which is repeated gesturally in bar 260 (now 5-4-3-2), reflecting the contour's position within the graphical space (Figure 63). Contrast this with the percussion in bars 264-265 (Figure 64), where it appears higher within the graphical space. The texture, like the idea embedded within the graphical treatments, is *unfurling*, resulting in a less homorhythmic and regular presentation of the orchestral group's material. The peak of textural disorder in the context of this passage occurs in the woodwind at bars 270-271, where the smallest rhythmic values are introduced in two polyrhythmic groups, coinciding with the final (and largest) rapid oboe cascade figure in bar 271 (Figure 65).

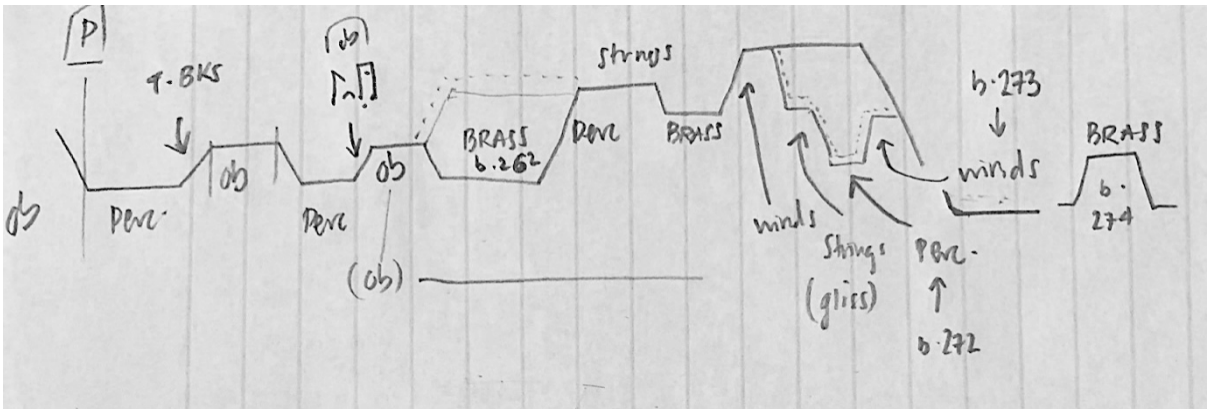


Figure 62. A sketch from Viae showing the design of timbral contouring.
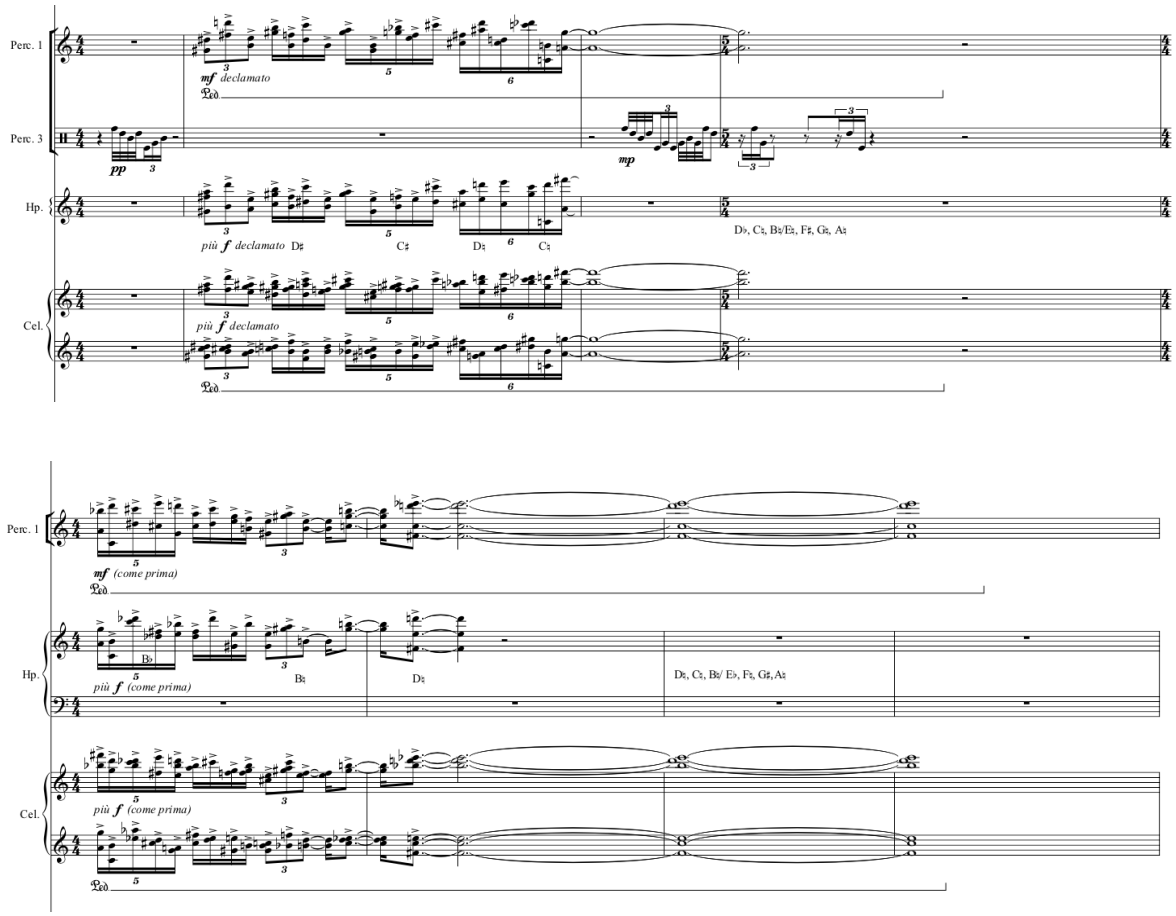


Figure 63. Hesketh, Viae*, bars 256-263 (percussion).*
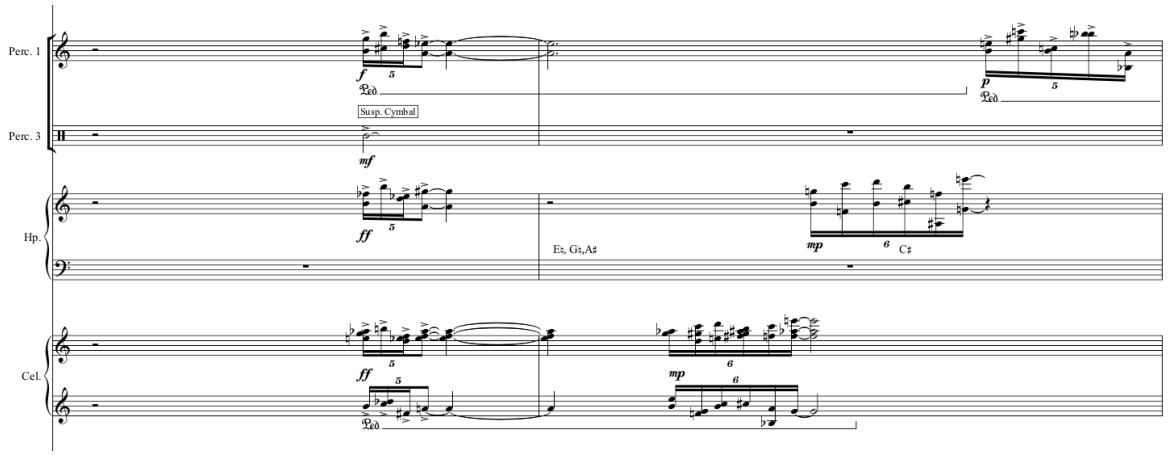


Figure 64. Hesketh, Viae*, bars 264-265, 'unfurled' rhythms (percussion).*
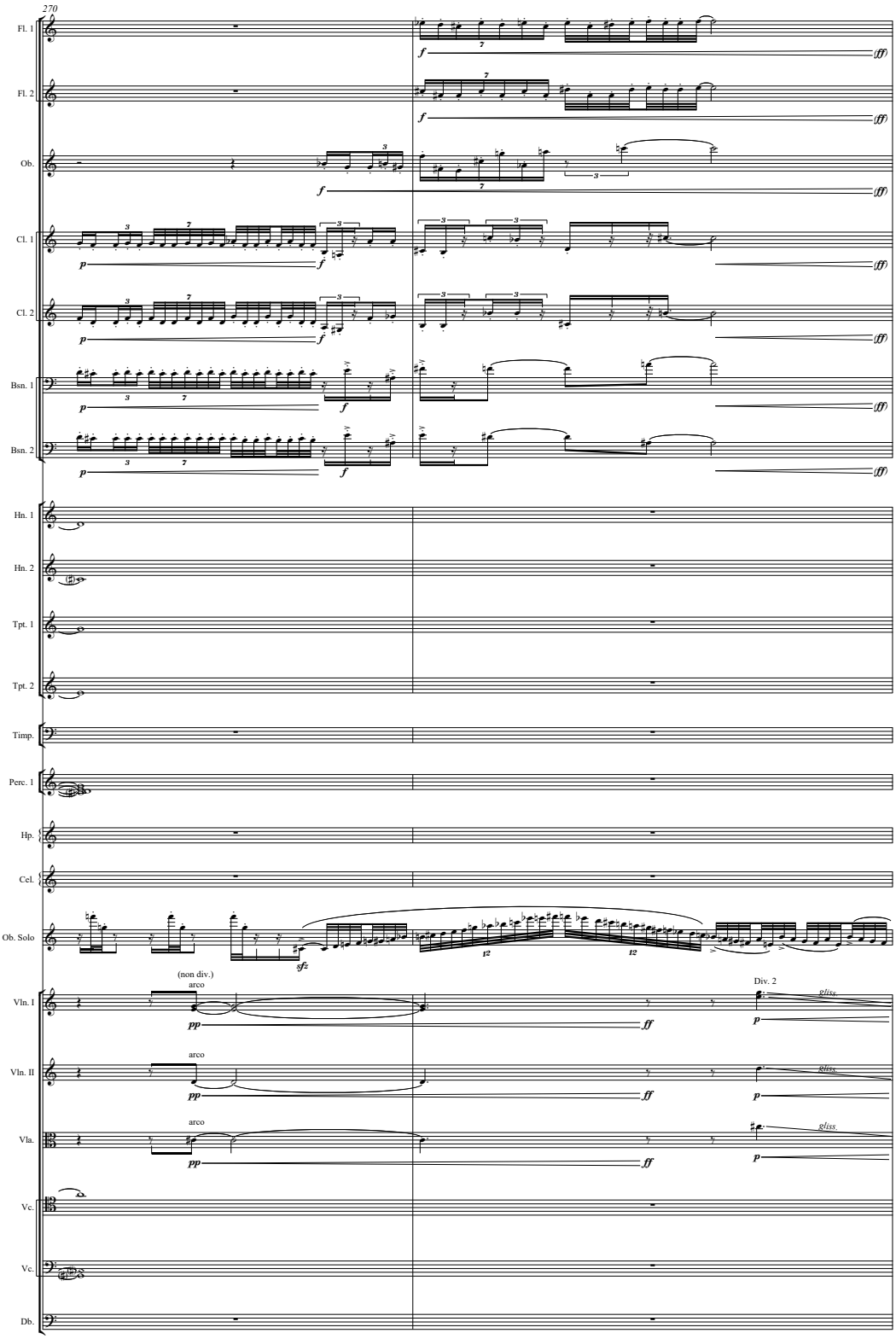


Figure 65. Hesketh, Viae*, bars 270-271.*

To date, the graphical ekphrasis in Hesketh's music has been most notable in works for soloist with orchestra, perhaps because the dialectical tension between soloist and orchestra can allow for the signifying qualities of the graphical insertions to be understood as a two-way system: 'internal' and 'external'. The incorporation and expansion of graphical processes has created musical works which transmedialise their extra-musical material in meaningful, effective, and coherent ways – extending their metaphor to one that is embedded in the process of musical generation itself: a graphical ekphrasis. It is an ironic paradox that the subsuming of 'unreliable machines' into these processes creates some reliability and recursion within the compositional process.

Each work discussed in this chapter can be seen as an advancement of a particular concern with graphical composition through a variety of musical parameters which seems to tend towards a graphically ekphrastic approach. This, combined with the composer's esoteric philosophy on music itself, often described in biological or scientific terms,[88] demonstrates that Hesketh's graphical ekphrasis not only has important formal ramifications, but can also play a role in engaging audiences through an interdisciplinary approach to composition. The decentralisation of the artwork is crucial in achieving this graphically ekphrastic reading of Hesketh's music. Whilst one may argue that Cardew's *Treatise* is an artwork in of itself, Hesketh opts for abstract data graphics and labyrinth typologies as ekphrastic objects. Indeed, the developments seen in *Viae* (i.e. deformation of labyrinths) further highlight the importance of 'composer as critic' in this decentralised context. In this way, the grammars constructed through transmedialisation may be esoteric and specialised but, by approaching composition in a graphically ekphrastic way, bear a strong formal connection to their visual source. The contextualisation of these processes within the surrounding music – whether it be by means of structure, harmony, or hermeneutics – adds

[88] For example see, K. Hesketh, 'The Backbone of Night: Mechanisms of Evolution in Henri Dutilleux's Ainsi la nuit', *Contemporary Music Review*, October 2010, Vol. 29(5), pp. 463-483.

another means of constructing the ekphrasis which draws more upon referential aspects (e.g. the cultural contexts of labyrinths, or technological failure). This contextualisation is something that will be expanded upon in Chapter 5.

4. Dynamic Graphical Ekphrasis: Constructions of Teleology through Pixelation

This chapter explores how the visual process of pixelation can be manifested in novel teleologies for acoustic music composition, constructing a *dynamic graphical ekphrasis* that not only creates an ekphrasis of the visual input, but also a relationship between iterations of that same space. This will be demonstrated through analysis and creative reflection of three of my own pieces which utilise pixelation as their musical impetus.[89]

4.i. An Introduction to Pixelation

Pixelation is a term used to describe a computational process carried out upon an image, the result of which obscures the visual representation. Daniel Chandler and Rod Munday offer these two definitions:

> 1. (television) An effect that turns a video picture into a mosaic of squares, which is often used in news programmes and documentaries to conceal sensitive information such as car number plates.
>
> 2. (computer graphics) A mosaic effect, especially when an image is magnified – revealing that it is made of a series of pixels.[90]

Whilst achieving the same visual effect, the slight difference in process between these definitions is fundamental in approaching pixelation musically. The first definition, rather than magnifying an image, changes the pixel size of the presented image by resampling (either up or down) and then applying an algorithm such as a 'near-neighbour interpolation'. In this pixelation method, the entire image remains as the source input, yet the values of sampling and interpolation (i.e.

[89] Scores and recordings for all three works can be accessed at www.thomasmkmetcalf.com/research.
[90] D. Chandler & R. Munday, 'Pixelation' in *A Dictionary of Media and Communication*, Oxford, Oxford University Press, 2020. Accessed 11 November 2020 [https://ezproxy-prd.bodleian.ox.ac.uk:2460/view/10.1093/acref/9780198841838.001.0001/acref-9780198841838-e-2061]

changing pixel size) are altered. A demonstration, using an online pixelation tool,[91] is given in Figure 66. The pixel size (as defined by this tool) of a representation of the word 'pixel' is changed from 1 to 10:

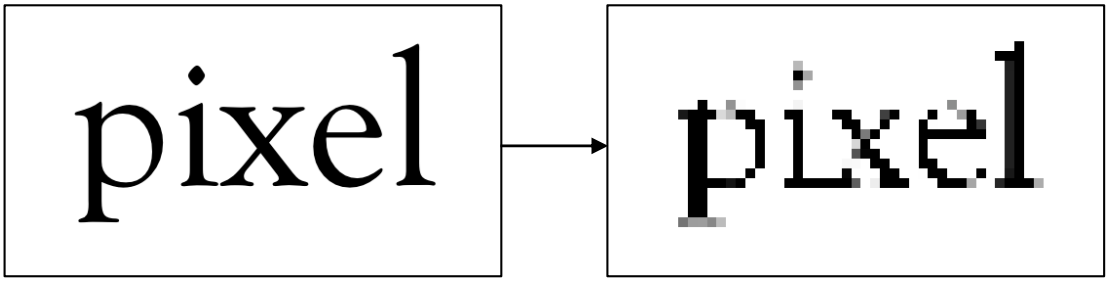


Figure 66. An example of the first definition of pixelation.

There is only one explicit reference to this notion in contemporary music discourse to my knowledge, in a small example given by Johannes Kreidler (b. 1980). In his Darmstadt lecture on New Conceptualism,[92] Kreidler describes his piece (or concept) *Beethoven Pixel'd* (2012), where he takes a MIDI file and compresses each different pitch within a bar into a single chord – in this case, using Beethoven's *Für Elise* (1810). This notion takes pixelation as analogous to linear compression. In Kreidler's conception, the process of pixelation retains all of one musical parameter (in this case, pitch) which is manipulated through the modification of a temporal value. One may extrapolate that, to increase pixel size would be to merge more than a single bar together and, conversely, to decrease pixel size would see further divisions of bars implemented. The point of interest would be where the source material's identity is lost, and thus where representation fails – hence, why Kreidler used such a well-known musical example. In the examples within this chapter, pixelation is generally thought of in a more graphical and ekphrastic way, whereby

[91] https://onlinepngtools.com/pixelate-png. Accessed 1st October 2020.
[92] J. Kreidler, *New Conceptualism*, lecture given at Darmstadt International Summer School, 27th July 2012. Available at: https://www.youtube.com/watch?v=T-kEs_RIiiE&t=1930s.

compositional structures are constructed that can emphasise the visual trajectory (or movement between graphics), and thus put an emphasis on musical teleology.

The second pixelation method involves a magnification of a portion of an entire image in order to reveal its pixel layout. As such, the entire image does *not* remain through the pixelation process and a bound, or frame, is imposed on the area that is to be magnified. Anti-aliasing algorithms often try to correct for this, particularly when being printed (as it is seen as an undesirable visual effect), instead representing it as a blur where pixels are not visible. An example on the same image is shown in Figure 67:

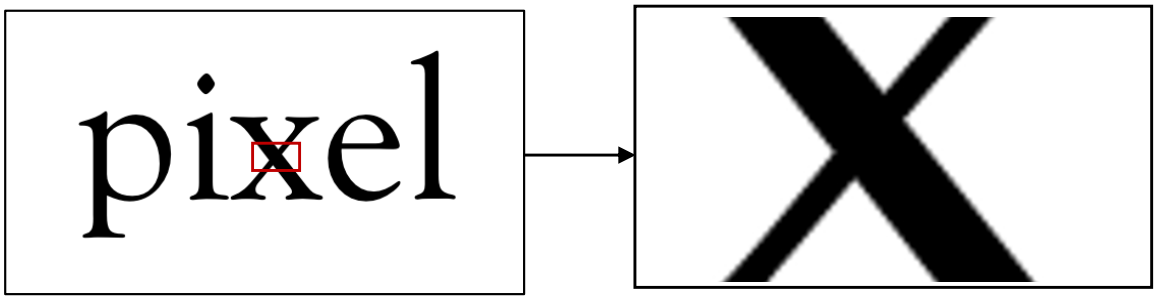


Figure 67. An example of the second definition of pixelation.

The distinction between these two processes is important because they allow for different explorations of compositional processes and musical representations that affect a work's teleological function. Through exploration of three works, I will demonstrate the value of pixelation as a dynamic compositional tool and, therefore, the effectiveness and depth of graphical ekphrasis in contemporary music.

4.ii. Failure as a Teleological Process: *DISSOLUTION* (2020)

DISSOLUTION is a work for solo organ, written for Daniel Mathieson, in which I explore twelve increasingly pixelated representations of a map of the River Thames through twelve short movements. The piece begins with an un-pixelated (or original) image, and ends with a single pixel as a result of the vastly increased pixel size. This graphic trajectory is mirrored by a harmonic one. The piece generates a pitch set from projecting the map into a pitch-time space, and transcribing the results, as seen in Figure 68. Over the course of the piece, the pitch sets are 'averaged' in order to emulate the near neighbour interpolation that is happening in the visual input. This process for Part One is shown in Figure 69.

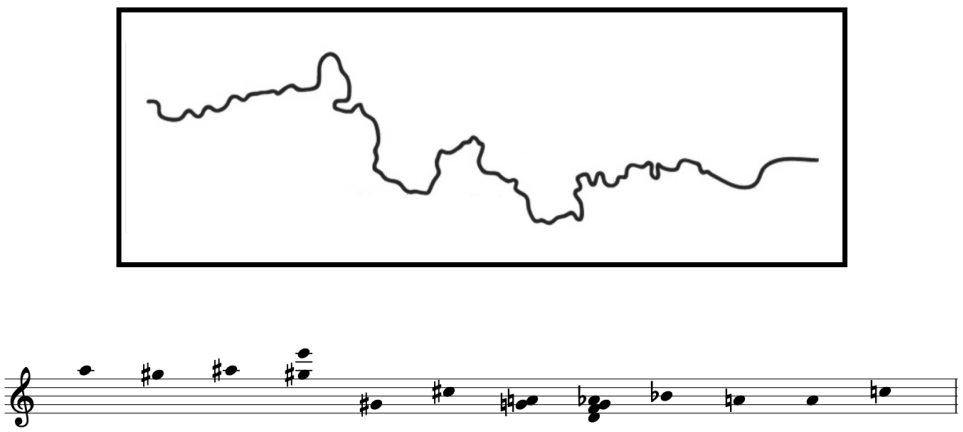


Figure 68. Initial pitch set derived from a River Thames graphic in DISSOLUTION.

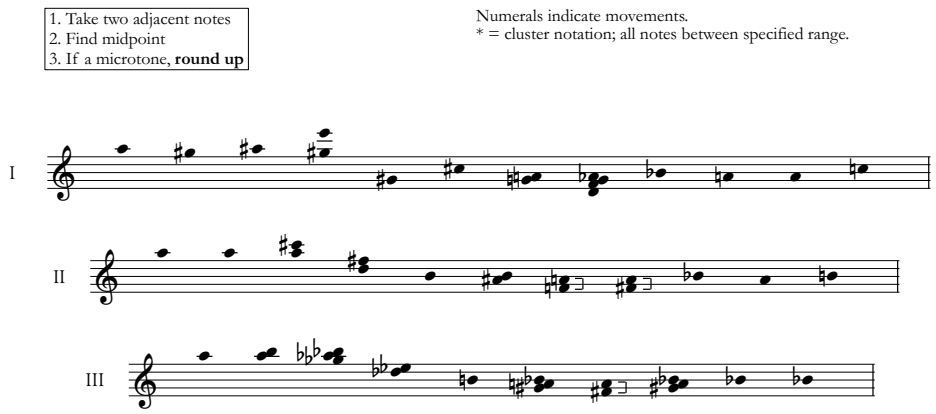


Figure 69. Pitch averaging process in DISSOLUTION.

As a result, the available pitches and harmonies not only reduce over the course of the piece, but become increasingly dissonant as a result of the averaging process, such that there is only a single three-note cluster aligned with a single pixel in movement XII.

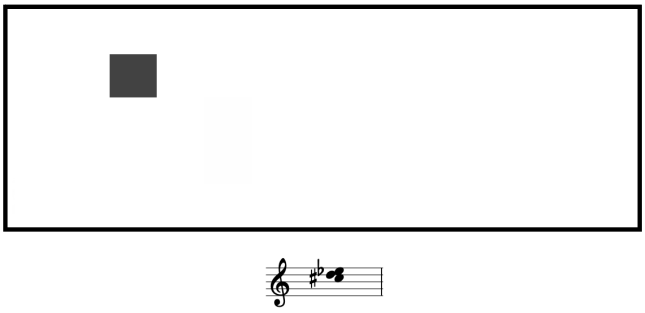


Figure 70. Metcalf, DISSOLUTION, *pixel layout and remaining pitches for movement XII.*

This is the *structural* process of failure that outlines the entire piece, and it acts as a scaffold upon which to mount an ekphrasis through the incorporation of musical metaphor and communicative semiotics, i.e. Bruhn's ekphrastic referentiality. First, however, it may be useful to demonstrate how I used pixelated images to generate material, as this often defines the characteristics of movements and thus the creation of dramaturgies in the construction of the 'failure' metaphor.

The piece is structured in three parts: 'representations', 'pixelations', and 'obfuscations'; the musical processes in each part are considered under these headings. For example, at the beginning of Part Two ('pixelations'), an isorhythm is constructed from the pixel layout which is used for the whole of the fourth movement, which opens dissonantly with the two parts playing apart at i.c. 1. It is arguably the simplest music so far in the work, and it communicates both the 'dot-like' pixel characteristic, as well as the idea of a kind of computational 'processing' error (via the

semitone displacement of the line); it is the first overt sign of 'failure' within the structure, and is aligned with a process that represents the pixel layout clearly and incessantly.

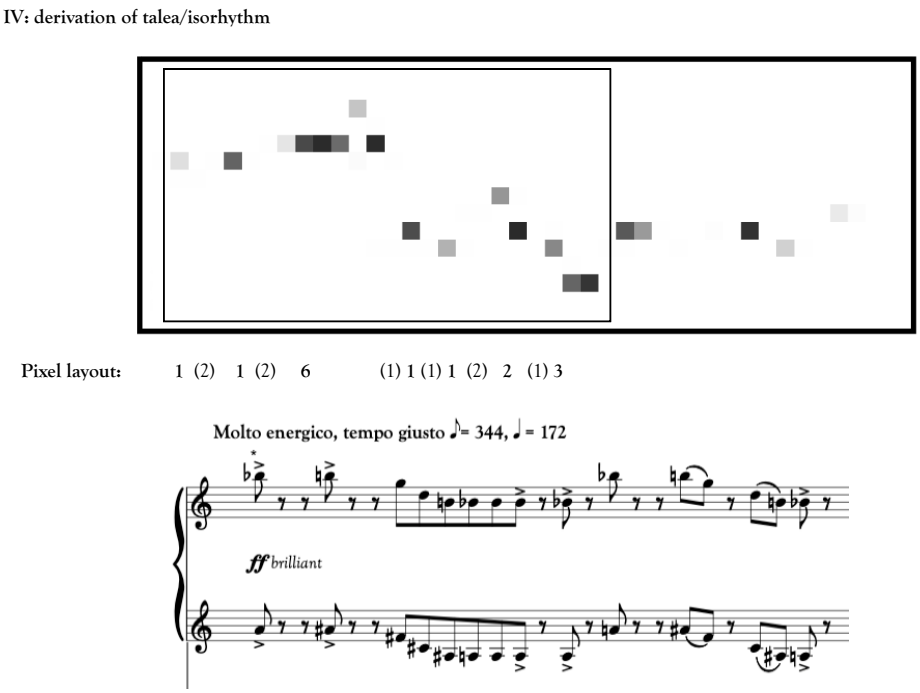


Figure 71. Metcalf, DISSOLUTION*, processes of pixelation in movement IV.*

Looking to movement VIII, (the end of Part Two), one can see a further reinforcement of a processing error through the disintegrating, 'glitchy', accompaniment figure in the left hand, along with interjections of clusters which are aligned to the pixel layout (Figure 72). The culmination of the gesture that begins in movement IV finds its resolution from bar 30 in movement VIII, where the music completely ruptures, causing a breakdown of the musical 'machine' represented by a 12-tone chord at the loudest dynamic in the piece so far (*ffff*) (Figure 73).

Part Three's pixel processes are much looser as a result of this rupture, and the final movement epitomises this relegation of control through the presentation of a graphic score which uses the original image, where the organist must modulate timbre and dynamics to interpret the contour of the map (Figure 74). The composer has, in a sense, 'failed' in the transmedialisation process

from visual image to determinately-notated score due to lack of remaining data – and this failure is achieved through notation's role as *ars signandi*.
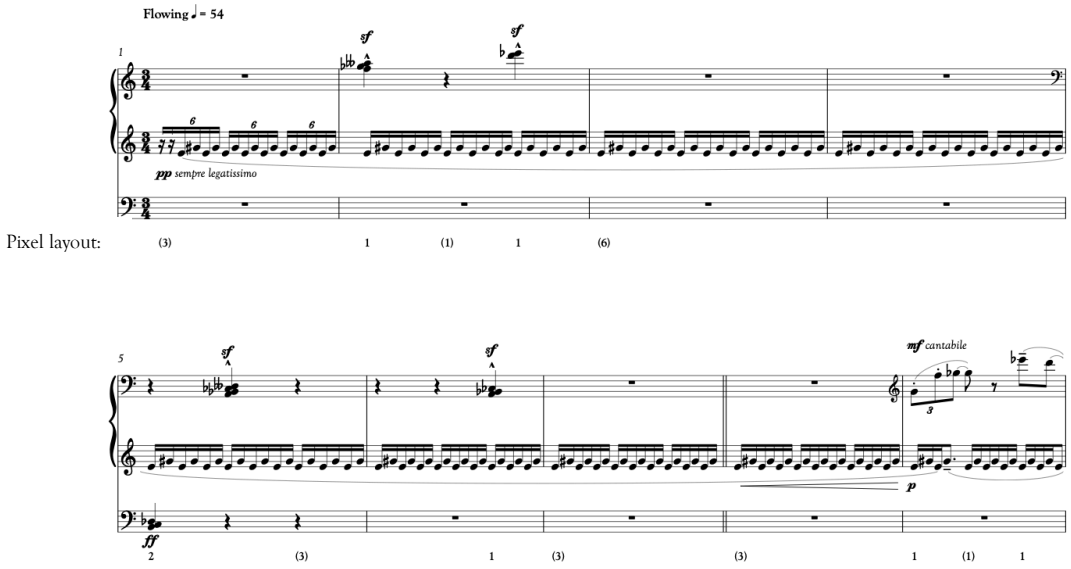


Figure 72. Metcalf, DISSOLUTION*, movement VIII, bars 1-9.*

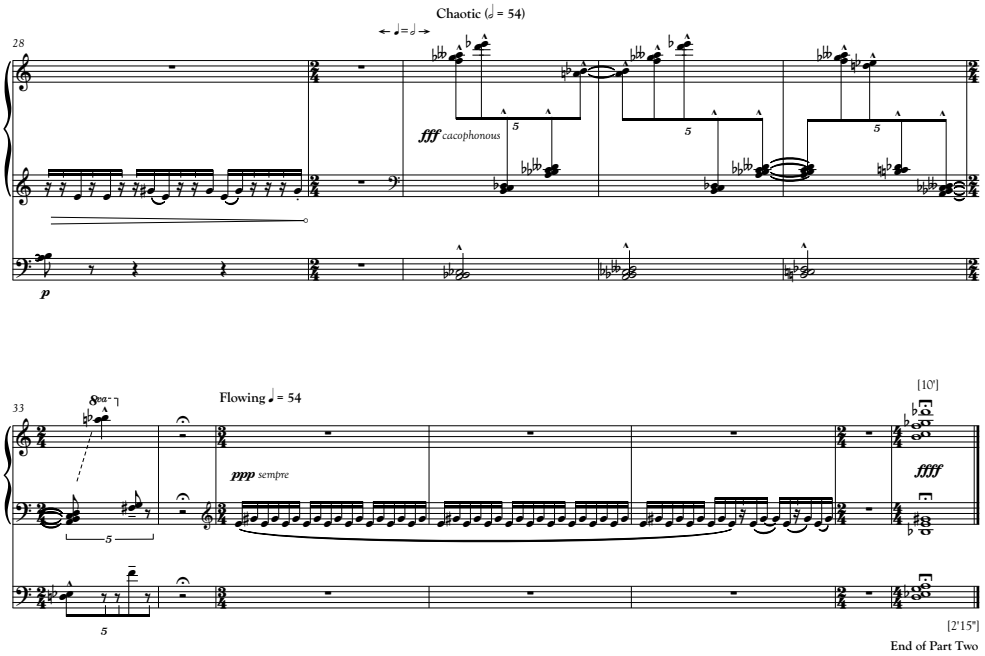


Figure 73. Metcalf, DISSOLUTION, *movement VIII, b 28-39.*

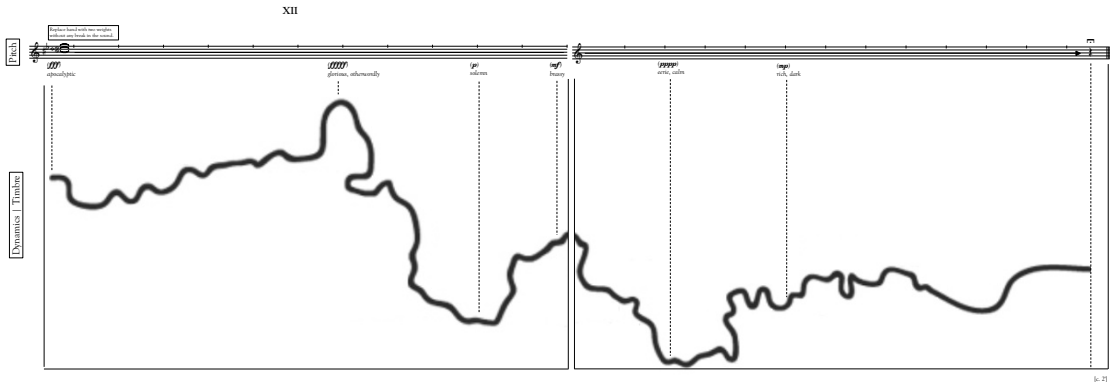


Figure 74. Metcalf, DISSOLUTION*, movement XII.*

Furthermore, the 'non-specific' nature of the registration markings (in favour of expressive terms) means that, to an extent, the organist is been in dialogue with the music and constructing an interpretation of the failure narrative timbrally that goes beyond the composer's initial aural intention and control. As Andy Hamilton summarises, '[a]ll skilled action is at some level improvised beyond a supervisor's instruction and therefore creative',[93] and this inversion of musical control – a realisation of improvisation – is a counterpoint to the loss of musical data in the graphical source. The expressive possibilities of this piece will vary greatly depending on the organ that is used, the organist who is playing it and, crucially, whether the registration process was collaborative or not. All of these considerations will ultimately affect the communication of the teleological goal.[94]

The relation of pixelations to macro-structure, micro-process, and musical narrative makes this piece strongly graphically ekphrastic and imbue it with a teleology of failure, in which the loss of data in the visual representation is mirrored closely in the musical materials. The realisation of this

[93] A. Hamilton, 'The Aesthetics of Artistic Collaboration' in M. Blain & H. Minors (ed.), Artistic Research in Performance through Collaboration, Basingstoke, Palgrave MacMillan, 2020, p. 68.
[94] For more on the collaborative process behind this work, see D. Mathieson & T. Metcalf, 'The "Graphical" Scaffold: Approaching Composition and Performance through the Lens of Timbral Diversity', *The Journal of the Royal College of Organists*, Vol. 14, Forthcoming.

failure is the teleological goal of *DISSOLUTION*, with the final movement acting as the catharsis of the piece, that recontextualises the preceding music. This teleological failure is achieved through both a formal depiction of failure as well as a referential metaphor of it.

4.iii. Non-Linear Teleological Failure: *All Dead Paper* (2020)

All Dead Paper is a work for soprano and viola, written for Sarah Dacey and Stephen Upshaw, as part of my participation in the *Nonclassical Academy 2020*. It uses the same pixelation type as *DISSOLUTION* but aims to create a different representation of the pixelated images; namely by arranging them into 'pixel arrays'. In these arrays, all pixelations are represented simultaneously and, through use of a random number generator, I plotted a path through each representation once, without repetition, until all have been used. The pixel array for *All Dead Paper* is shown below:

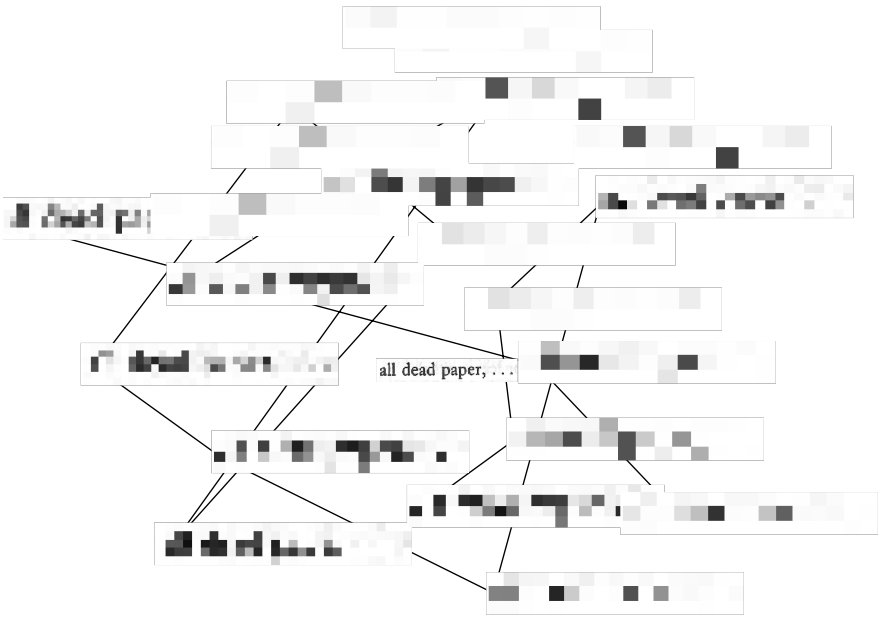


Figure 75. Pixel array using the phrase 'all dead paper...'.

The pixelation processes are confined to the viola's music, which represents the array, with the soprano part becoming affected by it. I designed three axioms to realise the pixel representations, and an illustrated example can be seen in Figure 76.

i. The number of horizontal units determines the durational unit of that pixelation group.

ii. The number of vertical units determines the density of the attacks, up to four (for quadruple stopping).

iii. The colour of the pixel generally determines dynamics (dark = loud, light = soft)

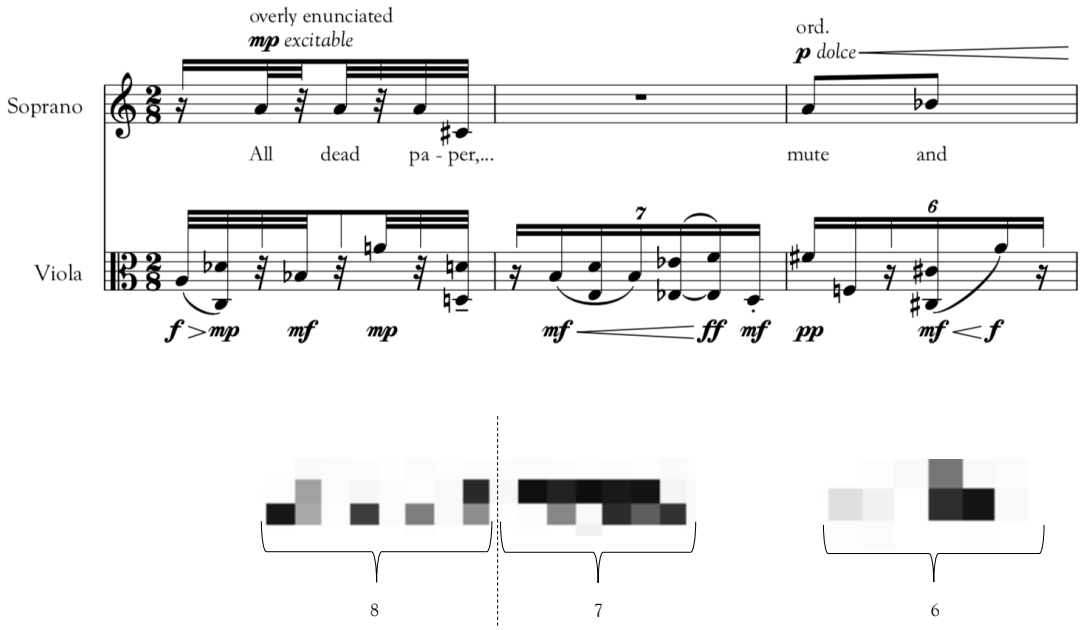


Figure 76. Metcalf, All Dead Paper*, bars 1-3, showing links to pixelations.*

The rules achieve a consistent compositional method that relates different levels of pixelation to one another in a compact, and perhaps more fleeting, sense (unlike in the longer structure of *DISSOLUTION*). As such, it is a depiction of the pixel array through mapping of parameters to data. The random nature of moving through the arrays denies a linear sense of teleology (e.g. moving from low pixelation to high) and thus the metaphorical aspect of the music (portrayed by

the soprano) is integral in achieving a coherence, as well as a graphical ekphrasis, that will fulfil the teleological failure. The soprano part exists in three sections, highlighted through a shared durational unit between viola and soprano that aligns with 'all dead paper' (the pixelated phrase).

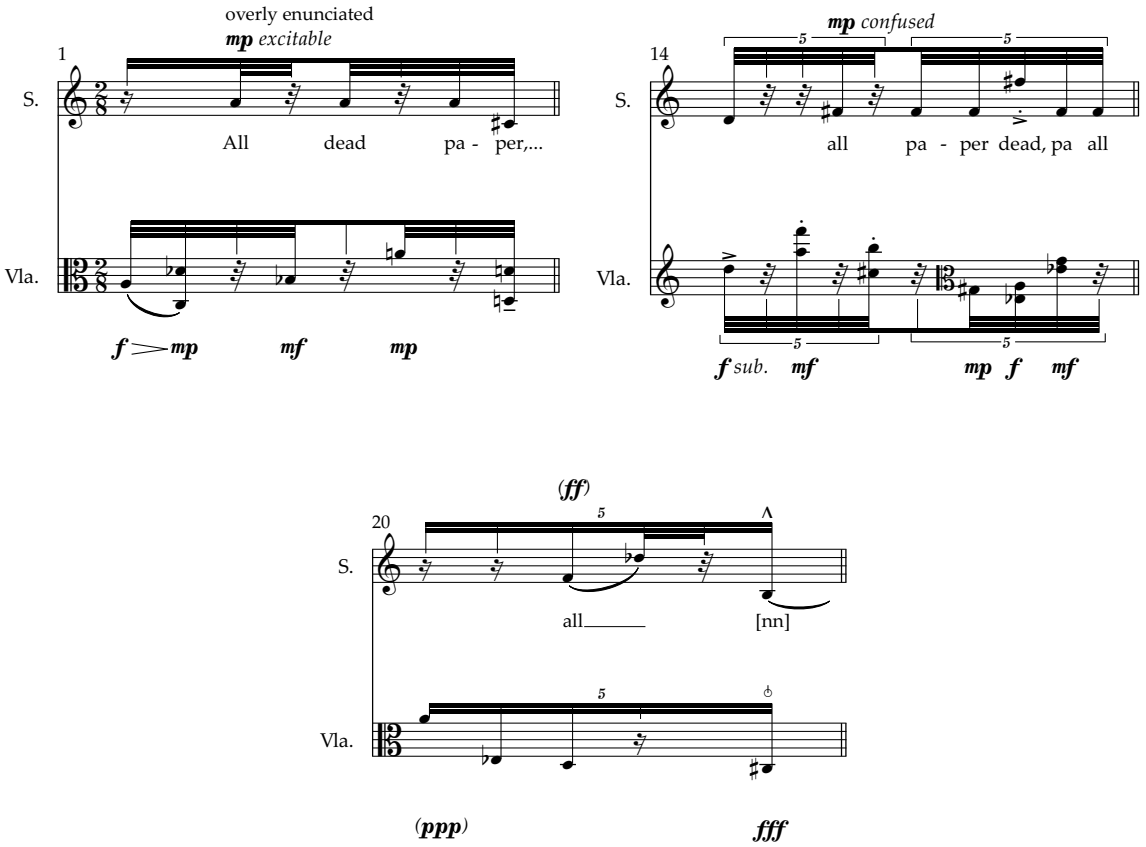


Figure 77. Metcalf, All Dead Paper, *disintegration of vocal part.*

As can be seen in Figure 77, the text becomes increasingly nonsensical as a result of the progressive metaphor of pixelation, with the final section introducing phonemes, rather than words. The alignment and deployment of these shifts is aligned with the most pixelated material in the viola, meaning that the new sections follow chaotic passages of very short durations. As such, the connection to speech breakdown is linked with higher levels of pixelation, where pixelation in the viola has been established through means of duration, density, and dynamic directly derived from the image. This heightens the metaphor and allows for a teleology to emerge

which centres on the speech itself, arguably the most easily comprehensible aspect of the music. The fulfilment of this teleology is at the point of termination, where the voice produces a non-sibilant sound, and the viola uses scratch tone: both denying their normative playing functions and sounds in order to represent rupture as well as the end of the pixel array. As highlighted in Chapter 1, Bruhn notes 'the purest cases of musical ekphrasis are unmixed transmedialisation' where the responding medium does not set the text to music, but rather 'reflects or comments on aspects of the source text without including the primary medium'.[95] Despite setting text, *All Dead Paper* subverts the use of text as poetry, and treats the pixelation arrays as the 'source text', implying an ekphrasis of the text's manipulation, rather than its poetic content.

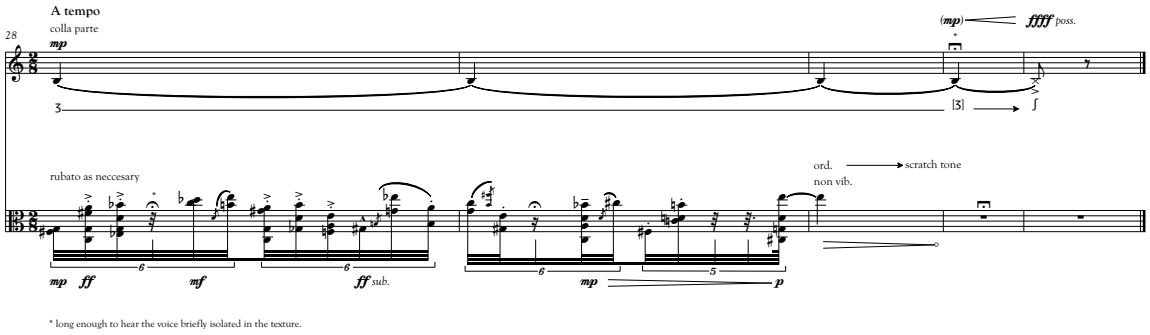


Figure 78. Metcalf, All Dead Paper*, bars 28-32.*

Both *DISSOLUTION* and *All Dead Paper* can be situated in Kim Cascone's notion of the 'aesthetics of failure', where he claims that 'our control of technology is an illusion'.[96] Pixelation is a degenerative visual process, from terms of representation, and one cannot (easily) control the algorithm that is used. As a result, the composer allows the music to structure itself, but when the structure is inherently one of degeneration then failure becomes a fundamental aesthetic quality within the work. Indeed, Cascone continues that, '[n]ew techniques are often discovered by

[95] Bruhn, *Sonic Transformations*, p. 9.
[96] K. Cascone, 'The Aesthetics of Failure: "Post-Digital" Tendencies in Contemporary Computer Music', *Computer Music,* 24(4), 2000, p. 13.

accident or by the failure of an intended technique or experiment'.[97] This could be true of novel teleologies as well. The teleological catharsis of *DISSOLUTION* – the graphic score – was a result of the failure of the process to generate any meaningful material with which to create a musical realisation; it is an exploitation of the terminal nature of the pixelation process, as well as an extension of a graphical ekphrasis.

4.iv. (Re)constructive Teleology: *Pixelating the River* (2020)

Pixelating the River is a large-scale work written for the Kreutzer Quartet as part of the project '*Pixelating the River': engagement with contemporary music through graphical inputs*, funded by The Oxford Research Centre for the Humanities, premiered in May 2021. Its harmonic structure is directly linked to pixelated representations of the River Thames, but this time using the second type of pixelation discussed above: magnification. The river graphic was divided into quarters, and assigned to each of the quartet instruments. Each quarter was then projected into a pitch-time space in order to derive a pitch set that is inherently linked to that section. A section of that quarter is then magnified and re-projected into a pitch-time space, deriving a secondary harmonic field that is linked with the first: these are the *regenerated* pitches. However, the portion of the graphic that is magnified carries through its pitches into subsequent iterations: these are *retained* pitches. A summary example is shown in Figure 79.

This process is applied to all quarters of the graphic to create a harmonic structure for the entire piece. As well as structuring the piece, this process also sets up harmonic tensions between retained and regenerated pitches, which is analogous to the representational tension between the original image and the magnified, or distorted, iterations. Indeed, this could be pragmatically characterised into 'foreground' and 'background' procedures and their balances. An example of

[97] Ibid.

this can be seen at rehearsal mark P (Figure 80), where the quartet is split to represent the two harmonic fields at once.

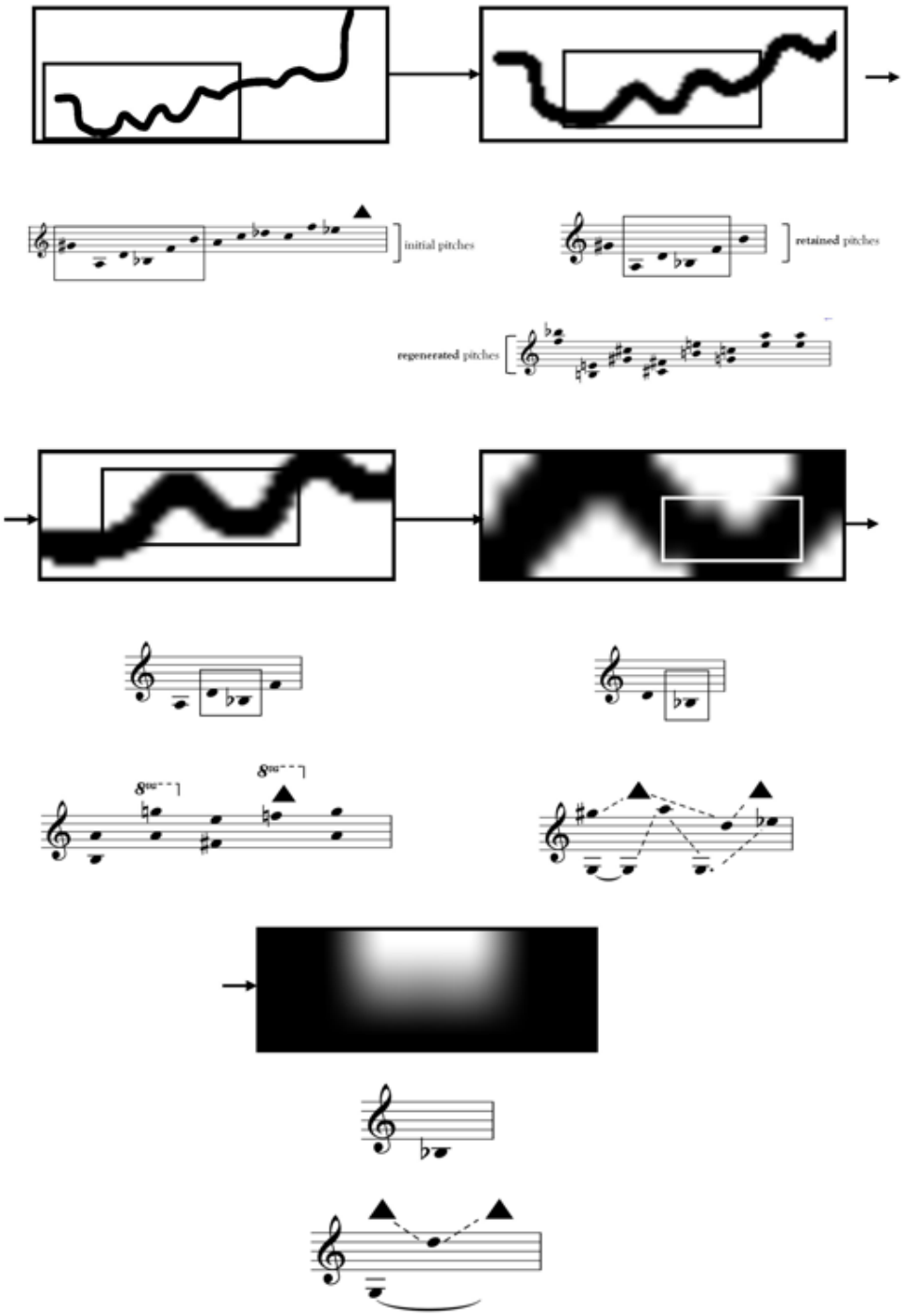


Figure 79. Summary of harmonic fields in 'Quarter 1' of Pixelating the River.
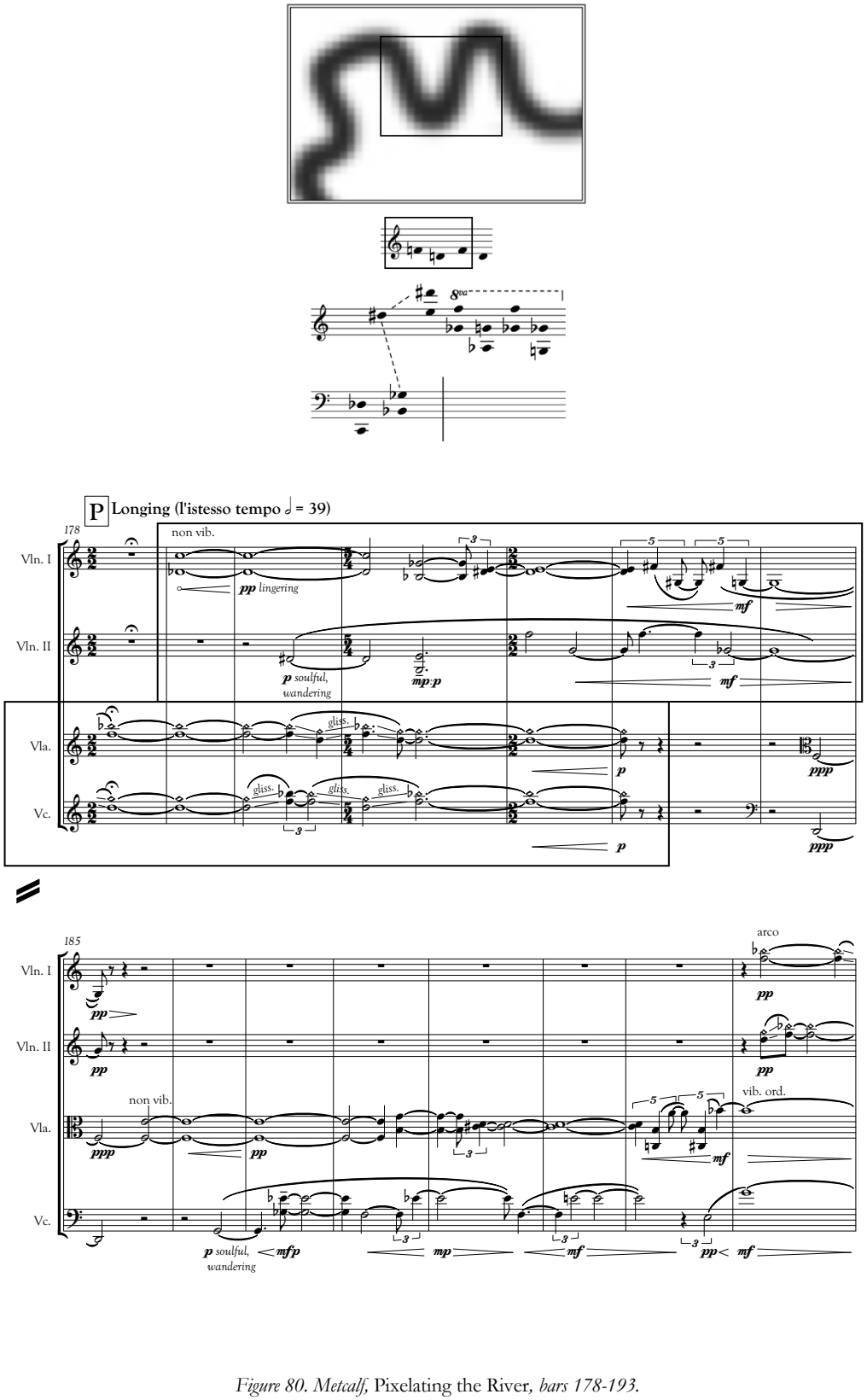


Figure 80. Metcalf, Pixelating the River*, bars 178-193.*

The structure of the quartet is signified through the use of graphical insertions of the river into the score, with the instruction, 'all lines are interpreted as glissandi; as if flowing through a river'. These moments are concluding points of harmonic fields (each quarter of the river graphic), and they allow for a coherence of two 'types' of river material and the prevailing harmonies (since these sections have the initial pitch set as their referential glissandi pitches). This is a similar transitionary approach to Hesketh's *Forms Entangled*, with the difference being that the signifying graphic is one which has generated much of the material of the preceding section. In this way, it invokes the idea of a 'direct' or 'true' representation (used in Harry's *Borderline*) providing the polarity between mediated and unmediated graphic processes derived from the same source. Techniques such as this allow for the construction of a sonic *ductus*: a palaeographic concept in which the work leads one through itself in its visual presentation and features of production.

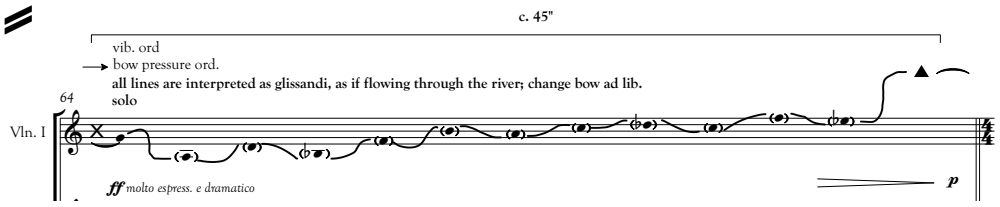


Figure 81. Metcalf, Pixelating the River*, bar 64 (violin 1).*

In *Pixelating the River*, this ductus exists in two senses. The use of the specific graphic as a performance instruction further bolsters the depictive and metaphorical aspects of the graphical ekphrasis. Moreover, the fragmentation of the original set, through retained pitches, acts as an analogy to the magnification process that happens through pixelation. The teleology is based upon the deconstruction of these rows, and their situation in surrounding material (the regenerated pitches). In the same way that magnification processes focus on a single pixel, the set narrows to reveal a single pitch that is the culmination of a process of obfuscation. In this sense, the teleology

of the work exists as four 'arrivals', where the tensions of the pixelation process are set up in the preceding music.

Through this logic, the piece could feasibly end after the fourth, and final, graphical insertion. However, this is not the case. The final section of the piece exists as a contracted analogy for pixelation itself. The unison music of rehearsal mark Y is unfurled in such a way that subsequent parts become audible (away from the whole), much like how pixels become visible through magnification (Figure 82). This is sonically signified at rehearsal mark CC, where the quartet are in four different metrical layers which disintegrate to a sparse texture, representing a move from high data to low (Figure 83). The final section elongates all 'initial pitches' in harmonics, therefore referring to the opening material but also, for the first time, using these pitches *simultaneously* (Figure 84). In the same way that the magnifications are related to their original image, one must also acknowledge that these four quarters, when assembled, make a whole. This is the true teleological goal of *Pixelating the River:* re-construction.

In this way, one may explore musical meaning in *Pixelating the River* with relation to cognitive *image schemata.* Two schemata can be interpreted through the structure of the work, rationalising the ekphrasis being enacted. Firstly, the use of harmonic fields connected to a visual transition from high to low fidelity, articulated by an overt notational (and therefore performative) shift to graphic notation, could be read as a 'centre/periphery' schema. The graphic notation is the centre, since the prior music has been almost exclusively defined by this graphic, and the shifting harmonic fields (themselves a result of increased pixelation) act as periphery. This is further articulated by the graphic solos being in free time (i.e. arhythmic), and lacking any firm notion of harmonic rhythm; it is a parenthetic moment that seems to exist outside of the musical structure. However, as noted by Mark Johnson, 'what is central can become peripheral, and what is peripheral can

become central'.[98] It is due to the close, ekphrastic relationship of the musical materials that can allow for this oscillation in perceptual interpretation through presentation of similar material in new contexts (e.g. the violent cello solo of bar 140 versus the ghostly violin solo of bar 311).

The aspect of teleological reconstruction that emerges in the final section of the piece could therefore be read as a 'part/whole' schema, since this is the first time that the four quarters of the graphic have been assembled and thus the full graphic 'sounded'. Musical meaning and perception can be accrued through articulation of smaller structural parts (the river quarters), as well as the teleological goal of the whole (the full graphic). Michael Spitzer, in his refutation of structuralist histories of music which import inappropriate linguistic models and prioritise them over all else, claims that, 'by letting the music structure itself, we obtain (musical) structure without structuralism'.[99] When composing with an extra-musical impetus, one could argue that musical structure is a symptom of the composer's criticism; one which is conveys their interpretation of the source. As such, the use of a teleology centred around *multiple* images linked to a visual phenomenon (pixelation) allows for this structuring to be more easily mapped into the temporal domain, since contextual relationships are constructed (whether linear or non-linear) that will be articulated through the transmedial processes designed by the composer.

This chapter has introduced pixelation as a teleological function of acoustic music composition from a graphical perspective. It has shown that, through the application of both formal and poetic procedures, the pixelation metaphor can be constructed alongside the depiction of its properties, thus creating a sonic representation of the image(s) which can allow for heightened teleological communication to audiences and performers. This expands graphical ekphrasis to a form of *dynamic graphical ekphrasis*, something concerned as much with the musical representation of spaces

[98] M. Johnson, 'Image-Schematic Basis of Meaning', *Semiotic Inquiry*, 9(1-3), 1989, p. 112.
[99] M. Spitzer, *Metaphor and Musical Thought*, Chicago, Chicago University Press, 2004, p. 135.

themselves, but also in the *movement between spaces*, and how this can factor into music's structural and teleological properties.
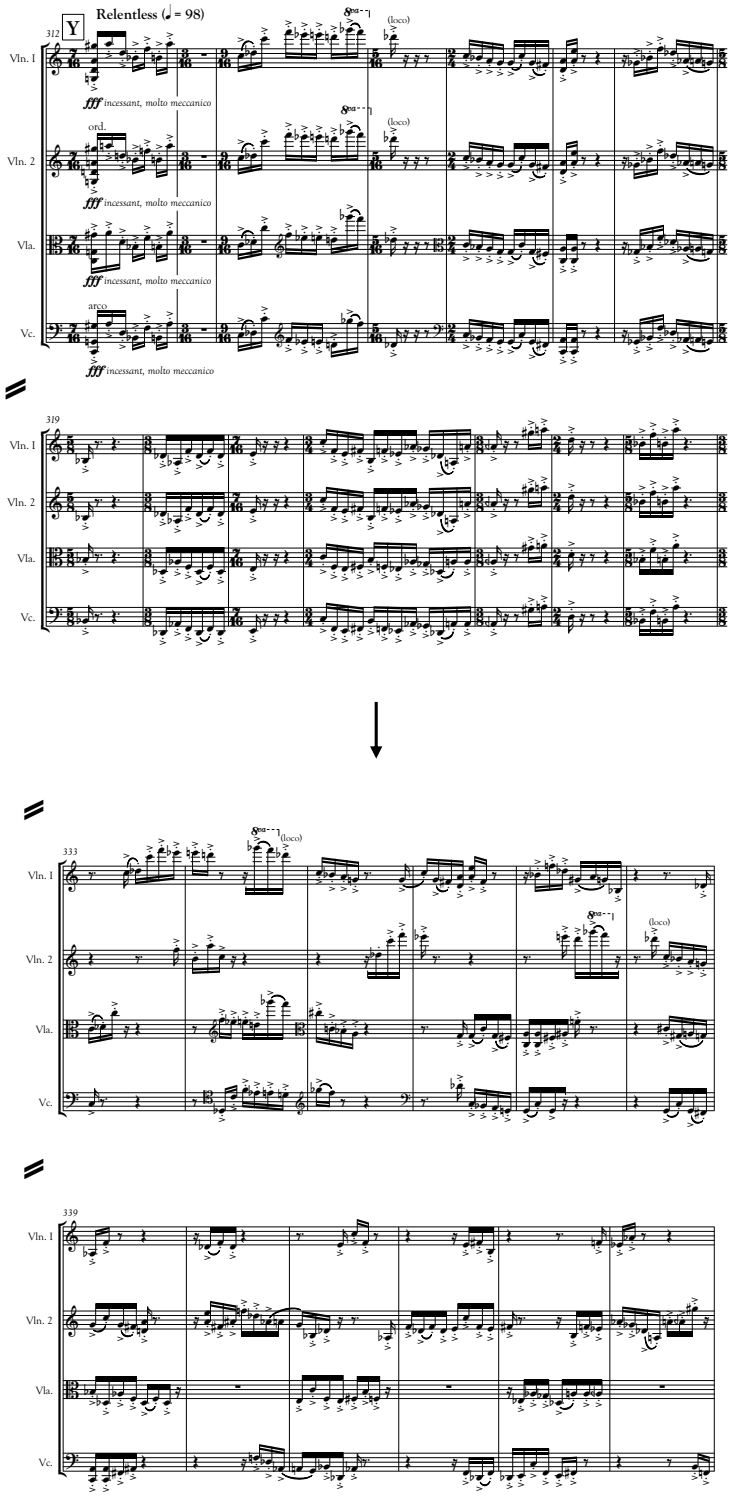


Figure 82. Metcalf, Pixelating the River*, bars 312-325 and 333-344.*
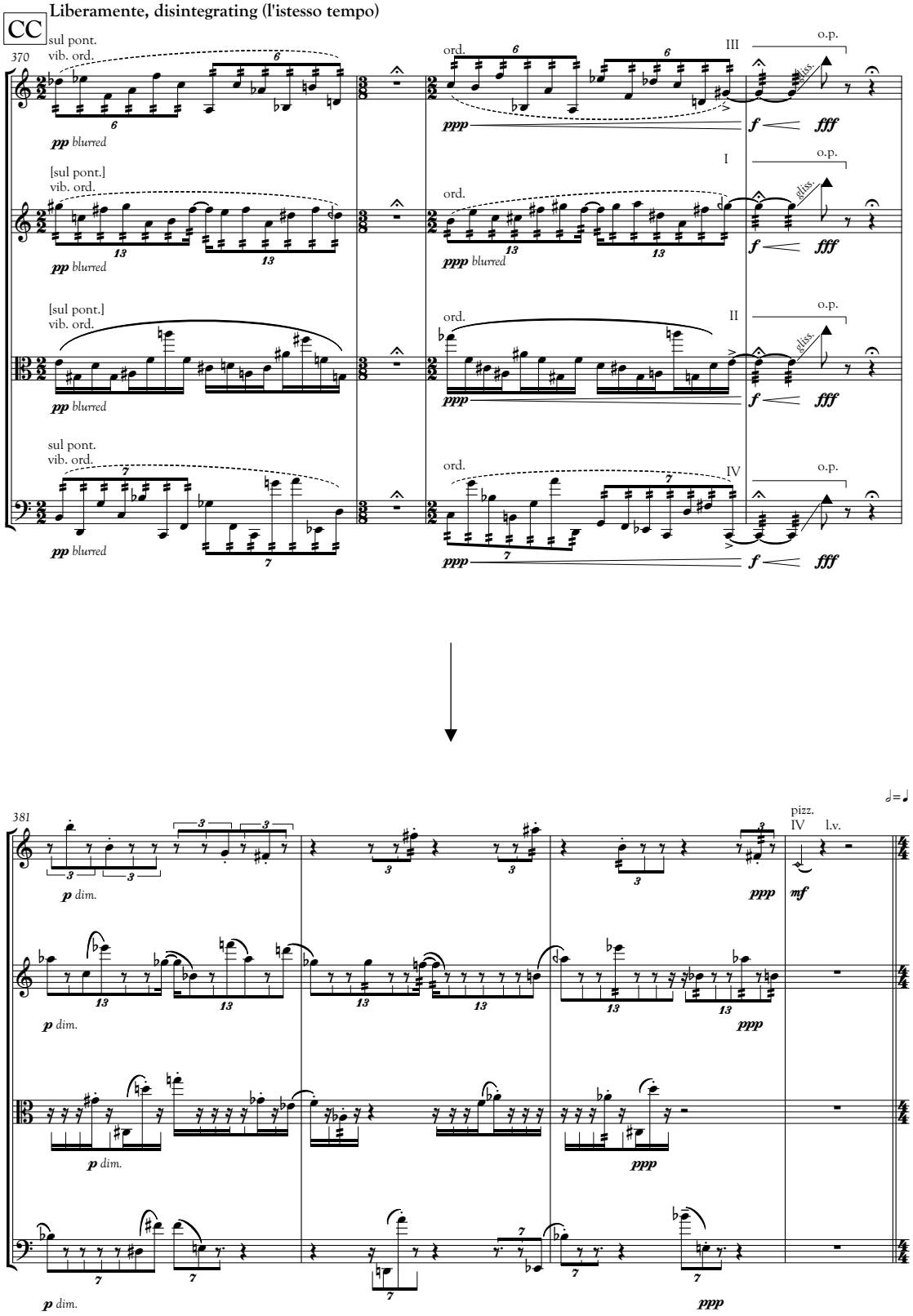


Figure 83. Metcalf, Pixelating the River*, bars 370-3373 and 381-384.*
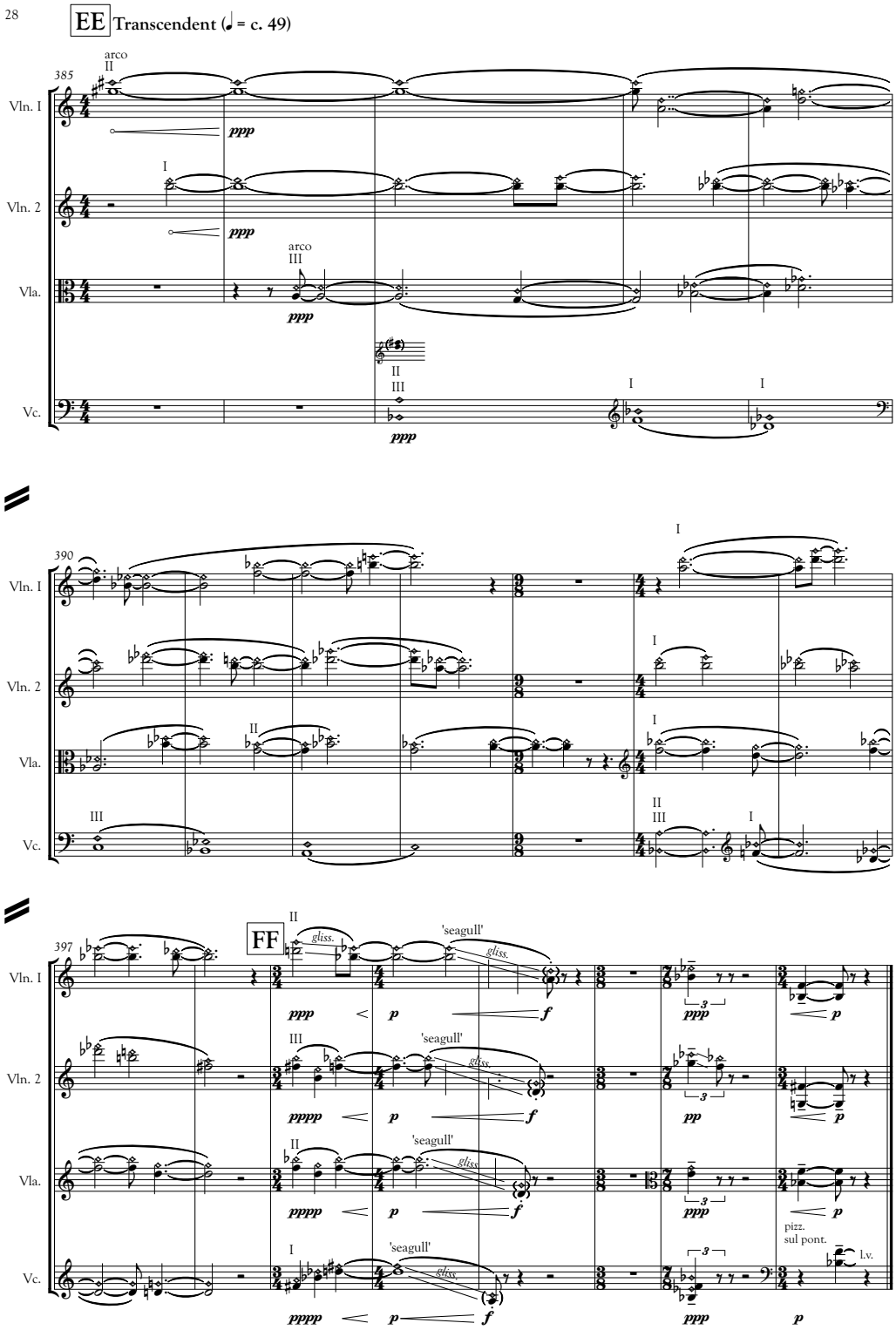


Figure 84. Metcalf, Pixelating the River, *bars 385-404 (end).*

5. The Aesthetics of Graphical Ekphrasis

Having demonstrated varied applications of graphical ekphrasis, the final part of this thesis will draw conclusions as to its wider implications, introducing novel composite frameworks through which to further develop this area in a more far-reaching sense, such as *parergon* theory and *audiation*. The thesis will conclude in arguing for the need for a 'transmedial aesthetics' that can cut across discipline and offer recontextualisations of not only contemporary music, but historical music also.

5.i. Ekphrasis as Experimental

This thesis has demonstrated the potential of graphical ekphrasis as both a compositional approach, as well as a means of constructing musical meaning. Through the notion of composer as critic and analyst – a crucial part of a graphically ekphrastic approach – it could be argued that a kind of experimentalism emerges in creative practice. Cardew's *Bun No. 2* was understood by the composer as a failed experiment, sitting uneasily between graphic and non-graphic philosophy and practice (and, importantly for Cardew, their socio-political correlates). Hesketh's graphic ekphrases are the result of a long-held exploration of extra-musical procedures (not all graphic) – a progressive refinement over a decade that has centred on an image (the labyrinth) that now has both formal and poetic significance to the composer's endemic musical philosophy of the unreliable machine. Indeed, reflecting upon my own work, I have found that graphical ekphrasis has provided a holistic way of composing – one which provides a variety of pre-determined factors that I must navigate in the construction of the artistic object. It is through experimentation with these new compositional grammars that I have better achieved the balance between formalism and intuition that was initiated with my first foray into graphical ekphrasis: *Out of the*

Web: Approximation (2017).[100] The crux of this ekphrastic experimentalism can be summarised by Aaron Cassidy's own understanding of the term 'experimental':

> Everything that I do as a composer, from the beginning of work on a piece to the end, exists to *set up scenarios that allow me to invent material that I wouldn't be able to imagine left to my own devices.* Principally these revolve around a many-layered set of restriction and constraint systems that, in a sense, control the available space for compositional decision-making. When they work best, they force me into decisions – and, more importantly, into sounds – that I otherwise wouldn't make.[101]

Once one engages with an extra-musical material with the hope of effectively 'transmedialising' it (i.e., preserving its formal features and symbolic content), then the composer will likely enter unfamiliar situations through the virtue of interacting with another text. The extension to a graphical ekphrasis is through the application of not just constraints or restraints, but the *systemisation* of them. In order to effectively transmedialise the graphic(s), more abstract systems of musical/visual mapping must be constructed, as demonstrated in the case studies. It is these systems that will then often come to define the entire work, and thus the listener's perception of the ekphrasis.

5.ii. Contextualising the Transmedial Process

Writing on the technical aspect of ekphrasis, Lawrence Kramer states:

> Ekphrasis is accordingly a technique of visualization, a means of training the eye. But it is also a hermeneutic technique, a means of commenting on what is visualized and therefore of training the eye to see meaningfully.[102]

Kramer highlights the distinction between seeing, and seeing 'meaningfully' – or, for the purposes of this study, hearing, and hearing meaningfully. We might understand graphical ekphrasis as not

[100] A score and recording can be found at https://thomasmkmetcalf.com/media/#chamber.
[101] A. Cassidy, *I am an Experimental Composer*, lecture given at the Orpheus Research Centre in Music, Ghent Belgium, 22–23 February 2012 [Italics mine] (full text available on Cassidy's website: http://aaroncassidy.com/experimental–composer/).
[102] L. Kramer, *Musical Meaning: Toward a Critical History*. University of California Press, 2002, p. 16.

merely the transmedialisation of a variety of visual stimuli, but also the subsequent commentary on that transmedialisation itself. In all of the case studies within this thesis, each composer responded to their use of graphical stimuli beyond instances of singular transmedialisation, in the sense that the transmedial process was then contextualised within the surrounding music. It is through this commentary that the graphical ekphrasis is communicated to listeners, since it is unlikely that the multitude of specialist analytical processes will be immediately comprehended (insofar as they are idiosyncratic to the composer's personal biases and educational experiences). The potential for hermeneutic exploration is thus more diverse as a result of decentralising the concept of the artistic 'text'.

Indeed, the element of visualisation within the music should happen holistically – without the need for such technical analysis from a listener – to allow for construction of meaning to be necessarily dynamic. Jonathan Cross highlights that the 'authority' of the composer in pointing out the so-called 'salient' or important aspects of the work is one which is fraught with difficulty. Writing on the use of Dowland's *In Darkness Let me Dwell* (1610) in Birtwistle's *The Shadow of Night* (2002) (which was highlighted by the composer in an uncharacteristically illuminating composer's note in the score), Cross posits, 'I wonder if we would give it quite this prominence if the composer had not chosen to drawn [sic.] our attention to it'.[103] In a way, this contrasts with Nattiez's *inductive poietics* and implies a kind of 'artifice' in projecting the perceived musical meaning of a work that the composer wants us to glean – drawing parallels with the concerns raised in Chapter 1 with Bruhn's very general, ekphrastic reading of Ptaszyńska's concerto.

Hearing 'meaningfully' through graphical ekphrasis is, arguably, more achievable than through Bruhn's conception of musical ekphrasis, when considering the multiple layers of referentiality

[103] J. Cross, 'Writing about Living Composers: Questions, Problems, Contexts' in Peter Dejans (ed.), *Identity and Difference: Essays on Music, Language, and Time*, Ghent, Leuven University Press, 2004, p. 17.

that may be necessary in transmedialisation (and this is clear when reading her texts, which have analyses of source works that often exceed that of the music). There is a directness in the relationship of the visual to the aural that is enacted through a compositional formalism, as well as a more general contextualisation of that formalism to create the full ekphrastic piece. This idea of 'meaningful hearing' runs into multiple other areas of enquiry, outside the scope of this thesis, but this notion of embellishing the transmedialisation process is best summarised by Iannis Xenakis, who stated, '[a] drawing may define the outlines of an object, its general contours, its shape, but does not always reveal the details that make it interesting or "alive" … there has to be a dynamic effect, otherwise they have no meaning'.[104] It could therefore be argued that despite the changed perception of the ekphrastic subject away from codified 'artworks', Bruhn's category of reference still exists through the need for graphics to be in some way 'alive'. What graphical ekphrasis allows for is this symbiotic relationship to emerge between musical content and musical meaning; the referential layers are derived from the composer's analysis/criticism of the visual input, which then subsequently comes to define the entire piece – manifested in multiple parameters. As such, as long as the initial graphic is communicated to a listener, then the latter understanding of the whole piece is not so much pre-determined – as a musical ekphrasis using a narrative or representational pictorial text may imply – but becomes organic, tempered by the listener's interpretation of the graphical/musical connection.

This process of communication, or construction of musical meaning from the composer, aligns with Karlis Racevskis's idea of the 'authorial instance':

> The artist, or author, can thus be seen as an artistic or authorial instance, neither preceding nor exceeding his or her work. This is not to say that the artist is completely without the freedom to create, it only means that the work of an artist takes place in a vast field of imaginary elements that are the products of artistic, discursive, and other kinds of cultural practices. The creative act

[104] I. Xenakis quoted in B. Gibson, *The Instrumental Music of Iannis Xenakis: Theory, Practice, Self-Borrowing*, Hillsdale, NY, Pendragon Press, 2011, p. 151.

> then consists of choosing form the multitude of elements and, by reintegrating them in the field of the symbolic, the artist provides these elements with new powers of evocation.[105]

In the process of critiquing the graphic, the composer enacts the authorial instance through an essence of analytical deconstruction in order to construct formal systems – the first part of the transmedial process. It is then the integration of this closed system to a wider musical one (i.e. contextualisation in the surrounding music) which sets up the space for evocation of both the graphic and a commentary upon the processes used in its elucidation. In a way, both listener and composer exist in a liminal space, where a gap between seeing and hearing must be bridged through use of referential symbolic systems that may, or may not, have been part of established musical practice or timbral phenomenology (e.g. the use of scratch tone in *All Dead Paper* or *Pixelating the River* to represent 'glitch': the sound of failure).

5.iii. The Liminal Space of Graphical Ekphrasis: Towards a Transmedial Aesthetics

It is this liminal space, stimulated by the 'authorial instance', that echoes out in a multitude of ways, since systems of visual-musical translation are varied and numerous. For example, in computer music and scientific fields, data sonification is a method of representing one form of data (numeric) to another (sound), described by Carla Scaletti as 'a mapping of numerically represented relations in some domain under study in relations to an acoustic domain for the purposes of interpreting, understanding, or communicating relations in the domain under study'.[106] If this numerical data were represented as a graph, could one not speak of transmedialising the graph, and thus creating an ekphrasis of the shape, its contours and its formal

[105] K. Racevskis, 'The Imaginary, the Symbolic, and the Real: Nexus for the Authorial Subject', in D. Leach (ed.), *Generative literature and Generative Art*, Fredericton, York Press, 1983, p. 37.
[106] C. Scaletti quoted in D. Worrall, 'Introduction to Data Sonification', in R. T. Dean (ed.), *The Oxford Handbook to Computer Music*, Oxford, Oxford University Press, 2011, pp. 312-313.

features? Perhaps, but this is fraught with ideological ramifications of the practising communities. Scaletti, in her somewhat polemic article, 'Sonification ≠ Music', tries to highlight the incompatibility of sonification processes with musical ones:

> Sonification is not a mapping from a visualisation to sound; it's a mapping of the original source data to sound. In other words, a sonification is not a map of a map; it's a map of the territory.[107]

Despite offering a clear contrast in terminology, Scaletti then offers sentimental viewpoints on the act of composing which re-conflate these issues:

> When we create music, we're creating a sonification of what it's like to be inside our heads, to feel time passing, to move through space, to be alive. And when we listen to music, it's like mind-melding with the person who created that music.[108]

It is notable that both Bruhn and Scaletti use Joseph Gogeun's concept of the 'semiotic morphism' to argue their respective cases[109] – the goal of transmedialisation is shared, but the *framing* of the process, and how we should comprehend it, produces ideological tension.

Scaletti's idea of a 'data-driven' genre within music, one where the data plays a role in composition but isn't *the* composition, is appealing, and helps to construct a spectrum through which to understand visual-musical transmedialisation – a way of navigating the liminal space. Here, we can see potential crossover with a graphically ekphrastic framework: the idea of privileging formalism in order to transmedialise the subject, whether through number, geometry, etc. One could then argue that a positioning along this 'transmedial' spectrum is through the rigor of the composer's graphical analysis, and in the strength of the integration into their symbolic musical language. Herein lies a further consideration of transmedial aesthetics that similarly resonates with the authorial instance: *audiation*.

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[107] C. Scaletti, 'Sonification ≠ Music', in R. T. Dean & A. McLean (eds.), *The Oxford Handbook to Algorithmic Music*, Oxford, Oxford University Press, 2019, pp. 371-372.
[108] Ibid, 378.
[109] Bruhn, *Musical Ekphrasis*, p. 51; C. Scaletti, Sonification ¹ Music', p. 364.

Audiation, coined by pedagogue Edwin Gordon, 'is to music what thought is to language … we audiate when we hear and understand in our minds music that we may or may not have heard, but are reading in notation, or are composing or improvising'.[110] The term has recently been applied to the contemporary compositional process writ large by Roger Redgate, who describes audiation as 'initial apprehension of sound or musical image in the mind of a composer,' and that 'any form of setting down inevitably references some kind of audiative image … a strong, almost visual, imagery associated with audiation'.[111] In this sense, audiation seems elusive; part of the creative process manifested in the mind of the composer that remains intangible. It *is* the liminal space that occurs through interaction with an extra-musical image with the purpose of transmedialisation. The contextual element of graphical ekphrasis, whereby the surrounding music is coloured by the transmedial processes, is the way through which the ekphrasis is communicated to those who are not privy to the idiosyncratic compositional process. In this way, one could think of audiation existing on the part of the listener also, especially if any graphical impetus is communicated through other stimuli (e.g. in programme notes, or similar). This links back to Bruhn's categories of depiction and reference and reminds one that, whilst depiction is indeed foregrounded in a graphical ekphrasis, the need of communicating musical meaning still relies on the referential aspects that the graphic may hold through its cultural significance.

One final aesthetic consideration relates to the idea of the interconnectedness and tensions of transmedial process and result in graphical ekphrasis, through the notion of the *parergon*. A parergon is loosely defined as something external to the artwork: a 'supplement',[112] or 'ornament'.[113] As Paul Duro explains, 'for Derrida, the frame is the part of the artwork that "gives

[110] E. Gordon, 'All About Audiation and Music Aptitudes', *Music Educator's Journal*, 86(2), 1999, p. 42.
[111] R. Redgate, 'Do You Hear What I Hear? Audiation and the Compositional Process', *Principles of Music Composing*, Vol. 18, 2019, p. 21.
[112] J. Derrida, *The Truth in Painting*, Chicago, University of Chicago Press, 1987, p. 55.
[113] Kant gives examples of parerga as 'the frames of pictures, or the drapery on statues, or the colonnades of palaces'. See I. Kant, *Critique of Judgment*, tr. James Creed Meredith, Oxford, Clarendon Press, 1978, pp. 68. (Original published in 1790).

rise" to the artwork, completing the work in a way that the work … is incapable of achieving'.[114] One could argue that the process of transmedialisation is this frame; a formal process that is inherently linked with the specific spatial and symbolic aspects of the visual work, and thus is integrated as part of a larger musical metaphor. Derrida himself echoes this idea of transforming message through structure:

> The parergon … must … designate a formal and general predicative structure, which once can transport intact or deformed and reformed according to certain rules, into other fields, to submit new contents to it.[115]

Through arguing that compositional processes are this frame, we can understand Robin Marriner's summation of Derrida that, 'the "work itself" … will be formed and informed by what we take and bring to its exterior';[116] the composer is the mediator of this internal and external dialogue of the artwork. This confirms the idea of composer as critic in the inherent analysis of the source work, allowing a construction of 'those relations without which the object lacks its specific identity'.[117]

A reading of transmedial process as parergon allows for a shift away from one which is analysis-centric, and towards the implications of adopting these processes in the first place. It provides a framework with which to interrogate everything *other than* these specialised processes but, through doing so, will provide a more nuanced understanding of the ekphrastic object generally. Simone Heller-Andrist, writing on the parergon in literature, highlights the 'friction of the frame' in reconciling a work's 'parergonality' with literature's teleological bent, by virtue of existing most prominently through the medium of the book. Heller-Andrist argues, '[j]ust as the wood of the archetypal frame around a work of art can be used symbolically to describe the working of a

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[114] P. Duro, 'What is a Parergon?' *The Journal of Aesthetics and Art Criticism*, Vol. 77(1), 2019, p. 30.
[115] J. Derrida, op. cit., p. 55.
[116] R. Marriner, op. cit., p. 353.
[117] Ibid., p. 55.

frame, the materiality and the differing parts of a book can be read in the same symbolic manner'.[118] Heller-Andrist argues that the conventional materiality of a book – e.g. through its use of editorial introductions which only make sense once one reads the proceeding material – provide tensions with how its material is subsequently framed. Indeed, applications of parergon theory to music posit some new questions which do not generally concern art, nor literature, namely concerning music's multiple nature as existing as fixed text (as score) and non-fixed text (as live performance). Its existence as many media, each with their own frames, will provide great potential for further study on the idea of transmedialisation with relation to parergonality. It is clear that, in the creation of liminal sites through the authorial instance between graphic and composer/listener, a similarity in parergonality (regardless of medium) is present through what Heller-Andrist describes as a 'critical pluralism':

> Critical pluralism as such allows for a harmonious co-existence of contradicting interpretations of the same work of fiction. This harmonious co-existence, in turn, endorses personal convictions and the ensuing authoritative position towards the text.[119]

One need only to read 'fiction' as 'music' to understand the applications to the present study. Arguably, this critical pluralism stands for both interpretation of graphics, as well as the transmedial process. Graphical ekphrasis should, therefore, be situated as part of a wider framework of 'transmedial aesthetics' that can account for the variety of framing devices used to transmedialise the ekphrastic subject, and can examine the spectrum from formalist extremes such as sonification, to elusive referential concepts of audiation. By doing so, not only can new works be read in these numerous ways, but it allows for a retrospective upon historic musics that have been bound up in towering and, somewhat general, concepts, such as programme music.

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[118] S. Heller-Andrist, *The Friction of the Frame: Derrida's Parergon in Literature*, Tübingen, Narr Francke Attempto Verlag, 2012, p. 13.
[119] Ibid., p. 17.

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