

LABYRINTHS, LIMINALITY AND EKPHRASIS: THE GRAPHICAL IMPETUS IN THE MUSIC OF KENNETH HESKETH

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Abstract: This article is an introduction to the graphical impetus in the music of Kenneth Hesketh (b. 1968), from around 2012 to the present day, including his recent work, *Viae* (2020). Through examination of Hesketh's graphical control of a number of musical parameters, the article will demonstrate that the idea of a 'musical ekphrasis' can be extended through the incorporation of spatial aspects in determinate music to result in what the author deems a graphical ekphrasis. Whilst in no way exhaustive in its exploration of Hesketh's multi-parametric approach to composition, the article provides an analysis of selected compositional methodologies relating to both composition design and audience communication, situating them alongside other contemporary musical examples and trends.

When one thinks of a graphical approach to music composition, the immediate thought is of a graphic score, seen in the work of composers such as Sylvano Bussotti or Cornelius Cardew, in which the musical notation is indeterminate, creating singular performances driven by the specific performer's interpretation. However, the sphere of graphical composition is much more far-reaching, with many composers who use more determinate, standard staff notation, using visual inputs, not only as metaphor, but as part of a functional, or generative, creative process. Few composers, however, approach it as a more thorough orthodoxy, affecting a variety of compositional factors. This article explores the graphical impetus in four recent works of Kenneth Hesketh (b. 1968): *Forms Entangled, Shapes Collided* (2012), *Inscription/Transformation* (2015), *Uncoiling the River* (2018) and *Viae* (2020). 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.

Hesketh's approach to graphical composition can be seen as an extension of Siglind Bruhn's 'musical ekphrasis',¹ which I term *graphical ekphrasis*, heightening the poetic metaphor and providing a fruitful creative process through the imposition of liminality on compositional decisions that elucidates the spatial dimension of the source image.

¹ Siglind Bruhn, *Musical Ekphrasis* (Hillside NY: Pendragon Press, 2000).

It allows for a more robust ‘transmedialization’ (to use Bruhn’s term)² from the visual to the aural, and it is a more aesthetically unified presentation of the extra-musical stimuli; it is more strongly ekphratic.

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 *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.³ Similarly, multimodal projects, such as *Ein Lichtspiel* (2006), use a visual input (in this case a Moholy-Nagy film from 1930) as a compositional input to create an ‘abstract ballet’.⁴

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*.⁵

The combination of external generators that generate these ‘complexes of material’, then subsumed into the mechanistic process writ large, can give us an understanding as to the creative liminality of such processes. Moreover, this concept highlights a concern with listener perception: it is clearly important to the composer that this is as much of a 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.

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’.⁶ The graphical impetus within this piece resonates with these influences, particularly mutation, in its existence as a hybrid of

² Bruhn, *Musical Ekphrasis*, p. 51.

³ Kenneth Hesketh and Caroline Potter, ‘Unreliable Machines: An Interview with Kenneth Hesketh’, *Musical Times*, 149, no. 1905 (2008), p. 18.

⁴ Hesketh and Potter, ‘Unreliable Machines’, p. 20.

⁵ Kenneth Hesketh and Caroline Potter, ‘5 Questions to Kenneth Hesketh (composer) on his 50th Birthday’, *I Care If You Listen*, July 2018, www.icareifyoulisten.com/2018/07/5-questions-kenneth-hesketh-composer-50th-birthday/. Italics mine.

⁶ Kenneth Hesketh, ‘Forms Entangled, Shapes Collided’, *RCM Research Online*, 2012, accessible at: <http://researchonline.rcm.ac.uk/205/>.

Example 1: Kenneth Hesketh, *Forms Entangled, Shapes Collided*, bars 87–91. Reprinted by permission of Schott Music Ltd. All rights reserved.

* see footnote arco, sul pont.
 * this passage should be executed as an harmonic glissando tremolando, following the suggested contour above the notated pitch. The final note of this section should be higher than all others.

determinate and indeterminate notation. An example of this is given in bars 87–91 (see [Example 1](#)), 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 (see [Example 2](#)).

The juxtaposition of these elements belies the idea of fidelity and mutation in the context of the surrounding music. Rather than feeling improvisatory, as is often 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. Its second appearance, in bars 142–148 (see [Example 3](#)), 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*); also that a dialogue is beginning to form with other instruments, for example the brilliant 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 (see [Example 4](#)), 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.

The graphical material in *Forms Entangled* can be seen, in its own context, as the point of mutation: a parenthetical moment in which something incomprehensible takes place that affects subsequent developments of the material. A loose counterpoint to this idea can be seen

The image shows a musical score for three instruments: Piccolo (Picc.), Clarinet (Cl.), and Viola (Vi.). The score is divided into two systems. The first system shows the beginning of a glissando passage. The Piccolo part has a whole note chord. The Clarinet part has a melodic line with a glissando indicated by a wavy line. The Viola part has a whole note chord. The second system shows the continuation of the glissando. The Piccolo part has a whole note chord. The Clarinet part has a melodic line with a glissando indicated by a wavy line. The Viola part has a whole note chord. The instruction "(Sul A)" is written below the Viola part. The instruction "Glissando ad lib., regardless of metre, over longer or shorter stretches of string, the sliding finger merely touching the string (as for harmonic) varying the sliding speed, so that at its lowest the natural harmonics are clearly displayed: with some pressure on the bow, drawn very close to the bridge (sul ponticello). Remain briefly stationary on a good high harmonic from time to time and then resume the sliding. The peaks should be different pitches as often as possible, letting the finger go beyond the fingerboard as far as practicable, occasionally." is written below the Viola part. The instruction "end gliss. on highest practicable pitch." is written below the Viola part with an arrow pointing to the end of the glissando. The instruction "Picc." is written above the Piccolo part in the second system. The instruction "mf" is written below the Piccolo part in the second system. The instruction "pp" is written below the Viola part in the second system.

(Sul A) Glissando ad lib., regardless of metre, over longer or shorter stretches of string, the sliding finger merely touching the string (as for harmonic) varying the sliding speed, so that at its lowest the natural harmonics are clearly displayed: with some pressure on the bow, drawn very close to the bridge (sul ponticello). Remain briefly stationary on a good high harmonic from time to time and then resume the sliding. The peaks should be different pitches as often as possible, letting the finger go beyond the fingerboard as far as practicable, occasionally.

end gliss. on highest practicable pitch.

Example 2: Roberto Gerhard, *Libra*, rehearsal mark 55.

Example 3:
Kenneth Hesketh, *Forms Entangled*,
Shapes Collided, bars 140–151.
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in the contouring of pitch elements, seen in the composer's sketches for this piece (see Example 5). 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.

Another contemporary example exploiting this context-driven graphical tension can be seen in Martyn Harry's 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 (see Example 6).

444 **FF**

A. Fl.

B. Cl.

Perc. (Mba) with regular mallets

Vln.

Vc.

* - this passage should be executed as an harmonic glissando tremolando, following the suggested contour above the notated pitch. The final note of this section should be higher than all others.

440

A. Fl.

B. Cl.

Perc. (Mba)

Vln.

Vc.



444 **FF**

A. Fl.

B. Cl.

Perc. (Mba) with regular mallets

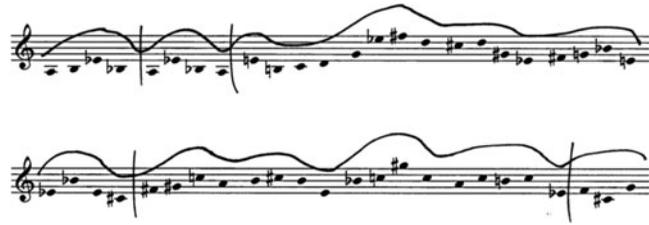
Vln.

Vc.

* - this passage should be executed as an harmonic glissando tremolando, following the suggested contour above the notated pitch. The final note of this section should be higher than all others.

Example 4:

Kenneth Hesketh, *Forms Entangled, Shapes Collided*, bars 444–456.
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Example 5:
An example of pitch-contouring
from sketches for *Forms Entangled*.

S Borderline Solo 2

243

Vln 1 *p sempre*

Vln 2 *mf molto espress.*

Vla *p sempre*

Vlc

vs *pp* vs *pp* vs *pp*

(1) (2) (3)

Example 6:
Martyn Harry, String Quartet No. 3,
Borderline, bars 243–246 *Borderline*. ©
Martyn Harry, reproduced with
permission from the composer.

Framed as ‘Borderline solo’ or ‘duet’, these passages use 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, 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’,⁷ strengthening the metaphor of conflict through the use of indeterminate glissando figures, whilst also providing another sonic manifestation of the border itself. 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 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.

⁷ Martyn Harry, programme note, String Quartet No. 3, *Borderline* (2019).

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.⁸ 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 2012–17 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.⁹

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.). This philosophy is reminiscent of Kim Cascone's notion of the 'aesthetic of failure' when he identifies that 'our control of technology is an illusion'.¹⁰ The Collatz sequence is a numerological construct that may be represented graphically. Hesketh uses the death date of Dutilleux (22 May 2013 = 5/22/2013) to generate three Collatz sequences, represented graphically below (see [Figure 1](#)).

This creates three graphical representations that indicate differing levels of volatility. From a graphical composition perspective, 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 2](#), taken from the composer's sketches.

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.¹¹ [Figure 3](#) shows examples from Hesketh's sketches in which contrasting contours, using high ($n = 2013$) and (low $n = 5$) graphs, can be seen.

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.

⁸ 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.

⁹ Kenneth Hesketh and Christian Morris, 'Kenneth Hesketh at 50 Interview', *Composition Today*, 11 July 2018, www.compositiontoday.com/interviews/kenneth_hesketh.asp.

¹⁰ Kim Cascone, 'The Aesthetics of Failure: "Post-Digital" Tendencies in Contemporary Computer Music', *Computer Music Journal*, 24/4 (2000), p. 13.

¹¹ For more on the combination of 12-tone composition and data sonification, see Thomas Metcalf, 'Graphical Data Sets as Compositional Structure: Sonification of Colour Graphs in "RGB" for clarinet and piano', *Leonardo*, forthcoming.

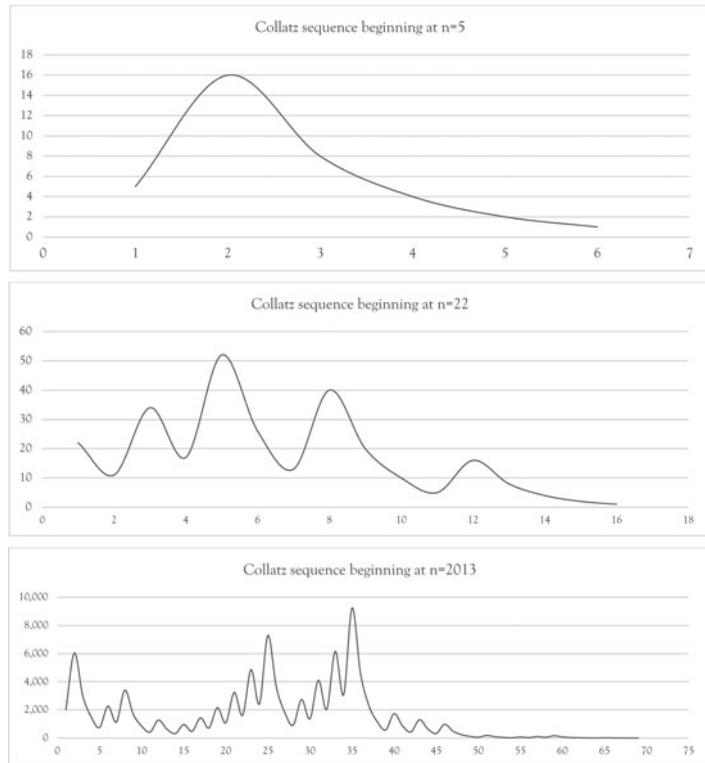


Figure 1:
Graphical representations of Collatz sequences, using $n = 5$ (top), $n = 22$ (middle), and $n = 2013$ (bottom).

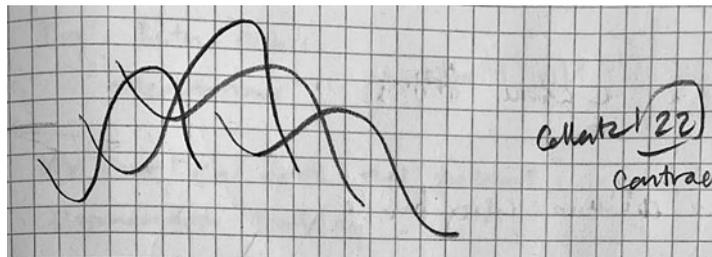


Figure 2:
Kenneth Hesketh: overlaid curves in the composer's sketches.

The incorporation of 'unreliable machine' gestures can highlight and saturate the contouring of the curve (see [Example 7](#)).

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 uses imitative gestures following the vibraphone and violin II, which play repeated material of differing lengths (two and three beats respectively). Violin II more closely resembles the Collatz contour and is distinguished through use of pizzicato, which is 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 [Example 7](#). 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

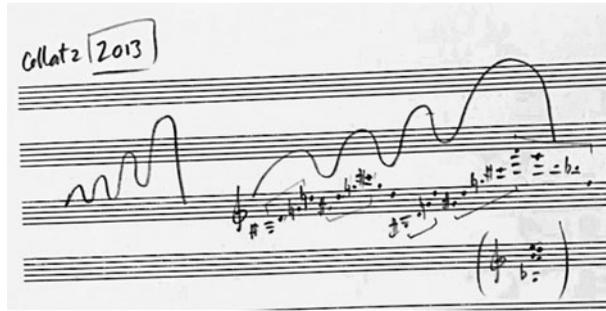


Figure 3:
Kenneth Hesketh: contrasting curves
used as pitch contours in *Inscription/Transformation*.



Example 7:
Harmonic analysis of bars 46–59 in
Inscription/Transformation.

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.

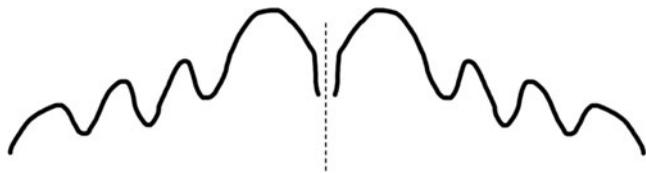
Disruptive elements are introduced in the vibraphone, whose repeated group is interrupted by the axial symmetry pitch (A) at the start of bar 48; this coincides with the peak of the curve in violin II and the harp, like the interjections seen in *Forms Entangled*. Similar disruptions can be seen in the 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 (see [Example 8](#)).

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.

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 the pitches that are not shared between the harmonic groups before and after symmetrical rotation (as indicated by the beamings in [Example 9](#)). 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 B₂, 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,

Example 8:
Reduction of bars 46–48 of
Inscription/Transformation.

Figure 4:
Graphic representation of pitch
contouring in bars 46–52 of
Inscription/Transformation.



when the B_b becomes a B_{\sharp} . 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 'aesthetic of failure' through an ekphrasis of the graphical inputs.

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 5.

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 5 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

The image displays a page of a musical score, specifically bars 43-52 of Kenneth Hesketh's 'Inscription/Transformation'. The score is arranged in a standard orchestral format with multiple staves for each instrument family. The instruments listed on the left include Flute 1 and 2, Oboe 1 and 2, Clarinet 1 and 2, Bassoon 1 and 2, Horn 1 and 2, Trombone 1 and 2, Percussion 1 (Vibraphone), Harp, Cello, Double Bass, Violin 1 and 2, and Viola 1 and 2. The notation is dense, featuring various rhythmic values, slurs, and dynamic markings such as 'pp' (pianissimo) and 'rall.' (ritardando). The score is set in a 4/4 time signature.

Example 9:
Kenneth Hesketh, *Inscription/
Transformation*, bars 43–52. ©
Cecilian Music, reproduced with
permission.

that cannot be processed as neatly as the lower energy graphs, seen in the internal homophony of the brass and string sections.

At the opening of the work, the brass play sparingly, quiet and static until they become more agitated around bar 59, but even then they play repeated chords rather than melodic lines. This changes at bar 67, where the brass erupt from their dormant role, 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[at]z 5'. 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 *fff* 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.

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

Example 10: Kenneth Hesketh, *Inscription/Transformation*, bars 57–69. © Cecilian Music, reproduced with permission.

* - from this point on, Brass are muted till the end of the work

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 in Figure 7. This graph is clearly 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.

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 ekphratic nature of graphical

Example 11:
 Bars 135–136 of *Inscription/Transformation*. © Cecilian Music, reproduced with permission.

Example 12:
 Reduction of brass 'choral textures' in *Inscription/Transformation*.

Figure 5:
Sketch version of bars 135–158 in
Inscription/Transformation

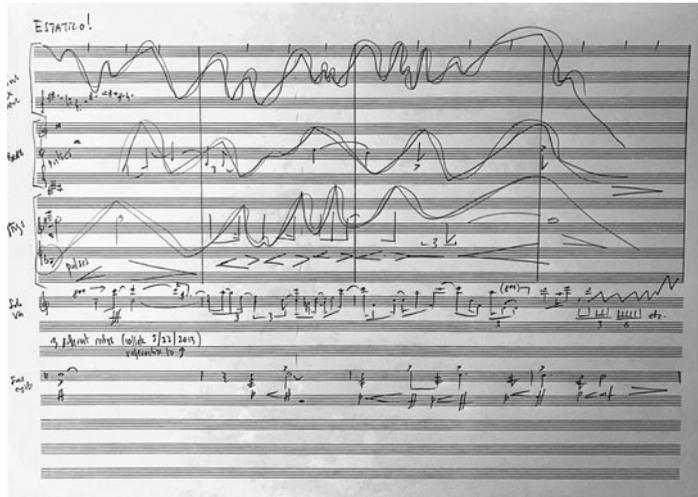
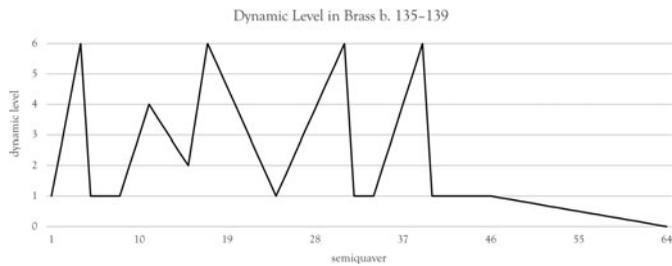


Figure 6:
Contouring of brass harmony in
Inscription/Transformation using a
'low-energy' curve.



Figure 7:
Graphical representation of dynamic levels in the brass section from bars
135–139.



composition is found in another contemporary exponent of the labyrinth: Harrison Birtwistle. In his discussion of the labyrinth within modernity, initially in Monteverdi, but then in complex urban spaces of the twentieth 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'.¹²

¹² Julian Johnson, *Out of Time: Music and the Making of Modernity* (Oxford: Oxford University Press, 2015), p. 135.

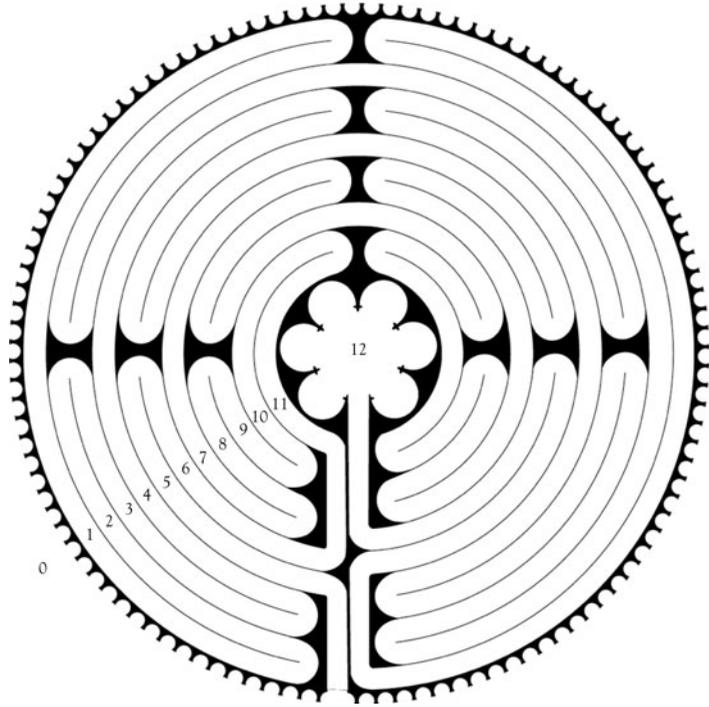


Figure 8:
The Chartres Cathedral labyrinth.

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 the labyrinth; the musical ekphrasis is scaffolded by the graphical ekphrasis of the constituent materials. Through a combination of these ekphratic 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.¹³

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)¹⁴) but they do showcase notable extensions to specific processes already explored, and they 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 (see Figure 8), a set of 12 concentric circles delineating 11 lanes which form the path one would take to the centre.

¹³ For more on the contextual and poetic in Birtwistle's process, see Michael Hall, 'The Sanctity of Context: Birtwistle's Recent Music', *Musical Times*, 129, no. 1739 (1988), pp. 14–16.

¹⁴ K. Hesketh, programme note, *In Ictu Oculi* (London: Cecilian Music, 2017).

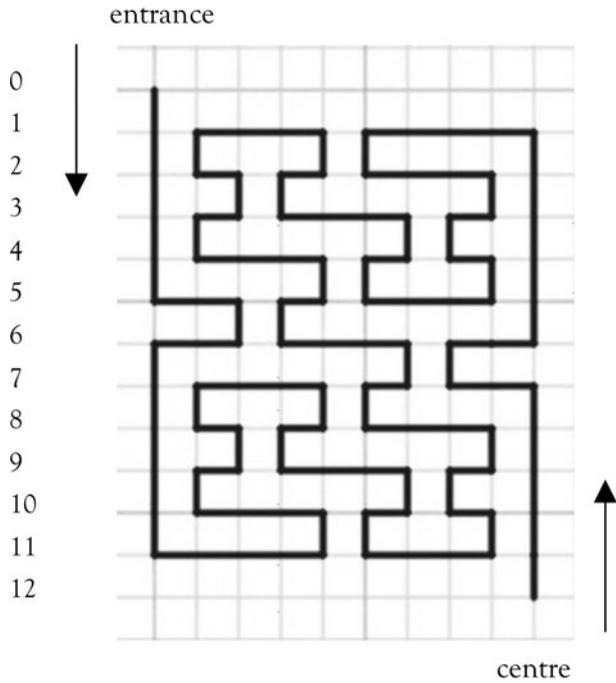


Figure 9:
The meander of the Chartres
labyrinth

Numbering each concentric circle, we can generate the path order by noting which circle we are 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 11, 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 9).

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, which was used to model algae growth is given below:

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

Example 13:

Kenneth Hesketh, *Uncoiling the River*, bars 468–473 (reduction). © Cecilian Music, reproduced with permission.

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

The rule-based approach of L-systems is comparable with the liminality of graphical composition, more strictly aligned with ideas of algorithmic composition.¹⁵ 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'.

Uncoiling the River

Uncoiling the River, a piece for piano and orchestra written for pianist Clare Hammond and premiered in 2018, is a large-scale work that employs numerous labyrinthian processes. I will focus on two aspects of graphical composition within the piece: rhythmic substructure, and the combination of labyrinth and Kolam 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 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

¹⁵ Stephanie Mason and Michael Saffle have expanded on Przemyslaw Prusinkiewicz's work on the possibilities of applying L-systems to musical composition in 'L-Systems, Melodies and Musical Structure', *Leonardo Music Journal*, 4 (1994), pp. 31–8.

The image displays four systems of musical notation for piano, arranged vertically. Each system consists of a grand staff with a treble clef on the upper staff and a bass clef on the lower staff. The first system begins at measure 80 and features a series of rhythmic patterns in the bass clef, with dynamic markings of *mf* and *pp*. The second system starts at measure 246 and contains a dense, continuous rhythmic texture in the bass clef, with dynamic markings of *mf* and *mp*. The third system begins at measure 448 and shows a more sparse rhythmic pattern in the bass clef, with dynamic markings of *mf*. The fourth system starts at measure 523 and includes a variety of rhythmic textures, with dynamic markings of *mf* and *p*, and a section marked *(lento)* towards the end.

Example 14: Piano rhythmic 'solos' in *Uncoiling the River*.

palindromic system of shorts and longs. It is, essentially, an analysis of a graphic which generates further compositional elements.

•• | -- | •• | - - - - | •• | - - - - | •• | - - - - | •• | -- | ••

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 first violin that is imitated and subsequently varied in the second violin, piccolo, and flute (all solo) (see [Example 13](#)). From bar 480 this process is repeated, with the first oboe having the initial rhythmic strand.

Like *Forms Entangled*, *Uncoiling the River* uses stark musical signifiers to indicate structural changes and to highlight the genotype of the proceeding material. These moments (shown in [Example 14](#)) consist of a repeated note, or notes, played aggressively loud (*sfzz*) in the piano.

The image displays a page of a musical score, labeled 'Example 15'. It features a large orchestral score with multiple staves for woodwinds, strings, and percussion. Above the woodwinds, there are two solo parts for Flute 1 and Flute 2. Below the strings, there are two solo parts for Violin 1 and Violin 2. The score includes various musical notations such as notes, rests, and dynamic markings like *sfzz* (sforzando) and *pp* (pianissimo). A section of the score is marked with a large 'E' in a box, indicating a specific structural moment. The page number '64' is visible in the top left corner.

Example 15:
Kenneth Hesketh, *Uncoiling the River*,
bars 80–86. © Cecilian Music,
reproduced with permission.

Example 16:
Kenneth Hesketh, *Uncoiling the River*,
bars 253–273. © Cecilian Music,
reproduced with permission.

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 significantly 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 and 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'. This is shown below in a sketch (formally realised as a gift

68

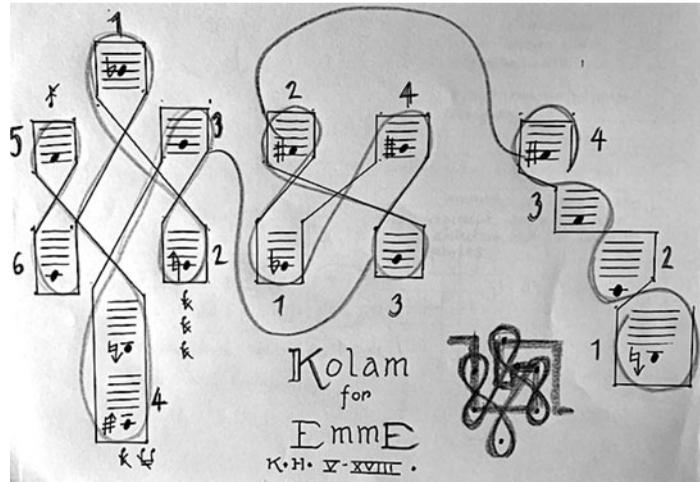
Example 17:
Kenneth Hesketh, *Vite*, bars 229–
232. © Cecilian Music, reproduced
with permission.

for Hammond) and is presented musically in the score from bars 685–699.

The embodiment of graphical sources in a performative context is intended by Hesketh as a form of communicative signal to the audience, an idea reinforced by the inclusion of a passage from Jorge Luis Borges' 'A New Refutation of Time' (from *Labyrinths*)¹⁶ in the preface to the score and the ideogram in the programme note. *Uncoiling the River* also uses graphical procedures to articulate the dialectical tension between the '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

¹⁶ Jorge Luis Borges, 'A New Refutation of Time', in *Labyrinths* (New York: New Directions, 1964).

Figure 10:
Kolam for Emme.



an accessible structural cohesion, the strength of the gestures enabling listeners to engage with the intricate structures of the music.

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 graphic of the labyrinth. To generate oboe lines, and orchestral textures, Hesketh unfurls the meanders of labyrinths, converting a graphical representation into a simple linear temporal space. Figure 11 shows an example of this unfurling process from the composer's sketches.

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 (see Figure 12). The unfurled labyrinth graphic is overlaid on itself twice, resulting in an exaggerated profile. To generate the contour, the composer follows any of the three pathways generated from this process, switching between them at will. 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 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 in dynamics and articulation so that these gestures can be heard as gesturally similar.

Figure 11:
An unfurled labyrinth meander

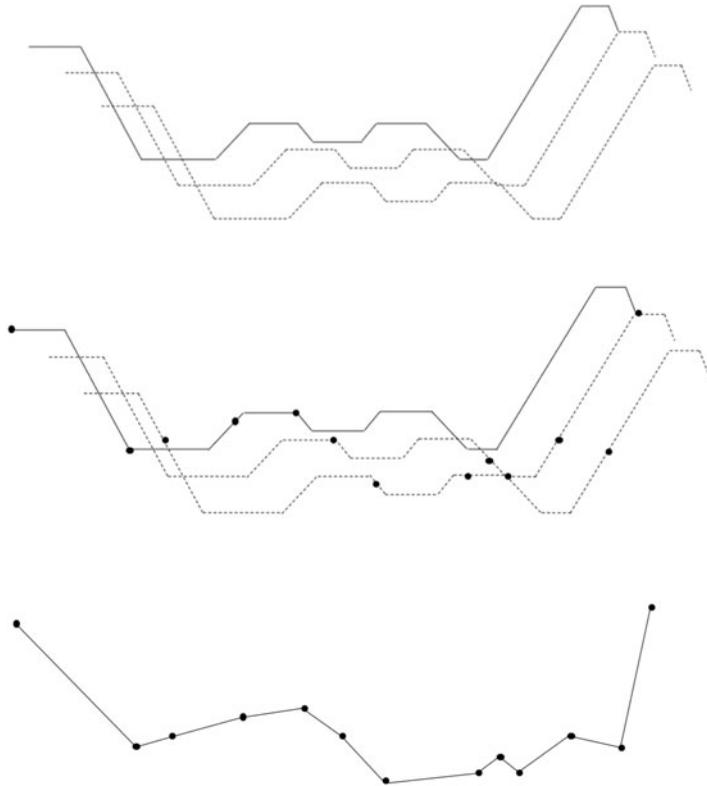
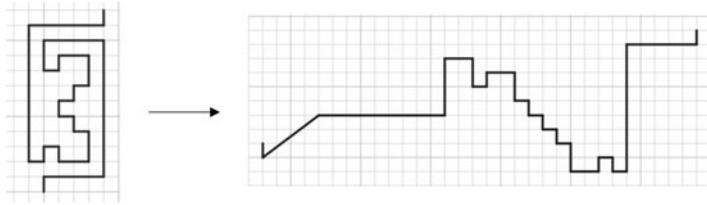
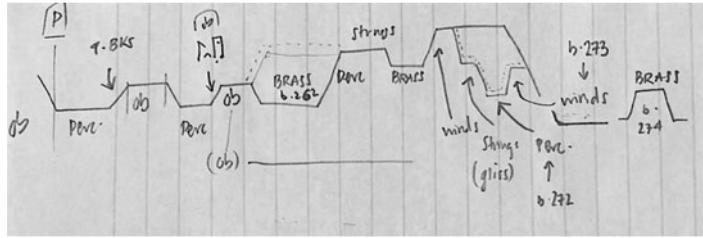


Figure 12:
The process of generating meander
contours from multiple graphical
layers.



Hesketh also links graphical contours to timbral mappings. This is a less immediate process, but nonetheless one which compounds the use of the labyrinth and consolidates the sense of a graphical ekphrasis. The sketch in [Figure 13](#) corresponds to bars 256–275. Unlike

Figure 13:
A sketch from *Viae* showing the design of timbral contouring.



Example 18:
Percussion section in bars 256–263 of *Viae*. © Cecilian Music, reproduced with permission.

Example 19:
'Unfurled' percussion rhythms in bars 264–265 of *Viae*. © Cecilian Music, reproduced with permission.

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 (see [Example 18](#)) 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 its position in the graphical space. Contrast this with the percussion in bars 264–265 (see [Example 19](#)), 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 height of textural

Example 20:
Bars 270–271 of *Viae*. © Cecilian
Music, reproduced with permission.

disorder in the context of this passage occurs in the woodwind at bars 270–271 (see [Example 20](#)), where the smallest rhythmic values are introduced in two polyrhythmic groups, coinciding with the final (and largest) rapid oboe cascade figure in bar 271.

To date, the graphical impetus 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'. Julian Johnson's judgement on Birtwistle's music is just as pertinent to the recent work of Kenneth Hesketh: '[T]he demonstration of the composer's skill stands in for the promise of the grammatical system itself, to render as balance, clarity, and order, a plurality that might otherwise be incomprehensible.'¹⁷

¹⁷ Johnson, *Out of Time*, p. 140.

The incorporation and expansion of graphical processes has created musical works which transmedialize 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 a paradox that the subsuming of ‘unreliable machines’ into these processes creates some reliability and recursion within the compositional process.

Each work discussed in this article can be seen as an advancement of a particular concern with graphical composition through a variety of musical parameters. This, combined with the composer’s esoteric philosophy on music itself, which is often described in biological or scientific terms, demonstrates that Hesketh’s graphical ekphrasis not only has important formal ramifications but can also play a role in engaging audiences in contemporary music through a fundamentally interdisciplinary approach to composition.