

Harrison's Clocks: a perspective on their
Context, their Time, and their Mechanisms.

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Of the four principle parameters of musical articulation (pitch/frequency, duration/time, timbre, dynamics/amplitude), it is the parameter of time that has become a particular preoccupation for many composers since the disintegration of harmonic (and therefore temporal) 'common practice' in the early part of the Twentieth Century. The immediate rhythmic and metrical energy of Stravinsky's *Le Sacre du Printemps* (1913) and the large-scale formal elusiveness of Debussy's *Jeux* (1913) both testify to this in their own ways. These pieces were influential, and the emancipation of the temporal parameter from the shackles of 'harmony' was pursued with yet more urgency in the period following the Second World War. Olivier Messiaen and Karlheinz Stockhausen, among others, are notable for their (self-conscious) explorations of alternative temporal possibilities in music, both on the levels of construction and experience. But if, in their search for eternity, Messiaen (eg. in *Et Exspecto Rurrectionem Mortuorum*) and Stockhausen (eg. in *Momente*) were trying to make time stand still, to reveal another world, the techniques they employed, and the forms they created, also opened the doors to numerous other temporal explorations and possibilities. Harrison Birtwistle, whose concern with the idea and articulation of time is evident throughout his career, could be said to have passed through some of those doors.

Works from different periods have addressed the idea of time from different perspectives, and it is characteristic of Birtwistle's approach that it should be so. Such a vast conceptual area cannot be adequately explored in a single work, and just as Birtwistle will often explore musical ideas (for example the trumpet motif in *Endless Parade*) by viewing them, over the course of a work, from many perspectives, so too

on a larger scale, different of Birtwistle's pieces reveal different aspects of his perspective on time.

Harrison's Clocks (1998) is not Birtwistle's only composition to deal directly with the subject of the timepiece through music. His two works referring explicitly to clocks are, however, very different. *Chronometer* (1972) is a work 'at least as much 'about clocks' as it is about an abstract structure of pulses' (Adlington, 2000: 98), and like the more recent work, can be heard to have many layers of meaning. While both works employ audible pulsation processes, *Chronometer*, being a tape piece, is actually constructed from 'the sounds of real clock mechanisms which have been computer-analyzed and regenerated onto 8 tracks' (Adlington, 2000: 98). The resulting similarity of sound, between the musical world of the composition and the real world of mechanical clocks, creates an immediate association in the mind of the listener between commonly distinct temporal experiences.

Whereas the clock in itself stands as a symbol of 'ontological' or 'absolute' time (that is 'objective time, the time that is shared by most people in a given society and by physical processes' (Kramer, 1988: 452)), the compositional treatment and layering of the pulses, and transformation of the sounds contradicts such a time concept and, in so doing, enables time to, in Birtwistle's words, 'transcend itself' (Hall, 1984: 73). As Jonathan Kramer has pointed out, the medium of music has a special relationship with time and 'offers alternatives to conventional temporal sequences' (Kramer, 1988: 6). *Chronometer* exploits this possibility by '[making] time timeless, taking externally regulated clock time into the subjective realm of the unconscious' (Cross, 2000: 184). As a result, the music may lead the listener to question the socially prevalent view that the ontological time of the clock represents absolute temporal reality, against the more subjective time of individual experience.

And thus, the listener might come to experience subjective time as constituting reality in its own right. Michael Hall sums this up succinctly: ‘we are so used to measuring things in terms of clock time, that we forget that time is multi-dimensional; things change at different rates’ (Hall, 1984: 74).

If *Chronometer* can be seen to challenge, in a fundamental way, the listeners preconceptions as to what time is through multi-layered pulsations, another work of the same year – *The Triumph of Time* – explores the nature of the motion of time through it’s juxtaposition of linear and cyclic processes. From a compositional point of view what this piece is really exploring is the nature of change and progress in a musical context – both rates of change, and more significantly, degrees of change – and how context affects perception. This is achieved through the employment of certain distinctive musical ‘objects’ recurring cyclically over layers of ostinati in (varying degrees of) continuous flux. As a result, the perception, or interpretation, of this work’s form and meaning depends heavily upon the processes of the listener’s memory (as, to an extent, does all perception) and the recognition of the changing contexts in which the memorable ‘objects’ recur.

Particularly significant ‘objects’ are the Cor Anglais melody (*Example 1*) which occurs four times, largely unchanged, over the course of the work, and the Soprano Saxophone motif (*Example 2*) which appears seven times exactly repeated before, adopted by the entire woodwind section, it ‘explodes... into a blossoming unison’ (Birtwistle quoted in Cross, 2000: 216). The perceptual impression of these repetitions is of something familiar - but not necessarily identical - appearing in numerous perspectives, suggesting that even the seemingly unchanging is ultimately subject to the contingency of time passing. Through these objects Birtwistle expresses the fact that ‘repetition is transformation too, and all transformation rests on the

possibility of repetition, of repeatable qualities' (Rahn, 1993: 53). However, the work's invocation of memory is not entirely self-contained, nor based solely on internal repetitions. Through the utilisation of material and quotation from previous works (notably *Chorale from a Toy Shop* (1967) and the opening of *The Fields of Sorrow* (1971)), the possible span of recollection stretches beyond the confines of the piece itself into the composer's own past. Even the notated work, the fruit of the composer's labours, is, it seems, cast into the flow of times transience.

Example 1: Cor Anglais melody (Cross, 2000: 215):



Example 2: Soprano Saxophone motif:



Robert Adlington has pointed out that 'taken together, *Chronometer* and *The Triumph of Time* present a template for Birtwistle's subsequent engagement with time-related compositional concerns' (Adlington, 2000: 102). In light of this, and Birtwistle's statement that 'I couldn't have written these pieces [*Harrison's Clocks*] at any other time' (Birtwistle, 2004: 14), it is worthwhile to view the more recent work in the context of its predecessors. The essential techniques and abstract concerns are,

in many respects, very similar, though the perspective has inevitably changed. As the brief preface to the score of *Harrison's Clocks* acknowledges: this 'work continues the composer's preoccupation with time and the idea of musical mechanisms'. These preoccupations will now be explored from the perspective of this work.

The principle factors to consider in relation to the 'time' of *Harrison's Clocks* are motion, stasis, repetition (both local and structural), transformation (the subjection of 'objects'/ motifs/gestures/repetitions to degrees of change), pulse, space (vertical and horizontal), direction, and the interaction/reaction of memory and perception with/to these things. An understanding of the large-scale formal framework of repetitions and other basic relationships provides a sound basis for the discussion of more detailed local events and structures.

The work consists in total of five movements, each lasting between four and seven minutes in absolute duration. Within the five-movement structure exist two movement types. Clocks I, III, and V are seen by the composer as toccatas which are 'Baroque in the way they are just concerned with one idea' and have open forms which 'could go on for ever – they usually just stop because some sort of procedure has come to an end' (Birtwistle, 2004: 12). Clocks II and IV on the other hand, are more self-contained, closed forms and in contrast to the rhythmically driven toccatas they explore the nature of repetition through certain 'pitch objects' or gestures: the 'note (E) and a chord-type (ten-note clusters) respectively' (Adlington, 2000: 112). They don't lend themselves so naturally to 'traditional' categorisation, but Birtwistle has suggested 'I suppose I could call them chiming pieces' (Birtwistle, 2004: 12) – so they will be designated thus.

The relationship between the 'toccatas' and the 'chiming pieces' can be seen in terms of the contrast between an emphasis on motion (in the toccatas) and on stasis

(in the chiming pieces). That is not to suggest that the toccatas solely pursue relentless progress, or that the chiming pieces fail to go anywhere, but indicates the predominant characteristics of these movement types. To be more precise, it seems that the Clocks II and IV are engaged in a continual search for motion and dynamic energy, but eventually submit to their naturally static tendencies. Whereas, Clocks I, III, and V are quite simply unable to find a way out of their highly charged (if not necessarily regular or predictable) pulsations and processes – thus Birtwistle’s suggestion that their endings are, to an extent, arbitrary.

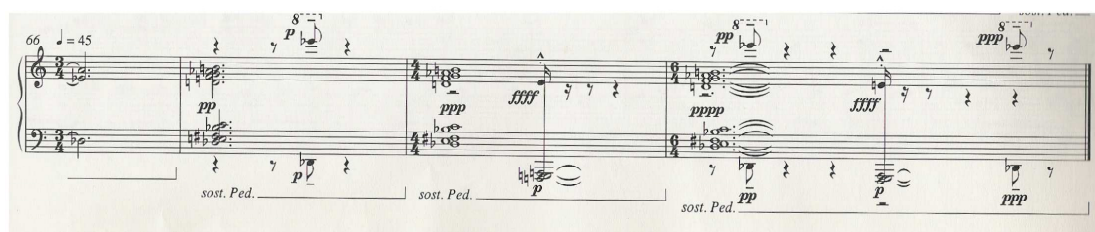
If we compare the first page of Clock IV (*example 3a*) with the first page of Clock V (*example 3b*), the distinct difference between the motional tendencies of those movements (and the type they represent) becomes clear. In Clock IV we see (or hear) a ten-note cluster seeking motion through minute changes of pitch and some fraught rhythmic articulations. For example, [Db, Eb, F, G, A, D, F#, G#, A#, B] at the start of bar 3, becomes [Db, E, F, G, A, D, Gb, Ab, Bb, C] by the start of bar 4, which amounts to only two of the ten pitches (Eb to E and B to C) actually changing – a perceptibly negligible difference given the registral confinement of the cluster. This failure to achieve motion through subtle pitch changes results in attempts to progress through rhythmic articulations of individual notes and new modes of attack in bars 5 and 7, but the desired energy, though sought, is not found: arpeggiation is not sufficient to create real movement. Thus, the search for motion begins anew, in what amounts to a varied repetition of the opening in bars 8 – 10, after which point numerous further attempts, with varying degrees of success, will be made. Ultimately however, though there are some energetic excursions and a few pitches escape the initial registral confinement, the cluster remains bound to where it began (*Example 4*).

Example 3a: The first page of Clock IV revealing the attempt of a ten-note cluster to find motion, its failure, and the start of a second attempt.

Example 3b: The first page of Clock V revealing the continuous and regular pulsations that dominate the movement, and the sense of motion achieved through changes in the pitch of the pulsations.

In contrast, Clock V has no trouble whatsoever in finding motion, indeed, it exists in a state of almost perpetual motion. Even the initial symmetrical stability of the B and E in bars 3-6 is driven forward by syncopation, and it is soon challenged by the intrusion of additional pitches (C#, C and F in bars 8-9) which sow the seeds of harmonic change. In bar 11 the oscillating focal pitches begin to shift, and the degree of pitch change frequently becomes such that it is no longer possible to speak of ‘focal pitches’ at all. In this case then, it is through a combination of perceptible harmonic change and driving pulsation (with frequently shifting syncopations) that the experience of temporal motion is created. These same ideas could be applied also to the other toccatas, though in Clock III the additional factor of layering distinct processes (to be explained in more depth below) – such that they function like cogs, driving one another forward – is also a significant source of motion.

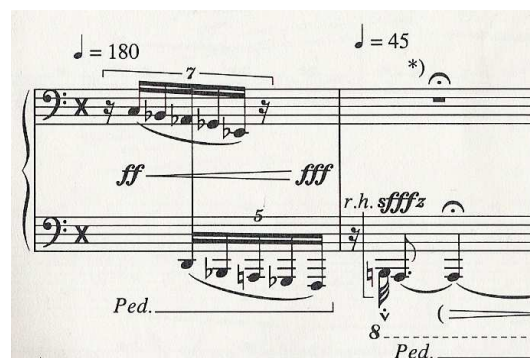
Example 4: The final bars of Clock IV show a cluster similar to that of the opening:



If degrees of motion and stasis can be seen to distinguish the toccatas and the chiming pieces from each other, common to all five movements is the employment of structurally significant repetition. This is hardly surprising given that Birtwistle’s ‘attitude to time, if time is the right word, is concerned with repetition – about how repetition changes our perception of how things happen.’ (Birtwistle and Lorraine, 1997b: 13). As such, repetition is probably the most heavily utilised compositional device in *Harrison’s Clocks*, and it is through the web of relationships that it establishes in the listener’s memory that the sense of form in the work is constructed.

Of all the work's repetitions the most obvious, and the most structurally defining at the large-scale, is the exactly recurring gesture – a 'loud, low, descending idea' (Birtwistle, 2004: 12) – which shall be referred to as the 'opening chime' (*Example 5*). It serves the principle function of announcing the start of each Clock and can be seen as analogous to the striking of real mechanical clocks, it's impending repetition being predictable at the end of each movement. Over the course of the work

Example 5: The Opening Chime:



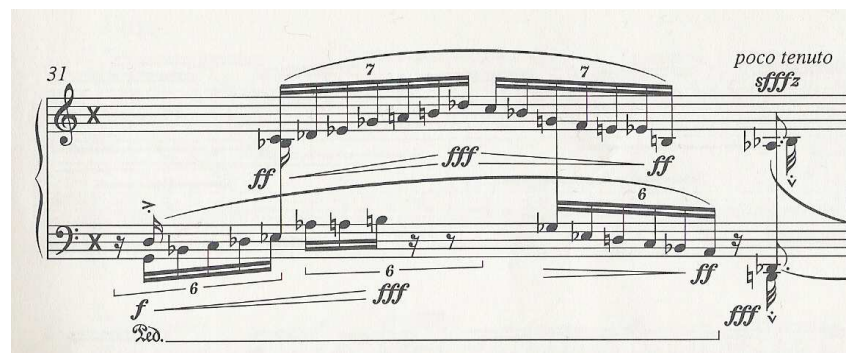
the 'opening chime' gesture acquires a weight and significance of meaning that does indeed change 'our perception of how things happen'. To hear it is to understand that a new (as yet unpredictable) musical process is about to begin – it opens the door on a new segment of time and assures us that what has gone before is now past. It is charged with expectation, and yet, characteristically of Birtwistle, even the meaning of this seemingly simple signal is brought into question – or rather, through it, the structure of the work's time is brought into question – when, in Clock IV, the 'opening chime' occurs three times (bars 8, 33 and 39) during the course of the movement.

To save this trick until near the end was necessary to build up the required expectations in the listener, but the increased frequency of the gesture in the fourth movement is not simply there to confound them once established. As explained

above, Clock IV is in continual search of motion, but each time it fails to find it, the search must restart. Having established its role as a signifier of beginnings, the ‘opening chime’ gesture becomes the most meaningful way in which to indicate the start of each new search. So, though in a sense the function of this gesture is made more complex by its role in Clock IV, it is also clarified.

The ‘opening chime’ is not the only significant (exact) repetition, though it is the only repeated gesture to occur in all five Clocks. Within the first movement there occurs a similar gesture (seemingly a transformation of the ‘opening chime’), which serves a cadential function, punctuating the fairly constant flow of semiquavers – it will be referred to as the ‘cadential chime’ (*example 6*).

Example 6: the Cadential Chime from Clock I:



If the ‘opening chime’ can be seen as analogous to the hourly strike of mechanical clocks, then maybe the ‘cadential chime’ – defining the time within the movement – is equivalent to their quarter hourly strikes. Such an analogy is not merely fanciful: a look at the proportions of the movement, and the points at which the ‘cadential chimes’ occur reveal almost exactly equal time-intervals (47 – 48 seconds) between its occurrences (*example 7*). The discrepancy between the time-interval before the first chime, and between the others, is explicable in terms an introductory process of ‘winding up’ the Clock (b. 3-6). Similarly, the longer time duration between the final

‘cadential chime’ of Clock I and the ‘opening chime’ of Clock II results from the process of ‘winding down’ that occurs towards the end of the movement (b. 149-156).

Example 7: Table showing the bars and times of the ‘cadential chime’ in movement I:

Bar (out of 156) at which chime occurs:	‘Real time’* (of 04.46) of chimes occurrence:	Time elapsed* since previous chime:
A: 31	01.00	01.00 (since opening)
B: 60	01.48	00.48
C: 89	02.35	00.47
D: 118	03.23	00.48

*The ‘real time’ is according to Nicolas Hodges’ recording, track 10 of ‘Harrison Birtwistle: The Axe Manual – Complete piano works’, Metronome, MET CD 1074.

Further, like the chime of a real clock (and like the ‘opening chime’), this gesture – as is implied by the momentary suspension of meter – has the impact of making time temporarily stand still. The memory is given the chance, if briefly, to collect past experiences into a timeless present, before expectation takes over and the flow is resumed.

Whereas in *The Triumph of Time* the invocation of memory (through the Cor Anglais or Soprano Saxophone figures) reveals the essential progress of even the most static objects, such transformation through repetition is not conveyed by the ‘opening’ and ‘cadential’ chimes of *Harrison’s Clocks* (though other aspects of the work do employ such techniques). Maybe this is because where in the earlier work the repeated qualities occurred each time in new vertical contexts, in *Harrison’s Clocks* the vertical dimension – in these instances – remains the same and only the horizontal contexts of past and future change. As such, through exact repetition, Birtwistle succeeds in creating windows of timelessness in the midst of the flux of varied

repetitions and transformations. Adlington's interpretation of the 'chimes' of *Chronometer* is equally applicable here:

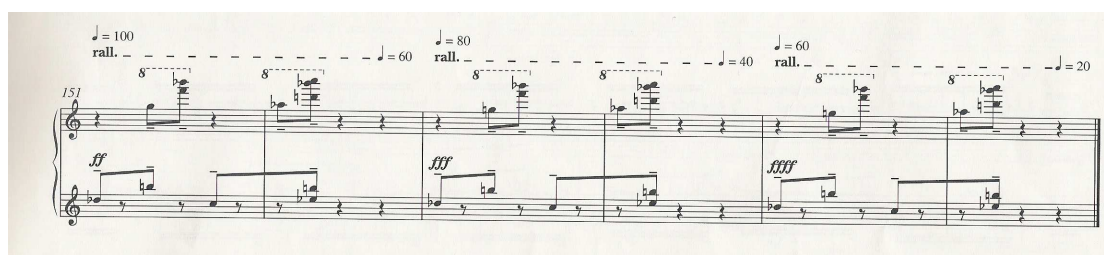
The chimes of a clock, though obviously implicated in clock time (for they quantify its perpetual passage), also invoke *memory*, in a way that insistent local metrication does not. An hourly or quarterly chime implicitly refers back to a previous, remembered one. In Adorno's eyes, it is memory that holds the key to transcending clock time, for memory offers the opportunity of a 'gathering up' of experience, one that transcends the linear sprawl of existence connoted by the clock. (Adlington, 2000: 99)

If the memory of exact repetition enables us to collect similar experiences into a timeless present, the invocation of memory through varied repetition can be seen to remind us of the transformation inherent in times passage – the 'triumph' of time. Such varied repetitions can occur and function at different structural levels, either within discrete processes/sections of a movement (low-level structure), across whole individual movements (mid-level structure) or between different movements (high-level structure). Depending upon which level is addressed the impact on the listeners perception and experience will vary greatly.

There are, to my ear at least, two particularly distinctive instances of ideas first heard in one movement recurring, transformed, in a later movement (high-level transformed repetition). Both have the rather intangible, dreamlike quality of distorted long-term memories, and it is only on repeated listenings that the relationships become clear. The first such relationship is between the final six bars of Clock I (b. 151-156) and the end of Clock III (b. 210-215) (*examples 8a* and *8b*). The principal similarities between these instances are the 'registral antiphony' (in both cases pitches in a medium-high register – left-hand – alternate with those in a very high register –

right-hand), repetition of some pitch content (though different pitches in each case), varying densities of note groups (from one to five in Clock I, and one to three in Clock III), and some notable intervallic similarities. The most distinct of these interval relationships are the pairs of oscillating minor 2nds (marked in red) which can be seen in both hands in Clock I (L.H: Db-C, R.H: G-Ab) and the left hand of Clock III (Bb-A).

Example 8a: Clock I, ending, ‘winding down’ gesture:



Example 8b: Clock III, ending:



The most obvious transformations are the inversion of contour, the reduced predictability of events and lack of tempo change in Clock III. Whereas in Clock I each group (that is to say, each beamed collection of notes) ascends, in Clock III the main (though not exclusive) tendency is toward descending patterns. And, where in *example 8a* the patterns of the separate hands can be seen to coincide once in every bar, like smoothly functioning cogs, *example 8b* is altogether more haphazard, revealing no simple process, nor an obvious relationship between the hands – except one of mutual avoidance. In light of the previous discussion of motion it is reasonable to suggest that this ‘distorted memory’ arises from the search of this toccata (Clock

III) for an ending within the scope of its materials. Its processes and mechanisms could, after all, go on indefinitely and the only previous example in the work, of a potentially open form coming to an end, is in Clock I. Thus, the characteristics of the end of Clock I briefly acquire a large-scale functional status.

Another ‘distorted memory’, this time of the cluster-based harmony and stasis in Clock IV, is revealed in the midst of Clock V’s obsessive pulsation. It is as if for a brief moment this *moto perpetuo* becomes aware, through a memory of the previous movement, of the possibility of not knowing where to go – of being in stasis. In order to shun anxiety, it soon regains its motion with a heightened sense of urgency, increasing the harmonic density of its pulsations. While it is true that a careful comparison of *example 9* with *example 3a* will reveal no precise correspondences between this moment in Clock V and Clock IV, in the subjective act of listening the memory (at least *my* memory) is triggered. It is probably because of the contrast between this moment and the rest of Clock V, alongside the fact that the clusters of Clock IV represent the most recent external contrast to the pulsating material that dominates the final movement, that it has such a perceptible impact on the memory.

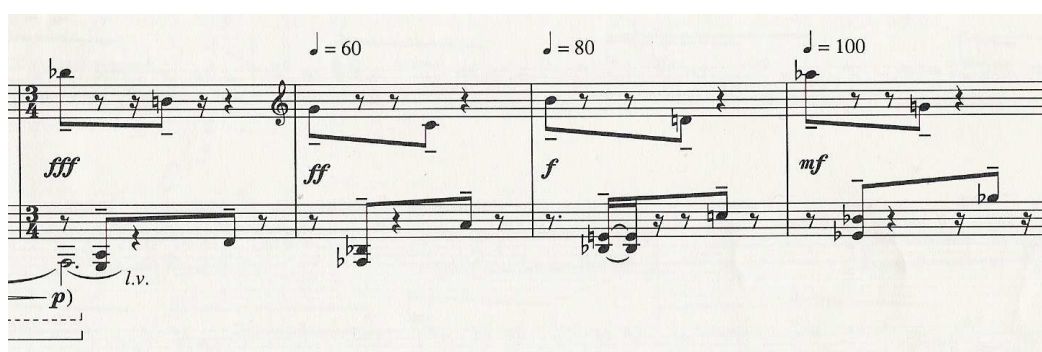
Example 9: Clock V, b. 154-165 showing a ‘distorted memory’ of Clock IV:

*) See note on page 44.

If the consideration of these large-scale transformations or ‘distorted memories’ may seem analytically tenuous, the invocation of memory through varied

repetition at the mid-level of structure (within individual movements) is more objectively explicable in terms of the score. The clearest example of this is to be found in Clock I. Immediately preceding and following every occurrence of the ‘cadential chime’ can be seen/heard two related gestures that will be referred to as ‘winding up’ and ‘winding down’ gestures respectively (because they lead into and away from the ‘cadential chime’). These gestures are directly related by both their function and their sound, yet none are identical in their detail, and therefore they defy predictability. They are also related to two similar gestures which I hear as ‘winding up’ (*example 10*) the energy at the start of the movement and ‘winding down’ (*example 8a*) to a halt at the end of it.

Example 10: ‘winding up’ gesture at the start of Clock I, b. 3-6:



The character of the initial ‘winding up’ gesture (*example 10*) is defined by its sense of multi-parametric contraction: tempo increases, dynamics decrease, and the left and right hands relate through contrary motion (becoming registrally closer towards the end of each bar). The final ‘winding down’ gesture (*example 8a*) has already been discussed, but two notable differences with its functional opposite are its decreasing tempo, and that rather than simply interlocking (in the right-left-right-left manner of the ‘winding up’ gesture), the parts of the separate hands sometimes interlock and sometimes coincide (according to their processes). Interestingly, the material of these gestures is present throughout the movement, underlying the busy

surface of pulsations unintrusively, only to emerge into the foreground once more at the approach of each ‘cadential chime’.

It is at these cadential points that the transformations of the ‘varied winding gestures’ takes place. To be more precise, it is after each ‘cadential chime’ that the ‘varied winding gesture’ appears transformed. The newly established form is then continued throughout the subsequent pulsating section of the toccata until the arrival at the next ‘cadential chime’, where the gesture is transformed once more. *Examples 11a,b,c,d* chart the process of transformation, juxtaposing each ‘winding down’ gesture (away from one chime) with its consequent ‘winding up’ gesture (towards the next chime). The related pairs can then be compared to the transformations. (NB. In all cases the right-hand has a treble clef and the left-hand a bass clef).

Example 11a: ‘wind down’ from ‘cadential chime A’ (b.32) and ‘wind up’ to ‘cadential chime B’ (b.57):

The initial ‘winding up’ gesture (*example 10*) appears here transformed into three-note groups, also in contrary motion, sometimes interlocking, sometimes coinciding (on every second attack of the left hand).

Example 11b: ‘wind down’ from ‘cadential chime B’ (b.61) and ‘wind up’ to ‘cadential chime C’ (b.86):

Example 11b shows two systems of musical notation. The first system begins with a tempo marking of $\text{♩} = 180$ and a dynamic of *ff*. It transitions to a tempo of $\text{♩} = 150$ with a dynamic of *f*. The second system starts with $\text{♩} = 150$ and *f*, then changes to $\text{♩} = 180$ and *fff*. The notation includes various note values and rests, with a left-hand part (l.v.) and a right-hand part.

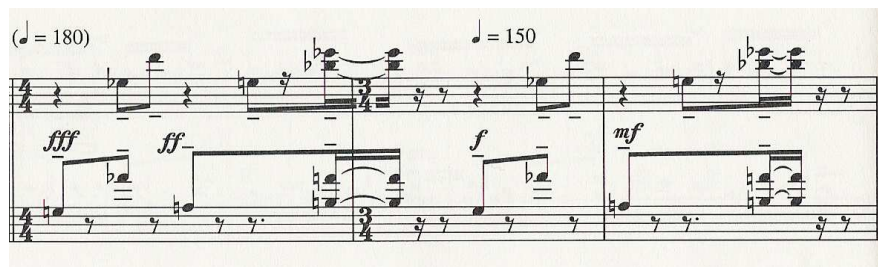
In this transformation, the left-hand retains the three-note group, but alters its contour to a descending shape. The right-hand retains the shape of its previous contour, but now expresses it through two pairs of notes which mirror each other. Again, the layers mostly interlock, but sometimes coincide.

Example 11c: ‘wind down’ from ‘cadential chime C’ (b.90) and ‘wind up’ to ‘cadential chime D’ (b.115):

Example 11c shows two systems of musical notation. The first system begins with a tempo marking of $\text{♩} = 180$ and a dynamic of *fff*. It transitions to a tempo of $\text{♩} = 150$ with a dynamic of *ff*. The second system starts with $\text{♩} = 150$ and *f*, then changes to $\text{♩} = 180$ and *mp*. The notation includes various note values and rests, with a left-hand part (l.v.) and a right-hand part.

Here the roles are reversed: a three-note collection in the right hand reflects the previous form of the left-hand. While the left-hand formation takes on ‘two pairs’ characteristic of the previous right-hand group – though it retains a descending contour. The relationship between the layers has become more predictable, every second left-hand attack coinciding with every first right-hand attack.

Example 11d: ‘wind down’ from ‘cadential chime D’ (b.119):



This final transformation reveals, for the first time, similar motion between the hands, and an equal balance between interlocking and coinciding attacks. A degree of rhythmic unpredictability is retained, but that too will be simplified by the final ‘winding down’ gesture (*example 8a*) which represents the last stage of this movement-long process of transformation through varied repetition.

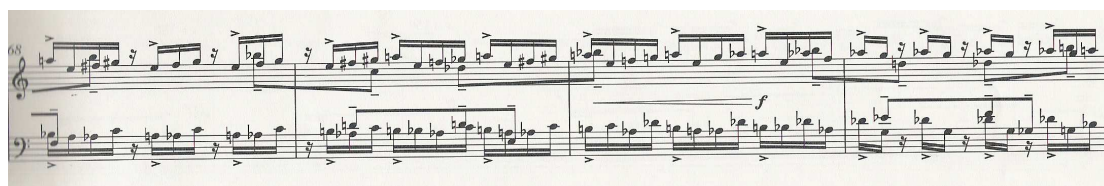
This particular process of transformation is emphasised by Birtwistle through his choice to present the moments of change free from any other events that could provide an alternative focus for the listener. However, the majority of the movement offers the listener with various possible paths through its time. In relation to this Birtwistle has commented:

I’m very intrigued by how pieces are completely different when you hear them several times. And I’m not talking about interpretation, I’m talking about what your mind, particularly in a complex piece of music, is deciding to listen to at a particular time; and that you take a path through it. (Birtwistle and Lorraine, 1997b: 14)

The consideration of this idea of perception changing with familiarity is very fruitful in coming to an understanding of Clock I (and indeed the whole of *Harrison's Clocks*). Particularly during the pulsating passages between the 'chiming' and 'winding' gestures, the presence of two distinct layers of material – each with two constituent parts – gives the listener a choice of possible focuses. It is a testament to the richness of the ideas, and their realisation, that where on one listening our attention will focus on the shifting patterns of accentuation, on another we may listen 'beneath the surface' to hear the pitch processes of continuations of the 'winding gestures' almost melodically (through a collection of the discrete units in the memory). This distinction between layers is possible because of their durational and registral differences. If we so choose, we may perceive the sustain of the quavers against the passing of the semiquavers. Similarly, where the semiquaver pulsations occur within a narrow registral bandwidth, pitches heard outside that defined boundary tend to stand out.

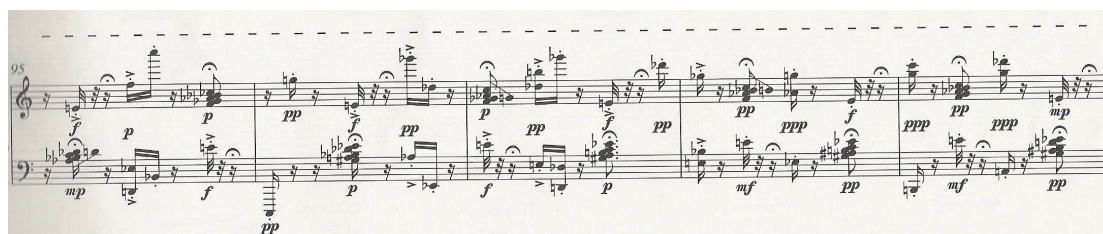
It is within such bandwidths, parametric boundaries, localised processes and mechanisms that the most microscopic, low-level (varied) repetitions take place. A glance at almost any actively pulsating passage in Clock I will reveal a significant degree of pitch, rhythmic and articulation-type repetition at the note-to-note level, within a particular layer. Yet through the continual renewal of context and slight variations of detail, this process never becomes banal or predictable (*example 12*).

Example 12: Clock I, bars 68-71 show repetitions in a shifting context:



Another form of varied repetition can be observed in Clock II. The near obsessive emphasis on the note E lends it a timeless quality – the listener is able to rely on its presence and its recurrence. In this respect past, present and future possess a great degree of similarity, yet our attempts to collect the memory of all E's into a timeless present are bound to fail due to the myriad of contexts in which it appears – stasis without eternity. The activity surrounding it ranges from quietly held clusters to pointillistic pitch patterns. Even when the focal pitch is not stated, we are able to 'hear' it – and thus it is in a sense still being varied even when absent (*example 13*).

Example 13: Clock II, bars 95-99.



The interesting thing about this passage is that the perceptible significance of the note E is disproportionate to the amount of 'real time' it occupies (only one or two staccato demisemiquavers worth per bar). This is probably because it is the only quantity to be exactly repeated each time that it occurs, as well as its role in the movement as a whole. As the object least in flux our memory holds on to it, and through memory it attains significance, if not timelessness.

Where Clock II deals with our memory of a simple object, Clock III – if we are to perceive its relationships and processes – requires us to retain a substantial amount of rather complex information. This intricately beautiful movement is constructed from the juxtaposition of 'six different mechanisms, each registrally as well as rhythmically defined, [which] sporadically kick into action – as if one coils a spring that then suddenly activates another.' (Adlington, 2000: 111). Our experience of each of these mechanisms is defined both by its internal workings – based once

more on varied repetition – and also by its relationship to all the other mechanisms that it coincides with during the course of the movement. There is no identifiable overriding principle governing the numerous different combinations of the six mechanisms, yet each is musically effective, and there is often a sense of causal necessity to them (presumably the result of the composers intuition).

Example 13 shows the first two pages of Clock III on which each of the mechanisms, at its first introduction, is indicated by a different colour:

- Mechanism 1 (b. 3-20, R.H) = Red
- Mechanism 2 (b. 6-15, L.H) = Orange
- Mechanism 3 (b. 16-22, L.H) = Dark Blue
- Mechanism 4 (b. 21-26, R.H) = Light Blue
- Mechanism 5 (b. 23-28, L.H) = Purple
- Mechanism 6 (b. 30-32, R.H) = Pink

The decision to order the mechanisms as above is arbitrary and based solely on the order in which they are first presented. They do not continue to reappear in this order, but the numbers are of use in distinguishing between the different types in discussion (where they will be abbreviated M1, M2 etc.).

At the most detailed level every single mechanism is constructed essentially through varied repetition. This is evident at a glance in M1, which alternates between two distinct motifs each of which changes some or all of its pitch content on each new appearance, while retaining its gestural qualities and certain pitch formations. M2 consists of a gesture similar to the ‘winding gesture’ of Clock I (possibly a reference, as was noted earlier in a comparison of the endings of the pieces), with the addition of an unpredictably occurring grace note figure – the descending contour of each pair remains constant despite unpredictable pitch processes.

Example 13: The mechanisms of Clock III:

The musical score is written for piano and consists of three systems. The first system begins with a tempo marking of $\text{♩} = 180$ and a measure number of 8. It features a complex rhythmic pattern with triplets and sixteenth notes. The second system begins with a tempo marking of $\text{♩} = 120-132$ and a measure number of 7. The third system begins with a measure number of 13. The score includes various dynamic markings such as *f*, *mf*, *p*, and *ff*, and performance instructions like *Ped.* and *l.v.*. The notation is highly detailed, with many accidentals and slurs.

Musical score for piano, featuring two systems of staves. The notation includes various musical symbols such as notes, rests, and dynamic markings like *ff*, *f*, *mf*, *mp*, and *staccatiss.*. The page is numbered 24 at the bottom.

The first system (measures 18-23) includes markings such as *staccatiss.*, *loco*, *mf*, *ff*, and *f*. The second system (measures 23-28) includes markings such as *mf*, *ff*, *f*, *mp*, and *staccatiss.*. The third system (measures 28-32) includes markings such as *staccatiss.*, *ff*, *mf*, *f*, *mp*, and *ff mart.*.

Like M1, M3 also oscillates between two distinct gesture-types: a brief snippet of two-part counterpoint being followed by a single punchy 4-note chord (again, with pitch variation each time). M4 is arguably a (distant) transformation of M2 in diminution, though its descending *staccatissimo* semiquavers seem, in their uninterrupted progress, to share greater unity of purpose and direction than the quavers of the earlier mechanism. Such a directed quality is not present in M5, its syncopated triplet figures seeming to dance wildly, free from constraint. While M6 oscillates rigidly between a fixed upper pitch and shifting (descending) lower ones. The general tendency towards falling intervals (within particular gestures) is a notable quality of this movement, though through the interplay of layers a sense of ‘registral antiphony’ in is not uncommon.

From the perspective of perception, it is the interplay of layers and mechanisms that really defines this movement – its myriad relationships forming into one macro-mechanism which is certainly more than the sum of its parts. During the course of Clock III every possible combination of the mechanisms occurs, however, due to their subtlety and contingency of form only a few of the possible relationships between combinations actually occur. The precise nature of the initial mechanisms is gradually transformed in a manner similar to the ‘winding gesture’ of Clock I, such that our experience of time occurs not only through the kaleidoscopic shifting of contexts, but also through genuine processes of transformation. It is beyond the scope of this essay to chart these transformations, but an awareness of their presence is sufficient to appreciate that this movement – like the work as a whole – operates simultaneously on many layers of temporal meaning.

A work so rich in internal (and external) relationships necessarily renders analysis unable to address every detail. Yet, it is not really in the minute details that

the most significant ideas and meanings in *Harrison's Clocks* are to be found. The details create the surface – a very exciting surface at that – but it is in the layering of processes and the attitude to repetition that the listener is provided with numerous possible paths through the piece. The experience, on repeated listenings, of taking alternative routes and focusing on different aspects has an almost spatial quality to it – like a journey through an unknown town, which slowly becomes more familiar. Such familiarity only grows with time passing, and the collection of lasting impressions in the memory. The permanence of impressions on the memory depends either on their scale (if they are unique or rarely occurring) or on their build up through repetition. By employing repetition at many structural levels, and numerous gestures of perceptibly different degrees of significance, *Harrison's Clocks* succeed in creating impressions of different sizes on the memory. These impressions (especially on repeated listenings) enter into a relationship with the immediate experience of the varied repetitions that arise throughout the work, and through this interaction arises a multi-dimensional experience of time.

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