VON DER FUGE IN ROT
BIS ZUR ZWITSCHERMASCHINE

PAUL KLEE UND DIE MUSIK

Thomas Gartmann (Hg.)
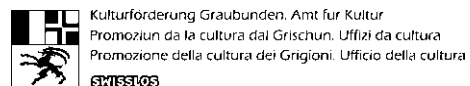
Inhalt

James Dickinson

Mechanical – Magical.
The Shared Creative Vision of Harrison Birtwistle and Paul Klee

"What I'm saying is best summed up by the work of Paul Klee. In the *Pedagogical Sketchbook* he's finding ways to proliferate his material, trying to make the sparks fly. […] If you then turn to the *Notebooks* and compare the theoretical sketch on one side of the page with the finished picture on the other you realize that the difference between them lies in the brush-stroke, the patina, which was neither contained in the theory nor present in the sketch. It's this which gives the finished picture its spontaneous quality, its magic."[1]

It was Michael Hall who stated that Birtwistle's musical 'bible' was not the string quartets of Beethoven, but Paul Klee's *Pedagogical Sketchbook*.[2] The combination of theoretical rigour and poetic fantasy was irresistible to Birtwistle, whose own desire to combine mathematical logic and a sense of theatrical drama would make Klee his ideal champion. It was within Klee's pedagogical writings that Birtwistle found the inspiration and at times specific solutions to his compositional aims.

In the above quotation, when discussing the difference between the theoretical exercises and the finished artwork, Birtwistle noted that it was the "brush-stroke" that gave the "magic", but in the same conversation with Hall, he stated that "In music, unfortunately, we don't have brush-strokes; we only have a pitch and a duration. So to compensate I use random numbers."[3]

Hall described Birtwistle's use of random numbers as "the dance of numbers", a phrase which brings together the spontaneous intrinsically rhythmic act of dancing with the fixed notion of a mathematical system.[4] It therefore eloquently embodies the tectonic-poetic dualism which lies at the heart of the creative visions of both Birtwistle and Klee.

Form(ation)

There are strong parallels between Birtwistle's and Klee's creative development. Klee's art existed in the cracks between movements such as Surrealism, Orphism and Cubism, mixing ideas from the disciplines of the visual arts and music, while existing 'out of time' as he combined modernist perspectives with eighteenth century musical styles. Birtwistle's creative path would also go on to fuse musical ideologies, combining modern atonalism with medieval techniques, and like Klee, he would reach out to other disciplines to find inspiration.[5]

During Birtwistle's early development as a composer he was strongly influenced by the music of Erik Satie, particularly the three *Gymnopédies*. He describes the music revolving around the same subject, as if viewed from different angles. "In an instant he knew he preferred the circling immobility of Satie's style, to what he was to call the 'goal orientated' music of the classical and romantic traditions".[6] Birtwistle compared Satie's music to a diamond, a multi-dimensional singular object that can be experienced from different perspectives. The idea of music as a physical object that can be navigated would become one of the central principles of Birtwistle's approach to composition. Birtwistle will often state that the music (object) is already present and that the act of composition is to work out ways to gradually reveal that object.

"I was interested in […] the notion that this piece of music exists, just like an object, and what you can do is perform certain facets of it, examine it in different ways. […] The total object is never sounded, but through time you build up a memory picture of what it is."[7]

With his notion of music as a physical object, it was a logical step that Birtwistle would turn to the visual arts for inspiration.

In the early 1920s, Klee stood out from his contemporaries, many of whom had entirely rejected representation in favour of a relentless march towards pure abstraction. Klee however had found a way to combine the personal expression of his figurative drawing with the abstract settings of his colour fields and grids. Similarly, Birtwistle was looking for a middle ground that combined personal expression through tonality and harmony with the more abstract, systemized nature of modernist serialism. Like Klee, who turned to eighteenth century music to provide structural solutions, Birtwistle found that the answer to his present musical problems also lay in the past.

The technique Birtwistle would employ was the fourteenth century style of *Ars Nova,* a development from simple repetition of monophonic lines in the preceding century. It allowed greater rhythmic independence and complexity, while retaining the sense of a repeating ostinato.[8] It is a form of *isorhythm*, where a repeating rhythmic pattern of a set length (*talea*) is superimposed onto a repeating pattern of different length (*colour*). In its application, Birtwistle had found a formal approach that relied on balancing disparate entities contained within an overall unifying structure. The tension within this non-symmetrical balance propels his 'line' forward – not a development through composed form, a propulsion based on tension and the subsequent need for release. As Birtwistle himself states: "incomplete symmetry, that is symmetry in process of being formed, is dynamic because it creates a structural need that eventually must be satisfied".[9]

In both Klee and Birtwistle the importance of line in relation to form building cannot be overstated. In his pedagogical writings Klee describes the way that the formation of a line is at the heart of his creative process: "The primordial movement, the agent, is a point that sets itself in motion (genesis of form). A line comes into being. […] It goes out for a walk, so to speak, aimlessly for the sake of the walk."[10]

Klee does not set out with a pre-determined form in mind. He allows his line to wander at will, yet as forms are produced he defines the products of that wandering line as either expressions of force, or figurative representations. Klee compares the relative freedom and control of his line to the development of a child when learning to draw.

"At first the pencil moves with extreme freedom, wherever it pleases. But once he begins to look at these first works, the child discovers that there are laws which govern his random efforts. […] The chaos of the first play-draw-

ing gives way to the beginning of order. The free motion of the line is subordinated to anticipation of a final effect".[11]

Therefore, Klee's line is a balance between the childlike freedom of the original motion and the constraint of the laws governing the representational forms that begin to develop.

Hall stated that "all Birtwistle's music, no matter how dense and rich it may be, is essentially monody".[12] This line can also be seen as a freely moving agent, perhaps without initial intention, but providing a platform for the proliferation of additional material as the structure develops. Like Klee however, the journeys of Birtwistle's lines are not a simple A to B, from a beginning to an end point. His line will transfer between registers and instruments, freeze in time, reverse and retrace its steps, break its continuity, fragment, suggest cycles or spirals and move between foreground and background at will. Using Satie's 'diamond' as an inspiration,[13] Birtwistle will conceive a virtual structure through which his line will travel, gradually revealing the architectural form, while leaving behind its trace in the memory of the listener.

(Secret) Theatre

Both artist and composer take a multiplicitous approach to the development of line. Often beginning with a single line, they will then proliferate this thread into heterophonic forms, subsequently exchanging the 'lead role' between its constituent parts. In section I.5 of the *Pedagogical Sketchbook*, Klee defines line as being "active", "passive" or "medial",[14] presenting this process as a continuum, with no starts or end points, the line being able to modulate freely between these states.

To understand this facet of the form building of both Klee and Birtwistle, it is important to see that both artist and composer view the unfolding line as a dramatic narrative, an actor playing a role. Both Klee and Birtwistle found that Opera provided a creative model, which allowed them to fuse this poetic, descriptive line with the absolute expression of pictorial colour and musical harmony respectively.

"Birtwistle conceives all his music theatrically. It is not merely dramatic in the sense that Beethoven's music is dramatic […]. Since drama requires
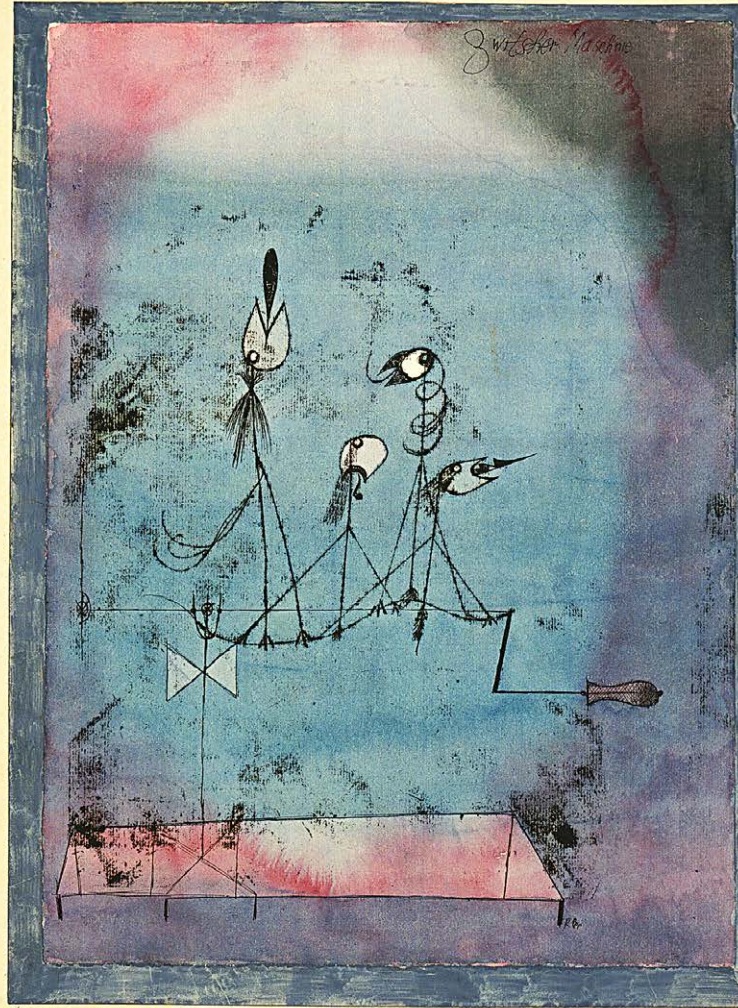
1 Paul Klee: *The Twittering Machine,* 1922, 151, oil transfer and watercolour on paper, edged with watercolour and pen on cardboard, 41.3 x 30.5 cm, The Museum of Modern Art, New York, Mrs. John D. Rockefeller Jr. Purchase Fund, Digital image © 2020, The Museum of Modern Art, New York / Scala, Florence.

2 Paul Klee: *Konzert auf dem Zweig (Concert on the Branch)*, 1921, 188, pen on paper on cardboard, 28.2 x 22 cm, Zentrum Paul Klee, Bern, ZPK Picture Archive.
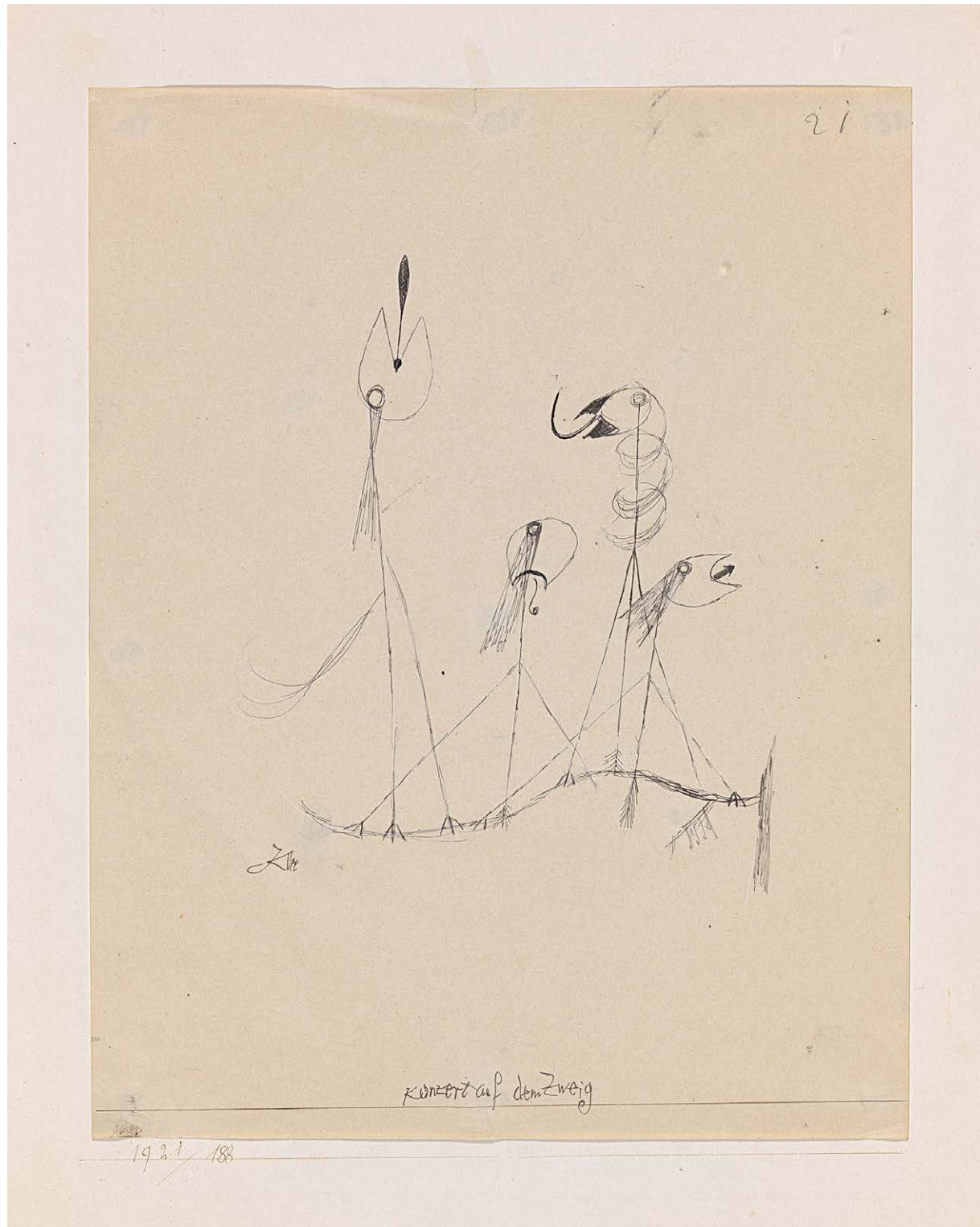
conflict […] there must be strong contrasts. Control is therefore contrasted with waywardness, inconspicuousness with prominence."[15]

"The importance of theatre and drama as a source of inspiration for Klee goes beyond mere subject matter to take on a decisive role in his approach to form … the play of perception and the ambiguity of becoming and seeming, as well as the playful conflict between opposing forces and their coexistence within the framework of the stage."[16]

In Birtwistle, as in Klee, formal hierarchy is rejected as dramatic roles are exchanged between the foreground and the background. Birtwistle came to define these roles as "cantus" (taken from *cantus firmus,* a recognized musical term for a pre-existing fixed melody in polyphonic music) by which he means a gestural, horizontal linear element (what Klee would term "individual"). He then combines this with "continuum", the structural setting, which is more vertical, rhythmical and circular (by Klee's definition "dividual").[17]

During the 1920's Klee produced a large number of works, which brought together his fanciful drawings and his abstract colour fields. These works were defined by writers such as Grohman and Kagan as "operatic works",[18] as they bring together his narrative line (representing the libretto) and 'absolute' colour (which represents the musical accompaniment). Klee would employ his oil transfer technique, to 'superimpose' the line drawing onto the colour setting. The spontaneity of this technique would create unpredicted results, which both exaggerated the separation of each element, while at the same time synthesizing them into a new context. Klee would cover a sheet with black oil paint and place it on a clean sheet of white paper. He would then trace a drawing placed on the oil sheet so that the line is transferred to a new setting, albeit imbued with a scratchy, broken quality. One important oil transfer painting which embodies all these elements and also the work that has received the most attention from composers[19] is the painting *The Twittering Machine* (1922, 151) (Fig. 1).

Twittering Machine is a powerful example of the merging of the narrative fantasy of Klee's line and the absolutism of his colour fields. If we study the original drawing, *Concert on the Branch* (1921, 188 – Fig. 2) side by side with the finished painting, the potency of placing the subject into the 'cosmic void' of the colour staining is apparent. The four birds

are now placed in a context, which suggests a more profound interpretation.

It was this painting, which so perfectly exemplifies the oppositional balances between the mechanical and magical, that Birtwistle would choose to base his composition *Carmen Arcadiae Mechanicae Perpetuum* (1978) upon. Despite all the self-declared influence of Klee upon Birtwistle's work, this is his only composition explicitly and directly related to an individual painting.

Twittering Machine is actually a fusion of three experimental agendas that concerned Klee leading up to and during the early 1920s. The drawing *Concert on the Branch* is combined with a colour field setting, which is derived from the watercolour staining technique that Klee first used in 1910 and later in works such as *North Sea Island* (1923, 242 – Fig. 3)

The third pictorial influence comes from a series of works comprising Klee's graphic mechanical inventions. A regular preoccupation of his fantastical drawings were these imaginary mechanisms, their purpose suggested, yet obscure, often containing inherent flaws that would prevent them from actually operating in a conventional or effective manner. The oppositional balance between control and freedom was a key theme in many of these works and very often there was a musical subject, examples include *Instrument for New Music* (1914, 10) and *Apparatus for Mechanical Music* (1921, 223 – Fig. 4).

Apparatus for Mechanical Music has clear links to both *Concert on the Branch* and the finished composition *Twittering Machine.* One of the most immediately striking features of the birds in *Twittering Machine* is that they all appear to have three legs, excepting the tallest bird on the extreme left of the composition. Thus far, scholars have not offered an explanation for this phenomenon, but inspection of *Apparatus for Mechanical Music* reveals that the formation has clear parallels to this work, where the legs are in fact the lower sections of music stands.

Further links between the two works can be found, such as the spring mechanism holding the sphere in position and also the arrow with its barbed shaft protruding skywards from the sphere. In addition, the arrangement of right angles in the construction of the mechanism parallels the support structures within *Twittering Machine. Apparatus* has a large megaphone-like structure to amplify the sounds within, whereas *Twittering Machine* is distinctly mute in this regard. When
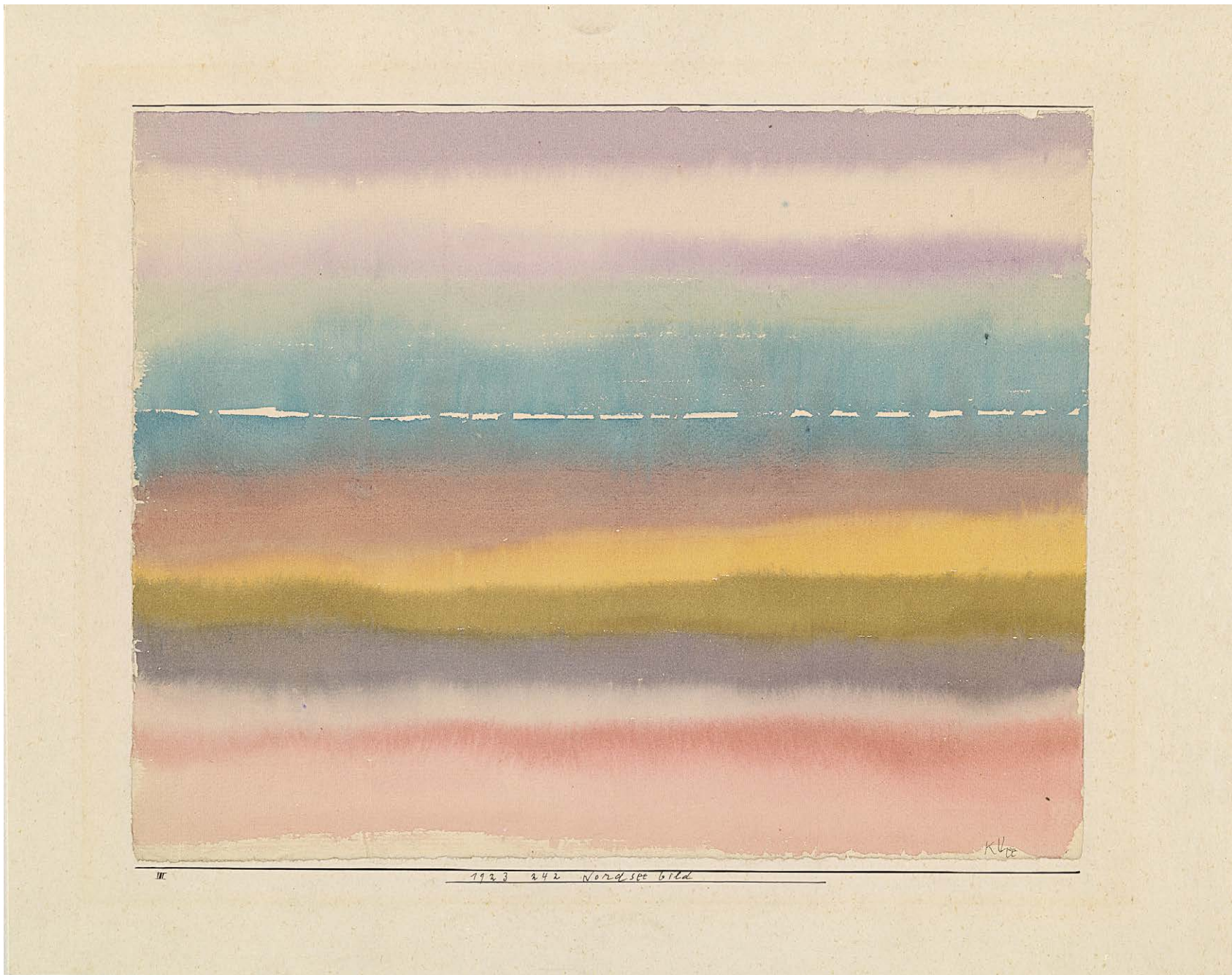
3 Paul Klee: *Nordsee bild (North Sea Picture)*, 1923,
242, watercolour on paper on cardboard, 24.7 x 31.5 cm,
Zentrum Paul Klee, Bern, ZPK Picture Archive.
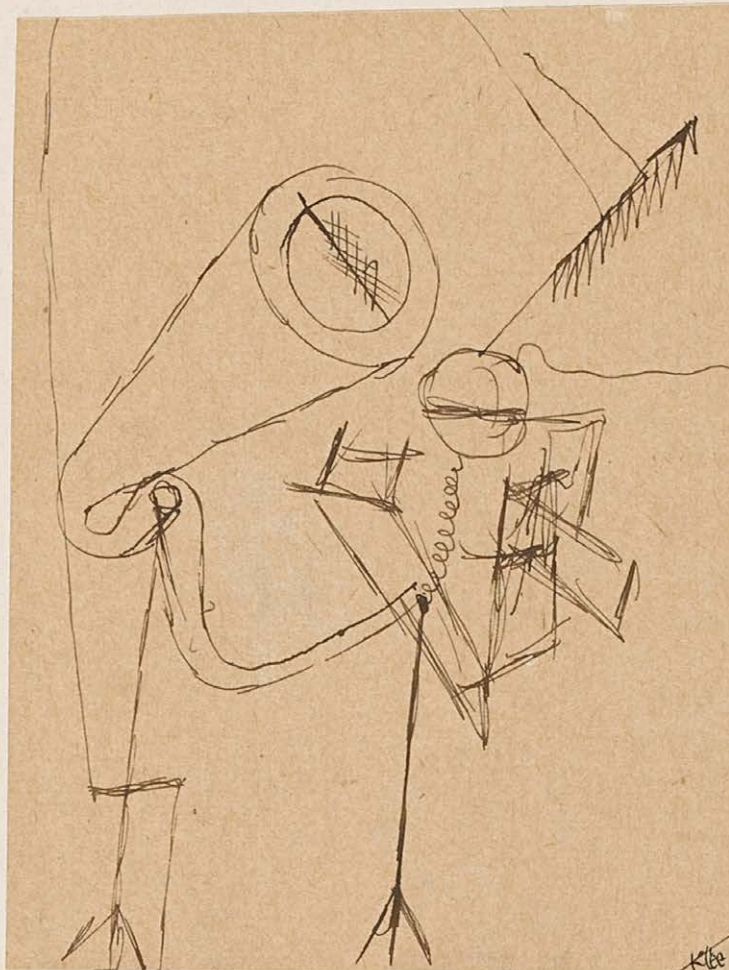
4 Paul Klee: *Apparat für maschinelle Musik (Apparatus for Mechanical Music)*, 1921, 223, pen on paper on cardboard, 11.1/11.3 x 8.5 cm, Zentrum Paul Klee, Bern, ZPK Picture Archive.

Klee decided to turn his three birds into an automaton, *Apparatus for Mechanical Music* was the perfect solution to bring his birds into a state of mechanical subservience.

Symbolism within the work

Twittering Machine is full of graphic signs that for Klee served as important symbolic metaphors throughout his œuvre. Some of the legs of the birds have the feathered flights of arrows at their base rather than feet. The arrow is one of Klee's most important symbols, used both as a formal device to direct the eye and as a metaphysical symbol of man's desire to extend his reach beyond his physical limitations. In *The Twittering Machine* it relates to both the desire to fly and attack, as the points are firmly embedded into the birds themselves; there is a clear differentiation between the erect bird with its well-groomed tail feathers, confidently spouting a dangerous doctrine, and the less assured birds, standing awkwardly on 'musical' legs while under attack from arrows that pierce them from below.

Another device to serve this differentiation is the respective tongues or 'voices' of the birds. The bird on the far left rises above the others in an exaggerated manner. Its tongue is represented as an exclamation mark; a symbol that Klee would often use in his work to depict danger.[20] Having established the way Klee emphasized the disparate relationship between the birds, we can now examine the machine on which they are fixed. Comparing the original drawing to the final painting it is clear that any vestiges of the branch that would suggest its original identity have been stripped away, the bark-like quality of the sketch work and the delicate twig, which projects beneath the main branch, have been removed.

The branch is now transformed to a smoothly engineered crank with a brutally angular handle. The crank is unattached at one end adding to the sensation that the mechanism is floating/suspended in the vaporous colour clouds of the setting. It is however, attached to the base by a defined vertical strut, which attaches to the horizontal crank using an inverted arc reminiscent of an inverted musical *fermata*. This use of the *fermata* is repeated as the crank meets the horizontal edge of the machine where a vertical structure is faintly suggested. The arc as an architectural motif repeats throughout the composition, appearing in these linking structures, in the tongue of the third bird, in the mouths of second and fourth birds and in the shape of the bird heads (forming a full *fermata* when combined with the dot-like eyes).

The final, but perhaps crucial, instance of the arc is in the contours of the crank itself. The arc here appears in both the upright and inverted form, a common design feature of automaton, as this will induce the birds to bob up and down with the turning of the crank. This creates a dance like movement to contrast with their captive state, but also altering the respective hierarchy of the birds as presently shown suggesting that this is just one perspective of a multitude of other possibilities that this machine could produce. Like the arrow, the *fermata* is a fundamentally important graphic symbol for Klee and I shall return to its special significance for both the painting and the musical work later in this essay.

There have been numerous proposed readings of *Twittering Machine*: Shapiro suggests that the purpose of the machine is to trap unwitting birds, their song producing a siren-like effect to draw its victims in.[21] Otto Werckmeister sees the painting as a fusion of machine and animal, while according to Wheye and Kennedy, the painting is often interpreted as "a contemptuous satire of laboratory science".[22]

While it is tempting to propose that the painting is open to multiple readings, the evidence points to another explanation, one which takes into account the way Klee would often use his art as a biographical diary to chart his experiences. It is well documented that at the time the original sketch and the subsequent transfer painting were produced the Bauhaus was in a state of extreme turmoil. In a letter to his wife dated 6 October 1922, Lyonel Feininger wrote:

> "This is a time for everyone at the Bauhaus that would be difficult for you to imagine. Yesterday we met with all the Masters and workshop leaders from 8:00 until 12.30 A.M. […] I cannot, I dare not try to describe briefly what's happening there. A fanatical cabal has assembled. Unfortunately the motive of the movement appears to lie in the wounded vanity of the attackers and anxiety about their precarious authority – and this drives them to moralistic assaults of every kind against our friend."[23]

The arguments during the tumultuous year of 1922 at the Bauhaus concerned the tension between Walter Gropius's shift towards an approach to creativity derived from industrial design and Joseph Itten's more

spiritual philosophy. Itten's position was at odds with Gropius's move toward a more practical design focus and the disagreements culminated in him leaving the Bauhaus in late 1922.

Further evidence of *Twittering Machine's* connection to the events of the Bauhaus can be found in *The Morality Wagon* (1922, 123) executed just before *Twittering Machine* and drawn as a satirical response to the debate highlighted in Feininger's letter. This work bears striking similarities to the composition of *Twittering Machine*; there are four protagonists, all seemingly locked into a mechanical device, in this case a runaway train wagon.

Like *Twittering Machine* there are several symbolic elements that drive the narrative of the work. The opposition of freedom versus constraint is embodied in the paradox of a vehicle designed for movement, yet it is firmly anchored to the ground. Further conflict can be seen in the facial features of the characters, which mirror the anchor, while displaying Klee's favoured symbol with which to express the desire for intellectual, physical or spiritual movement – the arrow.

Three of the party are attached to the largest arrow, and with direct reference to Feininger's letter, Kagan describes them as "puppetlike members of the 'fanatical cabal' […] who manipulate the large arrow of moralistic assault".[24]

What Klee had produced in *Twittering Machine* was a 'visual opera', with a plot that dealt with the vicious power struggles raging within the Bauhaus during this period. He placed his characters in a state of mechanistic perpetual bondage, the futility of their situation emphasized by the contrasting cosmic void in which the action is set.

> "Klee liked the detached quality of operatic action; its human characters represent elementary facts rather than psychological entities, like Good and Evil, the Pure and the Demonic, Ugliness and Beauty. The symbolical content is shared among a number of figures, so that the general is embodied in the individual. The abrupt changes, from the adventurous to the devout, from the grotesque to the pleasing, does not disturb the unity of the operatic world because its ensemble depends on contrasts and contradictions, and the most diverse realities result in an unreal world of illusion that veils the indescribable."[25]

Carmen Arcadiae Mechanicae Perpetuum

Carmen Arcadiae Mechanicae Perpetuum (1977), literally translated as 'The Perpetual Song of Mechanical Arcady', was composed to mark the tenth anniversary of the London Sinfonietta.[26]

Written as a direct homage to Paul Klee and based upon the painting *Twittering Machine*, Birtwistle's program notes give some clues as to the specific nature of this connection and the way in which Klee's approach informed his own methodology.

> "The piece is by way of a homage to Paul Klee and the title is a title he could have invented. It consists of six mechanisms which are juxtaposed many times without any form of transition. The dynamics of the piece have a time-scale independent of that of the mechanisms, creating an independent dynamic life of their own. This process is also applied to the registers of the piece."[27]

In the same passage Birtwistle describes *Carmen* as "contrast within contrast, context within context". Early reviewers noted the surprising juxtaposition of materials and the mechanical nature of the piece, but perhaps missed the deeper, more profound nature of the work. Bayan Northcott, described Carmen as a "toyshop" piece concluding that it "seemed to accumulate a kind of comic exasperation, and makes, if not a profound, at least an entertaining addition to Birtwistle's output."[28] But like the painting, a more complex structural topography lies beneath the seemingly playfully chaotic surface of the piece. It was not until later that reviewers began to understand the special significance of *Carmen* as a pivotal work for Birtwistle, serving as a catalyst for a new direction in his work.

In his conversations with Fiona Maddocks, he reflects on the piece as "one of those moments in which all the ingredients come together. […] It seems to me like a sort of focus, a turning point in my career."[29]

Birtwistle's music is considered by many scholars to be extremely difficult to deconstruct in any logical way. Owing to the arbitrary nature of their construction, some scholars consider it a virtual impossibility to carry out any meaningful interpretation of his pieces.

> "Rigid repetition is combined with haphazard alteration […]. There's a middle level of obvious pattern – the level of repeated notes, or chords, or

motifs – while the lower level of detail and the upper level of large-scale form provide no simple answer to scrutiny."[30]

There have, however, been some scholars willing to take on the difficult detective assignment of unravelling the complexities of *Carmen*, and my own work draws upon and extends the work of three such analyses.[31] All three analysts conclude that there are six mechanisms[32] and that they are defined by their textural/rhythmic properties. To the time of these analyses, only David Beard had accessed the sketches kept at the Paul Sacher Foundation in Basel. The key to understanding Birtwistle's compositional approach to *Carmen* and, crucially, its links to Klee's creative ideology, lies in comparing the finished structure (evident in the score) with the one proposed on these original sketch plans. Table 1 (transcribed from the compositional sketches) shows the original ordering of the mechanisms in the plan. But a comparison between the score and the sketch plan reveals numerous changes in the final version (Table 2).

Note that the score ends after 22 mechanisms even though the plan continues. The sketch plan reveals that the disputed blocks of A10 and E12 have been switched around and that F13 went through 3 prior alterations; D, E, A and then finally F, underlining the significance of these blocks to the composer.

What is clear from the plan and the subsequent changes is that the piece has a clear bilateral form. The first half strictly adheres to the plan
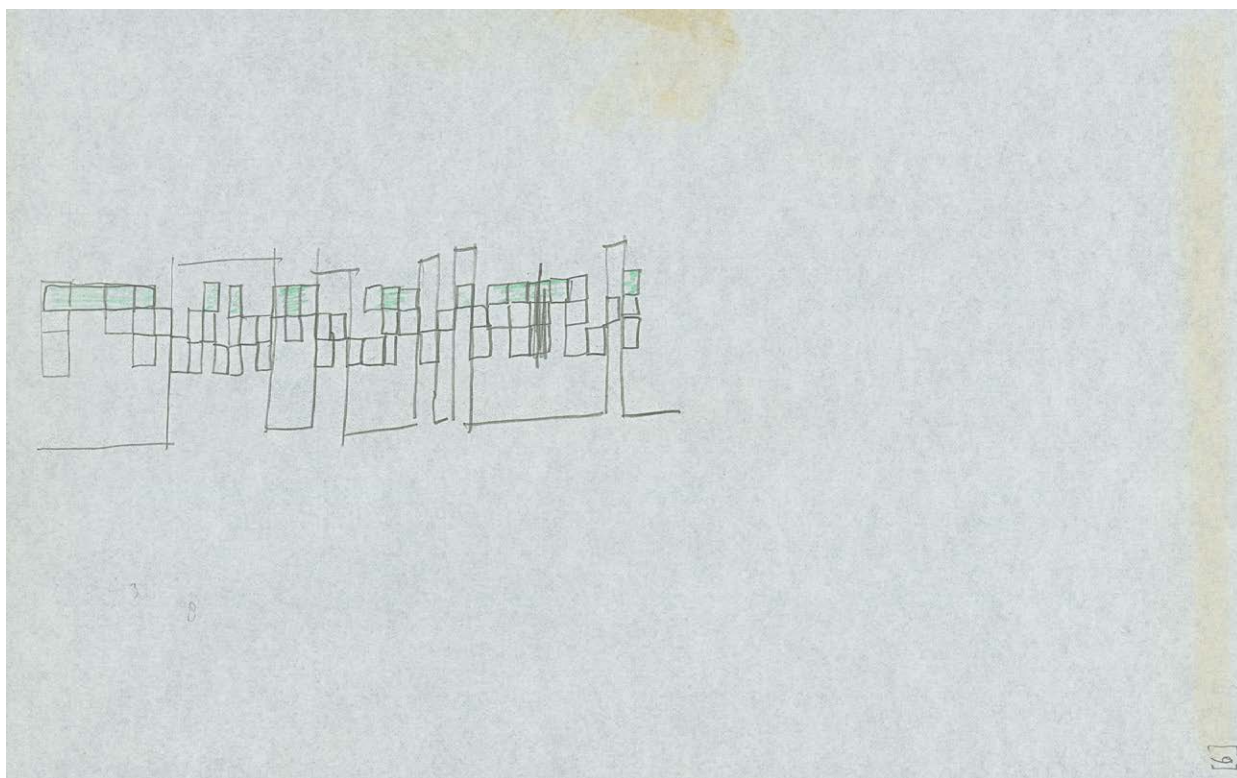
and is characterized by divisible units of 36. There is then a key transitional phase followed by the second section, which becomes less predictable, displaying an individual asymmetrical nature. All but one of the mechanism occurrences have been altered from the plan, transgressing from his own system in order to achieve a particular musical effect, by re-ordering and even discarding almost a third of the original plan.

Until recently it was not clear why Birtwistle did not continue the score to the end of the plan, but recent revelations in Maddocks's book have shed new light on the mysteries surrounding the compositional processes in *Carmen*. In conversation with Maddocks, Birtwistle reveals that he composed the mechanisms as discrete blocks, confirming that each one possesses a distinct rhythmic/textural character. From the sketches and Birtwistle's own brief program notes we know that he then applied a separate organizing system to the register/orchestration and dynamics (discussed later in this analysis). But what he reveals is that he completed an initial version of the piece (perhaps strictly according to the plan), but he then 'edited' the results.

> "So I generated a long piece and then I put a line through it. This line was like a circle. I cut out from it. [...] that piece – *Carmen Arcadiae* – is the part I cut out, the part that survived. [...] I made a circle of manuscript paper round my walls and looked at the pieces. [...] So this is how it relates to Klee."[33]

What Birtwistle was searching for was a way to close his circle, to create a perpetual rhythmic mechanistic music analogous to the subject of the painting. As he stated to Maddocks, "I can tell you something specific about Paul Klee, and the indebtedness in this piece *Carmen arcadiae mechanicae perpetuum*. When I express how that piece came about, it's non-linear."[34]

One solution to achieving this "non-linear" form was quite simple; chop away the last eight mechanisms to enable a return to mechanism D with its relentless machine-like character: the mechanism which starts the piece, in such an idiosyncratic way, then acts as a central pivot heralding the entry of the second section, before ending the piece to complete the cycle, ready to begin again the endless round of mechanistic pulsations and chirpings. The other alterations outlined in Table 2 may also have occurred at this point. Certainly Birtwistle may have placed the manuscript around the room to try and 'visualize' the piece as a

	A	B	C	D	E	F
Cycle 1	3	2	5	1	4	6
Cycle 2	6	3	1	5	4	2
Cycle 3	4	3	6	1	2	5
Cycle 4	4	1	6	2	3	5
Cycle 5	4	6	3	1	5	2

Table 1: Original arrangement of mechanisms in the sketch plan.

	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5
Plan	DBAECF	CFBEDA	DEBAFC	BDEAFC	DFCAEB
In the score	DBAECF	CFBADE	FDBCEA	EFBD	

Table 2: The actual order of mechanisms, in the finished score.

large circular form. It is not too far-reaching an assumption to suggest he may have moved some of the blocks around by physical exchanging them in order to gain the overall musical cyclic form he was striving for.
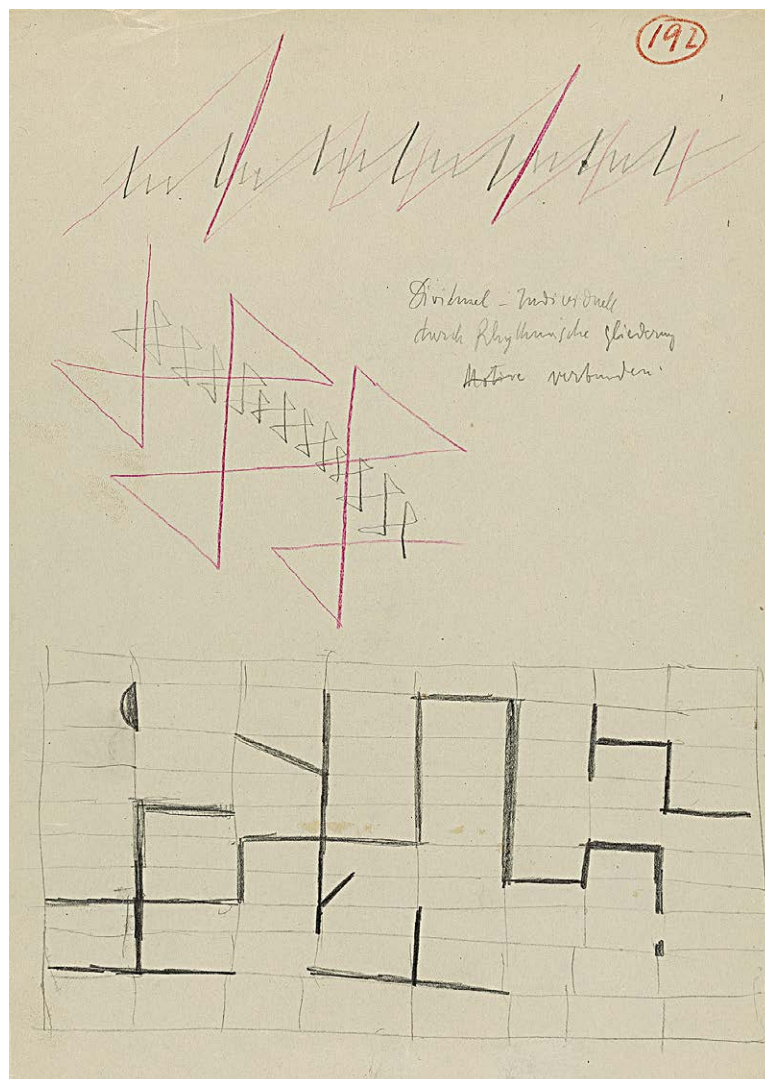
Three opposing schemes

Having established the nature of his six mechanisms and a potential order in which they might occur, Birtwistle then set about placing them within a system which would establish 'independent time scales' for the mechanisms, register and dynamics of the piece. To understand how he approached this, we must return to the compositional sketches.

   A large part of the sketches consist of the pre-compositional plan highlighted earlier, but before referring to this section of the sketches, I would draw attention to a previously overlooked small sketch found on page nine of the portfolio (Fig. 5). This sketch is particularly signifi-cant, as it shows the early stages of Birtwistle working out a structural

approach to *Carmen*. The sketch consists of an arrangement of hand drawn squares distributed among three horizontal rows. The resulting structure produces a seemingly random set of vertical relationships combined with a 'dividual' one plus one horizontal rhythm. Birtwistle has then imposed a 'higher articulation' of a single line, which intersects the smaller scale structure. This line has an 'individual' character with its proportionally random horizontal distribution.

   Birtwistle was very familiar with Klee's notion of 'dividual' versus 'individual' structure, and this drawing shows us that this was very much in his thinking when working out his structural approach to *Carmen*. There are striking similarities between Birtwistle's sketch and the ones made by Klee concerning 'individual – dividual' structure in both volumes of his notebooks.

   Purely Planar (Fig. 6) shows how Klee would combine a 'dividual' structure described here as "[a]n unaccented rhythmical base" with a "higher articulation in free choice individually accented and rhythm-icised."[35] Like Klee, Birtwistle seems to be working out some kind of

subdivides these lines into durational blocks.[36] The lower line contains blocks that are made of regular cells of eighteen units, with the other lines having a mixture of durations – the middle line containing longer durations and the upper line containing more irregular durations. It is interesting to note the similarities of Birtwistle's sketch plan to Klee's classroom examples such as the example in Fig. 8, where Klee is discussing the combination of 'individual' (in this case based on golden section proportions) and 'dividual' elements to create rhythmic movement.
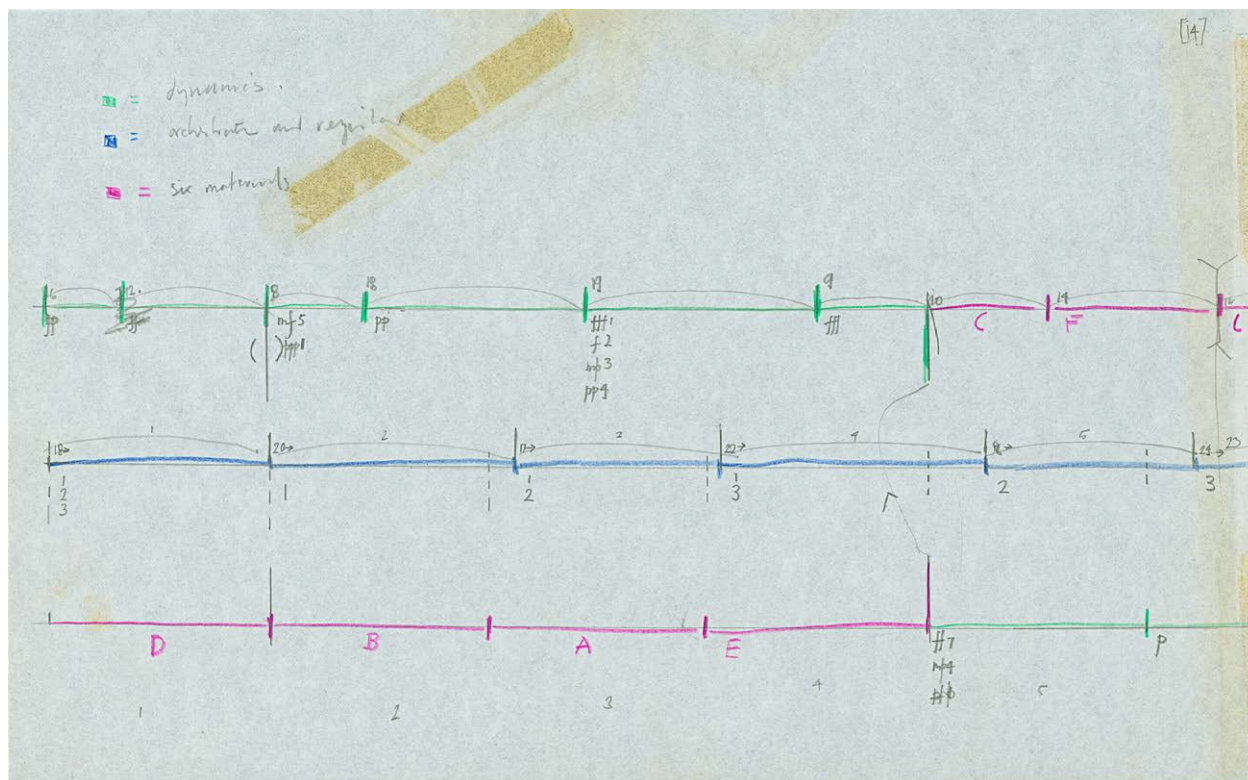
Birtwistle then divides his compositional materials into three separate schemes to govern dynamics, orchestration-register and the six mechanisms (textural rhythm). He then distributes these schemes among the three lines. In the sketch plan (Fig. 7) he has placed the first four occurrences of the mechanisms (D, B, A, E) along the lower regularly spaced line before moving the next in the series up to the more irregularly spaced top line. The dynamics scheme then moves from the top to lower line and the register and orchestration maintain their path on the middle line.

The register scheme denotes a simple *high, middle* or *low*, while the dynamics scheme consists of groupings of one to two, three and four types: these are then assigned numbers *pp, mp, f, ff*. In the sketch plans both the dynamic and the register elements are assigned numbers, which he then selects at random from tables.[37]

The overall effect of this methodology is that the three elements are acting upon each other, contributing to an overall compositional effect, but at the same time they are entirely independent of each other, which gives the piece its multi-layered and unpredictable quality.

However, as with the sequence of the mechanisms, it seems Birtwistle did not leave the decision-making in the composition of *Carmen* entirely up to the systems he devised. As stated earlier, the bilateral structure of the overall piece, characterized by the shift from a more regular order to a more irregular one, coincides with a marked deviation from the original plan. We can therefore assume that one compositional aim of the piece is to present a navigation from a determinate system to a higher level of intuitive decision-making. Birtwistle's propensity towards deviation from his original systems has caused difficulties for previous analysts (as discussed later in this article), yet, it is this deviation, which lies at the very heart of understanding the artistic aim of the piece.

Although *Carmen* is a complex composition, containing multiple dialectic relationships, the overall oppositional relationship and there-

dialectical relationship between a 'dividual' grid system across three rows and a higher level of decision-making, superimposed upon it.

What it does show is that 'individual – dividual' structure and therefore symmetrical versus non-symmetrical balance was central to his thinking in his compositional approach. Furthermore, the idea of a systemized grid structure, onto which a higher level of decision-making could be imposed, was at the heart of this balance.

As Birtwistle begins to develop his structural ideas, he transfers his three tripartite grid structure to three horizontal lines (Fig. 7). He then

7 Harrison Birtwistle: *Carmen Arcadiae Mechanicae Perpetuum* (1977/78), plan of composition, p. 14, Harrison Birtwistle Collection, © Paul Sacher Foundation.

fore the main artistic tension within the piece is the one between the composers intuitive will and the system he himself has designed. This is not a question of the composer making decisions purely for musically decorative results; this is the main artistic objective of the piece, acting as a perfect analogue for the oppositional relationship between freedom and constraint, inherent in the painting

Harmonic materials

Another example of this oppositional balance between system and self can be found in the choice of harmonic materials themselves. Analysts have expended great effort in trying to define the exact harmonic relationship of the pitch choices in *Carmen*. That there is a unifying scheme at work is supported by Birtwistle's recent discussions with Maddocks:

"In *Carmen arcadiae* I invented, like wild track, say five different musics which had no relation to each other. I didn't consider what the relationship of these various elements was, only that there was a unity because of the harmony I chose. They all belonged to the same harmonic family – like different people within it, each with their own character. […] there was an inner unity."[38]

There has been some disagreement between previous analysts regarding the specific application of a harmonic scheme in *Carmen*. In his conversations with Maddocks Birtwistle himself states that "It's about making a chord. […] How do you make something from your intuition? […] I've often thought about trying to formulate this but I don't want to. I'm quite happy it's vague."[39] As so often with Birtwistle, what at first appears to be an admission of a lack of rigor in his approach is actually evidence that his decision to leave a degree of intuitive decision-making to this aspect of his compositional approach is carefully considered. It

is fundamental to his balancing act between intuitive and systemized decision-making.

Like the harmonic setting in *Carmen*, *Twittering Machine* uses a limited palette of complementary blues and pinks in order to provide its own dramatic setting. In Klee's words, if this complementary colour theme existed in isolation "a kind of tranquillity would set in", as we saw earlier in the composition *North Sea Picture*, but as Klee states "it would be dead, an inactive harmony. What we need is an active harmony. This requires deviation."[40]

In *Twittering Machine*, Klee creates tension by superimposing the mechanistic automaton with its twisted unnatural birds and its dark smudged forms onto the simple two-part 'static' harmony of the colour

8   Paul Klee: *Bildnerische Gestaltungslehre* [Manuscript 1921/22], p. 69a (www.kleegestaltungs lehre.zpk.org/ee/ZPK/ BG/2012/01/04/071/) "rhythmic individual with golden ratio" – "it repeats the assembled unit (I): eight to thirteen[;] rhythmic individuals".

field. In *Carmen* Birtwistle introduces his static generic chord and regular rhythmic pulse onto which he superimposes his rhythmical, textural mechanisms and asymmetrical schemes of dynamics and register.

Time

Having established the structure of *Carmen* in relation to its harmonic materials, rhythmical/textural mechanisms and the organization of the independent register and dynamic schemes, this leaves one final, structural element, the *fermatas*, which separate the majority of the mechanisms. It is possible that their importance to the compositional aims of *Carmen* has been underestimated by previous analyses, particularly their significance in relation to the correlations between the creative approaches to time of Birtwistle and Klee.

As a musician, Klee was familiar with the function of the *fermata* in a musical context. The symbol represents a note or pause the length of which is at the discretion of the conductor or musician(s). This is often used by composers to intensify beginnings, endings and transitional phases, for example, a sustained chord following a cadence returning to the tonic exaggerates the sense of resolution. Equally, if that chord was a suspension or dissonant in nature it would heighten the sense of incompleteness, suggesting that further movement is required to achieve balance. This psychological dualism inherent in a single symbol embodies Klee's static – dynamic dualism. The other function of the *fermata* is to suspend time, to remove the viewer or listener from the worldly concerns of strictly measured tempo. In the context of *Carmen* this seems a particularly useful device, as it contrasts so strongly with relentless mechanical nature of the mechanisms.

Analysts have suggested that the purpose of these pauses is to delineate between the sections, negating any sense of transition between them. "They are not transitions between mechanisms, but they do mitigate the starkness of the oppositions, signalling the end of one block and the beginning of the next."[41]

While this is certainly one possible function of the rests, I would propose a further role, which takes into account the structural meaning of the painting itself. As described earlier, the colour field setting for the subject is of vital importance to understanding the dialectic relationships within the work. The sense of a multi-dimensional cosmic space,
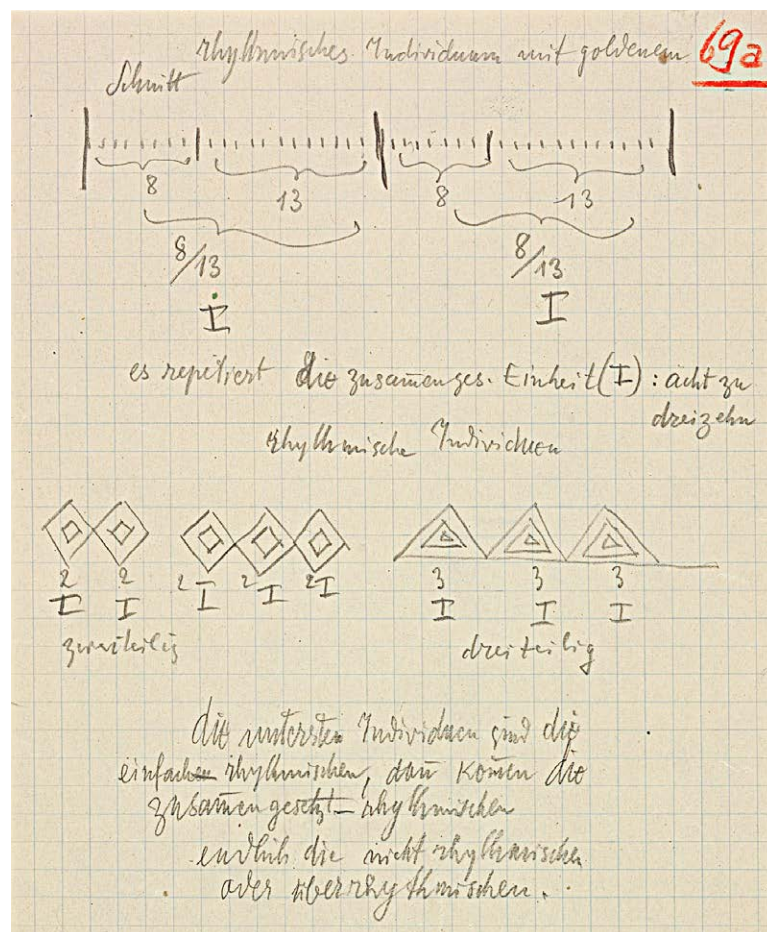
in which the machine is situated, would conceivably allow the viewer to navigate around the machine viewing it from multiple perspectives. The *fermata* can be seen as an analogue for the cosmic setting of the colour field, both suggesting a suspension of rational law.

As Kagan and Kennon point out "The fermata is, in a sense, a symbol for the suspension of the laws of rational time in musical composition because it momentarily and indefinitely disrupts the calibrating framework of the rhythmic structure, beat, and tempo."[42] The colour field suggests multi-dimensional space, the viewer can sink back into the cosmic setting, which surrounds the mechanized device, to gain a different viewpoint. To the same end, Birtwistle employs his suspended rests to allow the composer to reposition his perspective, ready to present the mechanisms in a transformed way.

Andrew Kagan has suggested that for Klee the curved arch and fixed point represented a frozen analogue of the musical metronome. In his Bauhaus teaching, the metronome was an important symbol of the opposing balance between gravity and momentum.

> "The pendulum is an expression of temporal unity, a compromise between movement and countermovement, the symbol of mediation between gravity and momentum."[43]

The constraint of gravity and man's desire to fly is one of Klee's most potent oppositions; we find it in pictures such as *Hero with One Wing* (1905, 7)[44] and in the *Pedagogical Sketchbook* where he describes:

> "It is this contrast between power and prostration that implies the duality of human existence. Half winged – half imprisoned, this is man! Thought is the mediary between earth and world. The broader the magnitude of his reach, the more painful man's tragic limitation."[45]

Suspension of rational time, by stopping the metronome, would therefore allow the viewer/listener to enter a realm of non-rational suspended time, where earthly constraints such as gravity no longer have control and we are free to fly in a multi-dimensional space at will.

There is also a third element to the nature of some of the transitional rests, where the notes held in suspension are punctuated with a percussive staccato accent. These *fermatas* can be seen as a direct musical analogue of the visual *fermata* symbol.

By creating these active/inert structures, Birtwistle once again is challenging our perception of what to expect, creating dynamic tension by presenting *fermatas* that are neither static, or fully in motion, that confound classification, moving between a background or foreground role. In fact, the very last statement of the piece is a single held note while the score gives the direction "*molto rall[entando]*". This in itself is a performative impossibility, yet it can be seen as a fitting final statement as it embodies the static dynamic dualism inherent in the composition and in the painting itself.

Conclusion

The complex, seemingly chaotic nature of *Carmen* is immediately obvious in the aural perception of the piece. Yet analysis begins to show us just how rigorously composed that complexity is. Initially we have the conflict between the mechanisms themselves, highlighted by their distinct characteristics and the way Birtwistle avoids any obvious transitional material. He chooses instead to juxtapose them in a stark and brutal way, sometimes separating them with *fermatas* that serve to suspend any logical sense of temporal continuity. But acting upon these mechanisms, there are deeper layers of activity – the register and dynamic schemes, which Birtwistle has purposely disconnected from the sequence of the mechanisms, using a system of random numbers.

The potential for oppositional effects has therefore multiplied exponentially. So the question is: How do these oppositions relate to the painting? I have attempted to show how the painting itself is a visual analogue of the tensions and conflicts within the Bauhaus at the time of its creation and that like the musical work, the oppositions within the painting are more subtle and complex than at first perceived.

Like the musical composition, all of these elements multiply to build a multi-dimensional structure of opposing elements that contribute to a visual architecture, which seeks to contain these highly charged oppositional tensions.

It is perhaps at this higher organizational level when viewing/listening to the works that the links between them are most strongly evident. As I highlighted earlier, *Carmen* can be viewed as having a bilateral symmetry, yet like with Klee, this symmetry is never a straightforward equal divide. The second half of the work begins to display more asym-

metrical tendencies, which add to a greater sense of unpredictability, and as I have shown, this is largely due to the intuitive will of the composer overriding his own predetermined schemes.

This transition from the tectonic to the poetic, the theoretical to the magical is a perfect analogue for the relationships within the painting. The movement from the predetermined system to a less predictable and free compositional approach in *Carmen* mirrors the dualistic structure of the painting.

However, it would be wrong to simply view *Carmen* and *Twittering Machine* as musical and visual metaphors of a struggle between two opposing ideologies. Klee himself was always portrayed as being above/ removed from such polar debates. This neutrality, however, meant that he was often dragged into arguments to act as an impartial voice of reason. After one such occasion in 1921 he wrote to Gropius to state:

"I welcome the fact that forces so diversely inspired are working together at our Bauhaus. I approve of the conflict between them if the effect is evident in the final product. […] On the whole, there is no such thing as a right or wrong; the work lives and develops through the interplay of opposing forces, just as in nature good and bad work together productively in the long run."[46]

This quotation perfectly shows how Klee could rise above the trivialities of these ideological battles, but also that he saw the potential of these conflicts for fuelling the artistic product of the Bauhaus. These two perspectives (cosmic and earthly) are imbued in both the works discussed here. Klee and Birtwistle demonstrate the relative futility of the oppositions within their respective works in two ways. Firstly, by placing the drama in a setting that seems to transcend the worldly concerns of the immediate present. Klee conveys this cosmic viewpoint by placing the drama within his otherworldly colour field and Birtwistle achieves this through the 'out of time' nature of his *fermatas*.

The second is the way both composer and artist suggest the perpetual/ cyclic nature of their subject. The full title of *Carmen* clearly points to a sense of a never-ending procession of sounds and this concurs with his revelations to Maddocks, which confirm that Birtwistle viewed and indeed composed *Carmen* as a circle, not a linear sequence of events. In both the painting and music, the oscillation between foreground and background and the fractured discontinuity of line are further complicated by the use of circular form, looking backwards as well as forwards to create a sense of the perpetual, rather than a journey within a fixed temporal or spatial frame.

So when the third occurrence of the machine-like mechanism returns, rather than see it as a final musical statement and therefore a victory for the mechanistic side of the struggle, we see it as a beginning as well as an end; a return to the perpetual struggles of mankind, history repeating as viewed from a higher realm. The cyclic nature of the painting lies within the crank handle of the automaton, which can be stopped and started, at will, repeating the sounds of the opposing voices without resolution, ad nauseam. When the crank stops, it is at these moments that the viewer/listener draws away for the immediacy of the sounds and foreground action and enters the higher realm of the colour field and *fermatas*.

The initial encounter of both works suggests an eccentric, whimsical narrative that mixes mechanized and poetic sounds and images. Yet analysis demonstrates that beneath that surface impression, there lies a multidimensional structure, which serves to bring together opposing elements into a dramatic and highly charged composition. Both pieces place these oppositions within a wider context, one that suggests a philosophical commentary on the futility of such conflicts in relation to a higher fatalistic and eternal power.

Anmerkungen

1 Birtwistle at home in France in conversation with Michael Hall, December 1983. Michael Hall: *Harrison Birtwistle*, London 1984 (The contemporary composers, Vol. 4), p. 150.

2 Ibid., p. 26.

3 Ibid., p. 150.

4 See Hall's discussion of the "dance of numbers" (as named in the content of the book) in his analysis of *…agm…*, ibid., pp. 98–103.

5 Hall noted that Birtwistle would rarely be found at concerts preferring instead to visit art galleries where he could be seen "gazing at the Cézannes", ibid., p. 4.

6 Ibid., p. 7.

7 Birtwistle after Paul Griffiths: *New Sounds, New Personalities. British Composers of the 1980s*, London 1985, p. 191.

8 For a detailed discussion of medieval musical techniques including *Ars nova* see John Caldwell: *Medieval Music*, Bloomington 1978; or Lloyd Ultan: *Music Theory. Problems and Practices in the Middle Ages and Renaissance*, Minneapolis 1977.

9 Birtwistle in his notes for *Tragoedia*, cited in Hall: *Harrison Birtwistle*, p. 39.

10 *Paul Klee. The Thinking Eye*, ed. by Jürg Spiller, transl. by Ralph Manheim, London/New York 1961 (The Notebooks of Paul Klee, Vol. 1), p. 105.

11 Ibid., p. 103.

12 Hall: *Harrison Birtwistle*, p. 20.

13 Ibid., p. 7.

14 Paul Klee: *Pedagogical Sketchbook*, New York 1953, p. 21.

15 Hall: *Harrison Birtwistle*, p. 34.

16 Christina Thomson: Theater, in: *The Klee Universe* [Exhibition Catalogue Neue Nationalgalerie, Berlin, 31.10.2008–8.2.2009], ed. by Dieter Scholz and Christina Thomson, Ostfildern 2008, pp. 165 f., here p. 166.

17 For a discussion of Birtwistle's notion of Cantus vs. Continuum see Arnold Whittall: The Geometry of Comedy, in: *Musical Times* 134 (1993), pp. 17–19, esp. p. 19. A detailed discussion of the development of Klee's theory of 'Dividual' and 'Individual' structure can be found in *Paul Klee. The Thinking Eye*, pp. 217–292.

18 See chapter 2, "Operatic Paintings: The Roles of Line and Poetry in Klee's Mature Art", in: Andrew Kagan: *Paul Klee. Art and Music*, Ithaca/London 1983, pp. 95–143.

19 Musicologist Stephen Ellis was instrumental in providing much of the early material for the Paul Klee Centre music archive. He currently estimates there are over 800 works 'connected' to Klee's œuvre, and *Twittering Machine* is the most popular subject. Email correspondence with the author, 9 November 2010.

20 Other examples of the use of the exclamation mark to depict danger or impending disaster include *Main scene from the Ballet "The False Oath"* (1922, 155) and *Catastrophe, with the Bleeding Dog* (1922, 193). Interestingly Klee has removed the dot within the fermata during the transfer process, which was more pronounced in the original drawing.

21 Maurice L. Shapiro: Klee's Twittering Machine, in: *The Art Bulletin* 50/1 (1968), pp. 67–69. This is a theme enthusiastically taken up in John F. Moffitt: Paul Klee's *Twittering Machine* and the emblematic 'birds-in-bondage-vile' theme, in: *Studies in Iconography* 9 (1983), pp. 135–174.

22 Darryl Wheye/Donald Kennedy: *Humans, Nature, and Birds. Science Art from Cave Walls to Computer Screens*, New Haven, CT 2008, p. 79. See also Otto Karl Werckmeister: *The Making of Paul Klee's Career, 1914–1920*, Chicago/London 1989, p. 240.

23 Busch-Reisinger Museum, acq. No. 1962.31. English translation after Kagan: *Paul Klee. Art and Music*, p. 110.

24 Ibid., p. 111.

25 Grohmann: *Paul Klee*, New York 1954, p. 246.

26 The score is dedicated "To my friends the London Sinfonietta on the occasion of their tenth birthday". *Carmen* is the second in a trilogy of works that Birtwistle composed for the Sinfonietta between 1976 and 1984, the others being *Silbury Air* (1977) and *Secret Theatre* (1984).

27 Birtwistle quoted in Hall: *Harrison Birtwistle*, p. 177.

28 Bayan Northcott: London Sinfonietta Tenth Anniversary Concert, in: *Tempo* 124 (March 1978), pp. 27 f., here p. 28. Northcott refers to the title of an earlier Birtwistle work, *Chorale from a Toy-Shop* (1967). See also Alison Patricia Deadman: *Mechanical Arcady. The Development of an Aesthetic in Birtwistle's Orchestral Works Written for the London Sinfonietta Between 1977 and 1984*, MA Thesis, University of Leeds, 1990, p. 78.

29 Harrison Birtwistle: *Wild Tracks. A Conversation Diary with Fiona Maddocks*, London 2014, pp. 74 f.

30 Paul Griffiths: Harrison Birtwistle's hands, in: *The New Yorker* 69, No. 22 (19 July 1993), p. 85. Griffiths here refers specifically to Birtwistle's piano concerto *Antiphonies* (1991/92).

31 The analyses that have been considered are Jonathan Cross: *The Stravinsky Legacy*, Cambridge 1998, pp. 71–78; Brian Carl Robison: *Towards a Methodology for Analysing Carmen Arcadiae Mechanicae Perpetuum*, PhD dissertation, Cornell University 1999; and David Jason Beard: *An Analysis and Sketch Study of the Early Instrumental Music of Sir Harrison Birtwistle*, PhD dissertation, University of Oxford 2000.

32 Initially Cross defined seven mechanisms but he concluded that six and seven are subforms of the same one.

33 Birtwistle: *Wild Tracks*, pp. 67 f.

34 Ibid., p. 66.

35 *Paul Klee. The Nature of Nature*, ed. by Jürg Spiller, transl. by Heinz Norden, London 1973 (Paul Klee Notebooks, Vol. 2), p. 209.

36 One unit in the plan is equivalent to a duration of one quarter note in the score. Sketch page A4: 21 contains the workings for these durations.

37 Sketches detailing the number rotations for these elements are found in the A4 sized folder pages 8, 11, 12 and 14 (register) and 17, 24 and 25 (dynamics).

38 Birtwistle: *Wild Tracks*, p. 66.

39 Ibid., p. 75.

40 *Paul Klee. The Thinking Eye*, p. 515. Translated after Petra Petitpierre: *Aus der Malklasse von Paul Klee*, Bern 1957, "Harmonisch – organisch" (pp. 30 f.), here "Es würde dort eine Art Beruhigung eintreten, die gleichbedeutend wäre mit vollständigem Stillstand. Eine Harmonie, die ihren Sinn hat und als Exempel für Harmonie wertvoll ist, die aber dadurch, daß sich diese letzte Bedingung selbstlos erfüllt, tot wäre, ist eine inaktive Harmonie. Die Forderung ist aber eine aktive Harmonie. Somit erfordert dies ein Abweichen." Ibid., p. 30.

41 Cross: *The Stravinsky Legacy*, p. 78. Cross is comparing Birtwistle's approach to that of Stravinsky by paraphrasing Edward T. Cone: Stravinsky. The Progress of a Method, in: *Perspectives of New Music* 1/1 (1962), pp. 18–26.

42 Andrew Kagan/William Kennon: The Fermata in the Art of Paul Klee, in: *Arts Magazine* 56/1 (1981), pp. 166–170, here p. 67.

43 *Paul Klee. The Thinking Eye*, p. 387.

44 For further discussion of the man's incapacity to fly in Klee's art see Mark Rosenthal: The Myth of flight in the art of Paul Klee, in: *Arts Magazine* 52/1 (1977), pp. 90–94.

45 *Pedagogical Sketchbook,* p. 54.

46 Klee in a letter written to Walter Gropius in December 1921, cited after Grohmann: *Paul Klee*, p. 64.

Kurzbiografien

Christian Berger wurde nach dem Studium der Schulmusik und der Musikwissenschaft in Freiburg, Hamburg, Berlin und Kiel 1982 in letzterem promoviert, wo er 1981–1994 Assistent war. 1990–1995 nahm er zahlreiche Vertretungen wahr (Heidelberg, Bonn, Regensburg, Detmold, Greifswald), bis er 1995 dem Ruf auf den Lehrstuhl für Musikwissenschaft an der Universität Freiburg folgte. Schwerpunkte seiner Forschung sind die Musiktheorie des Spätmittelalters, insbesondere die Hexachord- und Modus-Lehre, die Musik des 14. und 15. Jahrhunderts, deutsche und italienische Instrumentalmusik des 17. und die französische Musik und Musikanschauung des 18. und 19. Jahrhundert (Rameau, Rousseau, Berlioz). 1998–2001 war er Schriftleiter der Zeitschrift *Die Musikforschung.* Er ist Herausgeber der Reihe «Grundwissen Musik», die bei der Wissenschaftlichen Buchgesellschaft Darmstadt erscheint.

Linn Burchert studierte 2008–2014 Kulturwissenschaft und Anglistik/Amerikanistik sowie Vergleichende Literatur- und Kunstwissenschaft an der Universität Potsdam. 2014–2017 war sie wissenschaftliche Mitarbeiterin am Lehrstuhl für Kunstgeschichte des Seminars für Kunstgeschichte und Filmwissenschaft an der Friedrich-Schiller-Universität Jena, wo sie ihre Dissertation *Das Bild als Lebensraum. Ökologische Wirkungskonzepte in der abstrakten Kunst, 1910–1960* abschloss. Seit 2018 ist sie wissenschaftliche Mitarbeiterin am Institut für Kunst- und Bildgeschichte der Humboldt-Universität zu Berlin. Forschungsschwerpunkte sind Beziehungen zwischen Kunst-, Ideen- und Wissenschaftsgeschichte sowie Naturkonzepte und Naturzugänge in der Kunst vom ausgehenden 18. bis zum 20. Jahrhundert.

James Dickinson is the Subject Leader for Commercial Music at Bath Spa University. He divides his time between research into "Visual Music", teaching (especially in Studio Production, Electronic Music and Visual Music) and his creative practice. He has performed and composed in electronic, experimental and rock genres and his many hits include a UK number 1 album with his band "Little Angels".

Thomas Gartmann studierte an der Universität Zürich Musikwissenschaft, Germanistik und Geschichte und promovierte zum Instrumentalwerk Luciano Berios. Er wirkte als Leiter Musik bei Pro Helvetia, NZZ-Rezensent, Lehrbeauftragter an verschiedenen Kunsthochschulen und Universitäten und übernahm 2011 eine HKB-Forschungsprofessur und das Forschungsmanagement an der Hochschule für Musik Basel. Heute ist er (Co-)Leiter des Berner Doktoratsprogramms «Studies in the Arts», der HKB-Forschung und von SNF-Projekten zur NS-Librettistik, zum Schweizer Jazz, zu Beethoven-Interpretationen («Vom Vortrag zur Interpretation»), zur Ontologie des musikalischen Werks sowie zum mittelalterlichen Rebec.

Wolfgang F. Kersten promovierte 1985 mit einer Arbeit über Paul Klee, Habilitation 2002 mit Studien zu modernistischer Malerei, 1985 Bauhaus-Archiv, Berlin, 1986–1991 Kunstmuseum Bern, 1991–2019 Kunsthistorisches Institut der Universität Zürich; parallel Ausstellungstätigkeit u. a. in Bern, Düsseldorf, Kyoto, Leipzig, Schopfheim, Stuttgart, Tokio, Wien und Zürich; seit September 2019 Verlagsinhaber, CEO und Forschungsdirektor. – Forschungsschwerpunkte auf dem Gebiet der modernen Tradition; Spezialisierungen für die historischen Phasen in Deutschland von 1871 bis in die Gegenwart, für Paul und Lily Klee, für «Neue Deutsche Malerei», für Schweizer Kunst nach 1945 und für Paul Strand. Publikationen siehe www.khist.uzh.ch/de/kol/emeriti/Kersten/forschung.html.

Roland Moser stammt aus Bern und studierte am Konservatorium seiner Heimatstadt u. a. Komposition bei Sándor Veress. Seine weitere Ausbildung führte ihn nach Freiburg/Br. und Köln. 1969–1984 unter-

richtete er am Winterthurer Konservatorium Theorie und Neue Musik, danach war er bis zu seiner Emeritierung 2008 Professor an der Basler Hochschule für Musik mit Klassen für Komposition, Instrumentation und Musiktheorie. Neben seiner institutionellen Tätigkeit wirkte er als Mitglied des Ensemble Neue Horizonte Bern und schuf ein umfangreiches kompositorisches Œuvre, das u. a. zwei abendfüllende musikdramatische Werke sowie Chor-, Orchester- und Kammermusik umfasst. Ein besonderes Interesse gilt – auch in zahlreichen Texten – besonderen Phänomenen von Harmonik, musikalischer Zeit und der Beziehung von Musik und Sprache.

Ulrich Mosch studierte an der Staatlichen Hochschule für Musik und Theater Hannover sowie an der TU Berlin, wo er über das Thema «Musikalisches Hören serieller Musik» promovierte. 2004 folgte seine Habilitation an der Universität Salzburg, dort war er anschließend Privatdozent. Daneben lehrt er unter anderem am IRCAM in Paris und am Centre Acanthes in Metz. Seit 2013 ist er Ordinarius für Musikwissenschaft an der Universität Genf. Er ist unter anderem Herausgeber der Schriften Wolfgang Rihms und schreibt über die Musikgeschichte und

Musikästhetik vor allem des 20. und 21. Jahrhunderts. Außerdem beschäftigt er sich mit der Verbindung von Musik zu den anderen Künsten – insbesondere Tanz, Film und Bildende Kunst –, mit der musikalischen Wahrnehmung, der Geschichte des Hörens, der musikalischen Interpretation und Reproduktion sowie der Musik in den Medien.

Osamu Okuda studierte Kunstgeschichte an der Universität Kōbe und am Kunsthistorischen Seminar der Universität Bern. 1996–2004 war er wissenschaftlicher Assistent der Paul-Klee-Stiftung im Kunstmuseum Bern, 2005–2016 wissenschaftlicher Mitarbeiter im Zentrum Paul Klee, Bern. Er veröffentlichte zahlreiche Publikationen zu Paul Klee und Künstlern seines Umkreises, darunter: *Paul Klee. Im Zeichen der Teilung. Die Geschichte zerschnittener Kunst Paul Klees 1883–1940* (Stuttgart 1995; gemeinsam mit Wolfgang Kersten); *Paul Klee und der Ferne Osten. Vom Japonismus zu Zen* (Zürich 2013; mit Marie Kakinuma); *Hans Bloesch – Paul Klee. «Das Buch»* (Wädenswil 2019; mit Reto Sorg). Okuda ist Co-Herausgeber der Online-Zeitschrift *Zwitscher-Maschine – Journal on Paul Klee / Zeitschrift für internationale Klee-Studien.*