Constraint Systems in Brian Ferneyhough's Third String Quartet

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Introduction: Control and process

Brian Ferneyhough's use of compositional constraints—self-imposed limitations that restrain (but also paradoxically nurture) invention—remains a little understood feature of the composer's process. Through a close look at the first movement of his Third String Quartet (1986–87), drawing on the composer's writings, sketch study, and score analysis, I hope to suggest new ways of understanding Ferneyhough's music of the 1980s and to address some of the common mischaracterizations of his compositional philosophy.

Ferneyhough's music is often described as a kind of decadent "hyper-serialism"—an anachronistic late twentieth-century offshoot of the Darmstadt school—as in this excerpt from Richard Taruskin's *Oxford History of Western Music*.

> Composers associated with the New Complexity put much of their effort into finding notations for virtually impalpable microtones, ever-changing rhythmic divisions and tiny gradations of timbre and loudness in an effort to realize their ideal of infinite musical evolution under infinitely fine control and presented with infinite precision, with absolutely no concession to "cognitive constraints." [...] But despite the evident progress it fostered in notational technology the movement was too obviously a rearguard action to inspire much interest.[1]

Ascribing the ideal of "infinitely fine control" to Ferneyhough and other "complex" composers suggests that they're driven by a will to power, a totalitarian desire to legislate every aspect of the performer and listener's engagement with the music. There are echoes of the twentieth century's anxiety over the increasing mechanization of human life and labour, as manifested in Taylorism and the practice of "scientific management"—a phenomenon referenced (but by no means endorsed!) by Ferneyhough in his *Time and Motion Studies I–III.* In descriptions like Taruskin's, we find that many misconceptions about mid-century European serialism have found their way into the discourse on Ferneyhough's music—in particular, the assumption that the use of serial techniques or other precompositional processes is primarily a matter of *control.* This characterization rehearses a tired stereotype of academic modernism, as the domain of pedantic, note-counting composers too egotistically obsessed with the control of details to see the musical forest for the trees. Taruskin is quick to dismiss New Complexity as an anachronism: "the movement was too obviously a rearguard action to inspire much interest."

Norwegian musicologist Erling Guldbrandsen recently argued that scholars misunderstand the purpose of serial techniques in Pierre Boulez's music when they describe them as guarantors of unity, coherence, and logic: he calls this the *control model* of serialism.[2] Under this model, serial procedures are employed methodically to ensure top-down control of every step of the compositional process and to produce a perceptible structural unity in the work. A one-to-one relationship is assumed between the types of organization implied by the serial procedures and the structural relationships evident in the completed composition. Guldbrandsen's interview with Boulez tells a quite different story:

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[1] TARUSKIN, Richard. *Oxford History of Western Music,* vol. 5, *Music in the Late Twentieth Century,* Oxford, Oxford University Press, 2005, p. 476.

[2] BOULEZ, Pierre and Erling GULDBRANDSEN. 'Pierre Boulez in Interview, 1996 (II): Serialism Revisited', in: *Tempo* 65/256 (2011), pp. 18-24.

> Pierre Boulez: ...you have a line of which you don't understand the [generative] logic any more, because the origin has disappeared. What you see is the result. The result could not have been there without all this logical preparation—and it is apparently a completely illogical result. And this is something that I like!
> *Erling Guldbrandsen: Does this mean that the aim of serial technique is* not *to obtain structural unity from the beginning—from the origin—to the end?*
> PB: For me, no. Not at all.
> *EG: ...and* not *to obtain compositional control from the start and right up to the end result?*
> PB: No.
> *EG: Mr. Boulez, this is not the picture of serialism that has survived in normal, ordinary textbooks and—with certain important exceptions like the analyses of Robert Piencikowski—not even in the general output of musicological analyses of your work. Everyone seems to talk about some kind of logical positivism of composition.*
> PB: Yes, but I mean, that is exactly the point where they are wrong. Totally wrong!
> *EG: This is precisely what I am trying to demonstrate in my study: that there is a kind of mythography, a mythology of serialism which I have called the "unity model" and the "control model" of serialism, and which is after all completely off the mark.*
> PB: Yes. That was the serialism of Schoenberg and Webern, but not mine at all. I myself, on the contrary, I always tried to distort this logic, or to bring this logic up to a kind of absurd point where it does not mean anything any more. Even in the phase when I was doing the *Structures*—I mean the first one ["Structure Ia"] is very easy, on purpose, but in the second one already ["Ic"] the logic is developed to such an extent that the result is completely chaotic from the "order" point of view.[3]

While this "control model" might be more appropriate for the more positivist American school of serialism centered on Milton Babbitt (though it would still remain a considerable oversimplification), European serialists have long explored a more complex and ambivalent relationship between process and result. Boulez agrees with Guldbrandsen's contention that in his music "the aim of serial technique is *not* to obtain compositional control from the start and right up to the end." Rather, Boulez describes a "distortion" or "twisting" of logic, often through the extension of the serial principle to an "absurd point where it does not mean anything anymore," and logical procedures lead paradoxically to chaos or a "completely illogical" result.

The control model—with its assumption that the main purpose of serial procedures is to *regulate the structure* of the completed work—falls short when applied to the music of Boulez or Ferneyhough. In contrast to the control model, their works are better represented by what we might call the *process model:* serial procedures no longer serve to provide works with an underlying structural unity, but rather to transform material in a variety of ways during the process of composition. The progressive application of different procedures will often completely separate the final result from the processes that gave rise to it. But these procedures—though imperceptible as structuring devices in the final score—are still essential to the compositional process, creating a conceptual ecology within which the composer can make meaningful decisions. As Ferneyhough writes,

> In the final act of composition these seemingly abstract dispositions [a matrix of rhythmic models] in fact exercised a remarkably strong influence on the direction and quality of local invention, in keeping with my general feeling that constraint systems are one of the most powerful tools available to the composer for the projection of musical meaning.[4]

The process model meshes well with Ferneyhough's descriptions of his own creative work, as expressed in a 1982 interview with Joël Bons. While the control model assumes that the score preserves the

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[3] *Ibidem,* pp. 23-24.
[4] FERNEYHOUGH, Brian. 'Third String Quartet/Zum Dritten Streichquartett', in: *Nähe und Distanz: nachgedachte Musik der Gegenwart,* edited by Wolfgang Gratzer, Hofheim, Wolke, 1996, pp. 140-59, p. 152.

structures created by various compositional procedures, and that these structures carry the primary sense or meaning of the music, the process model recognizes that the goal of compositional processes is essentially to enable action, not to leave recognizable structural traces.

> *Joël Bons: What can we see in the score of the structural devices you are employing?*
> Brian Ferneyhough: Probably one thing one sees right after only a cursory examination of a score is that I am very careful to cover my tracks. I try not to leave unambiguous evidence of specific structuring strategies, at least on the micro-level. The point about my systems in general is that they tend to be quite complexly interwoven, so that in the process of working with them I tend to lose track of what I am doing, which means that, if I can't manage to reconstruct what the generational principles were, I am forced to invent new ones, grafting them onto the extant stem in such a way as to make it seem that the previous principles were in fact still operative. [...] Also, it permits me all sorts of spontaneous reactions to a particular contextual constraint, the sort of situation in which I feel I work best. Overall, for me, structure is not something which generates compositional material, but rather situations in which I am free, within the prescribed limits, to act.[5]

Ferneyhough's compositional systems (sometimes but not always serial in conception) are "complexly interwoven," to the extent that he often loses track of them and must invent new ones. His creative process includes the construction of many "constraint systems" which guide and limit moment-to-moment invention: for Ferneyhough, these constraint systems permit "all sorts of spontaneous reactions to a particular contextual constraint." Limitations serve to make creative expression possible; as Ferneyhough states in another interview, "You can only act freely in a meaningful fashion if you are in a particular space which has been to some extent mapped out previously."[6]

As noted above, the process model does not assume that the compositional procedures leave structural traces in the finished piece: Ferneyhough goes still further, "covering his tracks," so that "evidence of structuring strategies" is not visible at the work's surface. In a 1990 interview with James Boros, Ferneyhough comments, "In an important sense, processes don't exist in order to generate music, they're there to predispose one to approach the act of composition in a work-specific fashion."[7] One of Ferneyhough's favored metaphors for musical creation reflects an ecological logic quite different than the structural, architectural principles of the control model:

> For me, a piece of music tends to grow like a coral reef, accumulating or sedimenting the remains of many small animalculae. In that sense, it is really a record of past processes, it is an imperfect and partial imprint of a no longer determinable set of compositional presuppositions.[8]

The piece remains a "record of past processes," but a flawed and organic one. Naturally, the eventual form of the reef depends on the strict unfolding of biological processes, constrained by the life cycles of its constituent organisms.[9] However, the interaction and superposition of life processes means that the reef's final form is impossible to predict given its initial state. This striking metaphor underscores the distance of Ferneyhough's aesthetic from the "ideal of… infinitely fine control" in Taruskin's

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[5] ID. *Collected Writings,* edited by James Boros and Richard Toop, Amsterdam, Harwood Academic Publishers, 1995, pp. 228-229.
[6] *Ibidem,* p. 291.
[7] *Ibidem,* p. 383.
[8] *Ibidem,* p. 382.
[9] In fact, one of the functions of Ferneyhough's characteristically detailed notation is to preserve a high enough resolution to capture traces, however fragmentary, of these processes. Even though the "compositional presuppositions" are "no longer determinable," Ferneyhough seeks to preserve signs of the compositional genesis of the work within the notation itself: "an adequate notation must (should) incorporate… an *implied ideology of its own process of creation.*" *Ibidem,* p. 4.

characterization—in fact, the ecological unfolding of the process model tends to undermine any attempt at a precompositional determination of the final result.

Ferneyhough's Third String Quartet: reflection in a "negative mirror"

For a specific example of how Ferneyhough uses constraint systems and quasi-serial compositional processes, I turn to the first movement of his Third String Quartet (1987). The quartet is among the last works to be completed before Ferneyhough's adoption of computer-aided composition tools in the early 1990s, and its genesis is amply documented in sketch materials and in a self-analytical article by the composer. Through an examination of these sources and independent analysis of the score, we can observe Ferneyhough's struggle with a particularly demanding compositional constraint.

After establishing a temporal matrix that acts as the framework for all rhythms in the first movement, Ferneyhough began composing the movement as a succession of diverse "Texture Types" in relatively free succession. **Figure 1** shows his list of Texture Types, as discussed by Lois Fitch and cross-checked against the original sketch page in collection of the Paul Sacher Foundation.[10] Ferneyhough describes the relationship between the Types as "notably fractured, gesturally abrupt, and largely non-linear"; however, in the intuitive process of composition, relationships gradually began to emerge between the Texture Types as they began to "establish individually appropriate expressive roles and structural functions."[11] Ferneyhough's description of this process indicates his typical practice of composing and writing out the final version of the score from beginning to end, with the support of preplanning and various sketchbook pages. New relationships can be discovered and established even in the course of producing the final score.

1. Glissando
2. held chords
3. gettato with figure
4. repetitive pitch pattern
5. "almost-octaves"
6. chord in harmonics (1) staggered entry
7. violent, short, rapid group (usually on A♭)
8. chord in harmonics (2) unison rhythm
9. rapid, regular group
10. fanning out from unison to chord / tremolo chords
11. [triplet 64th-note] figure
12. tremolo-glissandi (non-synchr.)
13. [grace-note] groups
14. violent, unison-rhythm chords
15. very violent polyphonic blocks
16. as for 2, but with regular internal pulsations /or/ staggered chord buildup and decay
17. continuous, "lyrical" melodic fragments
18. Doublestopping material (allied to 15)
19. ostinato-type melody (see Vln. 1 bars 41-42)
20. filigree-figurations in 2 or more instruments (usually works in <u>pairs</u>)

[10] FITCH, Lois. *Brian Ferneyhough,* Bristol, Intellect Books, 2013, p. 168. The Sacher collection of materials on the Third Quartet includes 138 pages of sketches and other documents. Particularly important materials include a list of the twenty-three Texture Types, a schematic diagram of their deployment in the piece, and a photocopy of the final score partially labeled with Texture Type numbers.

[11] FERNEYHOUGH, Brian. *Op. cit.* (see note 4), p. 154.

21. "canonic"-type imitative interlocking entries
22. slow counterpoint in harmonics. (Decorate later.)
23. Unison rhythm, "chorale"-type texture based on progressive inversions of microtonal chordal patterns. Usually 4-part, but can be increased at discretion.

Figure 1: Ferneyhough's list of Texture Types.

Having defined his twenty-three Texture Types, Ferneyhough describes the central "theme" of the movement as "the accommodation of these texture types, as forms of 'interrupted narrative,' to the exigencies of the prevailing pre-compositional environment."[12] The word "environment" is used advisedly here: we've already seen Ferneyhough's characterization of pre-compositional preparation as a "life-support system" making compositional decisions possible.

Ferneyhough forces the last third of the movement to reprise the events of the first two thirds, reflected in a *negative mirror*. A negative mirror, as described by Ferneyhough, does not "merely passively reflect... earlier materials," but exposes "qualities suppressed in their original formulations."[13] In the first movement of the quartet, the point of reflection takes place in measure 60, almost exactly two-thirds of the way through the piece (66.1%) when realized at the given tempi. After the point of reflection (shown in **Figure 2**), the negative mirror is realized by taking each Texture Type in retrograde order, and replacing it by a Type from the opposite half of the list: Type 1 is replaced by Type 23, Type 2 by Type 22, and so on. The result is thus not merely a retrograde, but a retrograde where an arbitrary counterpart replaces each material type. Texture Type 9 (before the axis) is replaced by Texture Type 15 (after the axis), Type 2 by Type 22, Type 16 by Type 8, and Type 10 by Type 14. It's important to note that despite the apparently systematic nature of the mirroring process, the fact that the numerical labels are essentially arbitrary means that there is no logical consistency between the processes transforming (for example) Type 9 to 15 and Type 10 to 14.)

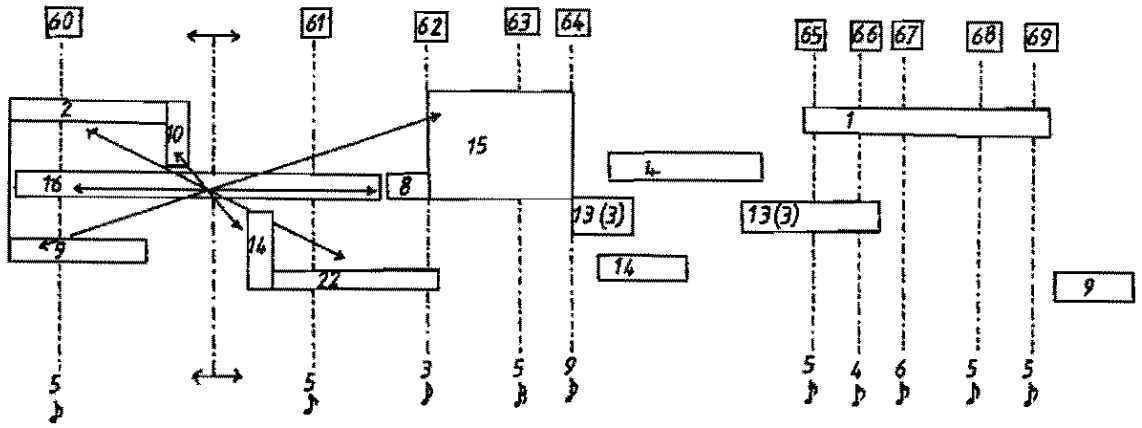

Figure 2: The composer's illustration of the "axial reversal point."[14]

Effects

The arbitrary nature of the "negative mirror" means that in the last third of the movement, Ferneyhough must struggle to string together a more-or-less arbitrary succession of Texture Types: the intuitive connections between Texture Types in the first two-thirds are replaced by unexpected and

[12] *Ibidem,* p. 152.
[13] *Ibidem,* p. 140.
[14] *Ibidem,* p. 151.

uncomfortable combinations. In a 1992 interview with James Boros, Ferneyhough states that he finds the "unease" of these peculiar contexts palpably expressive:

> The effect of this reversal was to thrust me into a situation where what had initially been a relatively 'natural' flow of material (where the characteristics of each type had largely been reflected in their temporal extension) became a series of abrupt accommodations and stratagems, attempting to fit types into spaces and combinatorially-specified roles which were often completely counterintuitive, having in no way been foreseen at the outset. I personally feel this 'unease' of the materials at finding themselves in inappropriate or downright alien temporal environments quite audible and disturbing."[15]

It's intriguing to listen to the movement with this notion in mind: that the final third is permeated by a sense of struggle or even failure. This interpretation is unlikely to occur to anyone on a first listening (or even perhaps a twenty-first!), since the constant virtuosity of the instrumental writing creates a strong sense of consistency from beginning to end. In earlier works, Ferneyhough already explored the same paradox of an apparently continuous surface produced by radically different underlying processes. In his organ work *Sieben Sterne* (1970), parts of the score are written in conventional notation, while others are designed as modular scores, with the ordering and timing of events open to interpretation by the performer. In a performance note, Ferneyhough demands that "it is vital that the ambiguity of these sections in the overall scheme be expressed by striving to make the resultant interpretations resemble the fully written-out passages as nearly as possible."[16]

What then might allow us to recognize as listeners the "unease" that Ferneyhough describes? The composer points to a few of the traces left behind by the specific constraints of the writing process:

> ...the earlier, intuitively established relationship obtaining between overall duration and defining characteristics of individual Texture Types came to be radically undermined, in that types not particularly amenable to extensive development or elaboration nevertheless were forced to occupy temporal spaces, and to appear in conjunctions with other elements not evidently corresponding to their innate qualities.[17]

Ferneyhough describes two kinds of "unease": "types not particularly amenable to extensive development or elaboration nevertheless were forced to occupy temporal spaces, and to appear in conjunctions with other elements not evidently corresponding to their innate qualities." We could gloss these two situations as (1) temporal mismatches between Texture Type length and content, and (2) counterintuitive juxtapositions of Texture Types.

Temporal mismatches

Ferneyhough's fascination with the unease created by a mismatch between certain types of musical material and the timespans in which they unfold is also heard in more recent works like *Les Froissements d'ailes de Gabriel* (the second section of the 2004 opera *Shadowtime*), which Ferneyhough describes as consisting of 128 sections, each one "just slightly too short": the particular quality of the material in each section is allotted a timespan "not adequate to the time required to understand it."[18]

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[15] FERNEYHOUGH, Brian. *Op. cit.* (see note 5), p. 440.

[16] *Ibidem,* p. 7.

[17] FERNEYHOUGH, Brian. *Op. cit.* (see note 4), pp. 154-58.

[18] FERNEYHOUGH, Brian. Liner notes for *Shadowtime,* with Nicolas Hodges, Mats Scheidegger, Neue Vocalsolisten Stuttgart, and the Nieuw Ensemble, conducted by Jurjen Hempel (NMC D123), compact disc, 2006.

The idea that a particular musical material possesses a certain appropriate time frame is discussed further in Ferneyhough's article "The Tactility of Time."

> We perceive discrete events as being of a certain density, translucency, as moving with a greater or lesser degree of dynamicism relative to the amount of information contained. If the perceived potential for informational substance is rather high, the time frame required for the efficient reception and absorption of that information is usually more expansive, so that if the time frame is deliberately compressed a sense of pressure, of "too little time" emerges as a major factor conditioning reception.[19]

Ferneyhough engages here with the possibility of a complex interaction between objective, chronological time and the psychological experience of time as conditioned by particular musical materials or textures. Gérard Grisey's "Tempus ex Machina: A composer's reflections on musical time" makes a similar distinction between the "skeleton of time" and the "flesh of time."[20] In Ferneyhough's formulation, certain types of events (those with a high "potential for informational substance") demand a long expanse of time for their comfortable unfolding. When they are forced into less time than would seem adequate, the experience of the events brings with it a sense of being rushed, of the the time allotted being incommensurate to their nature. Needless to say, such speculations on listeners' subjective experience of time are difficult to confirm—yet a consideration of these effects can considerably enrich our understanding of Ferneyhough's music.

In the Third Quartet, this temporal mismatch occurs most often when Texture Types suited to quick gestures are "forced to occupy" a long timespan better suited for material with developmental tendencies. In his discussion of the quartet, Ferneyhough describes a representative example of this mismatch between a material and its length. Texture Type 13, a grace-note group appearing shortly after the central point of reflection, is "an instance of a material (Type 13) being extended beyond the limits of what might be thought of as the natural limits and contextual appropriateness suggested in mm. 6 and 7."[21] Another example we can identify through score study and reference to the list in Figure 1 occurs at the first appearance of Texture Type 1 after the point of reflection. Type 1, the brief homophonic glissando figure that begins the piece (see **Figure 3**), lasting a little less than 1⅓ eighth notes, is forced in measures 65-69 to span 17 eighth notes (see **Figure 4**), filling a space occupied before the mirror by Type 23, a "unison rhythm, 'chorale'-type texture based on progressive inversions of microtonal chordal patterns." Type 23, with its patterned inversions, is far better suited to this long time span than the simple glissando of Type 1: as a result, Ferneyhough must find ways of extending and developing the glissando figure in ways quite alien to its "innate qualities." The result is a segment obsessively focused on a single playing technique, spinning it out far longer than intuition or traditional "good taste" might suggest.

[19] FERNEYHOUGH, Brian. *Op. cit.* (see note 5), 44-45.
[20] GRISEY, Gérard. 'Tempus ex Machina: A composer's reflections on musical time', in: *Contemporary Music Review,* 2 (1987), pp. 239-275.
[21] FERNEYHOUGH, Brian. *Op. cit.* (see note 4), p. 158.

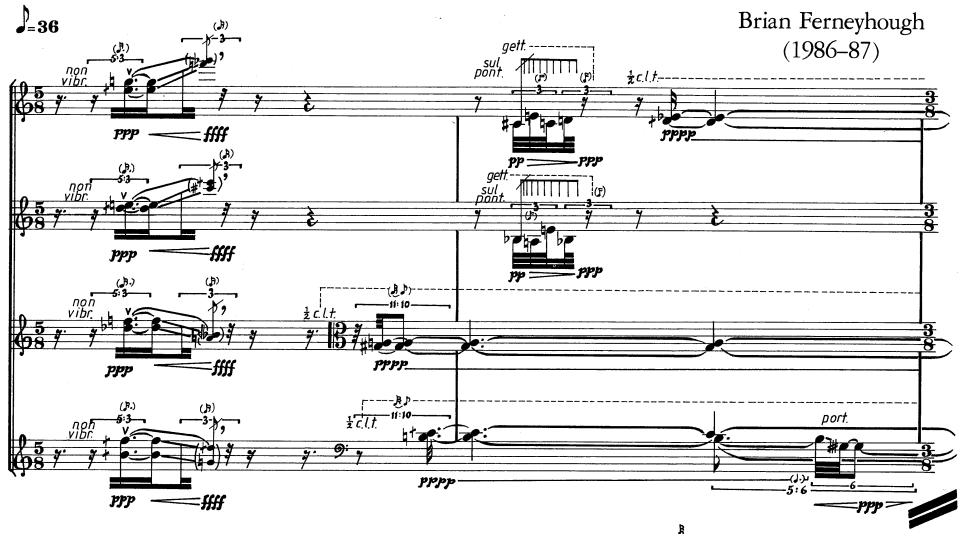

Figure 3: Brief appearance of Texture Type 1 (glissando) in measure 1, followed by Types 2 (held chords) and 3 (gettato with figure).

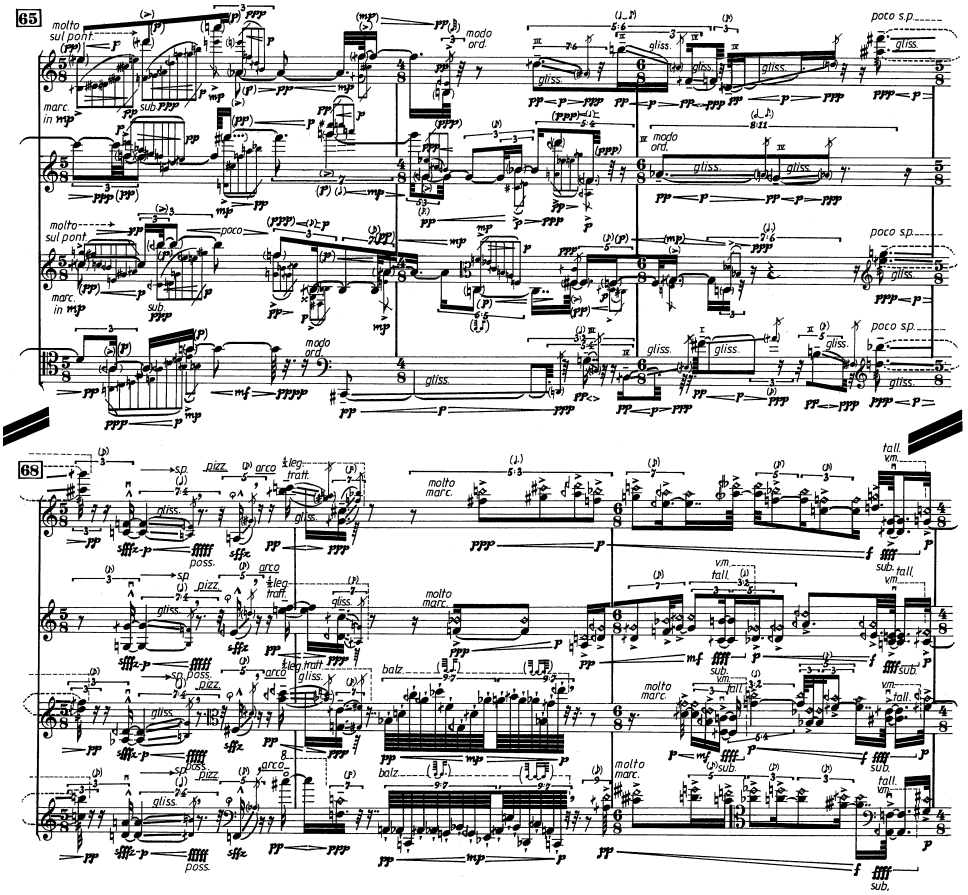

Figure 4: The return of Texture Type 1 as a "negative mirror" of Type 23 in the second part of the piece. The glissando texture is extended to fill a timespan of 17 eighth notes, starting at the fifth eighth note of measure 65.

Counterintuitive juxtapositions

The second type of "unease" between a Texture Type and its context involves the awkward juxtaposition of two Types that fit together poorly. In the intuitively composed first two-thirds of the movement, certain Texture Types tend to be grouped together. For example, two of the three occurrences of Type 21 (canonic interlocking entries) before the reflection point are associated with Type 11 (triplet 64th-note figure), as shown in **Figure 5**. Here, the short note values fit well with the quasi-imitative texture, creating propulsive gestures linking different instruments. In the last third of the movement (**Figure 6**), Types 11 and 21 are mapped onto Types 3 (gettato with figure) and 13 (grace-note groups), a less obviously symbiotic pairing of textures.

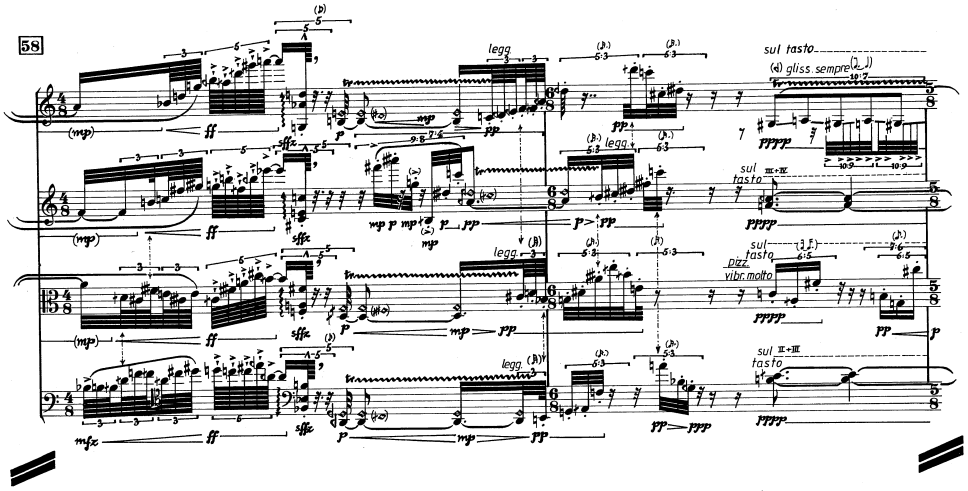

Figure 5: "Normal" conjunction of Texture Types 11 (triplet 64th-note figure) and 21 ("canonic"-type imitative interlocking entries) in measures 58-59.

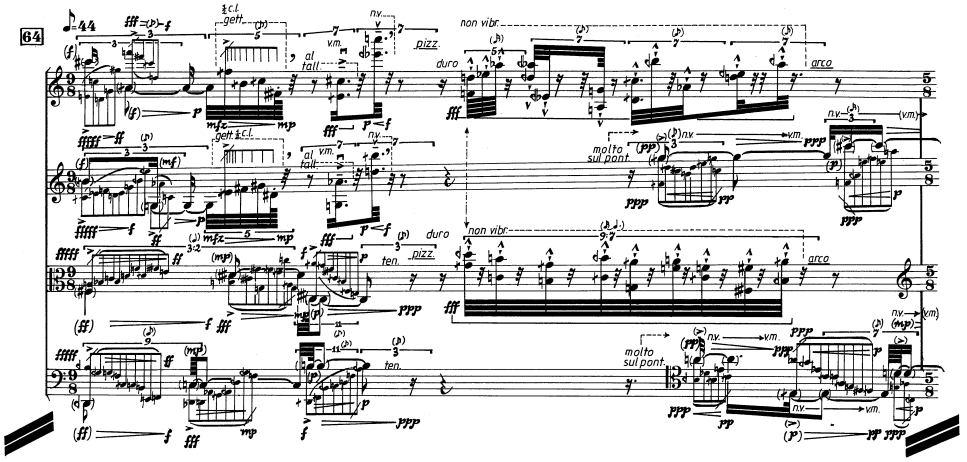

Figure 6: Texture Types 11 and 21 reflected in a "negative mirror" into Types 13 (grace-note groups) and 3 (gettato with figure) in measure 64.

It is by no means assured that a listener will be able to recognize either of these types of "unease," given the density of musical information and the provisional nature of our understanding of discursive norms in contemporary music. However, an engagement with the work which includes such concepts as "unease" and (intentional) failure or awkwardness—concepts far removed from the analyst's typical assumptions of unity and coherence—certainly broadens the aesthetic categories available to the interpreter.

The "negative mirror" and the aesthetics of constraint

Ferneyhough's use of the term "negative mirror" is eye-catching, and deserves further attention. The phrase surfaces here and there in the writings of Adorno,[22] and significantly in Italo Calvino's *Invisible Cities*:

> Marco enters a city: he sees someone in a square living a life or an instant that could be his; he could now be in that man's place, if he had stopped in time, long ago; or if, long ago, at a crossroads, instead of taking one road he had taken the opposite one, and after long wandering he had come to be in the place of that man in the square. Even now, from that real or hypothetical past of his, he is excluded; he cannot stop; he must go on to another city, where another of his pasts awaits him, or something perhaps that had been a possible future of his and is now someone else's present. Futures not achieved are only branches of the past: dead branches.
> "Journeys to relive your past?" was the Khan's question at this point, a question which could also have been formulated: "Journeys to recover your future?"
> And Marco Polo's answer was, "Elsewhere is a negative mirror. The traveler recognizes the little that is his, discovering the much he has not had and will never have."[23]

Through the conceit of a mirror that reflects what is *not* before it, the traveler has a new perspective on himself—similarly in the Ferneyhough quartet, the negative mirror reveals relationships and tendencies of the Texture Types in the first two-thirds of the piece by undermining them in the last third. This negative mirror is much more abstract than (for example) the more literal mirroring of a large-scale retrograde inversion—in the Ferneyhough case, there is no literal structural mirroring that could be uncovered by score study alone—rather, the mirror is an aspect of in the composer's creative process.[24]

Calvino is not an author frequently mentioned by Ferneyhough, though Simon Cummings and critic H. E. Elsom[25] have noted that the conceit of Ferneyhough's 1996 *Incipits* closely resembles Calvino's *If on a winter's night a traveller* (*Se una notte d'inverno un viaggiatore,* 1979)*:* both consist of a number of different "beginnings," refracting linear narrative into a number of fragments. Calvino, along with fellow members of the French literary group l'Oulipo (*L'Ouvroir de littérature potentielle*), often used strict structural constraints to guide the composition of their writings. These constraints can take different forms: we might draw an important distinction between "public" constraints, plainly evident at the work's surface (like the missing "E" in Georges Perec's novel *La Disparition*) and "private" constraints, like the rigorously controlled succession of themes underlying *Invisible Cities* or Perec's *La Vie mode d'emploi.* These private constraints go unrecognized by the reader, but make themselves felt by subtly affecting the process of writing—the negative mirror of Ferneyhough's quartet is of course another example of a private constraint. Ferneyhough shares with the Oulipians a cerebral playfulness that is completely overlooked in characterizations like Taruskin's, which invokes instead a dreary (and ominously totalitarian) obsession with control at any cost.

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[22] ADORNO, Theodore W.*, Probleme der Moralphilosophie,* Frankfurt, Suhrkamp Verlag, 2000; English translation by Rodney Livingstone, *Problems of Moral Philosophy*, Cambridge, Polity Press, 2000, p. 172. Describing Nietzsche's moral philosophy, Adorno writes "[H]is analysis of the individual moral problems he faced did not lead him to construct a statement of the good life. Instead... he came up with a positive morality that is, in fact, none other than the negative mirror-image of the morality he had repudiated."

[23] CALVINO, Italo. *Invisible Cities,* New York, Harcourt Brace Jovanovich, 1974, p. 29.

[24] Lois Fitch (*op. cit.,* p. 167) describes another instance of negative mirroring in the Third Quartet: the metric structure of the second movement is derived from the first by "reading the first movement's bar lengths backwards and subtracting 1/8 from every value"—though this is masked, she notes, by the interpolation of other material near the end.

[25] CUMMINGS, Simon. 'Plötzlichkeit (UK Première)', http://5against4.com/2013/01/18/ferneyhough-week-plotzlichkeit-uk-premiere/, accessed September 25, 2014; ELSOM, H. E., 'Contignations', http://www.concertonet.com/scripts/review.php?ID_review=2294, accessed September 25, 2014.

Improvisation and composition

If such private constraints are evident primarily through their effect on the author or composer during the process of creation, Ferneyhough amplifies this effect by choosing to compose most of his pieces in chronological succession from beginning to end with few revisions, linking himself to time's arrow rather than composing from a detached standpoint outside the temporality of the piece. The constraints that he encounters must be tackled in order as they arise, solved through an assortment of local strategies. The ad-hoc nature of these strategies and their irrevocability once chosen suggest the activity of an improviser—though of course Ferneyhough's improvisation is in slow motion, through notation rather than in sound.

We see here an image of Ferneyhough as a compositional virtuoso, even as that virtuosity is pushed to its limits in a struggle with demanding constraints, in much the same way as Ferneyhough's music challenges a virtuoso performer. The obstacles Ferneyhough sets for himself are comparable to those faced by performers of his music: given constraints so forbidding that a completely successful realization is impossible, the performer or composer must make a choice about which aspects to privilege: what Ferneyhough calls "the ultimate recognition of priorities."[26]

Commentary by Irvine Arditti offers first-hand observation of a highly adaptable compositional process, with new techniques and directions often adopted in the midst of composition.

> What's interesting with Brian is that he starts writing a new piece with an idea and then he can go off in another direction and then turn it into something else. I find that also very stimulating, that he's not conditioned by the original concept of the piece and how the piece progresses often determines where he goes and how he writes the piece. I remember when we were giving… the première of the Third Quartet he came to London to rehearse at my house and he'd only written the first movement and was beginning the second movement. He was supposed to be rehearsing the whole piece with us: in fact he hardly attended any rehearsals and spent the time in the bottom room writing the second movement while we were rehearsing, on our own, the first movement. And he left some plans or note plans in... I don't even remember where he was at that time, France or Freiburg or San Diego. But he left this material behind, I think it was in America, and he said "I can't get it: there's no one at home, it can't be sent" or faxed in those days; he said "I'll write different notes, I'll write a different piece, I'll continue in a different way." And so for me this was fascinating, to be so adaptable, to be able to do something like that in the middle of a piece.[27]

This is far from the image of a technocrat obsessed with control as painted by Taruskin: rather, we see the flexibility of a gifted bricoleur. The loss of sketch materials midway through the work is not the catastrophe it would be if Ferneyhough's aim was to implement a single, architectonic plan down to the final detail—rather, it amounts to a new twist in the complex process of the work's creation, a challenge to which the composer can react and invent.

Broken symmetry

We can observe an example of such flexibility in the Third Quartet. Close study of the score shows that Ferneyhough's realization of the "negative mirror" is in fact incomplete: there a large cut in the mirrored material. The mirroring is quite literal from the reflection point in measure 60 until measure 87. At this point, the next forty-four (!) Texture Types are skipped, and the movement closes with Types 11–15 then (after another brief cut) Types 21–23, a negative mirror of the opening measures.

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[26] FERNEYHOUGH, Brian. *Op. cit.* (see note 5), p. 5.

[27] ARCHBOLD, Paul. *Performing Complexity.* London, Institute of Musical Research, School of Advanced Study, University of London, 2011, p. 60.

This is a curious situation where the composer has chosen to break out of his self-imposed constraint system.[28] The existence of the constraint is clearly important for generating a certain type of tension and "unease" in the last third of the piece, but at a certain point the projected symmetry is broken. We can suppose that there's a tradeoff here: that whatever benefits resulted from working within the constraint system were sacrificed for a greater good. Here we can only speculate, but I think a reasonable guess is that Ferneyhough recognized that it would not be possible to complete the mirroring process within the pre-established length limits of the movement. The incompleteness of the mirroring procedure, taken in combination with the essentially arbitrary relationship between a Texture Type and its negative mirror image, are a sign that Ferneyhough's goal is not a finished and symmetrical "structure," but rather a *situation,* an environment within which he can effectively work.

Conclusion: imagination and constraints

Understanding the workings of this particular constraint system in the Third Quartet highlights the inappropriateness of the "control model" for the understanding of Ferneyhough's music, and the value of focusing instead on the interaction of compositional procedures and creative intuition. Ferneyhough does not use systematic processes to produce structural unity in the final work, but rather as prompts to action, which force him to find solutions to the specific problems they create. These processes are used not primarily for their structural imprint on the completed piece, but rather to create local challenges that need to be resolved effectively.

It is tempting to conclude that Ferneyhough's music succeeds not because of his constraint systems and quasi-serial processes, but in spite of them: that his strength as a composer is his creative imagination, his ability to intuitively negotiate the complex demands placed on him by his constraint systems. This would underestimate, however, the essential role of these systems in making this creativity possible by forcing the composer to explore new and unexpected paths.

[28] Nicolas Donin and Jacques Theureau's research on the genesis of Philippe Leroux's composition *Voi(rex)* offers a similar example of an abandoned symmetrical plan. The composer began the sketches for the fourth movement with a symmetrical scheme of nested blocks, despite his stated aversion to symmetry ("something I detest"). Even at the early stages of planning, Leroux knows that he'll depart from strict symmetry when actually writing the blocks: "But I know that when I write them, I will take some shortcuts." DONIN, Nicolas and Jacques THEUREAU, 'La Composition d'un mouvement de Voi(rex), de son idée formelle à sa structure', in: *L'inouï: Revue de l'IRCAM* 2 (2006), pp. 63-85, p. 67.