

## **‘New Chaconnes for Old?’: Steve Reich’s Sketches for *Variations for Winds, Strings and Keyboards*, with some thoughts on their significance for the analysis of the composer’s harmonic language in the late 1970s**

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*This article begins by locating Steve Reich’s Variations for Winds, Strings and Keyboards (1979) in the context of a growing interest in the 1970s, both by Reich himself and by other composers, in working with a variety of approaches to the chord sequence as a compositional determinant. An outline of what sources are available to investigate the composer’s compositional process at this period, and short discussions of the strategic and methodological concerns behind this research, precede a brief account of the musical materials of Variations as they are found in the published score. The main part of the article is devoted to a discussion of some of the sketches for Variations, focusing on the early period of the work’s conception, showing the extent to which issues of harmonic language and tonality in Reich’s development were affected by the decision to use a chaconne-style chord progression as the basis for a whole composition.*

*Keywords: Steve Reich’s Sketches; Evolution of Compositional Development; Variations for Winds, Strings and Keyboards; Tonality, Harmonic Language and Functionality*

### **Introduction**

The purpose of this article is to give an account of some aspects of the compositional thinking that lay behind Steve Reich’s *Variations for Winds, Strings and Keyboards* (1979),<sup>1</sup> using the composer’s sketches, housed at the Paul Sacher Foundation, as my main source materials.<sup>2</sup> *Variations* is Reich’s first mature composition in which the overall structure is based on a single chord sequence that is repeated as a complete entity several times in its span, rather than separated into single aggregates or groups of aggregates. The account of the sketch materials for *Variations* in the present article attempts to draw attention to just a few of the main lines in the development of Reich’s harmonic thinking during the time of its conception, especially in the summer of 1979, concentrating on surviving evidence of the nature and extent of the composer’s interest in exploring the tonal functionality that using a chord sequence as the basis for such a work might suggest. I will be offering observations relating to Section I of the final score. I attempt to answer the questions: what strategies does the composer deploy to elaborate and to vary the chaconne sequence, and how are these decisions made? And how might this knowledge be said to extend Reich’s, and our, understanding of tonality and harmony as structural determinants in building compositions driven by techniques that go beyond the rhythmic and contrapuntal devices familiar from his early minimalist music? From an examination of the sketches, I then proceed to a musical analysis that attempts to draw on the knowledge gained through these sketch studies.

Readers who know this composer’s music will immediately recognise that the words of my description of *Variations*, above, are carefully chosen. The work is not Reich’s first piece to deploy a sequence of chords with any degree of structural function at all; still less—unsurprising, perhaps, even in the output of a composer obsessed with counterpoint as his

basic texture—does it represent the first appearance, in his mature oeuvre, of a pitch aggregate that is both conceived as an entity in itself and deployed structurally in the finished composition. The only mature work written by Reich before 1973 to be based on a chord is *Four Organs* (1970): perhaps unsurprisingly, his only work between 1965 and 1972 not to be based on phasing. This had subjected just a single aggregate, which the composer has often called a ‘dominant 11<sup>th</sup>’ (Reich, 2002a, p. 50), to a grinding process of augmentation that turns any resemblance of harmonic evolution there might be in its gradual unfolding into something more resembling a subversion of traditional harmonic principles than anything to do with their conventional application. Three years later, in *Music for Mallet Instruments, Voices and Organ*, chord-building—using what, tellingly for any interpretation of an evolving sense of tonal functionality, Reich sometimes calls ‘chord cadences’ (Reich, 2002d, p. 76),<sup>3</sup> but which I prefer to call ‘oscillating chords’, since they constantly rock back and forth between each other—had signalled another important moment in the evolution of the composer’s harmonic language.

And three years after that, in 1976, the completion of *Music for 18 Musicians* saw the arrival of a chord sequence of more conventional length used, for the first time in Reich’s output, to determine overall harmonic control. The pitches of both the pulsing chords and oscillating chords that articulate this work’s unfolding are ultimately governed by the ‘cycle of 11 chords’ (Reich, 2002b, p. 87) that is heard in full at the piece’s beginning and again at its end; and generations of commentators have followed the composer in claiming that ‘harmonic movement plays a more important role here than in any of my earlier pieces’ (p. 87). Yet the role of the chord sequence in *18 Musicians* is far from the one familiar in repertoires from Western art music since the Renaissance to jazz and rock styles in the 20<sup>th</sup> and 21<sup>st</sup> centuries. Outside the work’s framing device, in *18 Musicians* the individual chords of this sequence occur only one at a time, a single chord in each section; it is the combination of pitches arising from those of the pulsing chords and oscillating chords involved, governed only rather inconsistently by the cycle of 11 chords, that determines the harmonic structure of the sections, one by one.

After this landmark composition in Reich’s development, the trumpet chords to be found in *Music for a Large Ensemble* (1978)—though comparable to the eruptions of sustained brass chords that, as we shall shortly see, occur in *Variations*—represent more a simple, almost ritualistic confirmation of the tonal direction already taken by the faster music that alternates, in each of this work’s four sections, with the ‘more extended melodies’ (Reich, 2002c, p. 97) that are one of the links between *Large* and *Octet*. Subsequently known as *Eight Lines*, the latter work—completed, as we have seen, just four months after *Large*—then not only takes further and more successfully *Large*’s development of melody, but also expands on its companion’s exploration of a variety of musical materials including oscillating chords, all subjected to changing key signatures as the main basis of its overall tonal planning.

*Variations* is, thus, also something of a landmark in Reich’s development. The reasons for this go beyond harmonic structuring in general to introduce—in the words of the composer’s own note in this score, which doubles as his programme note for the piece—‘markedly new formal, and timbral [sic] material into my music’ (Reich, 2002e, p. 99); even though the piece was actually premiered by Steve Reich and Musicians, and only later by the San Francisco Symphony Orchestra, by which it was commissioned, *Variations* is the first orchestral work by Reich that the composer generally acknowledges as successful.<sup>4</sup> Yet while the adoption of the chaconne form as a basis for a whole piece was undoubtedly a consequence, at least in some part, of the choice of instrumental forces being deployed here, the selection of that form itself, and its implications for the development of Reich’s harmonic language, remain central, I would argue, to the evidence for this work’s significance. ‘These

variations', the composer writes, 'are on an harmonic progression somewhat in the manner of a chaconne, but with a considerably longer harmonic progression than the four- or eight-bar progressions customarily found in the chaconne' (p. 99). The focus on harmonic concerns that this quotation reveals is typical of the thrust that lies behind many of the pages of Reich's sketchbooks of the period in which the work was written.

### **The Sketchbooks and Other Source Materials for *Variations***

The composer's sketchbooks are proving a valuable source for any attempt to trace the creative process behind individual works; in particular, a comprehensive account of the evolution of the composer's tonal and harmonic thinking over the last five decades<sup>5</sup> would be impossible without them. Some of the seeds of work on *Variations* can be found in ideas explored in these sketchbooks between 1977 and mid 1979, including various ways in which harmonic planning might be devised for individual sections of a piece, or even whole works. The period in Reich's development immediately following the completion, world premiere and subsequent international touring performances of *Music for 18 Musicians* in 1976-1977 is covered by Sketchbooks 15 (dated '20 Feb 1975–20 Mar 1978'), 16 ('3/21/78–5/22/78') and 17 ('6/3/78–2/20/79').<sup>6</sup> But it is the three volumes immediately following these that include all the materials related to *Variations*: these are Sketchbooks 18 ('2/20/79–9/26/79'), 19 ('9/27/79–12/13/79') and 20 ('12/13/79–9/30/80').

Two other sources at the Sacher Foundation should additionally be mentioned here. The first constitutes five files of material specifically identified in the Foundation's catalogue as related to *Variations*. As so often found, however, with such files on individual works by Reich, these contain little beyond various kinds of copies of the full score and orchestral parts, mostly, if not entirely, made in connection with work on the final score as published by Boosey & Hawkes in 1981: useful, perhaps, for examining the minutiae of the process of producing the end product as represented by the published score, but not of much interest as far as the work's conception and working-out of the version as first performed is concerned.

Secondly, I should note that when composing this work, Reich was continuing his by then well-established practice of combining his notated efforts with trying out ideas in sound, via what he calls 'work tapes'; by 1979, he was using an eight-track tape machine to record different layers of the musical material that he was developing, and combining these with 'live' attempts of his own in his studio, experimenting with various further elaborations of his ideas.<sup>7</sup> Though he was probably engaged in such activity from a fairly early stage in writing *Variations*, it would appear that, in the work tapes for his compositions in general, Reich probably made particular use of these to refine and finalise the details of his music once a number of his basic materials and strategies were broadly in place. Since my article is concerned, in particular, with the early stages of the composer's work on this piece, and with attempting to discover Reich's evolving ideas about the nature of the harmonic language he would use for it—not with how he determined all the note-to-note details eventually required to realise such ideas in a completed piece—I have not sought to draw on the work tapes for *Variations* in this article; there are, on present reckoning, at least three of these. Besides, as the sketch of 3 August 1979 (given in Figure 4, below) shows, the sketchbooks themselves could be used as a repository for the results of Reich's efforts with the work tapes, and thus become at least some kind of record of this studio activity. There are also, it should be said here, technological and practical issues to be addressed when attempting to elicit reliable research data from these tapes. All in all, it seemed wise to leave such an investigation for future research.

## Strategy of the Present Article

Since it is obviously impossible, in an article of this length, to discuss all these pages of sketches, I have selected just a few of what I regard as the most seminal examples to examine in detail below. The shift of focus to composing with chord sequences as a central concern is the main reason why Reich's working out of harmonic issues—especially the making of broad decisions affecting the tonal structure of each of the work's three sections, and of the work as a whole—seems to occur chiefly in the earlier pages of sketches: those in Sketchbook 18 that date from July and August 1979. Concentration on these sketches will permit some inspection of the significant kinds of decision-making involved in the tonal and harmonic planning that lies behind *Variations*, during the period in which what we might call the conceptual groundwork for considerations of this work's harmonic language and tonality is most to the fore. In the final part of this article, I provide a harmonic analysis of Section I of the work, given in Figure 7, and attempt to establish the basis for a comprehensive examination of the nature and extent of the relationship between Reich's sketch materials and the finished composition; such a comprehensive examination is, however, beyond the scope of this article.<sup>8</sup>

Building a musical work upon a chord sequence that is subjected to repetition, decoration and variation is, of course, not merely one of the oldest and most firmly established methods of composition in the Western classical tradition, but also the basis of many popular musical forms, old and new. Attempting to estimate the radical reach of Reich's strategies in this work—during a period of his career often portrayed as one of increasing compliance with the norms of Western classical music—is among my aims here. *Variations* also makes a contribution to a more general resurgence of interest in composing with chord sequences around the time that this work was written; Philip Glass and Michael Nyman are just two of many examples of other minimalist composers who could be said to have been working their way out of minimalism during the late 1970s by extending their harmonic interests in this kind of way.<sup>9</sup> Before proceeding with an investigation of Reich's approach to the chord sequence as a compositional tool, I need first to consider briefly the issues of terminology that are involved when this composer's tonal and harmonic practice is discussed, and contextualise this a little within its composer's output in the 1970s. Prefacing my enquiry into the sketches with a brief summary of the main musical materials to be found in the score of *Variations* as eventually published, I will then attempt to address the various questions that have been raised with an examination of some of Reich's sketches for this work. The article concludes with an example of how knowledge of these sketch materials might be invoked in a musical close reading of Section I of *Variations* itself.

## Establishing a Methodology for Discussing the Tonality and Harmonic Language of *Variations*, and how Reich's Sketches for the Work Might Assist This

Despite the interest in tonal issues shown in *Mallet* and *Octet*, *Variations* becomes, as suggested at the beginning of this article, the first work by Reich in which a pre-planned and repeated chord sequence, working through a series of different key signatures, underpins both note-to-note harmony and overall tonal direction throughout a whole composition. In *18 Musicians*, chords had been taken individually as the basis for the whole of each section, and

a single key signature was retained, with the exception of Section V, throughout (though Reich also modified this key structure by using accidentals from time to time—also, arguably, another example of how he departs from the chord structure here). In *Variations*, repeated ‘passes’ (to invent my own terminology) through a chord sequence combine to form, in this case, three different elaborations of its harmonies as the triple ‘pillars’ of the piece.

The ensuing issues of harmonic vocabulary and tonal grammar in Reich’s music are too complex to examine in any comprehensive way in an article of this kind. A harmonic language originating in horizontally conceived modal patterning is, to take just one problem here, not readily susceptible to the kinds of terminology normally applied to vertical structures by theorists of Western art music; or, for that matter, of jazz or rock (the former has long been an important influence on this composer in a number of ways). As a consequence, Reich found himself using several different ways of describing his note-to-note pitch organisation and the key structures with which this might operate. His materials might simply be described in terms of their modality, using a mixture of major-minor and modal terminology. The former would commonly be said already to imply some degree of functionality, which is probably one reason why, in his note for *Variations*, Reich is careful, both times he mentions the work’s main tonality in his programme note, to refer to ‘C minor (or C dorian) [*sic*]’ (Reich, 2002e, p. 99). As we shall see, the sketches for the work reveal such equivocation as well.

From early on, too, the composer seems to have used the term ‘stacked fifths’<sup>10</sup> to describe chord structures—or even just tonal areas that might, in horizontal rather than vertical terms, simultaneously be defined modally. Pile up perfect fifths—perhaps occasionally including augmented or diminished fifths as well, and also allowing intervals smaller than the fifth to separate different segments (often ‘trichords’) of a stack of fifths—and you get an aggregate with properties comparable in their harmonic flexibility to those of materials conceived entirely in horizontal, modal terms. This can often be a matter merely of describing the same phenomenon in two different ways, one horizontal, the other vertical. But in showing how chords of stacked fifths might be assembled to form a chord *sequence*, Figure 5, further below, also demonstrates the potential of such material to generate tonal motion. Other kinds of pitch structure investigated over the years in his sketchbooks include alternative modalities such as the octatonic scale, a formulation much associated with the music of Igor Stravinsky, long favoured by Reich himself. The shifting approach to tonal grammar that was explored by the composer at this time to create large-scale structures with such harmonic vocabulary draws on many influences from both Western art music and elsewhere.

Composing with chords—even with what are basically only two at a time—as Reich did from *Mallet* onwards, increases the potential for such functionality to play some kind of role; the sketches for *Variations* show him thinking afresh about the degree of functionality that he could deploy in a work based on a chord sequence. He has written of *Variations*, as he has often said of his music more generally, that ‘The harmonic progression is followed in the middle register so that, from time to time, the bass may vary from variation to variation’ (Reich, 2002e, p. 99). Yet tonal functionality also determined in part, or at least in some way affected, by the bass lines of his chord progressions is always a potential factor, it seems to me, in Reich’s music from 1973 onwards. Even prior to *Variations*, the bass movements of the oscillating chords in *Mallet*, *18 Musicians*, *Large* and *Octet* can arguably generate a greater sense of functionality than in any of the composer’s music before that time. Seek out an approach that, in *Variations*, combines a chord sequence implying tonal motion with a slow harmonic rhythm (the ‘constant yet slow harmonic change’ of which the composer writes [p. 99]) and a further layer of ambiguity is added to the mix.

## The Basic Structural Elements in the Final Score of *Variations*

I will now turn to some preliminary close reading of Reich's *Variations*. This composition's basic textures can be seen by taking a look at Figure 1, the first two pages of the final published score. The work's harmonic scheme is articulated principally by the orchestra's string section, plus the third electric organ, the left-hand of Organ 2 and two pianos, importantly supplemented by a seven-piece brass section (with no French horns) at crucial moments. The consequences of the majestically slow progress that results include the complete, and for Reich unusual, lack of repeat markings, and also 'the slow recurrence of materials from variation to variation' as contributing to 'a sound quite different from my earlier music' (Reich, 2002e, p. 99).

**Figure 1:** Steve Reich, *Variations for Winds, Strings and Keyboards*, bars 1-8

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This already quoted 'slow harmonic change' underpins all three sections of *Variations* which, following Reich's mention of the word 'chorale' in the sketch of 11 July 1979 (see Figure 3, below),<sup>11</sup> one could term a set of chorale variations. Each section uses two devices to make these variations suitably varied. On the smaller scale, changes to the pitches of each chord in the basic chaconne sequence are made by the addition and subtraction of notes and by changing pitches, particularly via stepwise movement; in the sketches, the composer eventually makes reference to these as 'harmonic suspensions' (see, for instance, 8 August 1979, though this sketch is not reproduced in the present article). On the larger scale, changes of key signature take each of the three chaconne sequences away from, and eventually back to, their opening tonality of C minor (a tonal description that—given that bar 11 adds A $\flat$  to the pitches of the opening two pages of Figure 1, and that A $\flat$  recurs when this key does—seems more accurate here than 'C Dorian'). In between the segments in this key, each section charts a fairly swift move to harmonic areas with sharp key signatures, followed by a gradual return to flat territory leading back to C minor.

As Figure 1 demonstrates, there is another layer of material in this work. This occurs in the woodwind parts, doubled by the first electric organ and the right hand of Organ 2, and by two pianos. Only three flutes and three oboes (all amplified) are used to represent the woodwind section throughout the work, and in fact flutes and oboes do not play at the same time until the piece's final sixteen bars; the oboes do not appear until bar 49. The creation of timbral variety seems to be the simple aim, plus the important matter of giving these wind players time to catch their breath. The composer describes this layer simply as 'the melodic patterns in the winds', or 'the melodic material'.

The unfolding of this layer of material is determined, as usual, by a 'process' (the term that the composer uses in describing the ways in which, in *Mallet*, oscillating chords as well as repeating melodic patterns unfold in shifting combination [Reich, 2002d, p. 76]). As can be seen in Figure 1, the melodic material, here initially in continuous eighth notes with occasional syncopations, is subject to Reich's usual kinds of repetition: the initial flute-plus-organs-plus-pianos pattern in parallel thirds and occasional fourths repeats every two bars, while what the composer calls 'a third [instrument playing] in canon with the upper voice' (Reich, 2002e, p. 100) enters on the third quarter-note beat of bar 1, following exactly the higher of the initial pair of voices just a single eighth-note behind. Such canonic unfolding,

with modifications, remains typical of how this aspect of *Variations* proceeds. Reich says that ‘the notes [of these patterns] slowly yet constantly change to match the changing harmony’ (Reich, 2002e, p. 99): in other words, the woodwind-and-keyboard patterns are subservient to the harmonic structure that unfolds elsewhere.

There is, though, one way in which these melodic patterns can definitely be said to act as an influence on the slowly changing harmonies, rather than simply following them slavishly in all respects, and this is via the parameter of duration. As Figure 1 again shows, the two-bar eighth-note patterns create an alternation of 6/4 and 5/4 metres; this is preserved for the whole of Section I. Sections II and III, however, adopt different, more complicated schemes, first involving a (delayed) shift into an 8/4 metre, divided into 5 + 3 (Section II), and then adopting four-bar patterns in what one might call a constantly ‘lop-sided’ scheme of 4/4, 6/4, 4/4 and 3/4; furthermore, Section I’s steady and only occasionally syncopated eighth notes are gradually replaced, in the other two sections, by what Reich calls ‘an increasing amount of sixteenths, the effect . . . becoming more and more florid and melismatic’ (Reich, 2002e, p. 100).

### **A Selected Investigation of Reich’s Harmonic Thinking in the Sketch Materials for *Variations***

The evolution of all these aspects of *Variations* through study of the sketchbooks would be a worthwhile activity in itself, but this goes beyond the scope of the present article. I will confine myself here to the questions asked earlier, focusing mainly on how decisions are made about the ways in which the chaconne sequence is varied via key changes and by the use of added notes and passing notes that, as we have seen, the composer was eventually to call ‘harmonic suspensions’; particular attention will be paid to what evidence these sketches offer about Reich’s new interest in exploring a kind of functional tonality articulated with the support of a bass line that he had avoided in his earlier output.

June 1979, the month before Reich began work on *Variations*, had seen the world premieres of both *Music for a Large Ensemble*, at the Holland Festival on 18 June, and *Octet*, in Frankfurt on 21 June. The years 1977-1979 were critical ones for the composer: the protracted story, first of at least one significant failed project—called simply ‘Pulse Music’, intended for a line-up of Steve Reich and Musicians even larger than that used in *18 Musicians*—and then of the eventual completion of *Large* and *Octet* forms a background that is important to any more comprehensive understanding of the place of *Variations* in Reich’s output. As the sketchbooks show, *Large* (completed in December 1978) and *Octet* (completed in April 1979) were composed, at least to some degree, in tandem. Both works were first performed by members of the Netherlands Wind Ensemble, conducted by Reinbert de Leeuw, on the dates given above, after which they were taken on a brief tour. This activity is good evidence of the composer’s increasing reputation in Europe at the time, though these performances were in fact the first public performances of anything Reich had written since *18 Musicians*. In Sketchbook 18, Reich writes, in large letters: ‘JUNE 1979 Performing Music for a Large Ensemble & Octet in Holland, Belgium, Germany & France with Netheland [sic] Wind Ensemble’.

From 4 July 1979, the composer was in Vermont for the summer; and, as so often during his composing lifetime, this proved a good period for getting down to serious work on a piece. My focus for the present article is on the weeks in July and August that he spent in Vermont, when most of the hard thinking about the nature of the work’s harmonic language, in particular, appears to have been done.

It should be clarified that Sketchbooks 18, 19 and 20 reveal continuing work on the realisation of *Variations* right up to January 1980. Many pages of these later sketches are in the form of individual sections, or parts of sections, of the work, copied out either in short or in full score. Such sketches are concerned with making adjustments of several kinds: for instance, to the harmonic details of how each of the three sections of *Variations* will work through the basic chord progression, to the rate of that progression and to the overall length of each section. But as would be expected from their short- or even full-score format, they seem mostly preoccupied with matters of orchestration and the voicing of chords; less with fundamental considerations about harmonic language. A comprehensive account of this work's genesis as revealed by these three sketchbooks taken as a whole would address all this material, including those sketches that more explicitly explore harmonic ideas; there is, for example, a sketch dated 9 October 1979 that attempts a 'HARMONIC STRUCTURE FOR 2<sup>nd</sup> SECTION of Music for Strings & Winds'. Short-score versions of all of the work's three sections continue through December 1979 and into January 1980. To one of these sketches, in fact for Section I, Reich adds the words 'completed 12/20/79', which corresponds to 'December 1979' as found at the end of the published score; here we may note that, even at this late stage, changes in the notation of some sections from flat to sharp key signatures are being considered. Further sketches, too, notably one dated 13 January 1980, continue work on scoring details into the New Year.

The very first sketch made in Vermont—dated 4 July—is shown in Figure 2:

**Figure 2:** Steve Reich, sketches, 'July 4, 1979, VERMONT[:]' Analysis of harmonic progression in Purcell's "A New Ground"—1689'; 'July 5 Romanesca—bass' [Sketchbook 18]. Courtesy of the Steve Reich Collection, Paul Sacher Foundation, Basel.

This transcription of 'A New Ground' (1689) by Henry Purcell (no source is provided here) demonstrates not only that Reich might now be very interested in exploring a sequence of chords as the basis of a composition, but also that such a chord sequence could possess a degree of functionality: with clear determination of tonal motion via a systematically-controlled bass line, here first descending chromatically, then completing the overall progression from tonic to dominant with diatonic stepwise movement. On the following day, 5 July, he adds three one-bar melodic fragments—two in 5/4, the remaining one in 6/4—resembling the melodic patterns in the winds of his already quoted description in the programme note. Finally, three versions of a 'Romanesca'-style bass line are written out, implying movement from major to relative minor in a key signature of one flat. The influence during the late 1970s of Baroque music—Purcell was also the composer of choice for Nyman, with whom Reich had, at least until recently, then been close—is clearly manifested here.

A few days later, on 9 and 10 July—given here as Figure 3—the already mentioned one-bar melodic patterns are recast, now in two-part writing, to form symmetrical sequences of keys that Reich calls, respectively, 'a diminished 7<sup>th</sup> chord of 4 minor thirds' and one that unfolds as 'up a whole step—up a minor third—down a fourth'. Such schemes continue to suggest to him a more or less logically-ordered tonal plan for a whole composition, without any chordal basis being provided, at least at this conceptual stage. The implication, at this point in the work's evolution, seems to be that, contrary to what his earlier explorations of chord sequences might suggest, *Variations* might be structured, as *Large* and *Octet* had recently been, on a sequence of key relationships articulated by contrapuntal combinations of melodic lines as well as by any chords themselves.



**Figure 3:** Steve Reich, sketches, ‘7/9/79 [= 9 July 1979:] Cycles of scale – key . . . constant melodic – scale pattern –‘; ‘7/10 [= 10 July 1979]’; and ‘7/11 [= 11 July 1979:] Chord progressions in Music for Mallet Inst. – as chorale to repeat as harmony for strings’ [Sketchbook 18]. Courtesy of the Steve Reich Collection, Paul Sacher Foundation, Basel.

In the sketch dated 11 July 1979, Reich actually copies out the chords from *Mallet*, of six years before, noting the possibility of using them ‘as chorale to repeat as harmony for Strings’. Figure 3 also shows the pairs of chords notated here, which are an accurate transcription of the complete sequence in *Mallet*; so too is their outlining of a sequence of key signatures that move from three flats to six and finally to five flats. The key signature of five flats gives rise, as before, to two pairs of chords, not one; in identifying the key of each of *Mallet*’s four sections, Reich’s note gives the sequence ‘F dorian . . . A $\flat$  dorian . . . B $\flat$  minor’ and, simply, ‘D $\flat$ ’ (the last one for the fourth and final section, which thus turns the minor key using five flats into the same key signature’s major) (Reich, 2002d, p. 76). As Figure 3 also makes clear, this sketch follows up the task of mere transcription with a second line that modifies and decorates these chords.

Curious as it may seem, this short sketch can be argued to be the seed from which *Variations* subsequently springs. In context here, it implies that chords of the kind used in *Mallet* can become more sophisticated drivers of the overall key scheme of the later orchestral composition. They could achieve this simply via recourse to varied repetition: the essence of the variation principle yet to be applied, but already glimpsed as possibly the fundamental building block for a whole piece. They might also bring a crucial new degree of functionality to the chord sequence that might, in turn, result in a fresh approach to the treatment of its bass line.

From this point on, as though spurred by this reconsideration of the *Mallet* chords, combined with his thinking about how to handle changing key signatures, Reich now moves forward quite decisively in the remaining pages of Sketchbook 18 to make important decisions about the materials of his new orchestral work and how these will be structured. Already on the next day, 12 July 1979, he starts to muse on some ‘Problems’ he has discovered, and to begin to devise chords to go underneath the kinds of repeating and interlocking melodic patterns that we have already noted in Figure 2. Having apparently concluded that each section will be in a single key, he is unclear about ‘How to Harmonically organize [any] section’ and ‘the resulting harmonic change. [P]robably’, he suggests ‘by alternations of scale pattern’. Following this up, he wonders about modulation, presumably from section to section, and decides that this will ‘probably [be done] by dropping a sharp in [the] circle of fifths as a starter. Don’t need to have 12 sections but there could be 12’. His other concern on this date is for how the ‘Rhythmic structure for sections’ should be handled. ‘Should again grow out of scale pattern evolving into longer melodic material’, he decides. He proposes to ‘Work on [a] basic descending scale pattern’ to achieve ‘Harmonic alteration (chromatic alteration) to modulate’: he means, presumably, developing the kinds of chromatically evolving melodic patterns shown in Figure 2. ‘Melodic development and elongation’, as he terms this, remain a concern for him for several days too.

Meanwhile, still on 12 July, two sketches that seek to ‘develop and elongate’ one-bar two-part melodic patterns in F# minor interestingly underpin these with what can reasonably be described as ‘functional’ harmony in root position, the character of which is emphasised by supplying Roman numerals (I, V and so on) to these chords. Over the next two weeks, such ideas continue to be tried out, while new ones—for instance, ‘Alternate more chromatic

scales' (22 July 1979), which yields chords with varying key signatures suggesting possibilities for enharmonic changes to be involved—are added. We seem to be at a curious point in Reich's thinking about *Variations* here, at which ideas about chord progressions with a significant degree of functionality but sometimes considerable chromatic instability have evidently established themselves, yet the principle of a more extended chaconne-like chord sequence has seemingly yet to take firm root.

On 23 July, Reich makes three statements of his intentions that are worth quoting in full:

- 1      Make a harmonic progression or alternation – back & forth between two chords which can be voiced very differently & by voicing change descending (or whatever) melodic pattern.
- 2      Or aim for harmonic repeating cycle that goes through several chords but goes back to where it started. Voicing of statement of cycle can vary.
- 3      Rhythm of alternation – cycle will be determined by melody.

The second of these statements clearly suggests a move towards the repetition of a modified chaconne sequence.

On 26 July 1979, with a key signature of three flats for his ideas about the new piece now established, Reich assembles and extends a mixture of materials with which we are, in fact, by now familiar. Occupying most space are several attempts at devising melodic patterns in thirds: most of them, including more fully composed-out, alternating 6/4 and 5/4 time signatures in the manner of the final score (though this feature will actually not be put firmly in place until much later), incorporating quite frequent syncopation and trying out canonic elaboration of this melodic material. A chromatically descending bass line from C to G, reminiscent of the Purcell ground of some three weeks earlier, is accompanied by a few tentative chords in the same key of C minor. At the bottom of this full page, he adds to melodic patterns alternating 6/4 and 5/4 a slightly more developed rhythmic elaboration of a pair of oscillating chords with the bass notes A<sup>b</sup> and C, belonging to the same broad type as the ones from *Mallet* seen in the sketch of 11 July. Now, though, in the way in which they shift some of the inner parts separately against the main chords, these oscillations could be said, with hindsight, to offer a tentative exploration of what would later become the much more extended sliding 'osmosis' of pitch content that characterises the technique of harmonic suspensions. By 26 July, then, Reich is evidently contemplating a fairly significant degree of functional harmony; there are signs, too, in the full texture of melodic patterns and oscillating chords attempted on this date, that he is looking at ways to combine these elements with the strong progression of his bass line from the tonic of C minor to its dominant. The moves to foreign keys that will be a prominent characteristic of the final score do not feature here; on 27 July, however, Reich proposes that 'Later in [the] Piece there are sections in remote keys like A<sup>b</sup> minor alternating with C minor'.

By just over one week after this, on 3 August 1979 (see Figure 4), the composer has taken the crucial decision to replace pairs of oscillating chords—even ones decorated with added or passing notes, as in the sketch of 26 July—with something more resembling a proper sequence of chords with a moving bass line, underpinning the now familiar-looking melodic patterns; we might observe here the note near the top of this page revealing that this material 'was realized by tape 7/30', a reference to Reich's use of work tapes at this stage of composing *Variations*. As we have noted, a functional-looking bass of this kind has featured

in the sketch materials for some while. On 27 July, Reich had wondered about ‘Opening with a bass line—preferably not the usual 18<sup>th</sup> century C, B, B $\flat$ , A, A $\flat$ , etc.—but some bass line that avoids but leads to the dominant G and rests there with 2<sup>nd</sup>’. The ‘ground’ seen in Figure 4 (C, B $\flat$ , A $\flat$ , F, A $\flat$ , B $\flat$ ) had also occurred on 30 July, where it formed a six-chord sequence closer to that of the final score’s Section I; unlike in both Sections I and III, the bass line of this middle section of *Variations* will use C, B $\flat$ , and then A $\flat$  and B $\flat$  alternating, before punctuating further repetitions of B $\flat$  and A $\flat$  with F. At this stage, this is styled as a ‘New Bass line(s) and harmonies to open piece and feed [though that word is unclear] to Dominant melodic pedal’; its position in the work is thus, at this point, not the same as it will be in the final score. Just two days earlier, on 1 August, Reich had thought to ‘Eliminate Dominant pedal’ and ‘Begin removing bass from bottom as in Octet & rebuild to a different bass—also possibly changing melodic pattern’. For me, though, the overall impression of the chord sequence in Figure 4 is one in which triads and a functional bass line, at least hinting at a move away from C minor to settle on the flat seventh of that key as a possible alternative to the opening tonal centre, effect a *rapprochement* of a kind with tonal motion as we usually understand it.

**Figure 4:** Steve Reich, sketch, ‘Aug 3 [= 3 August 1979:] MUSIC FOR STRINGS AND WINDS’ [Sketchbook 18, page numbered 14]. Courtesy of the Steve Reich Collection, Paul Sacher Foundation, Basel.

The work now takes what is probably its single most decisive step forward with the second brace of staves dated 6 August 1979, given here as Figure 5. Reich’s labelling of this sketch—‘Harmonic structure—Music for Strings & Winds’—suggests a rare opportunity for insight, at this juncture, into how the composer might be conceiving any kind of more extended tonal plan for the work. Bass lines starting from C (their origins still arguably in the Purcell ground copied on 4 July) and ‘cadential figures’ continue to feature in the sketches immediately prior to this one. Most tellingly—on 5 August, immediately prior to Figure 5—Reich had written the following (his capitalisation and punctuation are preserved below):

PLAN OUT AN HARMONIC PROGRESSION THAT WILL  
BE USED FOR FIRST SECTION. MELODIC PATTERNS  
OF VARYING RHYTHMS & PITCHES BUT FOLLOWING  
HARMONIC PROGRESS FOR NOTES.

PROGRESSION WILL LEAD TO 2<sup>nd</sup> Section which is Page  
14. Chords in Progression can be realized through inversion  
& partial statement i.e. not all notes present. Can be cyclic  
or lead to related tonality probably by adding a flat.

This is a clear statement of the composer’s intention to devise a harmonic scheme that will work for all sections of *Variations*, each ‘pass’ through the sequence varying the harmonic details and changing keys as it unfolds.

**Figure 5:** Steve Reich, sketch, ‘8/6/79 [= 6 August 1979:] Harmonic structure – Music for Strings and Winds’ [Sketchbook 18, page numbered 18]. Courtesy of the Steve Reich Collection, Paul Sacher Foundation, Basel.

Unlike the oscillating chords that had previously been explored as the basis for the harmonic organisation of *Variations*, the first 14 of the 16 aggregates of Figure 5 are built on the principle of stacked fifths, discussed earlier in this article. The basic idea of the approach in this case appears to be to pile up pitches with the perfect fifth as the main interval between them; while in each chord the interval between the trichord in the treble stave and the trichord in the bass stave may vary, octave transposition would quickly reveal the origin of every chord in this ‘Harmonic structure’ as, at least ‘theoretically’, based entirely on the interval of the perfect fifth. Thus, for instance, chord 1 has C G D in the bass stave and E♭ B♭ F in the treble. Chords 3, 5 and 11 already offer a completely ‘straight stack’ of clearly notated perfect fifths.

Though the composer does not annotate his sketch to clarify this, it can readily be observed that these 16 chords group themselves, at least to a degree, in pairs, especially in the earlier part of the sequence. Here, the principle at work seems to be a kind of trichordal pitch-class inversion: the treble trichord of chord 2, C G D, is identical to the bass trichord of chord 1; and, of course, the bass trichord of chord 2, E♭ B♭ F, is likewise identical to the treble trichord of chord 1. What we may term this quasi-inversional relationship is neither carried through the whole chord sequence consistently, nor based solely on chord pairings of 1 and 2, 3 and 4, and so on. For instance, the next pair of chords to exhibit such a quasi-inversional relationship are chords 6 and 7, with their exchange of the trichords A♭ E♭ B♭ and C G D. While this principle of pairing is not pursued consistently throughout the ‘Harmonic structure’, it is still possible to interpret its progress to some degree in terms of chordal pairings. The treble trichords of chords 3 and 4, for instance, repeat pitch material that fits readily into the C-based tonality of the bass trichords of chords 1 and 2, while those initial bass trichords are themselves quickly replaced, in chords 3 and 4, by a pair that suggests a movement to a new harmonic territory. The handling of these trichords seems to follow up on the proposal—in the sketch of 5 August, just a day earlier—that ‘Chords in Progression can be realized through inversion & partial statement’.

We may, in addition, note that the 14 stacked-fifths chords of this ‘Harmonic structure’ chart a progression away from and back to C minor (or C Dorian, or even C Aeolian), following up the already-quoted comments in the sketches of 5 and 6 August by elaborating a scheme in which a departure to key areas far removed from that of the opening is eventually brought to a natural close by a return to the opening harmonic territory. Strategies related to this are briefly touched on in the annotations to the combination of melodic patterns and chaconne chords immediately beneath this ‘Harmonic structure’: first suggesting ‘staying in 5♭s’, then finding a way to ‘NO flats’, a procedure that will eventually be to some extent followed in the final score.

In the ‘Harmonic structure’ itself, key areas are notated entirely in flats. In charting a way through this progression, several different, potentially competing, interpretations could be offered as to the nature and extent of the tonal motion involved. For instance, the move to new flat-key territory instigated by chord 3 deploys bass notes a tritone apart to emphasise the key territory of G♭ as an alternative to the opening tonality of C minor; chord 4, with its bass note A♭, might be seen as backing this up, not with a triad of G♭ major but by extending the idea of ‘a diminished 7<sup>th</sup> chord of 4 minor thirds’ (from the sketch of 9 July 1979): the opening four chords of the ‘Harmonic structure’ articulate this via their bass pitches, C, E♭, G♭ and A♭. On the other hand, chords 5-7, with their bass pitches, F, A♭ and C, suggest that F, as IV in the opening tonality of C minor, is the goal here. And, of

course, we can undermine all such speculation as to the exact nature of Reich's tonal thinking here by invoking the suspicion of all such bass-related interpretations that appears built into the composer's overall tonal approach. As Figure 5 shows, this 'Harmonic structure' is then brought to a close with two aggregates that are not constructed as stacked fifths, but which—taking off from the return to C minor established by chords 12 and 14 (with the F-based chord 13 arguably reinforcing C minor by invoking the IV of C again)—evidently mark the start of a new departure from C for Section II.

The chords of the 'Harmonic structure' create, then, a sequence with several distinctive, if not particularly systematic, features that offer potential for long-range tonal planning, including an arguable degree of functionality in the bass. From the tonal tension initially created by the opening four chords to the eventual return of a C-based tonality towards the end of the sequence, this sketch seems to pull in several different directions in its path away from and back to relatively clear tonal territory; stacked-fifths chords based well to the 'flat-side' of the given key signature of C minor remain important, though.

Such a line of enquiry might appear too dependent on the bass line of the 'Harmonic structure', and it should be clarified that the only Roman-numeral annotation that Reich himself supplies to this sequence, unlike for some earlier ones, is 'I', for the opening C-based chord. But we can at least compare the above account with a look, at the end of this article, at Section I of the final score, and see to what extent both the chordal character of this 'Harmonic structure' and, in particular, its possible signs of functionality are followed through into the score itself. Emphasising the macro- rather than the micro-level here means that we shall, in the present article, ignore such theoretical enticements as a comprehensive analysis of the number of trichords in operation in this 'Harmonic structure' and the pitch invariance to be observed as a result of this exercise; or the possible origin of this sketch's stacked-fifths chords in the oscillating chords more typical of *Mallet*, which can be found in earlier sketches for *Variations*, as we have seen; or the tendency to play—quite typically for Reich, from other sketch materials I have perused—with symmetrical formulations both chordal and tonal, such as those articulated in imitation of 'a diminished 7th chord of 4 minor thirds', as in the already-quoted sketch of 9 July (see again Figure 3, above). Lastly on this sketch, readers might be amused to note the words in the top right-hand corner of this page, nicely suggesting Reich's ambitions for his burgeoning career as an orchestral composer to work with the London Symphony Orchestra and some of the world's greatest conductors. ('D.G. for 1981' is probably a reference to the Deutsche Grammophon company that released Edo de Waart's recording of *Variations* with the San Francisco Symphony Orchestra, though only in 1984, not 1981.)<sup>12</sup>

Finally, in our survey of the earlier sketches for *Variations*, those dated 10-15 August, shown in Figure 6, now offer evidence of Reich's thinking as he makes drafts of sections, or at least parts of sections. These two pages are just part of a version of the first 105 bars of *Variations*. As a whole, these sketched bars will take us around two thirds of the way through Section I; but Figure 6 offers us this material only from bar 1 to bar 42. Note immediately that the composer is indecisive here about which key signature to use, three flats or two flats. 'Maybe remove A $\flat$  gives really C dorian & not C minor', written in the top-left margin, shows the composer's continuing vacillation between modal and major-minor kinds of harmonic thinking; and it is clear, over these two pages, that he has first largely used three flats and then rubbed out the A $\flat$ s in the key signature.

**Figure 6:** Steve Reich, sketches, '8/10', '8/13', '8/14' and '8/15' [= 10, 13, 14 and 15 August 1979:] 'Music for Strings + Winds' [Sketchbook 18, pages numbered 23 and 24]. Courtesy of the Steve Reich Collection, Paul Sacher Foundation, Basel

The six-note, stacked-fifths chords of 6 August, from just a few days earlier, form the basis for the harmonic progression here, but in a modified version. Chord 1 of the 'Harmonic structure' is assembled by bar 8; chord 2 appears in a different voicing from bar 11 onwards. Following this, though, a stacked-fifths chord with G in the bass is interposed before the arrival of chord 3 of earlier sketch, with G $\flat$  in the bass. Readers might wish to trace the comparisons further for themselves; the length of Figure 6 allows this as far as the return of a C-based, revoiced stacked-fifths chord at the bottom of the second page.

On the matter of the relationship between the chaconne sequence and the melodic patterns, these bars demonstrate Reich's solutions at this stage of writing. This whole sketch is in 5/4, with no alternation to and from 6/4 at all. As a whole, the sketchbooks show that Reich was keen to avoid a situation in which the patterns merely followed the chords slavishly; and the final score demonstrates his care to address this, with some moments offering quite ingenious solutions in the melodic patterns to the changes of pitch collections and/or tonalities going on in the main chaconne layer.

### **Conclusion, with a Little Close Reading of Section I of *Variations***

What, then, do the sketches as a whole tell us about the composer's thinking that lay behind his harmonic and tonal decision-making in working on *Variations*? One more summative answer to this question is supplied by Reich himself, in a sketch dated 23 August 1979. Here, he interestingly proposes three 'Principles of revision', suggesting three different approaches to changing the melody, bass, and overall harmony at any point: first, to 'Change bass (as well as other notes in harmony) while keeping melody the same'; second, to 'Change melody while keeping bass the same' (in addition here, the words 'without changing bass' are crossed out); and lastly, to 'Change both simultaneously as before'. This list of alternative principles is interestingly open-ended, and it could contribute very usefully to any attempt to provide a comprehensive analysis of the harmonic procedures at work in *Variations*' final score.

In addition, the matter of addressing, for our own analysis of the final score, how Reich handled harmonic suspensions—the detailed modification of the chaconne chord sequence as it unravels as the basis for each of *Variations*' three sections—would doubtless be assisted by following through the implications of several later sketches. To give just a single example, the already-mentioned 'HARMONIC STRUCTURE FOR 2<sup>nd</sup> SECTION of Music for Strings & Winds' sketched on 9 October 1979 homes in on the note-to-note progression of these suspensions: something that the sketch in Figure 5 does not attempt. As this proceeds, though, the sketch of 9 October seems to bear increasingly little resemblance to any of the three sections of the final score, particularly since its notation of evolving key areas—still entirely through the application of accidentals, not shifting key signatures themselves—appears to accord only fitfully with the changes of key to be observed in the finished score. A fuller account of these sketches would compare this one, and several others of similar interest, carefully against each relevant section of the final score.

In general, however, the apparent lack of any detailed account, in these sketches, of how Reich moved from the stacked-fifths chords of Figure 5 to the nuanced combination of

harmonic suspensions and key changes to be observed in the published score means that the narrative of the compositional evolution of Section I presently has significant gaps in it. More research remains to be done here, admittedly; but on present scrutiny, the relative lack of clues in the sketches on how Reich conceived the note-to-note mechanics of the harmonic suspensions, in particular, is disappointing. The composer himself is likely to respond to such a suggestion by insisting that these decisions were achieved more by intuition than via any systematic approach; also, that many of the changes involved were effected at the work-tape stage—which, as we have already explained, makes them much harder to interrogate. It would certainly be good to have more information than these sketches provide on the thought processes involved; thus, if a deep immersion in the work tapes themselves does prove technologically possible, this would be one way forward for future research.

As for the composer's evolving conception of harmony and tonality—including degrees of functionality and the extent to which the bass line would take control of this—that lies behind the progression away from and back to a C-based tonality unfolding across each of the three sections of *Variations*, this also seems partially explained by the sketches. Many of the later sketches for the work are devoted mainly to copying out portions of these sections, or even whole sections themselves, and their chief purpose appears to be to finalise details—including the fine-tuning of pitch and rhythmic details, but also, not least, of scoring—prior to preparation of the performance materials for the premiere some months later. The harmonic contents of these later sketches are themselves often already close to those to be found in the published score itself, and are thus little help in bridging the gap in the compositional process that, despite the continuing appearance of sketches for *Variations* after this point, opens up soon after the sketch of 10-15 August.

How, then, did Reich move from what may be interpreted as still the experimental stages of the sketches of the summer of 1979 to the final score? If he did so, as seems possible, by means of an elaborate and much-altered reconstruction of a notated plan such as the 'Harmonic structure' of 6 August 1979 that involved extensive trial-and-error with his eight-track tape recorder, then what sorts of stages were involved in this undertaking? And why do so few of these stages feature, at least with clarity, in the sketchbook or in any other notated materials for *Variations* that survive at the Sacher Foundation? If there are, at present, no clear or easy answers to any of these questions, we can at least conclude by offering a few further observations on the harmonic scheme of Section I in the final score itself. Having attempted to discern the nature and extent of Reich's modifications to his harmonic language during what seems to have been the critical period for doing such thinking before applying it in detail to create the final score of *Variations*, such a strategy will allow us to test out, at least a little, how far the ideas in these sketches are reflected in the work itself. This strategy will, also, inevitably invoke the contrast, made earlier in this article when discussing Reich's work tapes, between 'theory' and 'practice': the likelihood that we are ultimately dealing here with some sort of combination of more-or-less systematic harmonic structuring, featuring the composer's new interest in the potential for his harmonic development of a functioning bass line, and levels of more intuitive 'practice', deriving from the ways in which Reich had, for many years before embarking on this composition, always made such unsystematic play an important part of his methods.

As just a single illustration of the distance that must be travelled between the composer's 'Harmonic structure' apparently intended for the opening section of *Variations*, as given in Figure 5, and the harmonic structure as revealed by the final score, let us finish with an attempt to determine some kind of strategy towards an appropriate method, and a notation for, a detailed harmonic analysis of Section I of the work as published. Figure 7, covering the first of the work's three 'passes' through its chaconne structure (bars 1-144), gives some indication of the problems that any analyst must solve:

**Figure 7:** A Harmonic Analysis of Steve Reich's *Variations for Winds, Strings and Keyboards*, Section I, bars 1-144.

This representation separates the main chaconne, played by strings plus two electric organs, from the other, decorative, layer of 'melodic patterns' that is played by flutes, oboes and, again, two organs, plus two pianos; and also by trumpets, trombones and tuba. (The hands of Organist 2, as we have seen, are split between these two layers of material.) The lower two staves of Figure 7 detail the progression of the chaconne itself, while the upper two staves clarify what is added to the chaconne by the decorative layer: either continuously, as on flutes/oboes/organs/pianos (with flutes and oboes basically alternating), or periodically, as with the brass.

All the pitches of the decorative layer are usually also present in the main chaconne layer; so, for the purposes of analysing the harmony, more attention can be paid to the latter. (For one instance of an exception to this, see bars 23-24, in which flutes and organs include D $\flat$  in their response to the new key signature of five flats, a pitch that does not feature in the main chaconne. Since these two bars are merely an enharmonic interlude on the way to the five sharps of bars 25-30, it will come as no surprise that C $\sharp$  then features—more importantly, since it lasts for longer—in the flutes and organs during those bars as well; C $\sharp$  only enters the main chaconne layer in bar 30, along with E $\sharp$ .) But in the hope of elucidating some of the ways in which Reich deploys his orchestral resources to add new perspectives to the chaconne material itself, I have indicated the basics of how the layer of melodic patterns colours the harmonies. In these upper staves, flutes are indicated by notating them as eighth notes with 'tails up', oboes as eighth notes with 'tails down'; the brass chords are notated as whole notes.

In the lower staves, all pitches are given as whole notes, except for a few passages (the first occurs in bars 31-40) in which half notes are used to delineate those shifting 'harmonic suspensions' (as the composer called them, discussed above) that seem to me of greater significance than the rest of the pitch changes falling into this category; these more important moments usually involve parallel movement in thirds, using octave displacement. With the exception of these, I have taken the chords as notated in the lower layer of Figure 7 as indicators mainly of harmonic collections for a segment as a whole; I should also say that, in the interests of attempting clarity, pitches are only sometimes, not always, given in all the registers in which they appear in the score. This analysis thus aims to elucidate the changes in pitch that I consider of greatest structural importance, while making no comprehensive attempt to indicate when pitch classes, if any, are subject to delayed entry, or which change register, until further into the segment in question.

At the composition's opening, to give an illustration of how this works (which will also allow the reader at least to compare the very beginning of this process here with the final score as given in Figure 1), it is the melodic patterns that first present the initial pitch collection, in bars 1-2. All six pitches—C D E $\flat$  F G B $\flat$ —occur during the course of this layer in bars 1-10: a revoicing of chord 1 of the 'Harmonic structure' of 6 August 1979 (Figure 5) in the manner of the opening bars as composed out on 10 August (Figure 6). The main texture of strings and electric organs does not enter until bar 3, and at first this plays only three pitches (D, E $\flat$  and B $\flat$ ), only then progressively adding C (bar 5), F (bar 7) and G (bar



9) to give the complete six-pitch aggregate for bars 1-10 as a whole and, in a modified version, in bars 11-22, as well. Of these six pitches, E $\flat$  and B $\flat$  are sustained until just beyond the introduction of sharp key signatures, at bar 25, that sets the chaconne on its passage through keys remote to the opening C minor; B $\flat$  is retained at the same register, but E $\flat$  moves up an octave at bar 13. C, arriving in bar 5, is sustained almost as long as E $\flat$ . F and G succeed each other as part of a stepwise movement adding new pitches to the D E $\flat$  B $\flat$  trichord; the arrival of A $\flat$  in bar 11 is simply the next stage in this process. At the same point, D falls out of the picture, while A $\flat$ , as well as C, is retained; thus, the aggregate given in Figure 7 for bars 11-22 is C A $\flat$  B $\flat$  E $\flat$ .

In the melodic patterns, G survives, along with D, until bar 17; at bar 23, C falls out (while still being retained in the main chaconne layer), and D $\flat$  and G $\flat$  are added, both being retained as the enharmonic shift occurs between bars 22-23 and bars 25-30. Returning to the main chaconne layer, it is the appearance of G $\flat$  in bar 20 (signalled with an arrow in Figure 7) that begins the move away from C minor; from here, while it is still possible to detect links to the sketches discussed above, arguing for meaningful connections is now made more difficult. C $\sharp$  shifts to C $\flat$ /B $\sharp$  when the move to sharp key signatures occurs: first enharmonically in bars 23-24, then with the move to five sharps in bars 25-30. B $\flat$  remains, now renoted as A $\sharp$ , to form part of the aggregate which, from bar 25, sets off the whole sequence of mutating chords notated with sharp key signatures, until Section I's final move back towards C minor.

Such procedures of adding, subtracting or changing notes, the techniques that Reich's sketches describe as 'harmonic suspensions', will be found through *Variations*; and to indicate all the intricacies of their working would, as the above pair of paragraphs demonstrates, render a harmonic analysis unreadable. Chords sustained in this way for many bars at a time, but subject to the sliding 'osmosis' of pitch content typical of harmonic suspensions, make it hard to devise an analytical method of representing harmonic changes with any precision or consistency. I have, for this reason, treated almost everything that happens to the pitches in the opening 22 bars of *Variations* as forming two related harmonic collections, the gradual assembly of which appears ultimately of less importance, in terms of any understanding of the overall tonal terrain, than each harmonic collection seen, and heard, as a totality. This seems to me to have the virtue of clarity, for one thing: my main aim here is to gain some understanding of the overall harmonic structure, not all the textural and timbral details.

Looking at Section I as whole, its progression of key signatures could be described as being based on the broad principle of modulation via a circle of fifths, as proposed in the sketch of 12 July 1979; it also both takes up Reich's idea, on 5 August, that the overall progression of his chaconne 'Can be cyclic or lead to related tonality probably by adding a flat' and, as a natural consequence of this, the proposal in the sketch of 23 July that a 'harmonic repeating cycle' should go 'back to where it started'. Once bars 25-30 have established the enharmonic shift into sharp key signatures, each of these key signatures could, of course, indicate either a major or a minor key; but whichever of these is chosen (and, typically for Reich, this music is sometimes ambiguous on the matter), the principle of the 'circle of fifths' essentially holds. (My decision, one made partly for simple contrast, to notate the pitches in the melodic pattern as scale-like sequences forces me to decide on the starting point for each of these; such decisions must, accordingly, be regarded as only provisional ones when significant ambiguity of key is involved.) The five sharps of bars 25-

30 increase to six (bars 31-48), then return to five (bars 49-74), before a drop to just three sharps (bars 75-85), then a single sharp (bars 86-94); the switch back to flat key signatures from bar 97 onwards concludes with the original three flats of C minor (bars 126-144). We should note that harmonic suspensions often help to blur the move from one key area to another.

What, though, of the concept of a bass line here, and the different relationships between ‘bass’ (plus ‘harmony’) and ‘melody’ posed above in the sketch of 23 August 1979? Throughout this score’s opening bars, discussed above, the lowest note to be heard is middle C: sustained while the chord above it soon deploys harmonic suspensions. From bar 24, this note C begins a descent that underpins the shape-shifting aggregate above it as the harmonic territory moves away from C minor into a key area remote to this that, after a brief enharmonic transition using a key signature of five flats, will be notated using sharp key signatures for around the next 70 bars. In bars 31-40, soon after the sharp key signatures arrive, the lowest note is still only the F# below middle C: articulated by what as yet feels like only a putative sort of bass line, formed from oscillations based on the F# below C. (In Figure 7, as I’ve already indicated, these are shown as half notes; while the stepwise pitch slippage here is still characteristic of other kinds of harmonic suspensions, the only other oscillating passages of this kind—more internally repetitive than the other types of harmonic suspension to be found in Section I—occur in bars 107-122.)

Then, at bar 41, we get a ‘real bass’ note for the first time in this score. This descent to G# in the chaconne layer is emphasised by the first of the brass chords that punctuate this section, sustaining harmony that reinforces the main layer of the chaconne in the strings and organs after the move away from C to the sharp-based territory. As the top pair of staves in Figure 7 demonstrates, a total of nine chords, each held for between six-and-a-half and exactly eight bars (the 5/4 time signatures involved cause the rendering of half bars to be only approximate), unfold through Section I from bar 41 up to bar 135, ending just nine bars before the section itself does. (In a sketch dated 25 September 1979, the composer had contemplated presenting these brass chords in the ‘held for a breath’ manner recently used for the four trumpets in *Large*; he also jokes here that the way his thoughts were tending suggested that titles such as ‘Symphony No. 1 in C minor’ might now be apt for his efforts.)

The way in which these brass chords are individually laid out offers the clearest indication that could perhaps be had of a connection to the ‘Harmonic structure’ of Figure 5. Each chord forms a six-pitch collection; and eight of these nine chords follow the format now familiar from the stacked fifths of that sketch. Unlike the main chaconne layer in the strings and organs, then, these brass chords are registrally ordered as they are in the ‘Harmonic structure’. (The exception is the third chord, at bars 58-65, but this involves only a minor registral difference in the voicing.) It would make nice and neat sense if the brass chords of Section I of the score both had a clear relationship, in their individual harmonic content, to the stacked-fifths chords in the ‘Harmonic structure’ and also told us something about the extent to which tonal functionality, especially the sort of functionality involving a real bass line, might be viewed as a meaningful agent either in the conception or the final realisation of *Variations*. Unfortunately, a chord-by-chord comparison of these brass chords and the ‘Harmonic structure’ does not suggest a detailed or consistent connection between the actual pitch content of the aggregates in sketch and score; even when we take into account that, in the score, six of the nine brass chords are noted in sharps, not the flats of the sketch.

On the other hand, in addition to retaining, quite consistently, the principle behind the chordal formulation of the ‘Harmonic structure’ throughout much of Section I of *Variations*, these brass chords introduce a bass line to a score that, as we have seen, had, for its first 40 bars, in terms of pitch register behaved remarkably similarly to the music of Reich’s ‘treble-dominated’ period, the early minimalist compositions of the years 1966 to 1972. (Works such

as *Piano Phase* [1967] and *Drumming* [1970-71] entirely avoided the bass clef.) Bearing in mind the evidently important role of these brass chords in placing the overall harmonic progression of the main chaconne into higher relief, helping to underpin that progress with its consistent deployment of a bass line, we can note several ways in which a significant degree of functionality seemingly embodied in this progression—as articulated by strings and organs, as well as brass instruments, in Section I of the score—is operating amidst all the shifting, sometimes very chromatic, pitch action going on, as well.

As bars 31-48 settle into the newly established harmonic territory, the already-mentioned G# bass note proves to be the starting point for a sequence of bass pitches that, in running through the next 54 bars, provides, I suggest, a certain stability to counterbalance the flux above it. This sequence moves from G# (bars 41-48) to E (bars 49-57), B (bars 58-65), F# (bars 66-74), E (bars 75-85) and finally B again (bars 86-94). (Note, in Figure 7, that the brass occasionally begin their chord a little later, and/or end it a little sooner, than the strings and organs.) Though there are important differences between *Variations* and *Octet*—the former, for instance, does not deploy the oscillating chords found in the latter work—such treatment of the bass line seems a possible legacy of the suggestion, in the sketch of 1 August 1979, to ‘[b]egin removing bass from bottom as in Octet, & rebuild to a different bass’. The whole of Section I of *Variations*, indeed, also appears to be an even better illustration of the ‘principles of revision’ of the sketch of 23 August, regarding the ringing of the changes between ‘melody’ (taken as meaning the eighth notes of the upper layer in Figure 7) and ‘bass’.

It still seems to me, however, perfectly reasonable to posit a degree of functionality to these notes, as they circle around what is in fact their own little stack of fifths, E B F#: first settling, with the E of bars 75-85, on what looks like (and to me *sounds* like) the dominant of A major (in the three-sharp key signature then in play); and then, with the B of bars 86-94, moving to the dominant of E minor (in the single-sharp key signature that has succeeded it). (Inspect the harmony above each of these notes and you will find at least some support for such an interpretation, I think.) By just after bar 94, the six sharps of bars 31-48 have been progressively stripped back to what the key signature of bars 95-96 suggests is a ‘white-note’ harmony, but which turns out to be only a brief ‘hinge’ between sharp and flat territories as the music returns to C minor—and, from bar 97 onwards, if not quite continuously, a low C in the bass. It should be added, for comparison, that while Section III of *Variations* offers a reduced and modified account of this proto-functional deployment of the chaconne, with some ‘proper’ bass notes, Section II leaves out this dimension entirely; the absence of brass instruments in the work’s middle section is clearly linked to this decision.

The idea of composing a work based on several ‘passes’ through a lengthy chaconne-style chord sequence had originated in the oscillating chords of *Mallet*; and it seems to have been the still putative suggestion of harmonic motion to be found in this material from six years before that had now led the composer to explore deploying an extended sequence of chords quite differently from the way in which he used the cycle of 11 chords in *18 Musicians*. Perhaps the most fascinating aspect of this exploration during 1979 is that, at least for a while, Reich takes very seriously the notion that bass lines comparable to those of the Purcell ‘ground’ that he copied out at the start of serious work on *Variations* could lead to music in which bass lines had a greater degree of functionality than he had previously found compatible with the kinds of harmonic vocabulary he was using. As further evidence of this to that given already in this article, we may cite two other sketches. On 30 September 1979, he writes of ‘[Looking] for contrapuntal-harmonic motion—same as before—in introducing functional dissonances and resolving them—using longer tones’; on 4 October 1979, he is thinking of ‘[Harmonizing] with ground basses’ and ‘several moving bass lines’. But having considered descending bass lines and their implications, Reich eventually decides to

incorporate such devices into the three-fold presentation of the chord sequence of the final score in ways which are, I would say, less controlled by concerns of bass functionality, and what music theorists call ‘directed motion’ generally, than might have been expected at several points during the compositional process that led to it. As it unfolds, *Variations* can, after all, be said to retain a significant dimension of ambiguity about its harmonic character and direction, notably by retaining its composer’s favourite technique of making the middle register of his unfolding harmonies take a significant part in the identity and control of the kind of tonality that results.

The short analytical illustration offered above must stand in here for the much more thorough analysis that could be attempted of the harmonic vocabulary to be found in this composition. As part of such a project, a comprehensive assessment will be required of the extent to which the grammar that Reich devised for this vocabulary can reasonably be said to develop any potential to operate in a tonally functional manner in the finished work. In addition, all three sections of *Variations*—not only, as here, Section I—must come into the frame of such a debate. I hope, however, that my discussion of the score itself, in relation to some of the sketches that gave rise to it, has given some indication of Reich’s strategy here of shifting tonal centres that maintain significant commonalities of pitch content between collections. A comprehensive harmonic analysis of the work would, in my view, be well worth while, due in notable part to the challenges that *Variations* poses for the music analyst. If it achieves nothing else, I hope that the present article will encourage others to pursue such analytical endeavours, not least as a further contribution to our understanding of the role played by functionality in tonal music of the late 20<sup>th</sup> century.

## Notes

[1] This work is dated December 1979 in the published score. Commissioned by the San Francisco Symphony Orchestra and dedicated to Betty Freeman (Reich’s benefactor on several occasions during her lifetime), *Variations* received its world premiere in an ‘ensemble version’ played by Steve Reich and Musicians at Carnegie Hall, New York City, on 19 February 1980. The version for full orchestra was first performed by the SFSO conducted by Edo de Waart at the War Memorial Opera House, San Francisco, on 14-17 May 1980. As far as I have been able to confirm, *Variations* was published in study-score form by Boosey & Hawkes in 1981. This is also the copyright date given in this score; however, this source also has ‘First printing 1989, United Kingdom’ on the page detailing the work’s instrumentation. (The description ‘ensemble version’ for the original performance by the composer’s own group comes from this source.). In the present article, I will generally use this abbreviated title for the work; I will also abbreviate titles of other works by the composer that are mentioned several times.

Two other matters can usefully be noted here. First, the ‘Oxford comma’ is sometimes used, by Reich and others, after the word ‘Strings’ in the title of *Variations*: see, for instance, Reich, ‘Variations for Winds, Strings, and Keyboards (1979)’, in Reich, 2002e, p. 99. The Boosey & Hawkes score, however, supplies this comma only on the opening page of music itself (as reproduced in Figure 1): not on the front cover or the title page. (*Music for Mallet Instruments, Voices and Organ*, mentioned later in the present article, is another of the composer’s titles that is subject to inconsistent punctuation.)

Second, over the course of the three sketchbooks involved, Reich changes his mind several times as to his new composition’s title. On 27 July 1979, two early titles read ‘Chamber Music for Strings, Winds & Brass (Chamber Version for Betty Freeman)’, with the last five words crossed out, and ‘Music for Strings [no comma here] Winds & Brass for Betty Freeman’. Freeman was the eventual dedicatee of *Variations*; ‘Chamber Version’ recalls the fact that the first

performance of what was really designed as a work for a fairly full orchestra was given with reduced forces by Steve Reich and Musicians. Soon after this, 'Music for Strings and Winds' (see Figure 4) becomes the title of choice when Reich begins to draft whole sections of the piece. Even after having decided, on 6 September 1979, that the idea of repeating his chaconne progression several times will mean that the work 'becomes a true VARIATION structure', the composer still adheres for some while to this title; only with the sketch dated 13-14 December, at the start of Sketchbook 20, do we encounter a close variant of the eventual one: 'Variations for Keyboards, Winds and Strings' (without a final comma). The confirmatory 'Variations for Winds, Strings, and Keyboards' occurs in the sketch of 17-19 December 1979. Just to confuse matters, the final 30-page, composed-out sketch for the work, with the date of 13 January 1980, is actually headed 'String scoring-Variations for Orchestra'. In addition, the labels on the work tapes in the Steve Reich Archive at the Sacher Foundation adopt several variations to the title, including 'Music for Organs, Strings, and Winds'. The score as published in 1981 establishes the title as *Variations for Winds, Strings and Keyboards* (though even here, as discussed above, the matter of the final comma remains unresolved).

[2] For other published research that draws on the Steve Reich Archive at the Sacher Foundation, see Potter, 2011, pp. 35-41; Potter, Gann, ap Siôn (eds.), 2013, pp. 19-37 (especially pp. 25-29); Pymm, 2013, pp. 279-96 (especially pp. 290-294); Wlodarski, 2015, pp. 126-163; and Hartenberger, 2016. See also endnote 5, below.

[3] The term 'cadential progression', also used for the same phenomenon, seems to have originated with Schwarz's 1981 pioneering article; also see Potter, 2000, p. 229 and Chapter 3's ft. 75.

[4] The instrumental forces of *Music for a Large Ensemble*, completed in December 1978, around a year earlier than *Variations*, are, to quote the composer's programme note on this work, 'the largest I have ever used and include all the orchestral families plus women's voices' (Reich, 2002, p. 97). In interviews over many years, however, Reich has stated his low opinion of this work, which he regards as having functioned merely to help him to compose his way out of the crisis in which he found himself in 1977-1978, after *Music for 18 Musicians* was completed. (See also Potter, 2000, p. 152.)

[5] For further discussions of Reich's harmonic language that are based on research conducted at the Sacher Foundation, see Potter, 2017, pp. 189-207 and 'Sketching a New Tonality, forthcoming.

[6] It should be noted that, in the following discussion of sketches, I have converted the various types of dating that Reich himself uses, including Hebrew references, to a single, easily readable format. The composer's original formulations are included in the main text when dates of complete sketchbooks are involved, as here; my captions to figures reproducing material from these sketchbooks also give the dates that Reich used for the individual items involved.

[7] The technical information here is taken from a personal interview between Steve Reich and the present author, conducted on 27 July 2015 at the composer's home in Pound Ridge, New York State.

[8] For discussion of the problems encountered in sketch studies, see, for instance, Feller, 2004. On p. 176, Feller quotes David Schiff's remark (originally in a publication that is devoted, like the present one, to research into sketch materials at the Paul Sacher Foundation) that 'composers' sketches rarely provide unambiguous evidence of the creative process; they are an incomplete and possibly distorted mirror of a composer's mental activity' (Schiff, 1998, p. 115). For a more recent example of such debates, and yet another publication drawing on materials at the Sacher Foundation, see Steinitz, 2012, pp. 115-134.

[9] Reich knew both Glass and Nyman well, though I cannot prove explicit influence in this regard, in either direction. One example of published research on each of these composers' approach to composing with chord sequences must suffice as evidence here. Bernard (2003, pp. 112-133) compares Glass's (minimalist, modal, non-chordal) *Music in Fifths* (1969) with his (postminimalist, chordally-based) 'Metamorphosis IV' (1988), adopting a highly critical stance towards the latter work. Ap Siôn, 2007, includes several analyses of chordally-based compositions by this composer.

[10] Perhaps curiously, Reich does not use the term 'stacked fifths' in his book, *Writings on Music*. In my interviews with him for *Four Musical Minimalists*, the composer told me that a song he had written in 1957, when he was a student, deployed such a stacked-fifths chord structure, tracing the origins of this idea variously to the opening of the second movement of Béla Bartók's Second Piano Concerto and to the influence of harmonies found in jazz. Another, still essentially 'pre-minimalist', instance is, arguably, to be found in the approach to chord structuring in *Music for Two or More Pianos* (1964). Further, still early, examples of its use in Reich's music occur with the group of pieces written for, and around, the Phase Shifting Pulse Gate: *Pulse Music*, *Four Log Drums* (both 1969) and *Four Organs* (1970): though various explanations are possible for the selection of pitches made in each of these works, the principle of the 'stacked fifth' can be argued to underlie them all. For all the above, see Potter (2000, pp. 155-156, 162-163, 192-194 and 200-203). This includes the complete score of *Music for Two or More Pianos*.

[11] All quotations from the composer's sketchbooks that are given in the main text of the present article appear, as with the manuscript sketches reproduced in the figures, by permission of the Paul Sacher Foundation; this also applies to the quotations relating to the evolution of the work's title, given in endnote 1.

[12] I am grateful to one of the anonymous reviewers of this article for this insight.

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