ANNIE K. YIH

Analysing Debussy: Tonality, Motivic Sets and the Referential Pitch-class Specific Collection

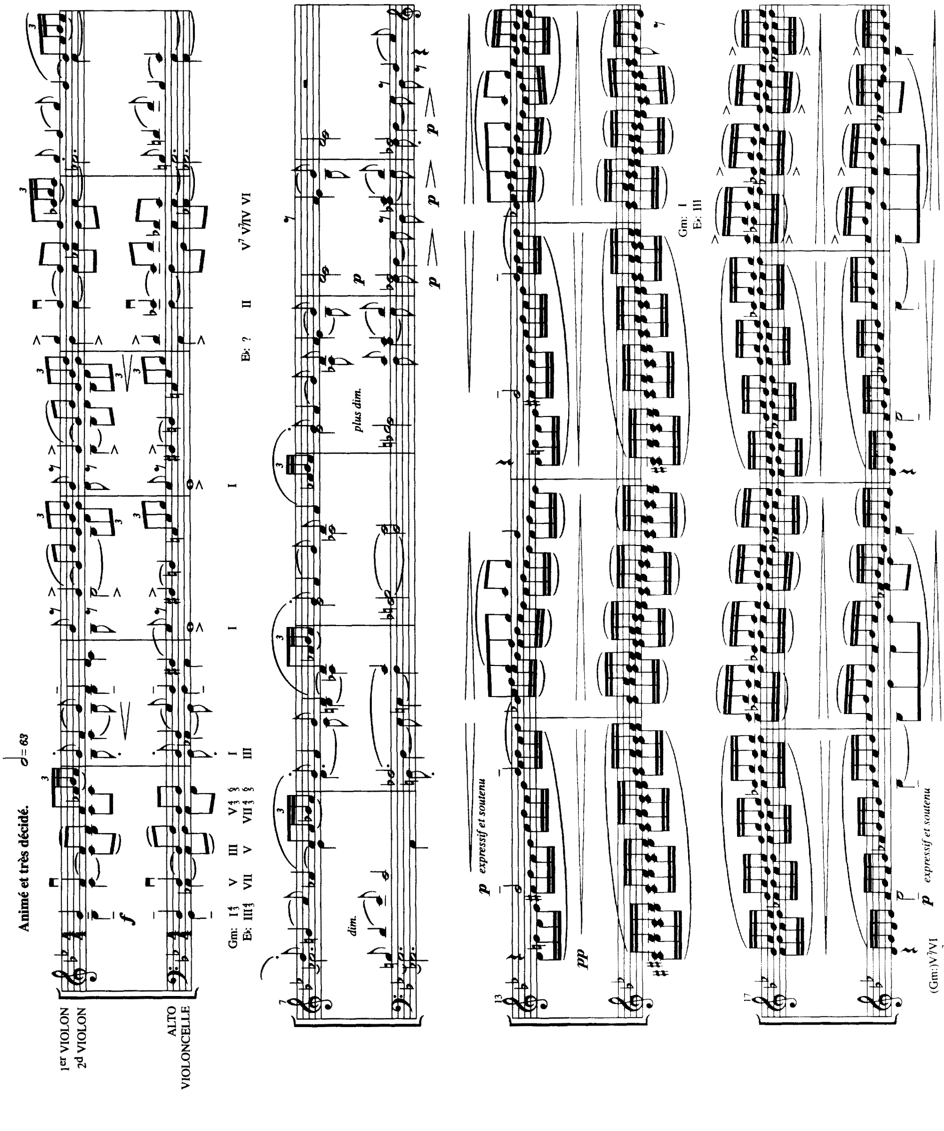
I

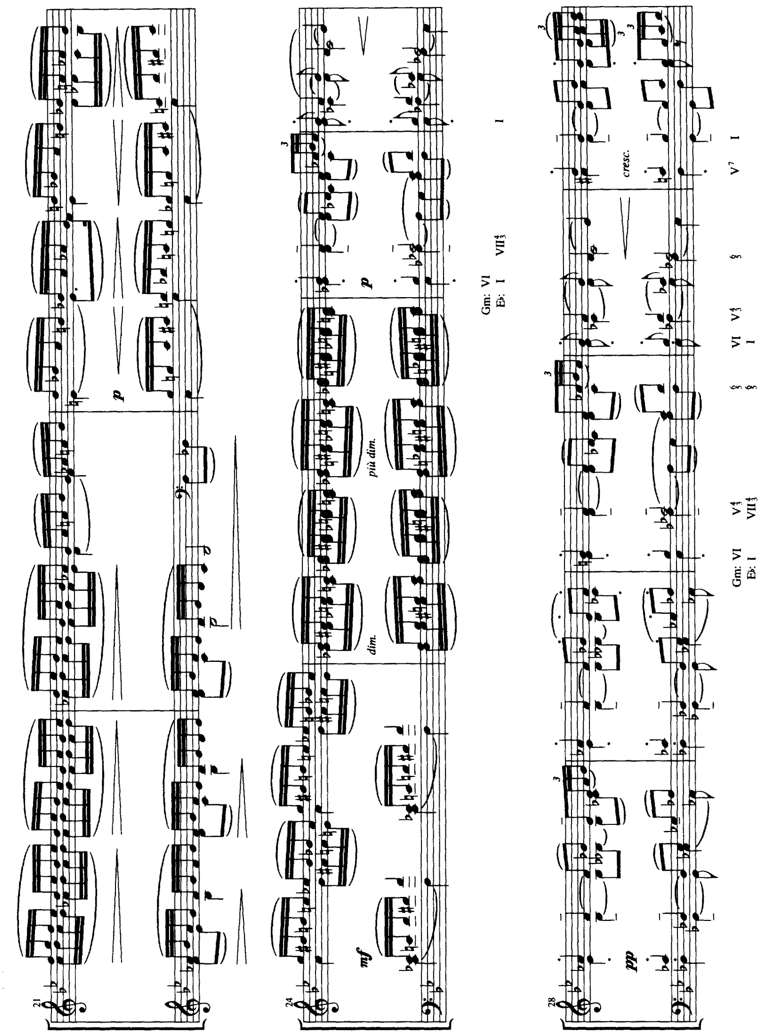
It is well known that Debussy rebelled against conventions, that he wrote extensively about his desire to renew musical thought, and that he criticised the direction in which traditional training was leading the musical world. In a letter to Pierre Louÿs, Debussy wrote: 'tonic and dominant... [have] become empty shadows of use only to stupid children.'[1] His preference for linear over harmonic considerations is reflected in another letter (written in 1893, the same year he composed the String Quartet), in which he glorified Palestrina's treatment of voices '... crossing with each other to produce something which has never been repeated: *harmony formed out of melodies* [emphasis added].'[2] Most of his music, particularly that composed around the turn of the century, is characterised by innovative sonorities (harmonies that are not deployed in a traditional 'tonal' way or that use 'non-functional' extended tertial chords).

In the analysis of works that employ diatonicism but that are permeated with prominent 'experimental' sonorities that cannot easily be explained in functional-tonal terms, the issue of tonality is a complex one. In studying Debussy's music composed at the turn of the century, it is easy to assume that the mere presence of tonal elements endows it with unity and coherence. But by assuming tonal elements as basic and relegating other pitch elements to an ornamental role, the importance of prominent innovative sonorities and unconventional voice-leading can be overlooked, forcing them to fit an *a priori* tonal model. In other words, by positing a hierarchical relationship between diatonicism and chromaticism in this music, one may be blind to the possibility that the so-called 'experimental' features themselves may play a structural role. Coherence in Debussy's music, I shall argue, need not be explained exclusively in functional-tonal terms.

Debussy's String Quartet (1893) is one such work that raises difficult questions for the analyst. Various approaches have been applied to music of this kind. The most common are: 1) modified Schenkerian paradigms and traditional Roman numeral style analysis;[3] 2) set-theoretic parsing of the harmonic vocabulary in terms of intervallic content;[4] and 3) a non-integrative combination of the above.[5] But Debussy's Quartet, I argue, does not fit into

Ex. 1 Debussy, String Quartet, first movement, bars 1–33 (piano reduction)




21
p
24
mf
dim.
più dim.
p
Gm: VI
E♭: I
28
pp
cresc.

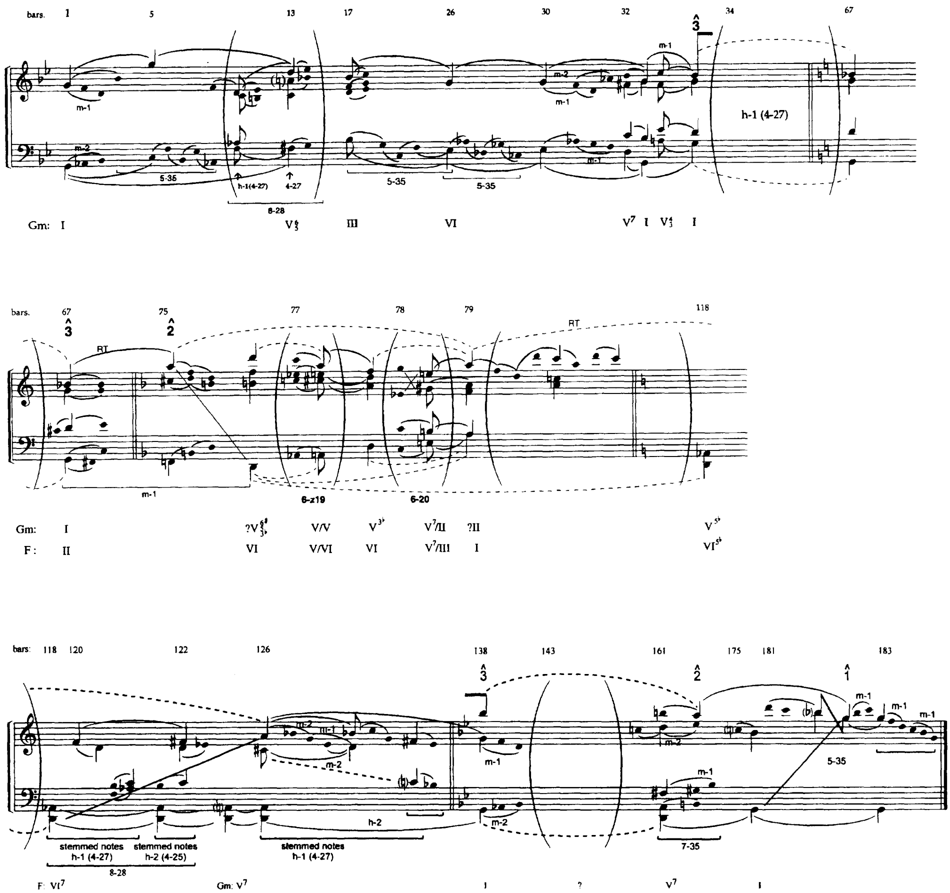
any of these paradigms. In this article, I propose an alternative analytical framework, one that is based on the concept of transformations of motives contained in a referential collection of pitches.

Before presenting my theory, however, I shall begin by examining some of the problems inherent in each of the three approaches listed above. Although Debussy's String Quartet exhibits some features – such as triads and seventh chords – that can be explained in terms of tonal function, and although it has key signatures defining diatonic pitch content, its tonal clarity is often challenged. Such is already the case in the opening passage of the Quartet (bars 1–33, Ex. 1). From the preliminary evidence of Ex. 1, it would seem possible to assume the predominant tonality to be G minor. The tonic triad on the downbeats of all four bars, the tonic pedal in bars 3–4 and the appearance of V^6_3 at bars 13–15 all suggest the key of G minor. However, the linear presentation of pitch materials does not support such a clear reading. The consistent presence of A♭ throughout the passage, the diatonic melody that suggests E♭ in bars 17–21, the melodic emphasis of E♭ major over G bass notes in bars 22–5, and the harmonisation of the opening melody in E♭ (beginning in bar 26), all lead to the conclusion that there may be two tonal centres at work: G, as the tonic of a minor-mode collection, though with a strongly Phrygian inflection of scale-degree 2, A♭; and E♭, as tonic of a diatonic major collection. Not only do alternations between these two third-related tonal areas (albeit without a strong cadence on either tonic) create an ambiguous environment for a clear monotonal interpretation, they also signify a polemical harmonic interpretation of this opening music, that is, E♭ as VI of G or G as III of E♭.[6] As the music progresses, it is further complicated by non-tonal pitch elements (whole-tone, atonal and octatonic) that cannot be explained in terms of traditional tonal relationships. Furthermore, the key relationships across the four movements are also difficult to explain using conventional tonal theory.

Using traditional Roman numeral notation on a local level, one would have to label the chords as having numerous chromatic substitutions or altered notes (for example, in the second chord of the first movement, the dominant seventh with lowered fifth, A♭, and a sub-tonic instead of the leading note, F♮ instead of F♯; in bars 120–25, a dominant pedal with a lowered third, F♮, and lowered fifth, A♭, that occurs in the retransition to the tonic; or, in bars 129–42, where a lowered sixth, B♭, appears with a lowered fifth, A♭, over a dominant pedal). This is a rather clumsy practice. One would also have to ignore the motivic significance of several interesting, if unconventional, sonorities.

If G is read as the tonal centre for the first movement of the Quartet, then a modified Schenkerian analysis may be possible. Ex. 2 illustrates such a tonal reading in which two occurrences of a foreground third progression may be identified in the first movement. The last note of the first occurrence, $\hat{1}$, becomes an inner voice as the beginning of the second occurrence of $\hat{3}$ overlaps

Ex. 2 Debussy, String Quartet, first movement



as an upper voice at bar 138. The two third progressions, however, are only foreground events for they are not sufficiently supported by motivic and harmonic expansions to constitute an *Urlinie*. Although it seems on the surface that the first occurrence could be read as a prolongation of $\hat{3}$, or a $\hat{3}$–$\hat{2}$ interruption, and thus as part of a $\hat{3}$–$\hat{2}$–$\hat{1}$ *Urlinie* for the movement (as are suggested by the use of beams in the graph), such a tonal reading is reductive to a fault, forcing the reading to fit a paradigm.[7]

The problems of a traditional tonal analysis are obvious in Ex. 2. The long stretches of music appearing in parentheses in the graph (bars 34–60, 79–117 and 143–60), as well as other shorter passages, contain sonorities that can only be explained in modified tonal terms. Too much material of critical importance in the piece is left unaccounted for by such an analysis. For central to Schenkerian theory is the organic unity – on background, middleground and foreground levels – of similar and mutually corroborative melodic diminutions of the fundamental line, which is itself founded on members of the tonic triad. Unity at the middleground level, in this case, would have to rely on relationships that are not characteristic of tonal theory. In brief, these two overlapping third progressions can only be obtained by modifying Schenker's theory in the following ways: 1) by ignoring those passages in parenthesis (in Ex. 2) that disrupt a continuous harmonic progression (such passages make up almost half of the movement); and 2) by reducing motivic characteristics of distinctive non-tonal sonorities to non-structural entities. I shall return to various set and motivic annotations of Ex. 2 in Part III below.

Approached from another perspective, one might consider Robert Morgan's concept of 'dissonant prolongation' for an explanation of the passages in parentheses, but they would have to be heard in the context of consonance-dissonance relationships.[8] In this study, I do not assume such a relationship; rather, I argue that the harmonic relationships depend on underlying motives, and that the music meanders through transformations of these motives within referential pitch collections.

Confronted with a G-minorish surface, supplemented with tetrachordal and pentachordal arrangements surrounding G, complete with A♭, A♮, F♯, F♮, E♭, E♮, B♭ and B♮ in the opening section of the first movement, one may speak of modal 'inflections' within a G major, minor or Phrygian scale as the basic pitch material. By settling on the concept of monotonality, relegating modal inflections and non-tonal elements as expansions of tonal harmonies, one assumes tonal primacy and ignores the possibility of other unifying principles.

To analyse such materials throughout the Quartet, set theory would seem to possess the appropriate power. Its advantage over other systems lies in its self-referential nature for it need not be used to consider hierarchies of relationships (although such considerations are, of course, possible). While set-theoretic operations can reveal a network of interval-content associations, a strictly set-theoretic analysis would not account for important tonal features in the piece (as revealed above), just as a strictly Schenkerian or functional harmonic analysis would not account for the experimental elements in the piece.

What would seem to be called for in Debussy's Quartet, then, is an analytical approach that is sensitive to all aspects of its sounding qualities. Part II of this article will introduce theoretical tools and concepts for the understanding of unity and diversity in the Quartet, and Part III makes use of these in a representative analysis of two passages previously identified in Ex. 2 as seemingly inimical. The analysis offers an alternative way of hearing motivic relations within a unifying referential context.

II

The Referential Pitch-Class Specific Collection (RPSC)

Considering the pitch organisation of the first movement to be linear, and that the notion of third-related keys (G and E♭) with modal inflections renders a traditional tonal reading too rigid, I propose a more flexible theory that allows the coexistence of various pitch materials. My theory understands Debussy's String Quartet to be founded on a diatonic collection of pitches and that the pitch constructs in this Quartet are regarded as referential motivic subsets with respect to this diatonic collection. My analysis of the music then aims to reveal how all pitch materials are derived from transformations of motives contained in this referential pitch collection. This theory will not only consider the various materials as unified, that is, that they are generated from the same source and integrated by common motivic material, but will also account for the key relationships across the movements, inexplicable through exclusive recourse to tonal principles.

With two flats as the key signature of the first movement, as well as the fact that it begins and ends with a G-minor triad, I assume the G-minor scale to be the basic pitch material to which all subsequent transformational processes are applied and from which everything (harmonically and melodically) is generated. In the discussion that follows, I shall refer to this scale as the Referential Pitch-Class Specific Collection (abbreviated to RPSC).[9] Leading from this assumption is a recognition of G as the 'key note' of this scale. The 'key' of G is only identified by motivic association, however, for even though the members of the scale resemble those in a G-minor scale, they are not always deployed according to tonal principles.

This study identifies two local-level transformational processes to account for much of the pitch material: 1) 'pc substitution', and 2) 'voice-leading transformation'.[10] Both processes will be applied to motivic subsets of the RPSC to explain their continuous development. The motivic focus of this article offers an appropriate theoretic modelling of Debussy's preference for harmonies 'formed out of melodies' (Lesure and Nichols 1987, p. 42).

Pitch-class substitution is the process of substituting one pitch for another in a harmony or collection of pitches. Although this process is similar to Schoenberg's concept of 'transformation' – which he defines as the use of chromatic notes to substitute for diatonic ones in order to expand tonal harmonies (Schoenberg 1969, pp. 44–50) – pc substitution in this study is not restricted to tonal formulations.

Voice-leading transformation describes the transformation of one or more pitches in a harmony that has motivic significance, resulting in another harmony that is transpositionally- or inversionally-related to the original harmony. Take the D–F–A♭–C tetrachord, for example, in a context where monotonality is not apparent. When D and C move to E♭ and B respectively, tetrachord E♭–F–A♭–B is generated; as an unordered set, E♭–F–A♭–B is transpositionally related to D–F–A♭–C. It is in this unordered set relation that the motivic significance of the relationship between the two tetrachords under discussion is to be understood. Unlike harmonic transformation in Schoenberg's music, pc substitution and voice-leading transformation in Debussy's Quartet create new harmonic sonorities that are developed, emphasised and projected through repetition, sequence, chordal parallelism, and other transformational processes. Consequently, emphases of non-tonal harmonies (including octatonic and whole-tone) and non-tonal voice-leading subject the listener to different pitch collections in relation to the diatonic RPSC. These generated harmonies cannot be described as functional substitutes for tonal ones. Their omnipresence is not only motivic but, more importantly, weakens the listener's perception of tonal relationships in the traditional sense. It is precisely the prevalence of these sets that undermines an exclusively tonal reading.

I extend the use of the term transformation to describe a voice-leading transformation between the two tetrachords in terms of a voice-leading set of four notes, B–C–D–E♭. These notes, which occur as linear events, form what will be called a voice-leading transformation tetrachord (abbreviated as VLT-tetrachord). As the music proceeds, this particular linear set gains prevalence; indeed, its particular voice-leading pattern can be seen to be characteristic of Debussy's music in general. Though the concept of transformation here seems to resemble Lewin's 'INJection Function' – which describes an operation within a canonical group or considers canonical equivalence with respect to the total-interval content of sets – my concept of VLT process focuses on the formation of a set that expresses the linear voice-leading motions in pitch space of pcs resulting from this process.[11]

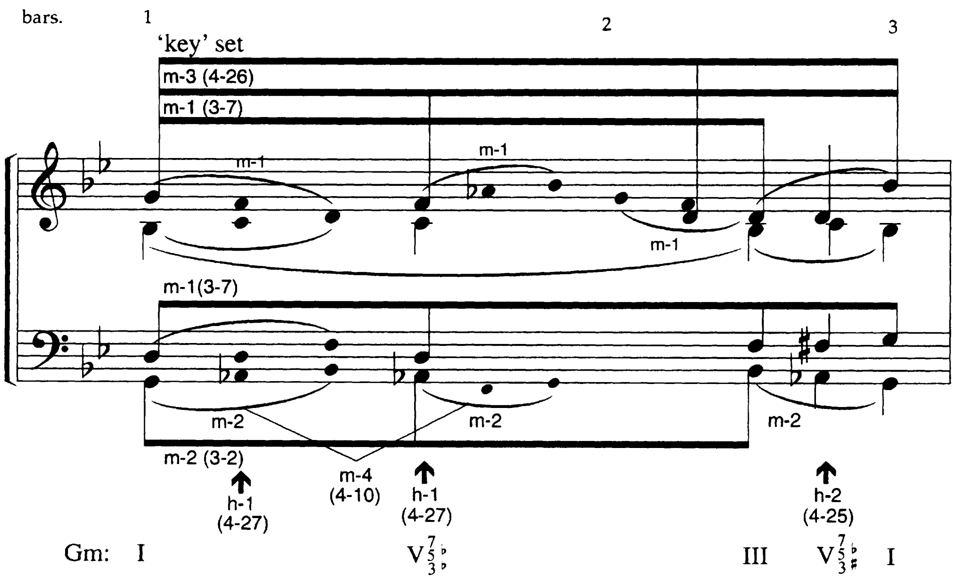
The continuous development of motivic subsets of the RPSC, understood through the two processes – pc substitution and voice-leading transformation – and their resultant sets, will be explored in the ensuing analysis. In this way, the unity of the Quartet becomes apparent.

III

Bars 1–33

I begin with the identification and discussion of the principal motives and their inherent properties in the first movement of the Quartet, followed by examples of the manner in which they are expanded through the two processes at the surface level. As a general principle, it is assumed that such motives may already have undergone transformations and are thus not pitch-specific subsets

Ex. 3 Melodic and harmonic motives (first movement, bars 1–33)



of the RPSC. (This is not dissimilar to examples of tonal music that begin in the tonic.)

Ex. 3 (bars 1–3) shows four principal motives: two each in linear and vertical formation. In this and the ensuing examples, the two linear (melodic) motives are labelled as m-1 and m-2, and the two vertical (harmonic) motives, h-1 and h-2. Of all these motives, only one form of m-1 in the upper part (G–F–D) is a pitch-class specific subset of the RPSC; the others contain pitches that are not pc-specific members of the RPSC (A♭ and F♯) but could be heard as modal inflections if a tonal reading were assumed. What makes these four motives important is that their boundary pitches form pc-specific members of the G-minor 'key' triad (G–B♭–D), which appears as the first and last chord of the movement.

The identification of the two linear motives depends on several factors. First, they both appear in the outer parts; second, they appear in counterpoint to each other; third, their significance is emphasised by immediate repetition and reappearance in the same instrumental parts. Other factors identifying these motives will become apparent as this study continues, for they involve processes that require further explanation.

The first linear motive, m-1, is a pitch-class specific trichord (G–F–D) outlining G and D; it is played by violin 1 in bar 1. The significance of m-1 is emphasised by its immediate reappearance, played by the same instrument but in retrograde and transposed up a minor third: F–A♭–B♭. Motive m-2, which consists of specific pcs G–A♭–B♭, outlines G and B♭; it is played by the cello in counterpoint to m-1 in bar 1. Like m-1, m-2 also recurs immediately in the same instrument but is inverted, transposed and reordered: A♭–F–G.

Set-theoretic labels are useful at this point to represent the motives' inherent properties and are pertinent to the description of motivic relationships. Using Forte's nomenclature, m-1 and m-2 are identified (on Ex. 3) as set-classes 3–7 and 3–2, respectively.[12] The relationship of the second to the first appearance of m-1 can thus be expressed as T_3(3–7); and, the relationship of the second to the first appearance of m-2 can be expressed as T_1I(3–2). Motives in Ex. 3 show a distinction among (close-to-surface) structural levels. Such a hearing is intuitively correct, given the prominence of these motives in the melodic figuration. Beams in Ex. 3 draw attention to motivic repetitions in the opening phrase.

Although most of the motivic material occurs at or close to the surface, a relatively deeper level of motivic activity may also be perceived. Consider the expansion of m-1. A new dimension may be added to the beginning notes of grouped surface events of m-1, thus generating a tetrachord, labelled m-3 in Ex. 3. Motive m-3 (G–F–D–B♭, represented as set-class 4–26) is a pc-specific subset of the RPSC. This motive constitutes the three notes of m-1 (G–F–D) and a fourth note, B♭, which follows D of m-1 at a leap of a sixth, ending the first fragment of the opening phrase on the downbeat of bar 3. The same tetrachord also constitutes the first and third triads (G–B♭–D and B♭–D–F, or tonic and mediant of G) in bar 1. Because tetrachord 4–26 is a subset of the pentatonic 5–35, emphasis of its pentatonic sonorous quality weakens the listener's perception of the key of G.

While m-1 is expanded in the violin 1 part, m-2 is expanded in the cello part. If repetitions of smaller motives are grouped into larger units, another dimension may be added to motive m-2, generating a second tetrachord (superset) motive, F–G–A♭–B♭, which is featured in the bass line and is labelled as m-4 in Ex. 3. Like m-3, this tetrachord is generated from the union of two interlocking inversionally-related trichords, 3–2: G–A♭–B♭ (m-2), pc set [7,8,10], and A♭–G–F, pc set [5,7,8], expressed as T_3I of m-2 [7,8,10]. This unordered linear tetrachord, 4–10, is characterised by its symmetrical BIP: [2][1][2].[13] The significance of this BIP lies in its having the characteristic property of an octatonic set. While the significance of m-3 lies in its being a pc-specific tetrachord of the RPSC, the second tetrachord, m-4, is a linear motive; the prominence of both tetrachords emerges as the music proceeds.

All pitches of the four melodic motives of the outer-most audible parts spell D–F–G–A♭–B♭. These notes form pentachord 5–25, which reappears as an important sounding body later in the Quartet. The pentachord 5–25 is a subset of both the diatonic and the octatonic collections: the emergence of octad 8–28 in the Quartet helps make clear the significance of this pentachord.

As harmonic progression in this music does not project unity exclusively in tonal terms, prevalence of motivic manifestations in the vertical dimension may aptly substitute for unifying tonal principles. In addition to the two trichord and two tetrachord motives (labelled in Ex. 3), two vertical sonorities are labelled h-1 and h-2. The first, which consists of specific pcs D–F–A♭–C, is emphasised by a down bow on the second beat of bar 1. It harmonises F of m-1 and A♭ of m-2, where F and A♭ are perceived as passing notes of their respective melodic motives expanding members of the G-minor key triad. Like the melodic motives, these harmonies' sonorous properties also have motivic significance.

The motivic significance of h-1 lies in its being the progenitor through pc substitutions and/or voice-leading transformations of other non-pc-specific subsets of the RPSC. A case in point occurs through pc substitution of F♯ for F where motive h-2 (D–F♯–A♭–C) is generated by transformation from h-1 on the last beat of bar 2 (indicated by a curving arrow at the bottom of Ex. 3). The second motive h-2, arranged in its prime form, is identified as 4–25 (the French-sixth chord). Pc set 4–25 is a symmetrical tetrachord with BIP: [2][4][2]. Although one could regard A♭ as substitute for A and hence a dominant-seventh chord, one would then be ignoring the music's characteristic whole-tone quality.

Transformations of harmonies through pc substitution, pc-adjacency voice-leading and voice-leading transformation are a common practice in late nineteenth-century music. In relation to the diatonic RPSC, both motives h-1 (D–F–A♭–C, henceforth identified as tetrachord 4–27) and h-2 (D–F♯–A♭–C, identified as 4–25) can be explained as sets generated by pc-substitution from a pitch-specific subset of the RPSC, D–F–A–C (tetrachord 4–26), with A♭ of D–F–A♭–C substituting for A of 4–26; and 4–25 is generated from D–F–A–C by substituting F♯ and A♭ for F and A respectively. Although D–F–A–C (arranged in its prime form, A–C–D–F) is not harmonically exploited here, another transposition (T_7) of tetrachord 4–26 has been featured as melodic motive m-3 in the opening thematic unit, D–F–G–B♭. This transposed set is also a pc-specific subset of the RPSC.

The pc-specific motive m-3, tetrachord 4–26, when arranged as an unordered set (D–F–G–B♭), is characterised by its symmetrical BIP: [3][2][3]; its internal intervallic configuration can be described as a union of two interlocking inversionally-related trichords, pc-set 3–7 (two forms of motive m-1): G–F–D (m-1), pc set [2,5,7], and F–G–B♭, pc set [5,7,10], where the relationship of the latter to the former is T_0I of [2,5,7]. It can also be described as two inversionally-related subsets: the 'key' set G–B♭–D that occurs as the first vertical chord and B♭–D–F that occurs as the third. Aside from being a subset of 5–25 (mentioned above), m-3 (set 3–7) is also a subset of the pentatonic 5–35 (F–G–B♭–C–D), another prevalent harmony in the Quartet.

Ex. 4 First movement, bars 194–205

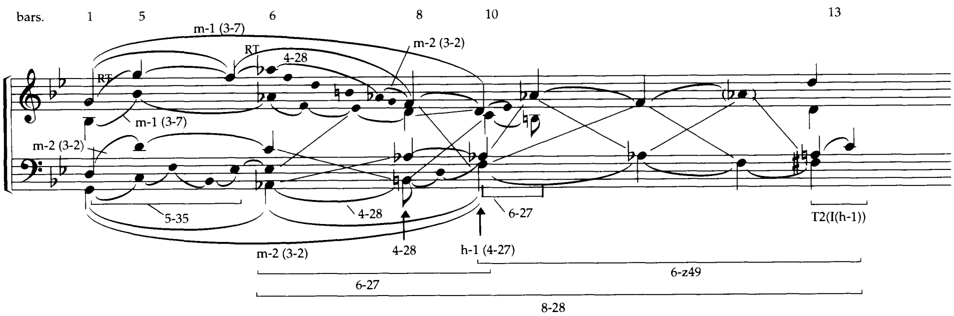
Ex. 4

Thus far, of the four tetrachord motives identified, the property of symmetry is contained in three: 4–26, 4–25 and 4–10. We shall see below that the prevalent use of symmetrical and inversionally-related sets undermines an exclusively tonal analysis.

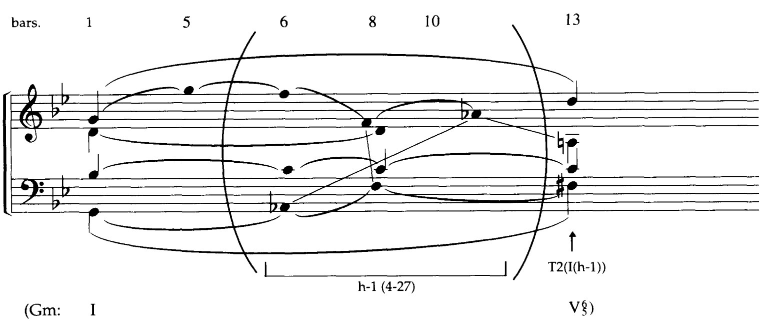
Having identified the principal motives in bars 1–3 and their inherent properties, the last part of this article will discuss how these motives are integrated and expanded at the surface level through the two processes of pc substitution and voice-leading transformation. Compared with those generated from motives m-1 and m-2, other symmetrical and inversionally-related sets occur less conspicuously. The diatonic pitches of the four melodic motives (ignoring A♭ and F♯ for the time being) spell the pentatonic 5–35, G–B♭–C–D–F. Unordered, 5–35 is a symmetrical set, a pitch-specific subset of the RPSC, and has an ambiguous tonal property. Like other pitch-specific subsets of the RPSC, this pentachord appears in different dimensions throughout the Quartet. One prominent instance occurs at the conclusion (codetta) of the first movement in a running passage, with specific pitch-classes of this pentachord in unisons and octaves. (See Ex. 4, first movement, bars 194–205.)

Symmetrical and inversionally-related sets, much favoured by Debussy in the Quartet, also occur in conjunction with expansions of the melodic and harmonic motives in multi-dimensional ways. (Exs. 5a and b present graphic analyses of bars 1–13.) Beginning in bar 1 in Ex. 5a, G4 of m-1 (G–F–D) is expanded in violin 1 by registral transfer to G5 in bar 5. As G5 descends to F5 on the second beat of the same bar, F5 is expanded from that point by registral transfer to F4 in bar 8, ending on D4 on the fourth beat of the same bar. The rhythmic and melodic emphases of F5 to F4 yield a non-functional fully-diminished-seventh chord, which can be identified as an octatonic tetrachord 4–28, B–D–F–A♭. As shown in the example, 4–28 appears in linear as well as vertical configurations. The expansion of m-1 is echoed in the cello part by the melodic expansion of T_3I of [7,8,10], G–A♭–F (pc set [5,7,8], shown as slurred notes in the example). The note G2 from the opening unit is connected to A♭2 on beat four of bar 5 through a circle of perfect fifths that begins on the downbeat of bar 5. A♭2 in the cello is then connected up to F3 (on the fourth beat of bar 8) as a member of an arpeggiation of tetrachord 4–28 (A♭2–B2–D3–F3). The motion from G2 in bar 1 to A♭2 at the end of bar 5, which then

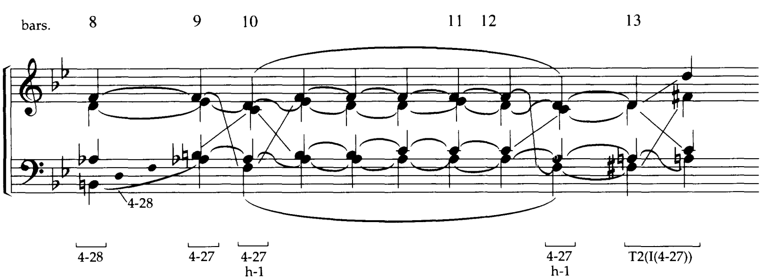
Ex. 5a First movement, bars 1–13



Ex. 5b

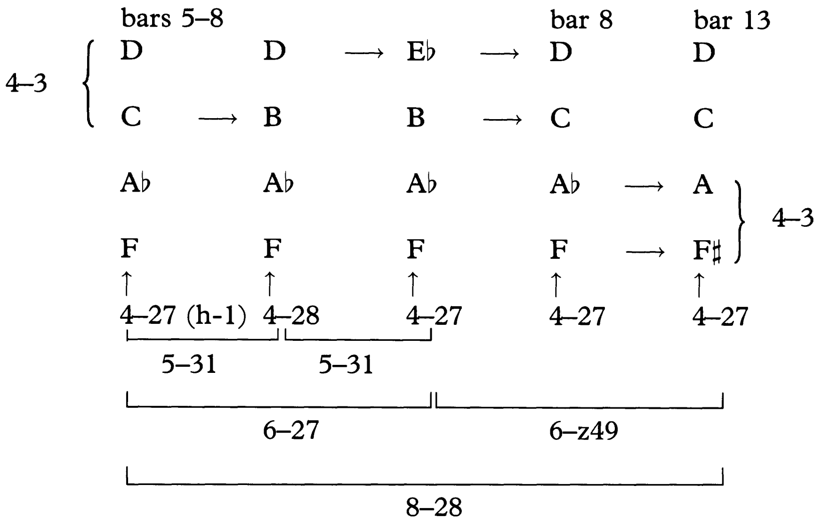


Ex. 5c



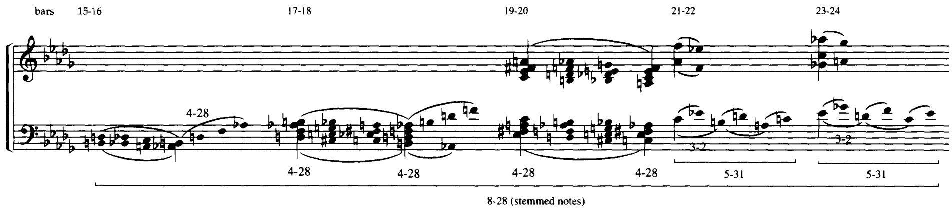
continues to F3 in bar 10, yields a large-scale reordered motive m-2 (G–A♭–F). As G2 moves in a circle of descending perfect fifths to A♭2 in bars 58, the notes involved in this motion yield a diatonic hexachord 6–32 (G–C–F–B♭–E♭–A♭), which is also a symmetrical set.

Fig. 1 Transformations of motive h-1 (D-F-A♭-C)



In bars 5–8, 8–12 and 12–13 (Ex. 5c), the harmonic motive h-1 undergoes three transformations, generating octatonic elements, and culminating in the octatonic octad 8–28 (D–E♭–F–F♯–A♭–A–B–C).[14] (See Fig. 1 for a summary of the voice-leading transformations of motive h-1, 4–27.) As B substitutes for C as a lower neighbour note in bars 6–8, an octatonic tetrachord 4–28 is generated. Then, in bars 10–12, two notes, E♭ and B, oscillate with their neighbour notes D and C of motive h-1, respectively. These four notes draw attention to their pairing as two voice-leading dyads (B to C and D to E♭), forming a VLT-tetrachord 4–3, B–C–D–E♭. (Tetrachord 4–3 has the octatonic characteristic of a BIP [1][2][1].) D and C of h-1 (4–27) move through voice-leading transformation to E♭ and B, respectively, resulting in another 4–27 (F–A♭–B–E♭). This new form of h-1 (F–A♭–B–E♭) is related to h-1 (D–F–A♭–C) at T_3. E♭ and B and the four notes of motive h-1 spell another octatonic hexachord 6–27. (B–C–D–E♭–F–A♭ is one of only six classes of octatonic hexachords contained in the octatonic octad 8–28.) F♯ and A appear in bar 13, voice-leading transformations of F and A♭ respectively. This transformation changes D–F–A♭–C (h-1) into D–F♯–A–C, an inverted form of h-1 at T_2, which can be expressed as T_2I of [2,5,8,0]. The two notes F and A♭ have been rendered significant through voice exchange in bars 8–12, and the change of F and A♭ to F♯ and A makes them stand out as two pairs of related dyads. Together, the four linear notes spell another octatonic VLT-tetrachord 4–3, F–F♯–A♯–A. With F♯ and A added to the four notes of motive h-1, they spell the octatonic hexachord 6–Z49 (another one of only six octatonic hexachords).

Ex. 6 Fourth movement, bars 15–24



When we consider all eight notes together, they spell the octatonic octad 8–28, B–C–D–E♭–F–F–A♭–A.

While it is possible to read the passage as a connection of the G-minor tonic triad in bar 1 to an inverted dominant chord on the downbeat of bar 13, as Richard Parks (1989, p. 10ff) has done, such a tonal reading neglects the motivic significance of h-1 in supporting the melodic motives and their transformations in bars 2–12. The voice-leading transformations of h-1, 4–27, are summarised in Fig. 1, revealing: 1) the two occurrences of the VLT-tetrachord 4–3 (B–C–D–E♭ and F–F♯–A♭–A) between two pairs of transformationally-related tetrachords (4–27); 2) the derivation of two of only six classes of octatonic hexachords (6–27 and 6–Z49); and 3) the generation of the octatonic octad 8–28.

The emerging importance of these eight pitches, which first appeared as the pitch-class specific octad in bars 8–13 of the first movement, can be found in bars 15–24 of the fourth movement, where they are featured as two 4–28s (Ex. 6). Other octatonic sets appear at higher structural levels in the music. Two pairs of inversionally-related octatonic pentachords (5–28 and 5–31) are contained in the two hexachords, 6–Z49 and 6–27 respectively, in bars 1–13 of the first movement. The two pairs of inversionally-related pentachords, 5–28 and 5–31 and their inverse, and their symmetrical BIPs are illustrated in Figs. 2a and b respectively. (Their significance, however, will not be observed until after bar 34, in the first passage that appears in parentheses in Ex. 2.)

While the above discussion has focused on Debussy's preference for symmetrical octatonic elements, the following discussion will reveal the integration of voice-leading-related diatonic and octatonic pitch elements. Pertinent to foreground events, several pairs of inversionally-related diatonic chords in the Quartet are of particular motivic interest to Debussy. Among the more prominent diatonic chords, we find three common traits: 1) that most of the referential pitch-specific subsets have symmetrical properties; 2) that the relationship between these subsets is usually inversional at a transposed level; and 3) that larger sets usually contain interlocking inversionally-related subsets. Because these pairs of diatonic chords are contained in the RPSC (represented as septad 7–35), an examination of 7–35's content and its inherent properties may prove

Fig. 2a

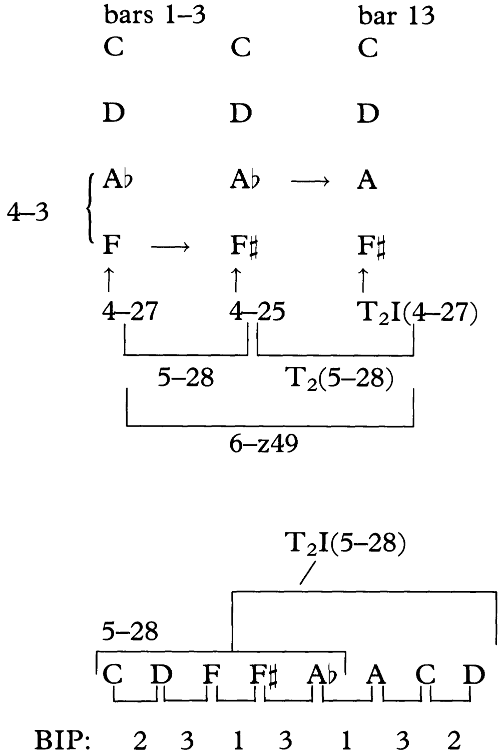
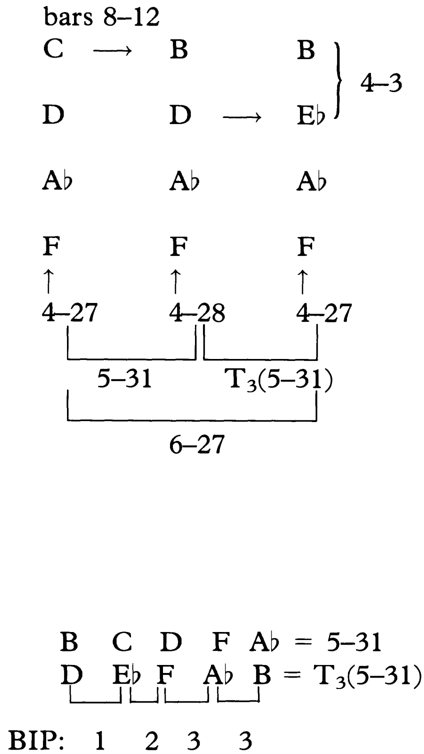


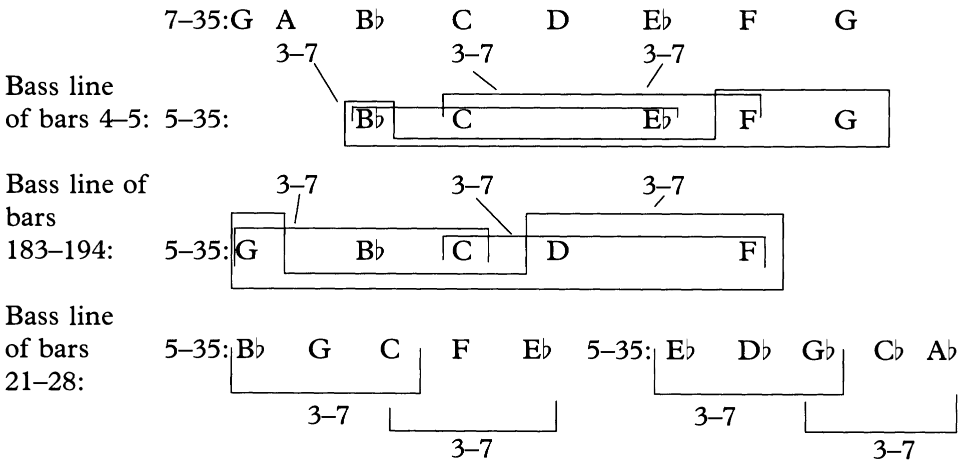
Fig. 2b



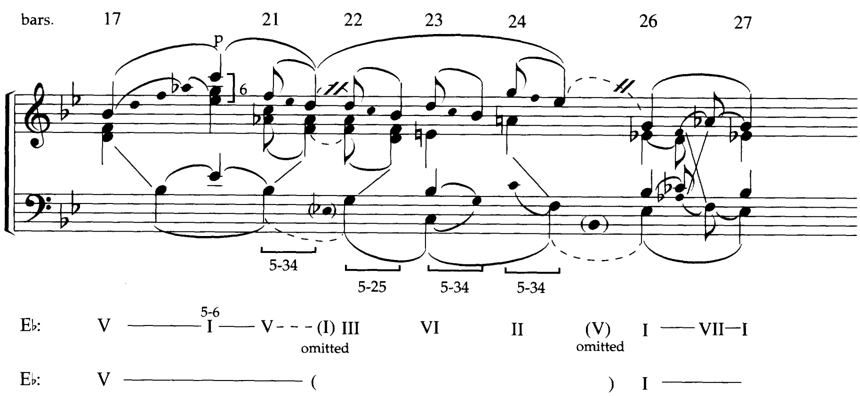
useful. Fig. 3 demonstrates referential pitch-specific subsets contained in the RPSC and their interrelationships. One of 7–35's most characteristic diatonic properties is its six occurrences of perfect fifths: its interval-class vector reads [254361].[15]

Two of many examples of each of these diatonic subsets in the Quartet are given in Exs. 7a–b and 8a–b (reductive analyses of bars 17–27 and 27–33, respectively). As has been discussed in reference to Ex. 5, the six pitches, which are presented in a circle of fifths, G–C–F–B♭–E♭–A♭, in the cello part in bars 4–5, spell hexachord 6–32. Although A♭ of this 6–32 is not a pitch-specific member of the RPSC, the boundary pitches, G–A♭, are pitch-specific members of m-2, trichord 3–2. The internal structure of 6–32 also has motivic significance. 6–32 contains two interlocking inversionally- and transpositionally-equivalent pentatonic pentachords, 5–35: E♭–F–G–B♭–C and C–B♭–A♭–F–E♭. The first pentachord appears in its pitch-specific form, as a subset of the RPSC; the notes are expanded by melodic figurations at the surface level and appear as 'out-of-order' fifths, B♭–G–C–F–E♭. Pentachord

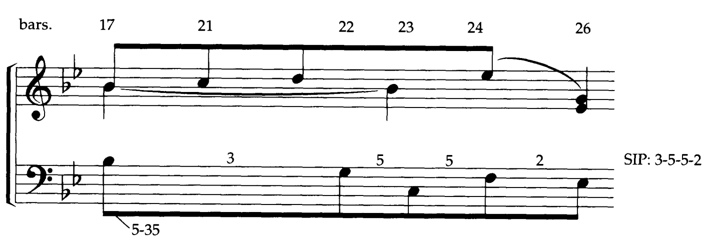
Fig. 3



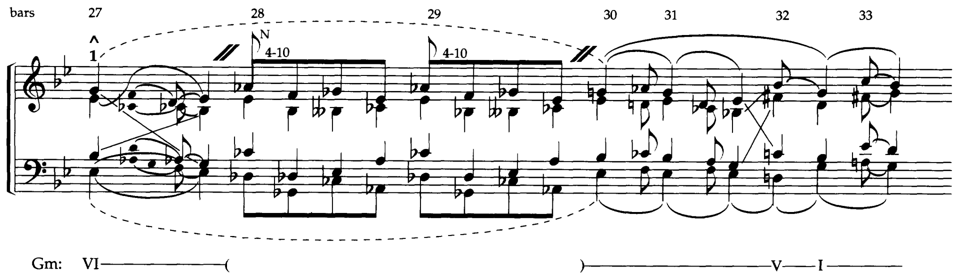
Ex. 7a First movement, bars 17–27



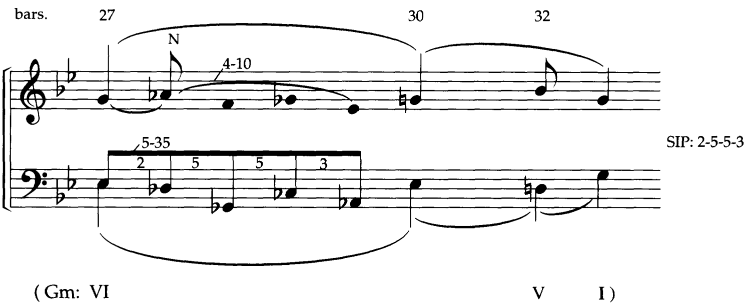
Ex. 7b



Ex. 8a First movement, bars 27–33



Ex. 8b



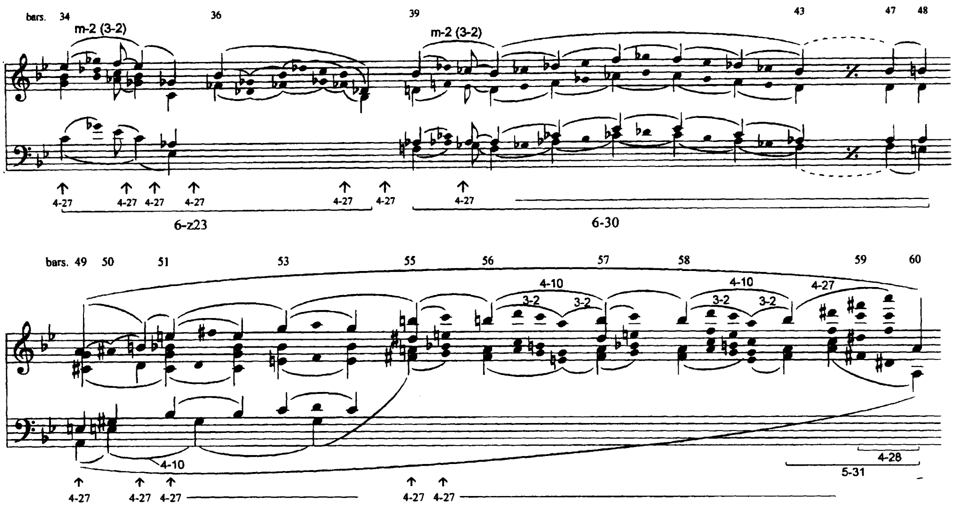
B♭–G–C–F–E♭ appears as an expanded bass line in the cello part connecting the E♭ theme to the E♭-major triad on the downbeat of bar 26. (The notes are beamed in Ex. 7b.) As shown in Ex. 7a, these five notes in the cello part support the connection of two of the specific pitches of m-1, F to G, in the violin part. Then, the E♭-major triad in bar 27 (Ex. 8b) is expanded to bar 30 by the occurrence of another pentachord 5–35, which appears in a transposed and again 'out-of-order' form in the cello part, E♭–D♭–G♭–C♭–A♭. The occurrence of the second pentachord supports the connection of two of the specific pitches of m-2, A♭ to G, in the violin 1 part (Ex. 8a).[16]

I have thus far accounted for the motivic interrelationships of structurally important pitches in bars 1–33. Although an exclusively tonal account of this passage is possible, the motivic approach provides a more unifying account of all the pitch materials (diatonic, octatonic, whole-tone, non-tonal) in this music.

Bars 34–60

Bars 34–60 constitute the first extended passage in which tonal functions are not discernible. While diatonic pitch materials are present, they are not

Ex. 9 First movement, bars 34–60



subjected to functional tonal treatment and the harmonies appear to be derived from other means of organisation. The discussion below of Ex. 9 (bars 34–60) supports my contention that the harmonic language of the work is principally that of motivic expansion.

In bars 34–5, the beginning and ending harmonies of the first phrase segment, C–E♭–G♭–B♭ and E♭–A♭–C–G♭ (melodically and rhythmically emphasised in Ex. 9), support a transposed inverted form of motive m-2 (E♭5–G♭5–F5) in the violin 1 part. While the two harmonies combine to spell the dominant-ninth chord of D♭, what follows is not the expected D♭ triad but a G♭-seventh chord with an added C that cancels any implication of C♭ as the tonic, as has been suggested by the G♭-seventh chord. These harmonies make no sense as tonal configurations but can be explained in terms of harmonic and melodic motives that have been presented at the beginning of the piece, and now resurface in new manifestations. Explained in the light of set-theoretic relationships, the first two harmonies in bars 34–5 (C–E♭–G♭–B♭ and E♭–A♭–C–G♭) are two forms of 4–27 that are inversionally equivalent at T_6, and the next seventh chord in bars 36–8, G♭–B♭–D♭–F♭, is also a 4–27, inversionally equivalent to the first seventh chord C–E♭–G♭–B♭ at T_4. (Fig. 4 summarises their properties.) Debussy's preference for inversionally-related chords, rather than a more traditional tonal harmonic conception, is clearly at the root of this passage.

Because these harmonies occur in a linear and sweeping fashion such that not one single harmony is emphasised, the listener can perceive a union of these three inversionally-related tetrachords. They form a collection of pitches

Fig. 4

Bars	34		35		36–38	
	G♭		G♭		G♭	
	B♭	⟶	A♭	⟶	B♭	
	E♭		E♭	⟶	F♭	} 4–3
	C		C	⟶	D♭	} 4–3
	↑		↑		↑	
	4–27		T_6I(4–27)		T_4I(4–27)	
	6–27 (bars 34–38)					

that belongs to the D♭-major scale (septad 7–35); and in bars 36–8, where F is changed to F♭, a combination of the parallel major and minor scales of D♭ is suggested. What follows in bars 39–47 is a passage that might be explained as related to bars 34–5 in terms of modified modal theory; such an explanation, however, would suggest that a new system of musical thought is suddenly being used. The resulting combination of different analytical perspectives would constitute a kind of material disunity that is not musically apparent in this piece. I believe that this passage may be explained as an expansion of melodic and harmonic materials already presented in the first section of the movement.

First, in bar 39, there are two tetrachords (F–A♭–D–B♭ and A♭–C♭–F–D♭), which are transposed and inverted forms of motive h-1, pc set [0,2,5,8], 4–27; they are expressed as $T_{10}I$ of [0,2,5,8] and T_1I of [0,2,5,8] or h-1, respectively. When these two tetrachords are combined, the result is the octatonic hexachord, 6–27 (D–D♭–C♭–B♭–A♭–F), which is inversionally equivalent to the prominent hexachord 6–27 (B–C–D–E♭–F–A♭) at T_1 in bars 8–12 (refer to Ex. 5a). Second, in bars 39–47 at the end of the arpeggiation of tetrachord 4–27, F–A♭–D–B♭ or $T_{10}I$ of [0,2,5,8], another 4–27 is generated through voice-leading transformation. B♭ and F of the F–A♭–D–B♭ tetrachord move to B and E, respectively, generating E–A♭–B–D. This latter 4–27 is related to the former at T_6. The combination of these two tetrachords generates another octatonic hexachord, 6–30 (A♭–B♭–B–D–E♭–F). (This hexachord is the third of six possible hexachords in the octatonic octad.) Third, a motivic voice-leading event associates tetrachord 4–25 (motive h-2) with its immediate successor, tetrachord 4–27 (motive h-1), in bars 36, 48 and 50. (The pairings of 4–25 and 4–27 sets are marked by horizontal brackets in Ex. 9 and their voice-leading is shown in letter names in Fig. 5.) In bar 36, a voice-leading event involves the upper adjacency note C of G♭–B♭–C–F♭ (tetrachord 4–25) moving to B♭ of G♭–

B♭–D♭–F♭ (tetrachord 4–27). Although C in bar 36 moves melodically to B♭, these two tetrachords in bar 36 are related by voice-leading transformation where D♭ substitutes for C. Fig. 5 demonstrates in letter names the three occurrences of pc substitution between the three pairs of 4–25 and 4–27, in bars 36, 48 and 50.

The enharmonic relationship of the second and third pairings of the transformations in bars 48 and 50 further emphasise the harmonic significance of the two tetrachords (motives h-1 and h-2). In bar 48, the substitution of B♮ for B♭ of E–A♭–B♭–D (4–25) generates tetrachord 4–27 (E–A♭–B–D). The notes of tetrachord 4–25 in bar 48 are then enharmonically respelled as E–G♯–A♯–D in bar 50. A♯ of this latter 4–25 also moves by pc substitution to B of tetrachord 4–27.

The union of any one of the three pairs of tetrachords 4–25 and 4–27 yields an octatonic pentachord 5–28. (The generation of pentachord 5–28 from the union of tetrachords 4–25 and 4–27 was earlier illustrated in Fig. 2a.) As already discussed, Fig. 2a shows the transformation of pitch-specific motive h-1 (D–F–A♭–C), tetrachord 4–27 in bar 1, through tetrachord 4–25 (D–F♯–A♭–C) in bar 3, to its inverted form D–F♯–A–C at T_2 in bar 13. The transformation by ic1 of the inverted form of h-1 into the whole-tone sonority tetrachord 4–25 would not have been significant had their relationship not been emphasised by their reappearance in bars 36, 48 and 50. Such recurrences weaken the seemingly 'dominant-seventh' sonority of tetrachord D–F♯–A–C or T_2I of h-1 (D–F–A♭–C), emphasising the union of any one of the three pairs of tetrachords 4–25 and 4–27 as one sonority.

It is not difficult to hear the specific pitches of the two transposed forms of tetrachord 4–25 (G♭–B♭–C–F♭ in bar 36 and E–A♭–B♭–D in bar 48, which is then enharmonically emphasised as E–G♯–A♯–D) form a whole-tone hexachord, G♭–A♭–B♭–C–D–E (6–35). 6–35 is found in several sections of the piece (such as in bars 97–100 of the first movement and bars 157–9 of the second movement.) The prevalence of whole-tone harmonies also cancels the seemingly 'dominant-seventh' function of tetrachord D–F♯–A–C.

Fig. 2a illustrates two interlocking inversionally-related pentachords, which generate the octatonic hexachord 6–Z49; they are expressed as 5–28 and I_n(5–28). As summarised in Fig. 5, the three occurrences of the pairing of tetrachords 4–25 and 4–27 in bars 36, 48 and 50 belong to the inversion at a transposition level of 5–28 type. Tetrachords 4–25 and 4–27, not paired in immediate succession in bars 1–13, now do so and can be paired to create an inverted form of 5–28 at a transposition level in bars 36, 48 and 50, and in other significant parts of the Quartet.

Finally, the use of harmonic motive h-1 (tetrachord 4–27) in association with melodic motives m-1 (trichord 3–7) and m-2 (trichord 3–2) in bars 48–58 presents another significant dimension of motivic unity. (The melodic

Fig. 5

bar 36			bar 48			bar 50		
F♭		F♭		D		D		D		D
C	⟶	D♭	⟶	B♭		B	⟶	A♯	⟶	B
B♭		B♭		A♭		A♭		G♯		G♯
G♭		G♭		E		E		E		E
↑		↑		↑		↑		↑		↑
4–25		4–27		4–25		4–27		4–25		4–27
T_nI of 5–28				T_nI of 5–28				T_nI of 5–28		

occurrences integrated with h-1 are explicated in reduction in Ex. 9). Tetrachord 4–10, which was discussed earlier as generated by combining the inversionally-related m-2 (trichord 3–2) in the cello part in bars 1–3 (Ex. 3), is now featured in the violin 1 and cello parts in bars 48–58. In bars 48–53, the cello part features motive m-1, E3–A2–G3 (trichord 3–7); as G3 is transferred to G4 in bar 55, it is preceded by F♯4, generating tetrachord 4–10, E–F♯–G–A. Then, F♯4 is expanded in bars 56–9 by two interlocking trichords, 3–2 (motive m-2), F♯4–A4–G4 and G4–E4–F♯4; the union of these two trichords yields another form of tetrachord 4–10, E–F♯G–A.

In bars 56–9, tetrachord 4–10 (E–F♯–G–A) in the cello supports another tetrachord 4–10 (A–B–C–D) in the violin 1 part. The latter tetrachord 4–10 is also generated by the union of two interlocking trichords, 3–2 (motive m-2), B5–D6–C6 and C6–A5–B5. Integrated with these linear tetrachords in the vertical dimension, as shown in Ex. 9, are a series of transformations of the harmonic motive h-1, tetrachord 4–27.

Although limitations of space prohibit analysis of the remainder of the Quartet, the materials accounted for in the sections above are representative of foreground processes contained throughout the Quartet. Before I conclude, I shall show briefly that motivic associations can also account for the large-scale design of key relationships across the four movements.

Even though much of the Quartet does not concern itself with traditional tonal harmonic usage, the parallel major and minor key signatures of G and D♭ are used throughout. The key signature of the first movement suggests G minor, that of the second suggests G major. The third movement begins with notes of the D♭-major scale (supported by the key signature of five flats), with a shift to the C♯-minor scale in the middle section before returning to the notes of the D♭-major scale in the final section. (The change from D♭-major to minor first appears in bars 34–8 of the first movement.) The notes of D♭ major dominate the opening of the fourth movement, before a shift to the notes of the G-minor scale takes place in bars 31–124. After further melodic expansions in several passages in the middle part of the fourth movement, the Quartet ends with a traditional cadential progression in the key of G major.

Using tonal theory, one would not be able to account for the choice of these particular keys or provide links between the motivic language of the piece and these nominal key centres. The way to an integrated picture lies in that collection of pitches derived from the combined pitches of the G-major and -minor, and D♭-major and -minor, triads, that is, those triads that form the referential sonorities of the four movements of the Quartet. The collection of pitches obtained from these four triads is: G–A♭–B♭–B–D♭–D–F♭–F, the octatonic octad 8–28.[17]

Conclusion

The generation of octatonic, whole-tone and non-tonal pitch elements from the diatonic RPSC and its motivic subsets through pc substitution and voice-leading transformation offers an alternative theory for explaining the relationships and integration of various pitch materials in Debussy's Quartet. Detailed discussion of two representative sections suggests that the use of a combined linear and set analytical approach reveals the motivic unity of the various pitch materials more convincingly than does any other single analytical method.

In brief, four observations can be made. First, by understanding tetrachord 4–27 as a motivic-harmonic entity, and by perceiving that its transformed equivalents are generated through voice-leading transformation at the surface level, one can appreciate the unifying function of the motive. Second, as expansions of the harmonic motive h-1 are integrated with the two melodic motives m-1 and m-2 (which are contained in the octatonic octad 8–28), the two seemingly tonal (bars 1–33) and non-tonal (bars 34–60) sections in the Quartet's first movement can thus be explained as motivically unified. Third, with harmonic motive h-1 functioning to support the expansion of the two melodic motives (m-1 and m-2), one can appreciate the motivic unity of octatonic and whole-tone harmonies that are generated by pc substitution and voice-leading transformation of subsets of the diatonic RPSC. Finally, an understanding of the correspondence between the interaction of motives and the large-scale octatonic structure suggests the particular key scheme of the larger four-movement structure and provides the means of access to an integrated understanding of this music.

NOTES

1. Debussy's search for a harmonic language and ways of creating coherence beyond those circumscribed by traditional practice can be revealed through letters and articles he wrote before and during the time he composed his Quartet. Debussy

wrote the letter to Pierre Louÿs after he returned from attending the Universal Exhibition in 1889 (Lesure 1980, pp. 70–73; Lesure & Nichols 1987, pp. 76–7). In 1893, Debussy proclaimed the importance of linear over vertical approaches (Lesure & Nichols 1987, pp. 40–42).

2. This is recorded in Lesure & Nichols 1987, pp. 40–42. In another context, he denounced the Paris Conservatoire for its 'altogether faulty' teaching of harmony as chords independent of linear considerations (Vallas 1929, p. 26). Later, in 1902, he preferred Bach's 'free play of sounds whose curves, parallel or contrary, produced the wondrous efflorescence of arabesque', to more harmonically conceived music (*Ibid.*, pp. 26–7). For a discussion of Debussy's use of the term *arabesque musicale* see Eigeldinger 1988–9, pp. 51–4. Eigeldinger points out Debussy's awareness of the aesthetics, both poetic and symbolic, of the term during 1890–91.

3. Among the earliest applications of Schenkerian concepts to post-tonal music are Katz (1945) and Salzer (1952). See also, more recently, Matthew Brown (1993, pp. 127–42). While it is possible to apply to Debussy's early works Brown's systematic redefinition of the boundaries of Schenker's theory by identifying four techniques that move away from nineteenth-century formal models, I shall present an alternative theory for Debussy's music.

4. An early application of set theory to post-tonal experimental music may be found in Allen Forte's article on Liszt's music (Forte 1987, pp. 209–28). Richard S. Parks (1989) identifies non-tonal pitch materials in Debussy's later works in a most revealing way. In two other articles, Forte uses set theoretic paradigms to reveal motivic organisation in one of Debussy's later pieces (Forte 1989, pp. 10–16) and attempts to cover the use of octatonic elements in a wide range of Debussy's music (Forte 1991, pp. 125–69).

5. The earliest use of an approach that combines tonal and set theoretic paradigms appears in Forte's article on Schoenberg's music (Forte 1978, pp. 133–76). Forte uses Schenkerian methods to reveal advanced chromatic tonal material, and unordered pitch-class sets to disclose atonal material in the music. Michael L. Friedmann, in his article on one of Debussy's later works (Friedmann 1982, pp. 22–35), uses a combined but non-integrative approach to reveal the non-tonal materials within the underlying tonal structure. Howard Cinnamon, in his article on Schoenberg (Cinnamon 1993, pp. 127–70), also uses a similar approach.

6. For a discussion of tonal ambiguity created by third relationships, see Stein 1985.

7. Schenker understood an 'organic' structure as occurring when motives can be seen to generate the musical events on all three levels (foreground, middleground and background) of a work. We can perceive organic unity when the fundamental line and the bass arpeggiation are 'composed out' through melodic and rhythmic figurations. Such tonal unity is not apparent here. Forte (1988, pp. 315–48) cautions that 'the uncritical application of Schenkerian paradigms to certain kinds of music has often led to poor results ... and has obscured important issues that require confrontation'.

8. See Morgan 1976. The concept of consonance-dissonance relationship and the

definition of prolongation and its application to post-tonal and atonal music in the late nineteenth and early twentieth centuries have also been discussed by many theorists – among them, Parks (1989), Salzer (1952), Straus (1987) and Wilson (1984).

9. The concept of a referential pitch-class specific collection in this article is conceived as a pitch-specific diatonic scale and not as a diatonic subset of the 12-note chromatic universe, as discussed in John Clough's and Jack Douthett's article (1991). By making this distinction, I assign the pitch-specific diatonic scale a fundamental structural role. The complementary pitches, which complete the 12-note chromatic universe, are generated through the transformations of subsets that comprise the RPSC.

10. I thank Allen Forte for suggesting the term for the second process.

11. One particularly important publication is David Lewin's *Generalized Musical Intervals and Transformations* (1987). See chapter 6 for the discussion of INJection Function and chapter 5 for related issues.

12. Set names facilitate the identification of sets that are associated by related properties, for example, properties such as equivalent successive ic patterns or total interval content. Because symmetrical sets are sometimes interlocked to form larger sets, inversionally-related sets will always be identified explicitly: I_n(3–7) thus designates the inversion of set 3–7.

13. Forte's BIP refers to the total interval-class pattern of a pc set in its prime form. The use of SIP (Successive Interval-Class Pattern) in Exs. 7b and 8b is derived from Forte's BIP, which, in the former case, refers to the ordered interval-class successions that occur as the pitches of a pc set unfold in time in the music. See Forte (1979, p. 63ff).

14. See Pieter van den Toorn (1983, pp. 50–51). According to van den Toorn, the notes belong to the octatonic octad, 8–28, Collection II.

15. The figure also explicates the structures and sub-structures of those inversionally-related chords contained in the RPSC, a characteristic diatonic septad. The configurations of larger subsets derived from each sub-structural level are based on the interlocking of transformationally-related subsets of the diatonic septad 7–35. 7–35 contains a pair of interlocking transformationally-related hexachords, 6–32 (B♭–C–D–E♭–F–G and D–C–B♭–A–G–F, where both hexachords are inversionally equivalent at a transposition level); each of the two 6–32s contains a pair of interlocking pentatonic pentachords, 5–35, where both pentachords are also inversionally equivalent at a transposition level; and, each 5–35 contains a pair of interlocking trichords, 3–7, that are inversionally equivalent.

16. Incidentally, the SIP of the first 5–35 and that of the second are in retrograde relationship. The first pentachord reads [3][5][5][2] and the second [2][5][5][3].

17. See Forte 1991 and van den Toorn 1983, pp. 50–51; according to van den Toorn, the notes belong to the octatonic octad, 8–28, Collection I.

REFERENCES

Brown, Matthew, 1993: 'Tonality and Form in Debussy's *Prélude à l'Après-midi d'un faune*', *Music Theory Spectrum*, 15/ii, pp. 127–42.

Cinnamon, Howard, 1993: 'Tonal Elements and Unfolding Nontriadic Harmonies in the Second of Schoenberg's *Drei Klavierstücke*, op. 11', *Theory and Practice*, 18, pp. 127–70.

Clough, John and Douthett, Jack, 1991: 'Maximally Even Sets', *Journal of Music Theory*, 35/iii, pp. 93–173.

Eigeldinger, Jean-Jacques, 1988–9: 'Debussy et l'idée d'arabesque musicale', *Cahiers Debussy*, 12–13, pp. 5–14.

Fontainas, André, 1928: 'Mes souvenirs du symbolisme', in *Essais critiques*, 10 (Paris: La Nouvelle Revue Critique), pp. 92–3.

Forte, Allen, 1973: *The Structure of Atonal Music* (New Haven: Yale University Press).

______, 1978: 'Schoenberg's Creative Evolution: The Path to Atonality', *Musical Quarterly*, 64/ii, pp. 133–76.

______, 1987; 'Liszt's Experimental Music and Music of the Early Twentieth Century', *19th-Century Music*, 10/iii, pp. 209–28; republished in *Music at the Turn of the Century: A 19th-Century Reader*, ed. Joseph Kerman (Berkeley: University of California Press, 1990).

______, 1988: 'New Approaches to the Linear Analysis of Music', *Journal of the American Musicological Society*, 41/ii, pp. 315–48.

______, 1989: 'Motivic and Linear Design in Debussy's *La Terrasse des audiences du clair de lune*', *Analyse musicale*, 16, pp. 10–16.

______, 1991: 'Debussy and the Octatonic', *Music Analysis*, 10/iii, pp. 125–69.

Friedmann, Michael L., 1982: 'Approaching Debussy's *Ondine*', *Cahiers Debussy*, 6, pp. 22–35.

Katz, Adele T., 1945: *Challenge to Musical Tradition: A New Concept of Tonality*, Chapter 7 (New York: Knopf).

Kostka, Stefan, 1990: *Materials and Techniques of Twentieth-Century Music* (New York: Prentice-Hall).

Lesure, François (ed.), 1980: *Claude Debussy: Lettres 1884–1918* (Paris: Hermann).

Lesure, François and Nichols, Roger (eds. & trans.), 1987: *Debussy Letters* (Cambridge, MA: Harvard University Press).

Lewin, David, 1987: *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press).

Morgan, Robert, 1976: 'Dissonant Prolongation: Theoretical and Compositional Precedents', *Journal of Music Theory*, 20, pp. 49–91.

Parks, Richard S., 1989: *The Music of Claude Debussy* (New Haven: Yale University Press).

Salzer, Felix, 1952: *Structural Hearing: Tonal Coherence in Music*, 2 vols. (New York: Charles Boni).

Schoenberg, Arnold, 1969: *Structural Functions of Harmony*, ed. Leonard Stein (New York: Norton).

Stein, Deborah, 1985: *Hugo Wolf's Lieder and Extensions of Tonality* (Ann Arbor: UMI Research Press).

Straus, Joseph N., 1987: 'The Problem of Prolongation in Post-Tonal Music', *Journal of Music Theory*, 31/i, pp. 1–21.

Vallas, Léon, 1929: *The Theories of Claude Debussy*, trans. Maire O'Brien (London: Oxford University Press).

van den Toorn, Pieter, 1983: *The Music of Igor Stravinsky* (New Haven: Yale University Press).

Wilson, Paul, 1984: 'Concepts of Prolongation and Bartók's Opus 20', *Music Theory Spectrum*, 6, pp. 79–89.

