

ABSTRACT

Title of Dissertation

**MUSICAL LANGUAGE AND FORMAL
DESIGN IN DALLAPICCOLA'S *SICUT
UMBRA***

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Dissertation Directed By:

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The goal of music analysis is to understand musical structure using constituent elements and to explain how these elements shape the piece. The purpose of this dissertation is to promote a better understanding of the interrelation between form and text as well as the relevance of Dallapiccola's concept of polarity in *Sicut Umbra* (1970). Dallapiccola's full recognition of the difference between tonal and twelve-tone music enables him to create his musical concept, Polarity, which is the simple answer to understanding and appreciating his twelve-tone music.

This analysis focuses on how the musical surface contributes to the creation of form and how the musical setting provides a better understanding of the text. The analysis of each movement reaches to several results: (1) the development of individual elements and their interrelations contribute to the progress of movement;

(2) the trace of every member of the dyads ([01] and [06]) and the trichords ([012], [013], [014], [016]) suggests the development of sonorities; (3) the developed sonority forms the coherence especially in shaping form; and (4) the musical elements contribute to the text setting and in achieving a better understanding of the poems.

Understanding this structure gives several insights into Dallapiccola's compositional style: (1) deeper understanding of his use of pitches (both row and outside row), rhythm, texture, and sonority, (2) an interpretation of how these elements shape the form and create the unique relationship to the text, and (3) appreciation for the combination of classical and twelve-tone techniques involved in polarity.

Dallapiccola's polarity is not a technique for composition, but is a concept inseparable from the set musical elements, their development, and functions and is essential to Dallapiccola's construction of musical form for expression and coherence.

MUSICAL LANGUAGE AND FORMAIL DESIGN
IN DALLAPICCOLA'S *SICUT UMBRA*

By

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For the glory of God

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Chapter 1. Introduction

Organization of the Dissertation

The purpose of this dissertation, “The Musical Language and Formal Design in Dallapiccola’s *Sicut Umbra*,” is to develop a better understanding of Luigi Dallapiccola’s musical language through detailed analysis of a single composition. I will investigate the interrelation between form and text as well as the relevance of Dallapiccola’s concept of polarity to the analysis of each movement and throughout the entire piece.

This dissertation comprises six chapters. Chapter 1 is an introduction. Chapters 2 through 5 consist of analyses, respectively, of the first, second, third, and fourth movements of this four-movement work. For each movement, the analysis begins with an examination of rhythm, texture, pitches (including row material), register, dynamics, articulation, and a variety of other elements. Through these analyses, I try to define the composer’s language and means of creating musical form. I also examine interconnections between music and text, and investigate the relevance of Dallapiccola’s concept of polarity to musical process. The analysis traces every member of chords, dyads ([01] and [06]), trichord partitions, and pentachords based on the section (or phrase), since in these chords lies the solution to how Dallapiccola achieves his conception of pitch polarity. In Chapter 6, I summarize and synthesize the analytic observations of Chapters 2 through 5 - uniting all four movements - and I attempt to clarify their relation to the text. It then concludes this dissertation by suggesting what Dallapiccola has achieved in this piece.

The present chapter is divided into three parts: (1) Dallapiccola's background, including a biographical sketch and survey of his musical style, (2) general comments on an analysis including polarity, an important concept in Dallapiccola's twelve-tone music, and (3) a brief overview of the piece, *Sicut Umbra*, and its text.

Biographical Sketch and Musical Style of Dallapiccola

Luigi Dallapiccola (1904-1975) was an Italian composer born in Istria, which at the time of his birth was a part of the Austrian Empire. Istria was detached from the mainstream of Italian cultural life. However, his sporadic education in music did not hinder his talent and enthusiasm for music. During the First World War, Dallapiccola's whole family moved to Graz where, for the first time, he had the opportunity to hear the operas of Mozart, Weber, and Wagner. Ultimately, his exposure to opera greatly influenced his decision to be a musician. In 1921, a decisive experience with Debussy's music gave him an inspiration to extend his horizons. After hearing Debussy's *Pelleas and Mellisonade* and *Iberia*, he stopped composing for three years to synthesize the impact of this important work. His later music is strongly influenced by Debussy's style, especially with respect to his use of timbre. Another crucial experience came in 1924 at a performance of Schoenberg's *Pierrot lunaire*, which proved to be a turning point towards atonality in Dallapiccola's music. This encounter with Schoenberg's music was his first exposure to the music of the Second Viennese School. This experience inspired him to begin studying the techniques of the Second Viennese School. As he recalls:

The night, on which I saw Arnold Schoenberg, I felt I had to make a decision. It goes without saying that I did not consider whether I should become atonal; for the time being, I decided to learn the trade.¹

In the 1920s, neo-Baroque music was a dominant trend in Italian musical life and guidance in twelve-tone composition was not available to Dallapiccola. Until 1935, Dallapiccola's musical language was based largely on diatonic set, using modal polyphony based on the influence of Vito Frazzi (one of Dallapiccola's Italian contemporaries), Debussy, and others. The influence of Frazzi dominated Dallapiccola's music during those years.² According to Dallapiccola, Frazzi suggested various solutions to the problems arising in his music and Frazzi's alternating scale (the octatonic)³ gave the basis for a system of diatonic tonalities.⁴ Debussy's influence is also apparent in Dallapiccola's music in the tendency toward soft and coloristic instrumentation.

Some contact with members of the Second Viennese School (a meeting with Berg in 1934, with Webern in 1942, and a letter from Schoenberg in 1949) gave Dallapiccola a chance to learn about the twelve-note system. After working for several years without any reference material and after some failure and some success in analyzing pieces using

¹Luigi Dallapiccola, "Sulla strada della dodecafonia," in *Parole e Musica*. Ed. Fiamma Nicolodi (Milan: Il Saggiatore, 1980), trans. Deryck Cooke, "On the Twelve-Tone Road," *Music Survey* 4 (October 1951): 318–32.

² Vito Frazzi (1888-1975) is an Italian musician. He was a professor of piano and harmony, as well as a composer. He was also Director of the Conservatory for a long time.

³ The scale consists of whole and half steps in alternation.

⁴ Frazzi explained how the "alternating scales" in two forms could be constructed upon the dominant rather than the tonic of a tonality, and would serve as he said as "the basis of a system which would tend to bring together all the diatonic tonalities." Dallapiccola applied this theory in his opera, *Re Lear* (1922–28). Michael Eckert investigated the possible relationship of Frazzi's theoretical ideas to elements in Dallapiccola's early music in his study of octatonic elements in these early compositions. See Eckert, Michael, "Octatonic Elements in the Music of Luigi Dallapiccola," *The Music Review* 46/1 1985: 35–48.

the twelve-tone technique, Dallapiccola slowly came to understand the fundamental principles of the twelve-tone system and developed his own style.

From 1940 until his death in 1975, Dallapiccola employed the twelve-note system as a basis for pitch organization. During this time, he continued to develop his own language. Meanwhile, his plentiful writings, concerts, lectures, and teaching in the United States at Tanglewood (1951), Queens College (1956–57, 1959, 1967), and the University of California at Berkeley (1962) earned him an international reputation.

He often used the twelve-note series in conjunction with diatonic materials. For example, *Tre Laudi* (1936–1937) begins with a twelve-note phrase, but succeeding phrases integrate diatonic elements (for example a symmetrical serial passage is immediately followed by a diatonic instrumental canon, then a twelve-tone series is juxtaposed with modal materials). In this period, Dallapiccola's musical scope continued to broaden as he learned ever more about the music of Busoni, Berg, and Webern. Berg's influence is especially strong and appears in Dallapiccola's music in chromatic passages and in instrumental writing that employ the saxophone and vibraphone.

In the 1940s, Dallapiccola's twelve-tone technique was flexible but still contained diatonic segments. In *Il prigioniero* (1950) and *Liriche greche* (1944–45), Dallapiccola used both chromaticism and dodecaphony as essential elements for an expressive language. The main reason for the adoption of a twelve-tone system as a primary technique was for the expression, as Dallapiccola states:

Personally, I have adopted this method because it allows me to express what I must express. The note-series technique is only a means of helping a composer to achieve coherence of musical argument.⁵

⁵ Dallapiccola, "On the Twelve-Tone Road," 330.

Actually, he had long ago recognized that tonal music was inadequate to convey what he needed to express and influence from Wagner and Debussy had changed Dallapiccola's music. Finally, his meeting with Webern played an important role in Dallapiccola's musical development, especially on his horizontal and contrapuntal expression. With his adoption of contrapuntal writing as seen in Webern's music, the polyphonic principle with its imitation, contrapuntal forms, and symmetrical structure became the basis of his musical thinking. The combination of the canon, a timeless melodic device, and the twelve-note system appears often in Dallapiccola's music. He uses the twelve-tone technique along with other musical elements of equal importance to achieve expressive melodies in polyphonic writing.

His slow approach to adopting the twelve-tone system and the significant influence of Berg and Webern in the 1940s resulted in the predominance of the twelve-tone as the primary technique in the 1950s. In *Tre Poemi* (1949), which is dedicated to Schoenberg, Dallapiccola first employed a single row throughout an entire composition. Most works composed in this period were vocal pieces. Through his interest in literature, he had encountered many literary movements and appreciated their works. Furthermore, his vocal writing often considers specific verbal expression and imagery in musical setting. His lyrical melodic line is due to Italian influence as well as his awareness in the text. Rhythmically, he adopted Messiaen's rhythms with added value as an important part, although generally not as a primary role in his compositions.

In the mid 1950s, Dallapiccola's style reached a point of stability.⁶ This established style let him focus on the poetic elements using highly colorful melodic lines,

⁶ John Waterhouse, *The New Grove Dictionary of Music and Musicians*, s.v. Dallapiccola, Luigi. 13 Sept. 2003 <<http://www.grovemusic.com/>>.

as is shown in *Piccola musica notturna* (1961) where the melodic line is one of the most important components. His handling of poetic expression creates symbolism rather than giving description, as is exemplified in *Goethe-Lieder* (1953). The symbolism always derives from close consideration of the text and is a guide to Dallapiccola's choice and use of forms of the row. He states,

Moreover, certain word emphases designed to give power to the significance of the word, or one aspect of it, is of undoubted Baroque origin. As an example, I can cite the verse "Un Buon uom mi diss Fa! [A just man said to me 'Do!'] in the "Chorus of Unhappily Married Men." The exclamation "FA!" comes on the note Fa [F] in all the voices.⁷

While this kind of symbolic expression already appeared in his music and was used in these periods, he later developed such symbolic expression from aural symbols to visual symbols. *Cinque canti* (1956), *Concerto per la notte di Natale dell'anno* (1956), and *Sicut Umbra* (1970) contain such visual symbols. The use of musical figures designed to represent constellations in the fourth movement of *Sicut Umbra* is an example of such visual symbolism.

His stable and unique style of the 1950s is possible by his understanding of a new dialectic of the twelve-note system. Recognizing the difference between the concerns of tonal music and twelve-tone music made it possible for him to establish his own style. He explains,

I had realized the difference between classical music and music based on a series: a difference of dialectic. In music based on a series, instead of finding ourselves faced with a character rhythmically and melodically defined at the outset, we have to wait a long time; exactly as we had to wait a long time for the rhythmic and melodic definition of Albertine, "a rainbow which, for me, linked our terraqueous world to regions I had hitherto considered inaccessible."⁸

⁷Luigi Dallapiccola, "My Choral Music," in *The Composer Speakers*. Ed. R. S. Hines. Norman: Oklahoma University Press, 1963, 156–57.

⁸ Dallapiccola, "On the Twelve-Tone Road," 329.

Two of Dallapiccola's friends, the greater writers, James Joyce and Marcel Proust, gave him a confirmation of what he dimly felt. The two writers' viewpoint of the problems that all the arts have, assonances, led him to realize that a most careful and conscientious effort must be devoted to the arrangement of tones in the twelve-note series.⁹

Dallapiccola's flexible use of serialism is distinguished by four characteristics:

- (1) the use of several rows in one piece
- (2) the use of unordered row material
- (3) the employment of incomplete row material
- (4) an increased use of derived rows.¹⁰

The use of several rows in one piece hinders the achievement of unity, according to Schoenberg who pointed out this problem in his essay, "Composition with Twelve Tones (1941)". He mentioned that any emphasis on one pitch in a twelve-tone composition would cause that pitch to acquire the status of a tonic, and the composer must avoid suggestions of tonality to avoid creating the expectation of further tonal reference.¹¹ He prohibited the use of more than one row in a twelve-tone composition in

⁹ Dallapiccola, "On the Twelve-Tone Road," 325.

¹⁰ A "derived row" is a twelve-note row formed by applying a certain operation to one of its segments. These operations include transpositions, inversion followed by transpositions, and retrogression coupled with either of the former two operations.

¹¹ Arnold Schoenberg, "Compositions with Twelve Tones (1941)," in *Style and Idea*. Ed. Leonard Stein (New York: St. Martin's Press, 1975), 219.

order to avoid unsystematic pitch class recurrence. However, Schoenberg actually used more than one row in the Third Quartet (three rows) and the String Trio (two rows).¹²

Dallapiccola preferred to use more than one row in his pieces. Most of his compositions in the 1940s contain more than one row and his pieces after the 1950s (*Ulisse* (1960–68), *Tempus destruendi/tempus aedificandi* (1970–71), and *Commiato* (1972)) also have several rows. Indeed, in his handling of the several rows in a composition, he overcomes the problem of creating unity. He used various techniques to associate the different rows of a single piece such as the use of the same source hexachord.¹³ Several theorists and composers discussed the recombination of hexachords. Among them, Milton Babbitt's concept of secondary set and Donald Martino's source hexachord deeply relate to Dallapiccola's creation of hexachords.¹⁴ The difference between Babbitt's and Dallapiccola's techniques is that Babbitt's secondary set combines segments from different transformations of the same row, while Dallapiccola combines hexachords from two rows. Dallapiccola also applies the process of recombination to dyads, trichords, and tetrachords.

¹² More than one row, for example two different rows, does not mean that the derived row generated by a segment of the basic row. Martha Hyde demonstrates Schoenberg's use of more than one row in Hyde's composition in "The Roots of Form in Schoenberg's Sketches," *Journal of Music Theory* 24 (Spring 1980): 1–36. Also, Schoenberg mentioned his employment of more than one row in a letter to Josef Rufer: "It does not seem right to me to use more than one series, but nevertheless the main thing is whether the music is good. The principles according to which it is constructed are a matter of secondary or tertiary importance."

¹³ The term "source hexachord" refers to the unordered pc set that, together with its complement, will generate the twelve pcs. See Martino, Donald. "The Source Set and its Aggregate Formation." *Journal of Music Theory* 5/2 (1961): 224–73.

¹⁴ See Babbitt, Milton. "Some Aspect of Twelve-Tone Compositions." *The Score and I.M.A Magazine* (June 1955): 53–61.

The use of unordered row material, partial ordering, clearly appears in the fourth movement of *Sicut Umbra*. Rosemary Brown considered Dallapiccola's use of unordered row material as evidence of "some small relaxation in serial unity."¹⁵ The employment of nine constellations for visual effect is based on outside the row, but their chord-type as well as subset is deeply related to the row's partitions. This relation increases the feeling of unity rather than decreasing it. The detailed discussion of this will come in Chapter 5. Among the four trends of Dallapiccola's language, one of them, the use of unordered row, is encountered frequently in *Sicut Umbra*.

Polarity

The goal of musical analysis is to understand musical structure using its constituent elements and then to explain how they work in the music. Music analysis is defined as 'the resolution of a musical structure into relatively simpler constituent elements and the investigation of the function of those elements within that structure'.¹⁶ This definition supposes two concepts: (1) the several constituent elements create the unity and (2) they show their diversities using elements' function and interrelation within the musical structure. In spite of using different analytical techniques today, many analysts' ultimate concerns are the same – showing what a composer expresses using the fundamental musical elements.

Until the end of the Romantic Era and before the appearance of non-tonal music, music theorists dealt with a more or less unified body of composition based upon

¹⁵ Rosemary Brown, "Continuity and Recurrence in the Creative Development of Luigi Dallapiccola" (PhD diss., University College of North Wales, 1977), 170.

¹⁶ *Webster's Collegiate Dictionary*, 15th ed., s.v. "Polarity."

common practice tonality. However, in the 20th century, there was a rapid movement toward the disintegration of tonal music using techniques such as polytonality, atonality, micro-tones, and, of course, twelve-note music. Accompanying this sudden revolution came unexpected changes in music, especially in the roles of its elements. Because of the dissolution of traditional tonal function and the equal consideration of twelve pitches within an octave, the twelve-note system looks like indifferent to tonal music. However, the traditional forms and analytic techniques are associated with it.

Arnold Schoenberg's comment that, 'the twelve-note series is a method and not a style', supports the view that the twelve-note system is another technique for composing music.¹⁷ Luigi Dallapiccola also mentioned that the twelve-note organization was for him the most complete answer to the problems of the method of composition, in that it offers a basis on which to build. Dallapiccola's above comment strongly supports Schoenberg's intention; the twelve-note system is a device for compositional technique. According to Dallapiccola, adopting the twelve-tone system was definitely necessary for expression. However, mere employment of twelve-tone technique did not ensure anything. He stated,

If anyone says that a work based on a series is automatically guaranteed such coherence, he is making a great mistake, since no artificial technique has ever guaranteed anything, and the unity of such a world will be, together with its melody, rhythm, and harmony, an inferior product.¹⁸

This statement indicates that Dallapiccola intentionally manipulated the row or several rows to achieve coherent expression. These considerations of coherence in

¹⁷ Schoenberg, "Compositions with Twelve Tones," 218.

¹⁸ Dallapiccola, "On the Twelve-Tone Road," 330.

twelve-tone music led him to discover the difference between tonal music and twelve-tone music and resulted in his concept of polarity. He explained,

Thus I came to the conclusion that if, in the twelve-note system, the tonic had disappeared, taking with it the tonic-dominant relationship, and if, in consequence, sonata form had completely disintegrated, there still existed, nevertheless, a power of attraction, which I will call *Polarity* (I do not know whether such a definition has been used before, or whether there is another): I mean by this term the extremely subtle relationships which exist between certain notes. These relationships are not always easily perceptible today, being much less obvious than that of tonic to dominant, but they are there, all the same. ... The interesting point about this polarity is the fact it can change (or be changed) from one work to another. One series can reveal to us the polarity that exists between the first and twelfth sounds; another that which exists between the second and the ninth, and so on. Here the time factor, which I mentioned just now, steps in, revealing its true importance.¹⁹

At the time of Dallapiccola's realization of the twelve-tone technique, the serial techniques were employed in conjunction with traditional forms such as chaconne and ternary forms as in the case of Schoenberg's earlier twelve-tone compositions.

Dallapiccola's statement reveals that his musical tendency is strongly based on the tonal.

"The extremely subtle relationship" means something similar to the tonic-dominant relation that exists in his music, but it by no means implies that Dallapiccola's music is in any sense "tonal." In Dallapiccola's twelve-tone music, there is a consistency as well as a clear vision of the ways in which such serialism can act as a focus of the work's expressivities. In his works from around 1945, Dallapiccola employs tonal elements within his twelve-tone language. For example, he uses the intervals of the row to generate traditional melodic and harmonic relationships or to emphasize a tonal center.

Throughout this era he seeks to create a sense of tonal attraction within his twelve-tone music despite the equal consideration given to all twelve tones. Dallapiccola always felt that there was a tonal component in his twelve-tone music.

¹⁹ Dallapiccola, "On the Twelve-Tone Road," 326.

On the other hand, several questions do certainly arise after considering the above statement. What specific methods might create this attractive force in music that, by definition, denies any feeling of tonic? What is the nature of these “subtle relationships” between pitches? Are the relationships inherent in some specific ordering of the total chromatic, or are they contextually imposed? If polarity does indeed exist in twelve-tone music, then is the “tonic” a pitch class (pc), an interval, or a pc set? Since his concept of polarity is fully based on the awareness of tonal music and the difference between tonal and twelve-tone music, the compared concept between tonal and twelve-tone music is useful to understand how Dallapiccola’s polarity is developed.

The concept of polarity contains three distinguishing elements: time factor, chord, and contrapuntal writing. First, a different dialectic between tonal and twelve-tone music implies a difference in another factor, time. Dallapiccola states,

Here the time factor, which I mentioned just now, steps in, revealing its true importance: by this means we can establish the characteristic interval by impressing it on the memory more deeply than the others, and thus we have a chance of making our musical argument understood.²⁰

Curiously, this statement arose from a consideration of the Marcel Proust’s notion of time in his great novel *In Search of Lost Time*. Dallapiccola noted that Proust presents the character Albertine at various points in the novel in such a way that the character is rounded out only gradually through her reflection in other characters’ conversation. Secondly, since rhythmic and melodic functions in the twelve-note system are quite different from those in classical music, this results in the different method of constructing chords. Dallapiccola explains,

²⁰ Dallapiccola, “On the Twelve-Tone Road,” 326.

Before reaching this rhythmic and melodic definition of the series, we may find it compresses into a single chord of twelve notes, two chords of six notes, three of four notes, four of three notes, or even six two-note chords... to speak only of the most elementary possibilities. It will be understood that, in every such combination, the sense of *polarity* must be alive and preset, so as to enable the listener to follow the musical argument.²¹

The gradual exhibition of a row's clear relationship such as recurrence of chord progression based on the row is one of Dallapiccola's intentions in composing. It would seem that for Dallapiccola the first presentation of a row could be made in either vertical-harmonic or in horizontal-melodic form as a row's fundamental symbolism. This statement directly demonstrates that polarity in his music usually involves the chord, dyad, trichord, tetrachord, or even hexachord. In addition to that, Dallapiccola creates polarity through contrapuntal writing. He states,

Even today it is still possible to write fugue, using traditional or even modern and atonal methods, yet to every such fugue there will always cling an antiquated character, for fugue is a "form," and as such, time bound, mortal. On the other hand, polyphony is not a form, but a principle; as such it is timeless and, as long as music continues to be created, immortal. It is necessary to emphasize that *canon*, which occupies such an important place in the twelve-note dialectic, is not a *form*, but part of the principle of polyphony.²²

Dallapiccola made an important distinction between the "form" of fugue and the "principle" of polyphony (of which canon is a part), and the distinction has great relevance to his own music, in which the canonic principle is often involved. The use of canon is one of the techniques to combine any pitches such as non-adjacent pitches. This technique has a decisive role in presenting what the composer wants to express in sonority.

²¹ Dallapiccola, "On the Twelve-Tone Road," 329.

²² Dallapiccola, "On the Twelve-Tone Road," 329.

Dallapiccola's three statements concerning time factor (rhythm), chord, and canon clearly show what polarity means and how polarity is created within the piece. Instead of the tonic-dominant tendency, another attraction, polarity, less strong than tonic-dominant but still present, remains in twelve-note music. According to Dallapiccola, polarity is related to rhythm, which gives weight to certain of the otherwise equal notes. His frequent employment of canon as a technique to form polyphony and the employment of a specific dyad, trichord, tetrachord, or hexachord play a function in combining melodic and rhythmic roles in the twelve-note series. Thus, polarity is easily found within the chord-type and presented by the canon. Something gradual and consistently repeated such as sonority and rhythmic pattern could be a polarity in Dallapiccola's music. In addition, these aspects of polarity are influenced by musical background, such as the chord by Berg's influence and rhythm and canon (contrapuntal writing) by Webern's influence. It can be seen that Dallapiccola established his own style in twelve-tone music, which included both the Second Viennese School's style and tonal elements.

Sicut Umbra exemplifies the three categories above: (1) proper use of rhythmic pattern and development through the piece, (2) contrapuntal writing using the canon, and (3) a single twelve-note row generating two hexachords, three tetrachords, four tetrachords, and even six dyads. In my analysis of Dallapiccola's work, I will demonstrate how polarity occurs as a result of twelve-tone operation as well as contextual emphasis related with the rhythm, text, pitch range, form, and other elements.

The term "polarity" has been used in reference to other composers including Stravinsky, but in these contexts, it means something different from Dallapiccola.

Mancini summarizes some of these other uses of the term, polarity.²³ According to Mancini, Arthur Berger pointed out that polarity in Stravinsky's music really means the priority of a specific pc, resulting in the formation of a tonal center.²⁴ Other writers have discussed the emphasis of specific pitches in Stravinsky's serial music. Thomas Clifton asserts Stravinsky created focal pitches or intervals through various types of symmetry.²⁵ Claudio Spies mentioned that pitch emphasis occurs in several ways, such as through octave duplication and common-tone links between hexachords related by transposition/rotation.²⁶ While Stravinsky's polarity is related to the formation of a tonal center, Dallapiccola's polarity refers to "any tendency to turn, grow, think, feel, etc., in a certain way, as if because of magnetic attraction or repulsion."²⁷

While there is little detailed research about his late work, this analysis of his third-to-last piece illuminates the musical tendencies of late work. No musical literature completely analyzes *Sicut Umbra* in detail. In Mancini's study of the first movement of *Sicut Umbra*, he takes an approach to pitch polarity that I will largely follow.²⁸ Mancini

²³ David Mancini, "Form and Polarity in Late Works of Luigi Dallapiccola" (PhD diss., Yale University, 1984), 26–54

²⁴ Arthur Berger, "Problems of Pitch Organization in Stravinsky," *Perspectives of New Music* 2 (Fall-Winter 1963): 11–42.

²⁵ Thomas Clifton, "Types of Symmetrical Relations in Stravinsky's, *A Sermon, A Narrative, and A Prayer*." *Perspectives of New Music* 9/1 (1970): 98–112.

²⁶ Claudio Spies, "Notes on Stravinsky's *Abraham and Isaac*." *Perspectives of New Music* 3/2 (1965): 104–26.

²⁷ *Webster's New Twentieth Century Dictionary of the English Language*, 2nd ed. s.v. "polarity."

²⁸ David Mancini, "Twelve-Tone Polarity in Late Works of Luigi Dallapiccola." *Journal of Music Theory* 30/1 (1986): 203–24; and "Form and Polarity in Late Works of Luigi Dallapiccola" (PhD diss., Yale University, 1984), 26–54. His dissertation covers detailed analyses of five movements written after 1960: the first movement of *Preghiere* (1962), the first movement of *Sicut Umbra* (1970), and the first, second, and third movements of *Commiato* (1972). According Mancini,

considers that polarity may arise from three factors: (1) the compositional association of non-adjacent pcs of a row, (2) the emphasis of interval axes, and (3) invariant segments shared by two or more row forms.²⁹ In Mancini's analysis of the first movement of *Sicut Umbra*, he discovers that Dallapiccola created polarity about pc set 4-5 [0126] through the juxtaposition of non-adjacent row dyads.³⁰ Mancini's suggestion about forming polarity in three ways provides one basis for this dissertation.

The concept of polarity in this entire piece differs from that described by Mancini. The differences are two-fold. First, Mancini did not make an exhaustive analysis of the entire piece (he examined only the first movement). Consideration of whole movements produces a different viewpoint of polarity. Second, my analytical approach focuses on relations among rhythm, texture, pitches, chords, row used, pitch range, dynamics, articulation, and text. I then develop a concept of polarity from the use and interactions among these elements. Mancini dealt with polarity considering only pitch material without considering other elements such as the text. Several analysts have studied Dallapiccola's music before 1950.³¹ However, none explain the concept of polarity; they

polarity in these works is defined as the priority of a pc, interval, or pc set in a given context. His article, "Twelve-Tone Polarity in Late Works of Luigi Dallapiccola," covers the same piece based on his dissertation.

²⁹ David Mancini, "Twelve-Tone Polarity in Late Works of Luigi Dallapiccola," p.205.

³⁰ Pc set names are those developed by Allen Forte in *The Structure of Atonal Music* (New Haven: Yale University Press, 1973).

³¹ For general research of Dallapiccola's works see the following: Rosemary Brown's dissertation ("Continuity and Recurrence in the Creative Development of Luigi Dallapiccola" (PhD diss., University College of North Wales, 1977)) presents a detailed survey of Dallapiccola's entire technique; *The New Grove Dictionary of Music and Musicians*, s.v. "Dallapiccola, Luigi" (by John Waterhouse), <http://www.grovemusic.com/> (accessed September 13, 2003); Hans Nathan, "On Dallapiccola's Writing Methods," *Perspectives of New Music* 15/2(1977): 34–57; and "The Twelve-Tone Compositions of Luigi Dallapiccola," *The Musical Quarterly* 44 (1958): 289–310 deals with Dallapiccola's works until 1958 with the detailed analyses of several works; Roman

only mention polarity as an aspect of Dallapiccola's musical thought. Indeed, analysis dealing with Dallapiccola's late works is rare. In a recent paper, Brian Alegant presents a theory of cross-partitions, a new tool for examining relations between harmony and voice-leading, and he applies the theory in an analysis of Dallapiccola's *Frammenti di Saffo*.³² I do not use this approach because Alegant's tool is for Dallapiccola's handling of details of the twelve-tone system, not for formal design.

In my analysis of *Sicut Umbra*, I will demonstrate how the composer creates form through twelve-tone procedures and other techniques. I will show how these procedures subdivide sections, create association between them, and how polarity can serve as an additional structural determinant. This dissertation employs two approaches to understanding this piece: first, analyzing the musical surface, the fundamental elements for understanding the relation between musical language and text in each movement, and second, combining these elements for a further step, discovering polarity. *Sicut Umbra* is an example of two concepts in music – unity and diversity. It surpasses both in its

Vlad, *Luigi Dallapiccola*, trans. Cynthia Jolly (Milan: Edizioni Suvini zerboni, 1957); Glenn H. Gould, "A Stylistic Analysis of Selected Twelve-Tone Works of Luigi Dallapiccola" (master's thesis, Indiana University, 1964) handles *Ciaccona, Intermezzo e Adagio* (1945), *Due Studi* (1946-47), *Due Pezzi per orchestra* (1947), *Quaderno musicale di Annalibera* (1952), *Piccola Musica Notturna* (1954), and *Concerto per la notte di Natale dell'anno 1956* (1957-58); and James Dapogny, "Style and Method in Three Compositions of Luigi Dallapiccola" (master's thesis, University of Illinois, 1971) discusses the *Goethe-Lieder* (1953), *Cinque canti* (1956), and *Preghiere* (1962).

³²Brian Alegant, "Cross-Partitions as Harmony and Voice Leading in Twelve-Tone Music." *Music Theory Spectrum* 23/1 (2001): 1-40. This paper consists of two parts: Part I covers general theoretical background starting with Martino's, "The Source Set and Its Aggregate Formation," and including the definition of cross-partitions; and Part II applies cross-partitions to Webern's concerto op. 24, Schoenberg's piano concerto, and Dallapiccola's *Frammenti di Saffo* focusing on voice-leading, harmony, and motive association. According to Alegant, cross-partitions means a two-dimensional configuration of pitch classes whose columns are realized as chord, and whose rows are differentiated from one another by registral, timbral, or other means. This analysis suggests Dallapiccola's handling the row.

integration of musical elements into a coherent form and in its perceptive musical setting of text.

Background for *Sicut Umbra*

Sicut Umbra (*Like unto a Shadow*) was commissioned by the Elisabeth Sprague Coolidge Foundation in the Library of Congress, Washington, DC, and first performed on 30 October 1970 (at a Library of Congress concert) by Jan de Gaetani and the contemporary Chamber Ensemble of New York conducted by Arthur Weisberg. In a letter to his publisher, Dallapiccola indicated that he opened the book of Juan Ramon Jimenez's poem by chance. While he read the poem, he paid attention to the word, *firmamiento* that immediately inspired him to compose this piece.³³

Juan Ramon Jimenez (1881-1958) is a Spanish poet; German Romanticism and French Symbolism influenced his early poetry. His works are strongly visual and dominated by the colors yellow and green. His later style changes to decisive, and dominated by white. He was awarded the Nobel Prize for literature in 1956. Table 1.1 shows all three texts and their translations by J.L. Gili.

All three poems used in this piece are chosen from Jimenez's collection, *Piedra y cielo* (Stone and sky). Dallapiccola chose the two poems employed in the second and third movements after deciding on the last movement's poem, "Epitafio ideal de un marinero" (Ideal Epitaph for a Sailor), which contains the word *firmamiento*. His complete understanding of 'Epitafio ideal de un marinero' enabled him to select the other two poems, "El olivido" (Forgetfulness) in the second movement, and "El recuerdo"

³³ Luigi Dallapiccola, Letter to Suvini Zerboni, August 26, 1970.

(Memories) in the third movement. The contrasting materials used in the second and the third movements deal with related concepts and furthermore develop to the poem of the fourth movement, which includes both of the text materials. His choice and perfect arrangement of these three poems contribute to the creation of unity.

Table 1.1 Text in *Sicut Umbra*

El Olvido

Olvido, hermoso olvido,
 libertador final
 de nuestro nombre puro,
 en la imaginación del tiempo feo!

— Hombres, hombres, hombres..., ay!-

Oh, venideros días,
 en que el alma, olvidada con su nombre,
 habra estado, en sí, en todo,
 y no estará, con otro, en nada!

Recuerdo

Come Medanos de oro,
 que vienen que van, son los recuerdos.

El viento se los lleva,
 y donde están, están,
 y están donde estuvieron,
 y donde habrán de estar...
 — Medanos de oro—.

Lo llenan todo, mar
 total de oro ineffable,
 con todo el viento en el...
 — son los recuerdos —.

Forgetfulness

Forgetfulness, beautiful forgetfulness,
 final liberator
 of our immaculate name,
 in the imagination of an ugly time!

— Mankind, mankind, mankind ... ah!-

Oh, future days,
 in which the soul, with its name forgotten,
 will have been, in itself, in all,
 and will not be, with another, in nothing!

Memories

Like golden sand-dunes,
 that come and go, such are remembrances.

The wind carries them away,
 and where they are, they are,
 and they are where they were,
 and where they ought to be...
 — Golden sand-dunes—.

They permeate all,
 absolute sea of ineffable gold,
 with the wind ever present...
 such are remembrances—.

Table 1.1 (*continued*)

Epitafio ideal de un marinero

Hay que buscar, para saber
Tu tumba, por el firmamento.
— Llueve tu muerte de una estrella
La losa no te pesa, que es un universo
De ensueno —
En la ignorancia, estas
En todo (cielo, mar y tierra) muerto

Ideal Epitaph for a Sailor

We must look, if we want to find
your grave, overhead in the sky.
— Your death rains from a star.
The tombstone is light upon you,
for it is a dream universe —.
Unknowing, you dwell
in all- sky, sea, earth-dead.

Sicut Umbra is scored for mezzo soprano and four instrumental groups. It consists of four movements, which gradually expand with respect to instrumentation. Over the course of the four movements, four groups of three instruments are introduced: three flutes (piccolo, flute in C, flute in G) in the first movement, three clarinets (piccolo clarinet in E^b, clarinet in B^b, bass clarinet) and three strings (violin, viola, cello) in the second movement, three flutes, three clarinets, and three strings in the third movement, and three flutes, three clarinets, three strings, and an ensemble of vibraphone, celesta, and harp in the fourth movement. It is a clearly structured sequence in the gradual employment of the other groups as the work progresses.

The first movement is without text; the three others set individual poems. Each movement is successively longer with an exception between the second and third movements: 1' for the first movement, 2'28" for the second, 2' for the third, and 4'15" for the fourth. Table 1.2 shows an overview.

Table 1.2 Instrumentation and Duration of *Sicut Umbra*

	Instrumentation	Duration
1 st movement	three flutes (piccolo, flute, flute in G)	1'
2 nd movement	three clarinets (clarinet in E ^b , in B ^b , bass clarinet) three strings (violin, viola , cello) vocal line	2'28"
3 rd movement	three flutes (piccolo, flute, flute in G) three clarinets (clarinet in E ^b , in B ^b , bass clarinet) three strings (violin, viola , cello) vocal line	2'
4 th movement	three flutes (piccolo, flute, flute in G), three clarinets (clarinet in E ^b , B ^b , bass clarinet), three strings (violin, viola, cello) and an ensemble (vibraphone, celesta, harp) vocal line	4'15"

Chapter 2. Analysis of the First Movement

Introduction

The first movement is nine measures long. Despite its brevity, the movement is analytically rich, with a canon guided by sensitivity to the workings of inversional axis and pitch-class invariance. David Mancini has analyzed the first movement.³⁴ He makes several significant observations concerning the concept of polarity.³⁵ Mancini focuses on Dallapiccola's creation of the same set type through the juxtaposition of non-adjacent row dyads. In particular, he illustrates the formation of pitch class set [0126] through the connection of adjacent and non-adjacent dyads in each row form of the movement.³⁶ In addition, he reveals the connection between the polarity about the C-C[#] inversional axis of P₁ and I₀ and the polarity about pitch class set [0126].³⁷

³⁴ David Mancini, "Twelve-Tone Polarity in Late Works of Luigi Dallapiccola." *Journal of Music Theory* 30/1 (1986): 203–24, and "Form and Polarity in Late Works of Luigi Dallapiccola" (Ph.D. diss., Yale University, 1984), 2:26–54.

³⁵ In Mancini's analysis, the example of polarity arises from (1) the compositional association of non-adjacent pcs of a row, (2) the emphasis of inversional axes, and (3) invariant segments shared by two or more row forms.

³⁶ There are two ways to name set classes: first is Allen Forte's contribution, 4-5, and second is prime form, [0126]. (The term *set-class* synonymous with *set-type* or *collection class*; it denotes a collection of pcsets related by T_n and/or I.) When the context is clear, terms such as *trichord* that usually stand for pcsets are sometimes used in an abstract sense, as in "trichordal set-class" or "set-class containing trichords." I use the second method, prime form, in this dissertation. See Allen Forte, *The Structure of Atonal Music* (New Haven: Yale University Press, 1973); Robert Morris, *Class Notes for Atonal Music Theory* (Hanover, NH: Frog Peak Music, 1991), or John Rahn, *Basic Atonal Theory* (New York: Longman, 1980).

³⁷ Because of enharmonic equivalence, there are only twelve different pitch classes. I will use the "fixed do" notation, C=0, C[#]=1, ... B^b=t and B=e. Another convention in the literature uses "A" for 10 and "B" for 11. Set classes are identified after the fashion of Morris (1987).

Example 2.1b Arrangement of Row in *Sicut Umbra*



Dallapiccola emphasizes some interval classes over others through his use of phrasing marks and rests. As shown in Example 2.1b, the eighth rest is put between order numbers 2–3 and 4–5 and the sixteenth rest is placed between order numbers 6–7 and 7–8. Thus Dallapiccola’s realization of the row articulates three interval class 1s, two interval class 2s, and one interval class 3. Interval classes 5 and 6 disappear in this partition.³⁸ Compared to the original row, the number of occurrences of interval class 1 changes from four to three, that of interval class 2 and 3 remain two. The row is partitioned by Dallapiccola’s realization; interval classes are articulated by the partition.

The nine measures of movement I contain three canons – two based on row forms P_1 (mm. 1–3) and I_0 (mm. 6–8) and one based on the pair of rows P_2 and P_0 (mm. 4–5). Several characteristics associate the canons of mm. 1–3 and 6–8. Both row-forms’ presentations are rhythmically similar, while the inverted melodic contours of each row form reflect the inversive relation between P_1 and I_0 .

³⁸ The terms *partition* and *mosaic* are used differently in the literature. Donald Martino, “The Source Set and Its Aggregate Formations,” *Journal of Music Theory* 5/2 (1961): 224–73, uses *mosaic* to refer to a partition that divides the aggregate into segments of equal size. Morris and Alegant, “The Even Partitions in Twelve-Tone Music,” *Music Theory Spectrum*, 10 (1988): 74–103, define a *mosaic* as a set of partitions that are equivalent under transposition and/or inversion and a *partition class* as the set of all partitions with equal partition-cardinality-lists (pcas). Ricahrd B. Kurth, “Mosaic Polyphony Formal Balance, Imbalance, and Phrase Formation in the Prelude on Schoenberg’s Suite, Op. 25,” *Music Theory Spectrum* 14/2 (1992): 188–208, and Andrew Mead, “Some Implication of the Pitch Class/Order Number Isomorphism Inherent in the Twelve-Tone System,” *Perspectives of new Music* 26/2 (1988): 96–163; 27/1 (1989): 180–233, uses *mosaic* and *mosaic class* in the way that Morris and Alegant use *partition* and *mosaics*, respectively. Also see R. Kurth, “Partition Lattices In Twelve-Tone Music: An Introduction,” *Journal of Music Theory* 43/1 (1999): 21–82.

As shown Example 2.2a, row forms P_1 (mm. 1–3) and I_0 (mm. 6–8) invert about the axes $C-C^\sharp$ and $F^\sharp-G$. These two rows maximize segmental invariance; that is, no other row form shares more invariant segments with P_1 than does I_0 . The invariant segments include eight dyads ($\{C^\sharp D\}$, $\{E^b A\}$, $\{GA\}$, $\{GF^\sharp\}$, $\{F^\sharp E\}$, $\{EB^b\}$, $\{FG^\sharp\}$, $\{BC\}$), four trichords ($\{AGE^b\}$, $\{F^\sharp GA\}$, $\{GF^\sharp E\}$, $\{EF^\sharp B^b\}$), three tetrachords ($\{AGF^\sharp E^b\}$, $\{EF^\sharp GA\}$, $\{EF^\sharp GB^b\}$), two pent chords ($\{E^b EF^\sharp GA\}$, $\{EF^\sharp GAB^b\}$), one hexachord ($\{E^b EF^\sharp GAB^b\}$), one octachord ($\{E^b EFF^\sharp GG^\sharp AB^b\}$), and two nonachords ($\{DE^b EFF^\sharp GA^b AB^b\}$, $\{E^b EFF^\sharp GA^b AB^b B\}$).

Example 2.2a Invariance of Two Rows, P_1 and I_0

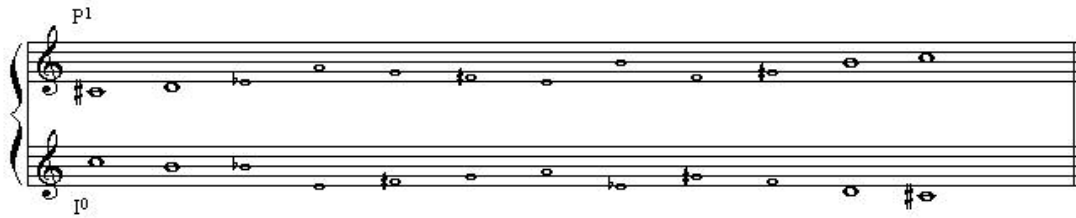
P_1 : C^\sharp D E^b A G F^\sharp E B^b F G^\sharp B C

I_0 : C B B^b E F^\sharp G A E^b G^\sharp F D C^\sharp

Five of the eight dyads held invariants between the two rows ($\{C^\sharp D\}$, $\{AG\}$, $\{F^\sharp E\}$, $\{FG^\sharp\}$, $\{BC\}$) are articulated by phrasing marks or rests in the piece (Examples

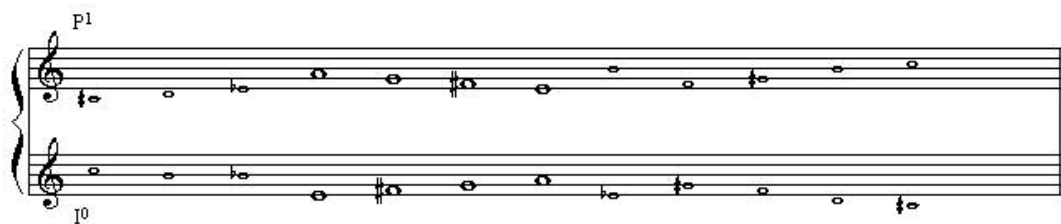
2.2a-2.2d). The five invariants dyads include two interval class 1s ($\{C^\sharp D\}$ and $\{BC\}$), two interval class 2s ($\{AG\}$ and $\{F^\sharp E\}$), and one interval class 3 ($\{FG^\sharp\}$). These invariances also share location exchange.

Example 2.2b Invariance Involving Interval Class 1



As shown in Example 2.2b, two interval class 1s occupy order positions 0 and 1 (the first dyad) and order positions t^{39} and e (last dyad); the first dyad is $\{C^\sharp D\}$ and the last dyad is $\{BC\}$ in P_1 . In I_0 , two interval class 1s also occur in the first and last dyads, $\{CB\}$ and $\{DC^\sharp\}$. The first dyad in the row P_1 becomes the last dyad in the row I_0 and the last dyad in the row P_1 turns into the first dyad in the row of I_0 and pc order reverses within each dyad.

Example 2.2c Invariance Involving Interval Class 2

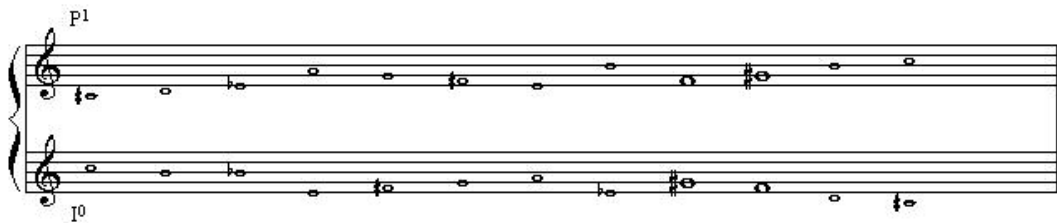


Instances of interval class 2 also exchange position and order (Example 2.2c). In P_1 , the dyad $\{AG\}$ is the order numbers 3 and 4 and the dyad $\{F^\sharp E\}$ is the order numbers

³⁹ I use t and e for 10 and 11, respectively.

5 and 6. On the other hand, in the row I_0 , the dyad $\{GA\}$ is the order numbers 5 and 6 and the order number of $\{EF^\#\}$ is 3 and 4 preserving the exchange of the order. In addition, the dyad $\{F^\#E\}$ occurs after the dyad $\{AG\}$ in the row P_1 , while the $\{EF^\#\}$ takes place before the $\{GA\}$ in the I_0 . Thus, the orders of two dyads in the P_1 are $\{AG\}$ - $\{F^\#E\}$ and that of two dyads in the row I_0 are $\{EF^\#\}$ - $\{GA\}$. Dallapiccola uses the $\{F^\#G\}$ dyad to articulate the inversionsal canon and axis.

Example 2.2d Invariance Involving Interval Class 3



For interval class 3, the two rows share one dyad, $\{FG^\#\}$, which occupies order positions 8 and 9 in both rows (Example 2.2d). But the order of appearance of the two pitches exchanges: the row P_1 , the order is $\{FG^\#\}$ and the order is $\{G^\#F\}$ in the I_0 .

Both P_1 and I_0 invert about the axes $\{CC^\#\}$ and $\{F^\#G\}$. The clearest emphasis of the inversionsal axes in P_1 and I_0 are the sustained pitches of each section: $c^\#_4$ in section A (mm. 1–3) and both $c^\#_4$ and c_6 in section A' (mm. 6–8). The other axis dyad, $\{F^\#G\}$, gains prominence by occurring in the same register in the opening row forms of each section (m. 1 and 6). In m. 1, the pitch range of g_4 and $f^\#_5$ (alto flute) is the same as that in m. 6 (flute).⁴⁰

⁴⁰ Incidentally, the entire pitch range in the first movement also articulates the axis. I discuss pitch range later in this chapter.

Form

Instrumentation in the first movement consists of three flutes (piccolo, flute, and alto flute) without the voice. The nine measures contain three canons, one in each section: section A consists of a canon by the single row P_1 , the transition by the rows of P_2 and P_0 , and section A' by the single row I_0 . The use of canon, texture, and tempo as well as row choice divide this movement into three sections: section A (mm. 1–3), a transition (mm. 4–5), and section A' (mm. 6–9) including a conclusion (m. 9).

Considering measures 4–5 to be the transition is based on the use of rows, canon, rhythm, and the tempo change. While sections A and A' each employ only one row form, P_1 (section A) and I_0 (section A'), the transition consists of two rows, P_2 and P_0 . In addition, sections A and A' have their own canons based on the single row form P_1 and I_0 , respectively. Both sections make use of inversional canon, while the transition makes one canon based on two rows, P_2 and P_0 . Rhythmically, sections A and A' are quite different from the transition. Sections A and A' consist of an alternation between duplet and triplet rhythms, while the transition is comprised of triplets (including the sextuplet). Tempo changes also support this sectional division. The transition has $\downarrow = 66$, while the tempo of both sections A and A' is $\downarrow = 44$. This tempo change plays an important role in creating the unique sonorities and structure (this will be discussed later in this chapter).

The last measure (m. 9) has the same tempo as sections A and A' ($\downarrow = 44$) and employs only one row form (RI_e) like sections A and A'; however, the texture of the last measure is quite different from that of previous sections, sections A and A'. Texturally, m. 9 is clearly different from mm. 6–8. In mm. 6–8, the texture is contrapuntal by the

canon, but the texture of m. 9 is homophony, unison rhythm. This homophonic texture in m. 9 foreshadows the music of the second movement. The row used in the conclusion is quite different from that of section A': RI_e in the conclusion and I₀ in section A' (the reason for the different character of the row RI_e compared to the previous rows used will be clear later in this chapter). Thus, the division of the conclusion within section A' is based on the texture and row used; however, the conclusion can not be considered an individual section. The quite different character of row RI_e and the homophonic texture could be enough for making a sectional division. But there is no tempo change where as section A, the transition, and section A' all had tempo change. There is no independent rhythmic element either. These factors make the conclusion best considered as included in section A'.

Musical Analysis

Section A (mm. 1–3)

Row and Pitch

Section A has one row P₁. While the flute sustains the pitch c[#]₄ (the first order number) through section A, the piccolo and alto flute play the row P₁ (order numbers 1–e) in canon. After the alto flute plays the row P₁ in mm. 1–3, the piccolo follows with the same row in mm. 2–3. The pitch range changes along with the order numbers: for order numbers 1–4, the piccolo's pitch range is two octaves higher than the alto flute's; for order numbers 5–9, the range in the piccolo changes to an octave above the alto flute's, and then returns to two octaves higher in order numbers t and e.

Example 2.3 Section A (mm. 1–3)

The image shows a musical score for three measures. The top three staves are labeled OTTAVINO, PICCOLO, and FLAUTO in Sol. The bottom three staves are labeled OCL., FL., and P1. Sol. The tempo is Scherzamente (♩ = 98). The Alto Flute part has a quintuplet in m. 1 and a triplet in m. 2. The Piccolo part follows the Alto Flute's rhythm with a quarter duration of B^b₄ in m. 2 and a dotted eighth duration of B^b₅ in m. 3. The score includes dynamic markings like ppp, pp, and p, and articulation markings like 'non articolato le note ribattute'.

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As shown in Example 2.3, the alto flute and piccolo have almost identical rhythms. Since the piccolo follows one measure behind the alto flute's line, the piccolo's rhythm in m. 2 is similar to the alto flute's rhythm in m. 1 and the piccolo's rhythm in m. 3 is similar to the alto flute's in m. 2. The quintuplet in the alto flute (m. 1) changes to the triplet in the piccolo (m. 2) and the quarter-duration of b^b_4 in the alto flute (m. 2) also changes to dotted eighth duration of b^b_5 in the piccolo (m. 3).

The rhythms of the last two order numbers t and e differ between the alto flute and piccolo. While the alto flute has the triplet rhythm (half-note duration) after the sixteenth notes in mm. 2–3, the piccolo's rhythm is the eighth-note (quarter-duration) in m. 3. This different rhythm, in spite of the canon, is due to the meter change. The meter starts as 9/8 in m. 1, but changes in every measure—8/8 in m. 2 and 7/8 in m. 3. As the meter changes from 9/8 to 7/8, the rhythmic pattern of the corresponding melody becomes shorter. In articulation, the b^b_4 in m. 2 (alto flute) is tongued and the b^b_5 in m. 3

(piccolo) is *Fitz*. Its different articulation relates the rhythmic change containing the same dynamics.

Example 2.4 Composite Rhythm in Section A



Example 2.4 shows the composite rhythm in section A.⁴¹ This rhythm consists mainly of the eighth-note duration. Between the eighth notes, there are the quintuplet and triplet rhythms in mm. 1–2. In addition, the eighth rest also appears between the eighth-note. The usage of eighth rest is consistent: after four eighth-note durations (two eighth notes and quintuplet sixteenth notes), the eighth rest appears in the middle of m. 1 and after two eighth-durations, the eighth rest takes place in the end of m. 1. It forms a regular pattern of $4 + \gamma + 2 + \gamma$ based on accounting the eighth duration. This regular appearance repeats in m. 2. From m. 3, the eighth rest changes to the tie and the regularity also changes. The tie appears every two eighth-note triplets. The $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ structure in mm. 1–2 changes to $2 + (1)$ in m. 3.⁴² This $2 + (1)$ structure continues and, thus, helps keep the sense of regularity rather than alternation.

This structure, the appearance of rest and tie, has deep connection to the sustained pitch $c^{\#}_4$ in the flute. The flute plays only one pitch, $c^{\#}_4$, reiterating it on the last beat of each measure. The first reiteration at the end of m. 1 is the same point as the beginning of

⁴¹ The pattern of successive entrances of tones, of successive attacks, in the three voices taken together can be called their “composite rhythm.”

⁴² The number in parenthesis counts the tied value.

second $4 + \gamma + 2 + \gamma$ within $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ and the second reiteration at the end of m. 2 is also the same as the changing point from the eighth rest to the tie. Thus, the recurrence of $c^{\#}_4$ strongly supports the composite rhythm, $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ pattern, since every $4 + \gamma + 2 + \gamma$ structure contains a re-articulation of this axis pitch.

Chord-Types

The use of canon between the alto flute and piccolo with the sustained $c^{\#}_4$ also brings out diverse vertical sonorities. In m. 1, all possible dyads, [01], [02], [03], [04], [05], and [06] occur in the flute and alto flute lines. With the addition of the piccolo in m. 2, dyads give way to trichords. Dyads return as the alto flute drops out at the end of m. 3. In contrast to the full range of dyads that occur in section A, there are only a few types—[013], [014], [015], [016], [025], and [026]. Of these six trichord types, the [026] has a short rhythmic pattern, the grace note. On the other hand, the [013] and [014] have a long duration, the dotted eighth duration. The pitch b^b_5 in the piccolo and the $c^{\#}_4$ in the flute make [013]s with the alternating pitches of b_4 and c_5 in the alto flute (Example 2.3).

The appearance of all possible dyads corresponds to the first $4 + \gamma + 2 + \gamma$ within the $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ structure and the long duration of [013] and [014] occur at the same point as the change from $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ to $2 + (1)$ structure. As the change from $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ to $2 + (1)$ forms more sustained notes by the tie, the trichords occur in longer durations. Table 2.1 shows all trichord types that appear in section A.

Table 2.1 Trichord Types in Section A

	[012]	[013]	[014]	[015]	[016]	[025]	[026]
Flute	{C [#] DE ^b } {BCC [#] }	{B ^b BC [#] } {C [#] CB ^b }	{DC [#] B ^b } {CC [#] E}	{G [#] AC [#] } {C [#] CG [#] }	{GG [#] C [#] }	{E ^b C [#] B ^b } {BC [#] E} {C [#] BG [#] }	{BC [#] F}

In summary, through the use of canon along with the sustained pitch $c^{\#}_4$, Dallapiccola's sonorities expand from dyads to trichords in the middle of section A and return to dyads at the end of the section. The piccolo's addition in m. 2 brings about this expansion. The use of piccolo not only expands the sonorities used from dyads to trichords, but also the pitch range to c_7 in the end of section A (pitch range in section A will be discussed in detail later in this chapter). In addition, the sustained pitch $c^{\#}_4$ contains two important things: its appearance and reiteration occurs at the same points as the rhythmic pattern (4 + 7 + 2 + 7 + 4 + 7 + 2 + 7) of the composite rhythm and it produces a variety of sonorities—not only all the possible dyads but also trichords with the alto flute and piccolo.

Transition (mm. 4–5)

Rhythm

The transition has two rows P_2 and P_0 , which appear in canon. While the row P_2 consists of a sixteenth-note sextuplet, P_0 has three different rhythms: eighth-note triplet (order numbers 0–4), half-note (order number 5), dotted sixteenth notes (order numbers 6–8), and the quarter-note triplet (order number 9–e). The rhythm of the row P_0 is augmented, relative to the rhythm for the row P_2 (Example 2.5). Between P_2 and P_0 , the rhythm associated with order numbers 0–4 in P_0 is doubled and the register of the order

numbers 0–4 moves down exactly one whole step. After order number 5, the rhythm and register of P_0 are not consistent when compared to the row P_2 .

Example 2.5 Transition (mm. 4–5)

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The composite rhythm consists of the sextuplet, duplet, and triplet as shown in Example 2.6. The sixteenth-note sextuplet is prepared by the sixteenth-note quintuplet in section A and the quarter-note triplet also comes from an example of the sixteenth-note triplet and eighth-note triplet in section A. This clearly shows a trend in rhythmic development: the fast rhythms develop to even faster rhythms (quintuplet to sextuplet) and the slow rhythms become even slower (from the eighth-note triplet to the quarter-note triplet).

Example 2.6 Composite Rhythm in Transition

The composite rhythm in Example 2.6 shows the slowing of the rhythmic pattern. It starts with a sixteenth-note sextuplet in m. 4 and changes to the dotted sixteenth note at the beginning of m. 5 and to the quarter-note triplet at the end of m. 5. Thus, the absolute beat becomes slower like a *ritardando* from 396 (sixteenth-note septuplet) to 99 (quarter-note triplet) via 198 (dotted sixteenth note). This occurrence of *ritardando* is to prepare section A' regarding the sonority and the beat. Since tempo changes in the transition from $\downarrow = 44$ to $\downarrow = 66$, the beat at the end of the transition (99 in quarter-note triplet) is similar to the beginning of section A' (88 in eighth note) creating a smooth transfer between sections. This planned change of beat set up an expectation for a change in another dimension—the sonority. Just what sonority this is and how it works, is a matter for discussion in the sonority section of this chapter.

While the triplet and quintuplet rhythms take place between the dominant duple rhythms in section A, the duple rhythm appears between the triplets (or sextuplets) in the transition. This alternated rhythmic pattern represents two meanings: (1) it shows a change in the characteristic rhythmic pattern (although it still contains similar rhythmic elements) between inverted canon (sections A and A'), and (2) this inverse rhythmic pattern implies that the inversional canon between sections A and A' is a transition, containing with the sections on either side.

Meter changes occur in both measures of the transition. The meter starts as 2/4 in m. 4 and changes to 7/8 in m. 5. While the measures become shorter (9/8 - 8/8 - 7/8) in section A, the meter in the transition expands from 2/4 to 7/8. The trend of the contraction of the meter in section A continues to the beginning of the transition from 7/8 (m. 3) to 2/4 (m. 4). In addition, the meter 7/8 (m. 5) in the end of the transition prepares

for the beginning of section A' by the expansion from 2/4 to 7/8. The dynamics are still soft (*pp* and *piu p*) as in section A.

Pitch and Chord-Types

The pitch $c^{\#}_4$ is sustained through the transition with a brief break and a change of instrument (from flute to alto flute). The alto flute prepares its $c^{\#}_4$ with a short rhythm in m. 4 and then overlaps with the flute on the eighth beat to ensure continuation. This switching instrumentation prepares the sonority of section A' (which will be discussed in section A'). In addition, the continuation of sustained $c^{\#}_4$ in the transition prepares as well as carries certain specific sonorities.

In the transition, the rhythm and phrasing mark emphasize a specific sonority, the [012] trichord. The row P_2 in m. 4 starts after the $c^{\#}_4$, which is tied throughout section A. The note $c^{\#}_4$ and the first five notes of P_2 ($d_4, d^{\#}_4, e_4, b^b_4, a^b_5$) occur consecutively within the sextuplet (Example 2.5). Thus, two [012] trichords, $c^{\#}_4d_4d^{\#}_4$ and $d_4d^{\#}_4e_4$, occur consecutively in the beginning of the transition. While two [012]s occur in the flute line, the alto flute forms the [012], $c_4c^{\#}_4d_4$. The order numbers 0-4 of P_0 (alto flute) make up the augmented canon a whole step below. Thus, the beginning of the transition carries three [012]s, $c_4c^{\#}_4d_4$, $c^{\#}_4d_4d^{\#}_4$, and $d_4d^{\#}_4e_4$ consisting of a semitone relation.

On the other hand, the phrasing mark breaks the piccolo's triplet rhythm as g_5 - $b^b_6b_5$ (1:2) in m. 5 (Example 2.5). The pitch g_5 associated with the previous notes e^b_7 - a_6 - e_6 by a phrasing mark, resulting in [0146] tetrachord. This set-class occurs in the row as a row segment and is used frequently in later movements. The notes b^b_6 - b_5 connect to the

next note, c_6 , played in the beginning of section A' and make the trichord [012], $b^b_6b_5c_6$.

Besides the creation of [012], there are also [013], [014], and [016] trichords as shown in Table 2.2.

Table 2.2 Trichord Types in the Transition

	[012]	[013]	[014]	[016]
Flute	{CC [#] D} {C [#] DD [#] } {DD [#] E} {B ^b BC} {BCC [#] }	{C [#] CB ^b } {FF [#] G [#] } {GA ^b B ^b } {A ^b GF}	{C [#] CA} {FEC [#] } {BB ^b G}	{DC [#] G [#] } {E ^b EA} {ED [#] B ^b } {FF [#] B}

In summary, the transition makes a bridge from section A to section A' by the alternated composite rhythmic pattern, developed rhythm, meter change, and increased transpositions in chord-types. It also suggests inverted canon between sections A and A'.

Section A' (mm. 6–9)

Rhythm

Section A' has the same rhythm as section A but includes one more measure, m. 9. The alternation between duplet and quintuplet or triplet and the $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma$ structure repeat in mm. 6–8 and then the long duration conclude section A'. Example 2.7 shows the composite rhythm of section A'.

Example 2.7 Composite Rhythm in Section A'

$\text{♩} = 44$

Meter change occurs every measure, 9/8 in m. 6, 8/8 in m. 7, 7/8 in m. 8, and 9/8 in m. 9. Measure length diminishes to 7/8 in m. 8 and returns to 9/8 in m. 9, the same as the meter in the beginning of sections A and A'. The tempo also returns to $\text{♩} = 44$ from $\text{♩} = 66$ in the transition. This returning tempo smoothly connects two notes' values, the last note in the transition ($\text{♩} = 99$) and the first note in section A' ($\text{♩} = 88$). Furthermore, the beat of the eighth-note triplet in the transition and that of the sixteenth-note quintuplet in section A' are also similar: $\text{♩} = 198$ and $\text{♩} = 220$, respectively. The articulation and dynamics are also the same as those of section A.

Pitch and Chord-Types

As shown Example 2.8, while the piccolo sustains c_6 , order number 0 of I_0 in mm. 6–8, the flute plays the order numbers 1–e in mm. 6–8 and the alto flute plays the order numbers 1–e one measure behind, mm. 7–8. The flute and alto flute make a canon at the octave.

Example 2.8 Section A' (mm. 6–9)

The image shows a musical score for three instruments: piccolo, flute (Fl.), and alto flute (Alto Fl.). The score is divided into two systems, each containing three staves. The tempo is marked as quarter note = 44. The piccolo part is marked 'a tempo' and 'ppp, sost.'. The flute and alto flute parts are marked 'ppp' and 'sost.'. The flute and alto flute parts are in canon at the octave. The alto flute part starts one measure behind the flute part.

Section A' has two sustained pitches, the $c^{\#}_4$ in the alto flute's line and the c_6 in the piccolo's line. The sustained pitches c_6 and $c^{\#}_4$ play an important role in creating sonority and pitch range. First, in sonority, those two pitches participate in four types of trichord, [012], [013], [014], [016], in the beginning of section A'. Introduced one at a time in section A and the transition, these four trichord types appear in direct succession in m. 6. This appearance also prepares for another appearance in m. 9.

The occurrences of these successive trichords in m. 6 and m. 9 have different pitch formations. In m. 6, the sustained pitch $c^{\#}_4$ and the first seven pitches of I_0 produce the four types of trichord, whereas the trichord partitions in RI_e make four trichord types in m. 9. However, they have a common texture as vertical trichords played by three instruments. The previous trichords, which are occurred before m. 6, consist of two instruments in vertical texture and one instrument in horizontal texture. These four trichord types, [012], [013], [014], and [016], appear continuously in the fourth movement and play an important role in the entire piece.

Table 2.3 Trichord Types in Section A'

	[012]	[013]	[014]	[016]	[015]	[025]
Flute	{AB ^b B} {B ^b BC} {BCC [#] }	{CC [#] E ^b } {C [#] CB ^b } {F [#] FE ^b }	{CC [#] E} {C [#] CA} {FED ^b } {BCE ^b }	{CC [#] F [#] } {C [#] CG} {F [#] FC} {A ^b GD}	{CC [#] F} {FEC}	{DCA} {B ^b CE ^b }

In addition to the trichords [012], [013], [014], and [016], other trichord types of [015] and [025] are formed in section A'. Table 2.3 shows several members of trichord-types in section A'. In terms of frequency, [014] is the most frequent, occurring five times; [016] is the second most frequent occurring four times. The [013] and [012] each occur three times. The trichords [012] and [013] occur less often, but have a characteristic

rhythm and position — the [013] in the middle of m. 8 has the longest duration, a dotted eighth note due to the changing pitches of d_5 and $c^{\#}_5$ in the flute with the pitches c_6 (piccolo) and e^b_4 (alto flute). The [012] appears three times, twice in the beginning and once in the end of section A'. Especially prominent are the occurrences in the beginning of section A' and at the end, which are actually the first and last sonorities in section A'. The last [012] sonority has a long duration. This shows the apparent importance in the formation of [012], which will be discussed later.

Comparative Analysis: Section A, Transition, and Section A'

Form

Within each section A and A', the canon consists of a similar rhythmic pattern and the register shows a one (or two) octave relation. The canon in the transition, however, uses different rhythmic patterns and pitch range. Furthermore, the canons in sections A and A' show an inversional relationship using the same rhythmic pattern but inversion in contour. The inversional canons in sections A and A' use rows P_1 and I_0 and have the development of member in four trichord types.

Axis and Invariance

Among the maximum number of invariant dyads between rows P_1 and I_0 , five dyads (two [01]s ($C^{\#}$ -D and B-C), two [02]s (G-A and $F^{\#}$ -E), and one [03] (F- $G^{\#}$)) are strongly emphasized by phrasing marks and rests. On the other hand, two rows P_2 and P_0 have one invariant, C- $C^{\#}$, which appears in the first dyad or in the last dyad. In addition,

the R_e also contains C-C[#] invariance in the first dyad. Example 2.9 shows the invariance in four rows.

Example 2.9 C-C[#] Invariance in Four Rows, P₁, I₀, P₀, P₂, and RI_e

P₁: C[#] D E^b A G F[#] E B^b F G[#] B C

I₀: C B B^b E F[#] G A E^b A^b F D C[#]

P₀: C C[#] D G[#] F[#] F E^b A E G B^b B

P₂: D D[#] E B^b A^b G F B F[#] A C C[#]

R_e: C C[#] E D G A^b F[#] F E^b A B^b B

Dallapiccola's choice of three rows—P₀, P₂, and RI_e—is apparently based on the potential for invariance. Furthermore, the invariant C-C[#] has the same pitches as the axis in two inversionally related rows, P₁ and I₀. Thus, the two rows related by inversion have the greatest possible invariance and their axis also appears in the remaining three rows' invariance. Dallapiccola's canonic treatment of these two inversionally related rows and choice of other rows obviously and strongly contains the C-C[#] dyad emphasized long duration.

Rhythm

Sections A and A' have the same composite rhythm due to the canon. In comparing the two sections' rhythm, the flute in section A and the piccolo in section A' have the same rhythm and sustain one pitch. The alto flute's rhythm in section A transfers to the flute's rhythm in section A' and the piccolo's rhythm in section A transfers to the

alto flute's rhythm in section A'. This produces a kind of texture inversion between sections A and A'.

Example 2.10 Composite Rhythm of the First Movement

The musical score consists of five staves of music. The first staff begins with a tempo marking of $J = 44$. It features a sequence of eighth notes, some grouped in triplets and quintuplets, with a half rest and a tie. The second staff starts with a tempo change to $J = 66$ and contains eighth-note triplets and sextuplets. The third staff returns to $J = 44$ and includes eighth-note groups and a half rest. The fourth staff continues with eighth-note patterns and a half rest. The fifth staff concludes with eighth-note patterns and a double bar line.

As shown in Example 2.10, section A keeps regular rhythmic pattern, alternating duplet and triplet (quintuplet) and produces $4 + \gamma + 2 + \gamma + 4 + \gamma + 2 + \gamma + 2 + (1) + 2 + (1) + 2$ structure divided by the eighth-rest and tie. The transition, starting with tempo change, alters the rhythmic pattern to become slower like a *ritardando* and then section A' starts with the same rhythmic pattern as section A and ends with the long sustained rhythm for the conclusion. The rhythm in the transition is important in the connection between inversional canons: the use of the same rhythmic pattern, the eighth-note triplet (sixteenth-note sextuplet), at the end of section A and the beginning of the transition secures the continuation. The formation of similar durations at the end of the transition and the beginning of section A' also provides a smooth connection. The slowing rhythmic pattern in the transition accomplishes a smooth connection between the two sections.

Tempo Change

Tempo change occurs in the beginning of each section. This is a basis for the sectional division of the musical surface. This tempo change also plays a crucial role in sectional connection and helps carry a specific sonority—in between section A and the transition, the piccolo's last two pitches (b₆-c₇) are the eighth duration and those two pitches repeat in the beginning of the transition, now having the eighth-note triplet duration. Due to the tempo change, the repeated pitches have a similar beat—the eighth duration in section A is 88 and the eighth-note duration within the triplet is 98 in the transition. This connection between pitch repetition and similar beat connects the two sections smoothly. Tempo change also plays an important role in sonority (which will be discussed later in the section dealing with chord).

Chord-Types

The beginning of sections A and A' are important in the formation of sonority. All possible dyads occur in the beginning of section A and dyads give way to trichords at the start of section A'. The piccolo's entrance in m. 2 expands dyads to trichords within section A, but only serves to introduce sonorities with three tones, rather than to create any consistent trichordal sonority. Seven types of trichord (Table 2.1) in section A reduce to four types of trichord (Table 2.2) in the transition, but these are not consistent. Finally, the beginning of section A' forms the different trichord types, [012], [013], [014], [016], consecutively. The same types occur in the reverse order to the end of section A' in the conclusion of m. 9.

Tables 2.4a-2.4d show all members of the four trichord types [012], [013], [014], and [016] found across the three sections A, transition, and A'. Only some members from each set class occur. The processes for establishing the four types and for developing certain members begin to reveal Dallapiccola's compositional techniques in choice of row, rhythmic treatment, occurrence of tempo change, handling of pitches, and so on.

Table 2.4a Occurrence of [012] Type Based on Section

	Section A	Transition	Section A'	Whole Movement
{CC [#] D}		✓		✓
{C [#] DE ^b }	✓	✓		✓
{DE ^b E}		✓		✓
{E ^b EF}				
{EFF [#] }				
{FF [#] G}				
{F [#] GG [#] }				
{GG [#] A}				
{G [#] AB ^b }				
{AB ^b B}			✓	✓
{B ^b BC}		✓	✓	✓
{BCC [#] }	✓	✓	✓	✓

Table 2.4b Occurrence of [013] Type Based on Section

	Section A	Transition	Section A'	Whole Movement
{CC [#] E ^b }			✓	✓
{C [#] DE}				
{DE ^b F}				
{E ^b EF [#] }				
{EFG}				
{FF [#] G [#] }		✓		✓
{F [#] GA}				
{GG [#] A [#] }		✓		✓
{G [#] AB}				
{AB ^b C}				
{B ^b BC [#] }	✓			✓
{BCD}				
{CBA}				
{C [#] CB ^b }	✓	✓	✓	✓
{DC [#] B}				
{E ^b DC}				
{EE ^b C [#] }				
{FED}				
{F [#] FE ^b }			✓	✓
{GF [#] E}				
{A ^b GF}		✓		✓
{AG [#] F [#] }				
{B ^b AG}				
{BB ^b G [#] }				

Table 2.4c Occurrence of [014] Type Based on Section

	Section A	Transition	Section A'	Whole Movement
{CC [#] E}	V		V	V
{C [#] DF}				
{DE ^b F [#] }				
{E ^b EG}				
{EFG [#] }				
FF [#] A}				
{F [#] GB ^b }				
{GG [#] B}				
{G [#] AC}				
{AB ^b C [#] }				
{B ^b BD}				
{BCE ^b }			V	V
{CBA ^b }				
{C [#] CA}		V	V	V
{DC [#] B ^b }	V			V
{E ^b DB}				
{EE ^b C}				
{FEC [#] }		V	V	V
{F [#] FD}				
{GF [#] E ^b }				
{G [#] GE}				
{AG [#] F}				
{B ^b AF [#] }				
{BB ^b G}		V		V

Table 2.4d Occurrence of [016] Type Based on Section

	Section A	Transition	Section A'	Whole Movement
{CC [#] F [#] }			✓	✓
{C [#] DG}				
{DE ^b G [#] }				
{E ^b EA}		✓		✓
{EFB ^b }				
{FF [#] B}		✓		✓
{F [#] GC}				
{GG [#] C [#] }	✓			✓
{A ^b AD}				
{AB ^b E ^b }				
{B ^b BE}				
{BCF}				
{CBF [#] }				
{C [#] CG}			✓	✓
{DC [#] G [#] }		✓		✓
{E ^b DA}				
{EE ^b B ^b }		✓		✓
{FEB}				
{F [#] FC}			✓	✓
{GF [#] C [#] }				
{A ^b GD}			✓	✓
{AA ^b E ^b }				
{B ^b AE}				
{BB ^b F}				

The [012] trichords play an important role, especially the formation and exposition of six members of [012] show the shaping of form through the manipulation of rhythm and row. Example 2.11 provides a diagram which members of [012] occur as row segments within the rows found in the first movement. First, in between section A and the transition, the sustained pitch $c^{\#}_4$ and the first three notes of P_2 introduce two [012]s, $c^{\#}_4d_4d^{\#}_4$ and $d_4d^{\#}_4e_4$. The $c^{\#}_4d_4d^{\#}_4$ is the same member to the first trichord in P_1 (beginning of section A, m. 1) presenting the same pitch range ($c^{\#}_4$ in the flute and d_4 and $d^{\#}_4$ in the alto flute). Second, in between the transition and section A', the last pitch of P_2

($c^{\#}_4$ sustained through the transition and section A') and the first two pitches of I_0 make a member of $\{BCC^{\#}\}$ in the beginning of section A', m. 6. This $\{BCC^{\#}\}$ has already appeared twice in the end of section A and in the beginning of the transition, mm. 3–4. The tempo change and repeated notes in the piccolo create the $\{BCC^{\#}\}$ in mm. 3–4 as explained in the section on tempo change. Thus, the repeated trichords in the transition have the same pitch ($c^{\#}_4 d_4 e^b_4$) or the similar beat ($b_6 c_7 c^{\#}_4$). A variation in texture accompanies the repetition of these two trichordal pitch-class sets: $\{C^{\#}DE^b\}$ is formed between two instruments in section A but becomes a melodic event in the transition, while the $\{BCC^{\#}\}$ formed between two instruments in the transition becomes an interaction among three instruments in section A'.

Example 2.11 Members of [012] as Row Segment in Rows P_1 , P_2 , P_0 and I_0 .

P_1	P_2	I_0
$C^{\#} D E^b \sim \sim \sim \sim G^{\#} B C$	$D D^{\#} E \sim \sim \sim \sim A C C^{\#}$	$C B B^b \sim \sim \sim \sim \sim \sim \sim \sim D C^{\#}$
$C^{\#}$	-----	
	$C C^{\#} D \sim \sim \sim \sim B^b B$	C -----
	P_0	

The last two pitches of the P_0 (B^b - B) and the first pitch of I_0 (C) produce the set $\{B^bBC\}$ in mm. 5–6. The breaking of the triplet rhythm into 1:2 ($g_5: b^b_6 b_5$) in m. 5 and the smoothly connected beat between the transition ($\downarrow = 99$) and section A' ($\downarrow = 88$) strongly articulates this trichord, which also appeared as the first trichord in the row I_0 . After the trichord $b^b_6 b_5 c_6$ at the end of the transition by the piccolo, the same member repeats in the beginning of section A' by the piccolo and flute. The employment of the

same instrument and the sustained pitch c_6 in the piccolo help to connect two instances of the same trichord that occur in different sections.

The first pitch (C) and the last two pitches (D-C[#]) of the I_0 also make a [012] at the end of section A', m. 8 ($c_6c_5^\#d_5$ in m. 8), due to the sustained pitch C. This member already appears in P_0 as the first trichord partition, which appeared in pitch range $c_4c_4^\#d_4$, m. 4 (Example 2.11).

The two rows P_1 and I_0 and the invariance between them play a crucial role in the four-fold repetition of {BCC[#]} (once in section A, twice in the transition, and once in section A'). The C-C[#] (the invariance and axis in P_1 and I_0) as well as an invariance (the remaining rows, P_2 and P_0) bring out an important textural feature. Until the transition, the {BCC[#]} is formed vertically, between two instruments. The fourth appearance of {BCC}, at the beginning of section A', involves three instruments.

The rows P_2 and P_0 used in the transition play an important role: the transition works as a bridge between sections A and A' containing the same members of [012] that appeared in sections A and A'. The transition contains two members of [012]—{C[#]DE^b} and {BCC[#]}—that are also formed in section A; two additional members {B^bBC} and {CC[#]D} appear in section A'. This produces the maximum effect of canon by overlapping and crossing trichords. The [012]s prepared horizontally from the beginning of section A finally form vertical [012] in the beginning of section A'. In addition, the last chord in this movement is also an [012] emphasized by a fermata.

Thus, I find here the repetition of [012]s, $\{B^bBC\}$, $\{BCC^\#\}$, $\{CC^\#D\}$, $\{C^\#DE^b\}$, relate to the contextual invariance used in this movement. The first pitch and the last two pitches or the first two pitches and last pitch in P_1 , I_0 , P_2 , and P_0 form four repeated [012] trichords. The reason to sustain the pitches $c^\#_4$ and c_6 occupying the first and last pitch in rows P_1 and I_0 is finally clear.

The formation of [012] utilizes four main techniques: (1) among eleven instances of [012]s in the entire movement, there are only six transpositions ($\{AB^bB\}$, $\{B^bBC\}$, $\{BCC^\#\}$, $\{CC^\#D\}$, $\{C^\#DE^b\}$, $\{DD^\#E\}$). The adjacent two pitches among these six members are either the first or last dyad in the five rows (P_1 , P_2 , P_0 , I_0 , RI_e) used in this movement. (2) The tempo change carrying the similar beat and the repeated pitches forms the two members of [012], $\{BCC^\#\}$ (mm. 3–4) and $\{B^bBC\}$ (mm.5–6). (3) The sustained pitches $c^\#_4$ in section A and the c_6 as well as $c^\#_4$ in section A' are involved in creating the [012]s. Finally (4) the pitch range of this movement, especially the lowest, highest, and middle ranges, engages four transpositions: $\{B^bBC\}$, $\{BCC^\#\}$, $\{CC^\#D\}$, and $\{C^\#DE^b\}$.

Pitch Range

The change in instrumentation between sections A and A' produces a higher sustained pitch in section A': the flute in section A changes to the piccolo in section A', the alto flute in section A changes to the flute in section A', and the piccolo in section A changes to the alto flute in section A'. Table 2.5 shows the pitch range in this movement.

Table 2.5 Pitch Range of the First Movement

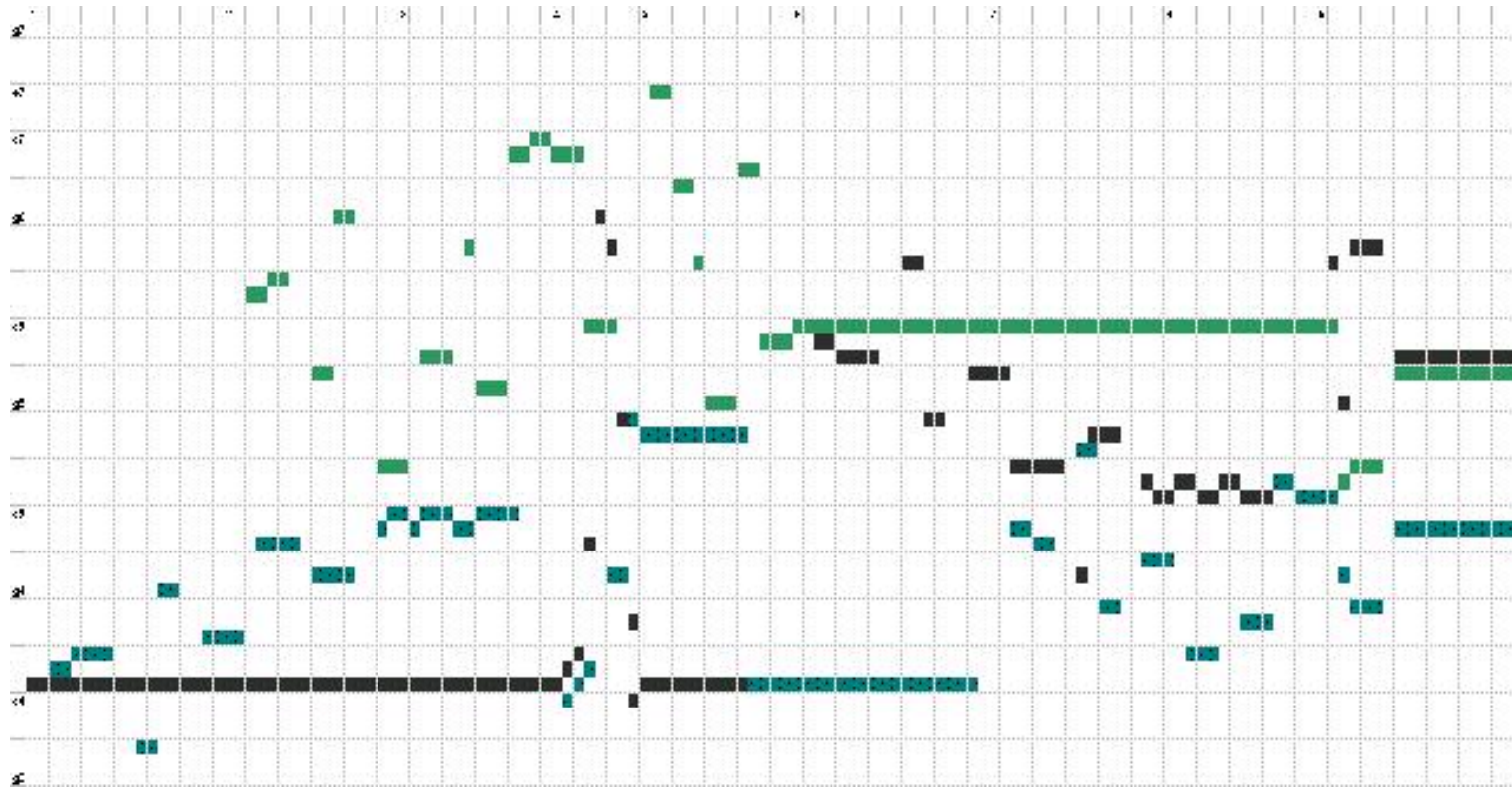
	Pitch Range	Center Pitch	Sustained Pitch
Section A	a ₃ to c ₇	e ₅ -f ₅	c [#] ₄
Transition	c ₄ to e ^b ₇	g ₅ -a ^b ₅	c [#] ₄
Section A'	g ₃ to c ₆	a ₄ -b ^b ₄	c [#] ₄ and c ₆

The pitch range of section A is a₃ to c₇. In spite of lowest pitch a₃, c[#]₄ is considered the lowest pitch due to its prominence having the long duration. While the c[#]₄ sustains through section A, the a₃ appears in a short rhythm, the eighth duration. The center pitch of the entire pitch range in section A is e₅-f₅.

In the transition, the range is from c₄ to e^b₇, which is the widest in this movement. The c[#]₄ may be considered as the lowest pitch in the transition, since the c₄ appears in a short rhythm, the eighth-note triplet, compared to the sustained c[#]₄. The upper range extends to e^b₇, while the c[#]₄ sustains in mm. 4–5 after short break. The pitch e^b₇ is the highest pitch in the entire first movement. The center pitch between lowest and highest pitches in the transition is g₅-a^b₅.

The pitch range in section A' is the narrowest as g₃ to c₆ among three sections. The expanded high pitch range in the transition apparently reduces to c₆ and low pitch range also descends to g₃ in section A'. The center pitch of section A' is a₄-b^b₄. Through the movement, the center pitches are c₅-c[#]₅, which is the middle position of two

Example 2.12 Pitch Range of the First Movement



sustaining pitches, c_4 and $c_6^\#$. Example 2.12 clearly shows the pitch range in the entire piece.

In pitch range, the contribution of two sustained pitches, c_4 and $c_6^\#$, is also significant. The pitch c_4 suggests the lowest pitch range in section A and the transition and the $c_6^\#$ is also the highest pitch in section A'. Actually, there are other lower (a_3 in section A) and higher pitches (e_6 and f_6 in section A') in this movement, but the two sustained pitches' duration is more prominent than the others. In addition, they are involved in creating [012] trichords. The lowest pitch c_4 in section A is a constituent member of $\{C^\#DE^b\}$ and the highest pitch $c_6^\#$ in section A' also creates the $\{B^bBC\}$. Both are the first trichord type in the two main inversional rows.

In section A, the low pitch range ascends approaching c_5 in the end of section A. In section A', the high pitch range moves toward $c_5^\#$ at the end of section A'. The middle pitches, c_5 and $c_5^\#$, are approached from the low (c_4) and high ($c_6^\#$) pitch ranges. One of the middle pitches, c_5 , appears in the end of section A and relates to the $\{BCC^\#\}$ in mm. 3–4. In addition, the other of middle pitch $c_5^\#$ occurring in the end of section A' also has a relation to the $\{CC^\#D\}$ at the end of m. 8. Consequently, the lowest pitch range containing $\{C^\#DE^b\}$, the highest pitch range involving $\{B^bBC\}$, and the middle pitch range having $\{BC^\#C\}$ and $\{CC^\#D\}$ deeply relate to the formation in [012], emphasized in the first movement.

Conclusion

One of the main purposes of this analysis is to discover how the work is unified and how the composer provides contrast and diversity within the unity. The first movement shows Dallapiccola's excellent control and balance in this regard. Dallapiccola establishes designed sonorities in a very short period of time (nine measures). The C-C[#] axis as well as invariance is held in the sustained pitches through the piece. In addition, those two pitches, C and C[#], are members of the repeated trichords [012] in the transition as well as in sections A and A'. These characteristics of row structure explain Dallapiccola's selection of row forms P₁, I₀, P₀, P₂, and RI_e in this movement.

Furthermore the composer notes "introduction" (introduzione) at the head of the movement. This introduction implies a role not only with regards to instrumentation—consisting of only three flutes without the voice and thus playing an introduction to the entire piece—but also regarding the four trichords that are prepared vertically and horizontally through the piece. The first movement introduces the trichord types of [012], [013], [014] and [016] which will be used consistently in the entire piece and establishes the [012] firmly. The homophonic vertical trichords in the conclusion then present the same texture as that of the second movement. In addition, we see that the long-range purpose of Dallapiccola's techniques is the projection of the body of relationships that together constitute the form of the movement and that will continue to expand and develop in the movements to come.

Chapter 3. Analysis of the Second Movement

Introduction

The second movement is scored for three clarinets (clarinet in E^b, clarinet in B^b, and bass clarinet), three strings (violin, viola, and cello), and the voice. The instrumentation changes radically compared to the first movement. The flute disappears in this second movement. As the number of instruments expands, the duration of the second movement also becomes longer as 2'28", while the first movement has 1' duration.

The second movement is foreshadowed by the end of the first movement; the vertical trichords that appear in the end of the first movement continue in the beginning of the second movement. The trichord-types, [012], [013], [014] and [016], are the same since they are the trichord partitions of the row. Just like the relation between the first and second movements, the end of the second movement also prepares for the third movement by using a rhythmic pattern that is used frequently in the third movement.

The addition of the voice and new instruments introduces new aspects of music compared to the first movement. However, some elements, especially the sonorities established in the first movement, continuously present and develop in the second movement due to Dallapiccola's use of the same row, but in different ways. After explaining the form of the second movement, my analysis begins with the fundamental musical elements such as rhythm, texture, rows used, pitches, and chord-types (dyads and trichords) and then considers how these elements interrelate to establish the unified sonorities and how they interact to express the meaning of the text.

Form

The rhythm, texture, and text's stanza divide this second movement into four sections, a prelude (mm. 10–13), section A (mm. 13–23), a transition (mm. 24–28), and section B (mm. 28–48).⁴³ First, the rhythmic durations clearly support these sectional divisions. The prelude consists of short rhythmic patterns such as the quarter-note triplet and section B has longer rhythmic patterns (dotted half note, whole note, and sustained eighth half notes) than section A. As the piece proceeds, the durations become longer. Second, the trichords' texture in each section differs—vertical trichords in section A and horizontal trichords in section B. These different textures of trichord deeply relate to the text. Finally, the text's three divisions match each section: section A, a transition, and section B. Table 3.1 shows the overall form of the second movement.

Table 3.1 Formal Overview

	Measure	Used Rows	Texture
Prelude	mm. 10–13	I ₇ , RI ₄	
Section A	mm. 13–23	I ₄ , I _e , P ₄	Short rhythms and vertical trichords
Transition	mm. 24–28	P ₁	
Section B	mm. 28–48	P _e , I ₅ , P ₂ , P ₀ , RI ₀ , I _t	Long rhythms and horizontal trichords

The prelude is instrumental having no vocal line, while the other three sections (section A, transition, section B) contain the vocal line. The reason for including the transition that uses the vocal line unusually in these sectional divisions will be discussed in relation to the text when it is discussed. Table 3.2 displays the text of this second movement and the translation.

⁴³ The second movement begins with measure number 10 rather than measure number 1. The measure numbers are continuous from the first movement to the fourth movement.

Table 3.2 Text of the Second Movement

El Olvido

Olvido, hermoso olvido,
libertador final
de nuestro nombre puro,
en la imaginacion del tiempo feo!

– Hombres, hombres, hombres..., ay!–

Oh, venideros dias,
en que el alma, olvidada con su nombre,
habra estado, en si, en todo,
y no estara, con otro, en nada!

Forgetfulness

Forgetfulness, beautiful forgetfulness,
final liberator
of our immaculate name,
in the imagination of an ugly time!

– Mankind, mankind, mankind ... ah!–

Oh, future days,
in which the soul, with its name forgotten,
will have been, in itself, in all,
and will not be, with another, in nothing!

The poem consists of three stanzas. The first stanza expresses the present idea of forgetfulness as the final liberator from restriction, repeats the word for forgetfulness, describes it as beautiful, and contrasts it with “an ugly time.” The third stanza describes the future hope and peace, which are to come from the forgetfulness. The exclamation in the second stanza acts as a transition from present to future.

Musical Analysis

Prelude (mm. 10–14)

The prelude introduces what sonorities will be developed in the instrumental line without the employment of the vocal line. Three strings and three clarinets form vertical trichords and alternate their trichords rather than playing simultaneously. There are two rows, I_7 and RI_4 , and dynamics remain soft as *pp* and *ppp* in the prelude.

Example 3.1 Prelude (mm. 10–14)

The image shows a page of a musical score for measures 10 through 14. The score is arranged in two systems. The first system includes parts for Violins I and II, Violas, Cellos, and Double Basses. The second system includes parts for Flutes, Clarinets, and Percussion. The music is in 3/4 time and features a mix of rhythmic patterns, including triplets and duplets. The tempo is marked 'Allegretto'.

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Rhythm

The prelude begins with the triplet and changes to the duplet rhythm in the next measure; the strings play the quarter-note triplet rhythm in m. 11 and the clarinets play the duplet rhythm (quarter note) in m. 12. Then, the strings keep the duplet rhythm in mm. 13–14. Examples 3.2a-3.2c show the rhythm of the prelude.

Example 3.2a Strings' Rhythm in the Prelude

The image shows two staves of musical notation. The top staff is labeled with measure 10 and shows a sequence of notes: a quarter rest, a quarter note, a quarter note, and a quarter note. The bottom staff is labeled with measure 13 and shows a sequence of notes: a quarter note, a quarter note, a quarter note, a quarter note, a quarter note, and a quarter note. The notation includes stems and beams to indicate the rhythm.

Example 3.2b Clarinets' Rhythm in the Prelude

Example 3.2c Composite Rhythm in the Prelude

The rhythmic pattern of the strings and clarinets is similar though not exact. The strings have long durations (dotted quarter note and half note tied to a triplet) in the first and second trichords (the second trichord has a longer duration than the first trichord) and change to short rhythmic patterns (the quarter-note triplet) by the end of m. 11. The clarinets also have a long duration (half note tied with quarter note) especially in the second trichord (m. 12) and then the clarinets change to short quarter notes.⁴⁴ The rhythmic unit is not the same between the strings and clarinets, but the rhythmic pattern, which has the longest duration in the second trichord and uses the same rhythmic unit in the rest of the trichords, is identical. The coordinated rhythmic trend also coincides with these instruments employing the same row.

The rhythm of the trichord in m. 13 is different from the previous trichords coinciding with the use of a different form of the row. The rhythmic duration in each

⁴⁴ The first trichord played by the clarinets in the end of m. 11 is considered to be included with the strings' part due to the notice of *eco* on the piece, the same trichord-type, [012], and the *fermata*. The *fermata* above the trichord in the end of m. 11 signifies an end rather than the beginning. Thus the third trichord (consisting of order numbers 6–8), which actually appears in the clarinets, is still regarded as the second trichord in the clarinets' line.

trichord is irregular, but the regularity is found in the entrances of the trichords. The first trichord begins after the sixteenth rest in m. 12, the second trichord is after the eighth rest, the third trichord appears after the dotted eighth rest, and the last trichord occurs after the quarter rest in m. 13. The duration of a sixteenth note is added in each time.

Row and Pitch

The strings and clarinets in mm. 10–12 play one row, I_7 , using repetitions. The strings play the first hexachord with repetition in two vertical trichords in mm. 10–11; then, in mm. 11–12, the clarinets play the second hexachord with repetition in two vertical trichords after reiterating the first hexachord.

In the first hexachord, two types of trichord, [012] and [013], repeat twice alternately, but each statement varies in register and actual instrumentation. In the first instance of the [012], the violin plays f_5 , the viola plays $f^\#_5$, and the cello plays g_4 . In the second occurrence of the [012], the violin plays g_5 , the viola plays f_5 , and the cello plays $f^\#_4$. The third time, the violin plays f_5 , the viola plays g_4 , and the cello plays $f^\#_4$. In the case of [013], the different pitch ranges and instrumentation provide the diversity in three appearances. The second hexachord has two types of trichord, [016] and [014], which repeat in different pitch range and instruments as it was with the strings.

The returning trichords in the strings in mm. 12–14 use the row RI_4 without any repetition. Four vertical trichord-types, [014], [016], [013], and [012], appear with the delayed beat, a sixteenth duration, as noted above.

The use of two rows organizes the different articulations and meter changes. I_7 has the standard articulation and meter change in every measure such as 2/2 (m. 10), 3/2 (m. 11), and 4/2 (m. 12), whereas the *tremolo* and lack of meter change (4/2) consist of the RI_4 (Example 3.1).

Chord-Types

Table 3.3 displays the examples of chord-types (trichords and dyads) formed in the prelude. The set class members in the prelude act as the basis for establishing chord members, which will be added and play an important role in shaping the form.

Table 3.3 Dyad and Trichord Types in the Prelude

	[01]	[06]	[012]	[013]	[014]	[016]
String	{CC [#] } {C [#] D} {DE ^b } {E ^b E} {FF [#] } {F [#] G} {B ^b B}	{C [#] G}	{DE ^b E} {FF [#] G}	{DC [#] B} {BB ^b A ^b }	{FF [#] A}	{C [#] CG}
Clarinet	{C [#] D} {E ^b E} {FF [#] } {F [#] G} {A ^b A}	{EB ^b }	{FF [#] G}	{DC [#] B}	{A ^b AC}	{EE ^b B ^b }

Two members of the four trichord-type occur in the prelude and each trichord-type contains [01] as a subset. Actually, the [01] was already emphasized in the first movement along with the [06]. The relation of a semitone or the tritone is the basis for developing sonorities through the piece (this will be obvious as the piece moves forward). Eight members ({CC[#]}, {C[#]D}, {DE^b}, {E^bE}, {FF[#]}, {F[#]G}, {G[#]A}, {B^bB}) of [01]

and two members ($\{C^\#G\}$, $\{EB^b\}$) of [06] occur in the prelude. Like the trichord-types, the members of the dyads [01] and [06] increase as the piece progresses.

Implications of the Prelude

Based on the two rows used, one can see that other musical features including the rhythmic pattern, articulation, and meter change show the bipartition. Two instrumental groups (strings and clarinets) change meter in every measure and use lots of repetition of the same sonority in creating the I_7 , while in the row RI_4 the one articulation of *tremolo* is used as are delayed beats without any repetition of notes or any meter change. The earlier occurrence of meter change containing more length in every measure introduces the pitches with the delayed beat in m. 13. The bipartition may be related to the division of sections A and B, which will be examined later in the chapter under the text and texture.

Section A (mm. 14–23)

The vocal line begins in section A with the three strings and three clarinets. Both the vocal and instrumental lines interact in sharing the row and together they present a coherent whole. Three rows, I_4 , I_e , and P_4 , appear in section A.

Rhythm

In mm. 14–17, the triplet rhythm dominates in the vocal part. The three dotted quarter notes in m. 14 and the three quarter notes in m. 17 could be considered as a triplet since those rhythms are grouped in three and located between the triplet rhythms. The

duration of the triplet rhythm is variable. Three dotted quarter notes (whole and eighth duration) in m. 14 change to quarter-note triplet (half duration) in m. 15 and change to the eighth-note triplet (quarter duration) in m. 16. This eighth-note triplet returns to the quarter-note triplet (half duration) through to three quarter notes (three quarter duration) in m. 17. A shortening rhythmic duration in mm. 14–16 and the extended duration in mm. 17–18 occur in the beginning of section A. After the triplet rhythms in mm. 14–18, the rhythm mainly consists of the duplet until the end of section A. Examples 3.3a–3.3c show section A’s rhythm.

The instrumental line’s rhythm principally supports the vocal line’s rhythm; the employment of the triplet rhythm and the occurrence of entrance on the same beat are based on the vocal line’s rhythm. The instrumental line’s rhythm does not break or hinder the vocal line’s rhythmic progression. This pattern changes from m. 20. The rhythmic progression is independent of the vocal line in spite of the employment of the triplet. Rhythmic divisions such as four dotted eighth notes (m. 22) appear against the voice. The composite rhythm (Example 3.3c) shows that the vocal line varies (shortens and extends) its rhythmic duration using triplets and then the instrumental line reduces rhythmic pattern to the sixteenth note. The triplet rhythm dominates in section A.

Example 3.3a Rhythm of the Voice in Section A

The image displays three staves of musical notation for Example 3.3a, illustrating the rhythm of the voice in Section A. The first staff begins at measure 14, showing a sequence of notes with a triplet of quarter notes in measure 15 and an eighth-note triplet in measure 16. The second staff starts at measure 17, featuring a quarter-note triplet in measure 17 and a quarter-note triplet in measure 18. The third staff begins at measure 20, showing a quarter-note triplet in measure 20 and a quarter-note triplet in measure 21. The notation includes various rhythmic patterns such as triplets and duplets, with some notes marked with 's' for slurs.

Example 3.3b Rhythm of the Instruments in Section A

Example 3.3c Composite Rhythm in Section A

Pitch

In terms of pitch material, section A has two kinds of pitches: those based on the row and those outside the row. Primarily, three rows, I_4 , I_e , and P_4 , occur in section A.

Among the three rows, the instrumental and vocal lines share two rows I_4 and I_e in mm. 13–18. In addition, the vocal line uses the P_4 except the first order number (E), which the bass clarinet plays at the end of m. 18, before the vocal line starts. Example 3.4 shows the distribution of the row's pitches in vocal and instrumental lines.

The different technique appears in formation P_4 – only the vocal line sings the row without sharing any of the row with the instrumental line except the first order

Example 3.4 Distribution of Rows (mm. 13–23)

The musical score is divided into two systems. The first system (measures 13-20) includes parts for Flute (Fl.), Clarinet (Cl.), Bassoon (Bsn.), Violin (Vn.), Viola (Vla.), Cello (Vcl.), and Double Bass (Cb.). The second system (measures 21-23) includes parts for Violin (Vn.), Viola (Vla.), Cello (Vcl.), and Double Bass (Cb.), along with a Voice part. The score contains various musical notations, including notes, rests, and dynamic markings such as *pp*, *ppp*, and *acc.*. The right side of the page is highlighted with a green vertical bar.

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number. This brings about another change in the formation of the row; the row P₄ has many repeated notes while the I₄ and I_e do not have any repetition.

Secondly, the instrumental line in mm. 18–23 also plays outside row pitches, especially in the strings' line. While outside the row, they still form two occurrences of the twelve-tone aggregate consistently, which will be explained in the section discussing chord-types, especially the dyad. The twelve-tone aggregate occurs twice in mm. 13–22; the former aggregate consists of vertical and horizontal dyads through mm. 13–21 in the entire instrumental line, while the latter aggregate shows consistent vertical formation in mm. 21–22 by the violin and viola.

Chord-Types

The two different types of pitch materials explained above establish the same sonorities, [01] and [06]. The reason for mentioning only two dyads is that these sonorities already appeared in the first movement, helping form the two axes (suggesting the sonorities' importance) that continue here. The pitches not based on the row create the dyad [01] vertically or horizontally. As shown in Example 3.5, having the same rhythmic duration, the violin and viola in mm. 20–22 and the violin and cello in the beginning of m. 20 form the vertical dyad [01]s. The viola's adjacent pitches in m. 20 and the cello's adjacent two pitches in m. 21 create the horizontal dyad [01]. These dyad [01]s (especially the vertical dyads) are prominent since they have the same rhythmic duration.

Example 3.5 Consistency of Dyad Formation in Section A

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These [01]s start from the beginning of section A in the pitches based on the row. The order numbers 0 and 1 in I_4 form the dyad [01], $e_2-e^b_4$ (bass clarinet-clarinet) in a long duration (eight quarter duration) (Example 3.4). Actually, the $\{EE^b\}$ overlaps between the last two pitches in RI_4 (prelude) and the first two pitches in I_4 (section A). Dallapiccola's choice of rows, RI_4 and I_4 , emphasizes the dyad $\{EE^b\}$. After this dyad $\{EE^b\}$, another dyad, $f_5-f^\#_4$, the order numbers t and e of I_4 , occurs in mm. 15–16 by the clarinet and piccolo clarinet with the duration of three quarter notes. Since the same long duration forms each dyad, $\{E^bE\}$ and $\{FF^\#\}$, [01] is a prominent sound. Furthermore, the violin and vocal lines in m. 17 repeat the $\{FF^\#\}$, which occupies order numbers 4 and 5 in I_e . Not only pitch class but also pitches are the same in the repetition. These chromatic dyads continue to $a_5-b^b_4$ (violin-cello) in m. 18, b_5-c_5 and $c^\#_6-d_5$ (violin-cello), and $g_5-a^b_5$

(viola) in m. 20 occurring outside the row. The formation of [01] in the row suggests and prepares the continued [01] formation in the outside pitches.

Just after [01]s, the sonority [06] is found in mm. 20–22. Two adjacent vertical [01] dyads show the tritone relation: the two dyads $g_5-g_6^\#$ and $c_6^\#-d_5$ in m. 20, the dyads $a_4-b_5^b$ and $e_5^b-e_4$ in m. 21, the b_5-c_5 and $f_6-f_5^\#$ in m. 22, and the $c_4^\#-d_6$ and $g_5-g_6^\#$ in m. 22 (Example 3.5). A previous aggregate created in mm. 13–20 also shows the [06] relation partly: the last two [01]s, $c_6^\#-d_5$ and $g_5-a_5^b$, (m. 20) consist of the tritone. Its partial occurrence foreshadows the consistent tritone relation in mm. 20–22. Two adjacent dyads make the [0167], the same rhythmic duration of two adjacent dyads support the tetrachord formation. This tetrachord has not yet sounded simultaneously in section A, but it appears in the transition.

The two occurrences of aggregates in mm. 13–22 have a common rhythmic trend, a shortening rhythmic pattern. Within the first aggregate, the eight quarter-notes duration in m. 13 becomes the duration of quarter-note triplet and then changes; in the second aggregate, the quarter-note triplet changes to a dotted eighth-note duration.

The vocal line also contains [01] and [06]. The sharing of rows with the instrumental line, the splitting of the row by the rest and phrasing mark, and the repeated pitches in the row emphasize the various members in [01] and [06]. In total, ten members of [01] ($\{CC^\#\}$, $\{C^\#D\}$, $\{DE^b\}$, $\{E^bE\}$, $\{EF\}$, $\{FF^\#\}$, $\{GG^\#\}$, $\{AB^b\}$, $\{B^bB\}$, $\{BC\}$) and four members of [06] ($\{CF^\#\}$, $\{C^\#G\}$, $\{DA^b\}$, $\{EB^b\}$) occur in section A. Table 3.4 displays the formation of chord-types in section A. Not all possible members of [01] and [06] occur in section A, but Table 3.4 shows the increasing number of members compared to the prelude.

Table 3.4 Dyad and Trichord Types in Section A

	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{CD ^b } {C [#] D} {DE ^b } {E ^b E} {EF} {FF [#] } {GG [#] } {AB ^b } {BC}	{C [#] G} {EB ^b }	{C [#] DE ^b } {E ^b EF} {GG [#] A} {BCC [#] }	{CBA} {C [#] DE} {EE ^b C [#] } {F [#] FE ^b } {B ^b AG}	{CBA ^b } {DC [#] B ^b } {DE ^b F [#] } {B ^b AF [#] } {BCE ^b }	{C [#] DG} {F [#] FC} {GG [#] C [#] } {B ^b AE}
Clarinets	{E ^b E} {EF} {FF [#] }	{CF [#] }	{DE ^b E}	{F [#] FE ^b }	{FF [#] A}	{EE ^b B ^b } {F [#] FC} {FF [#] B} {G [#] GD}
Voice	{DE ^b } {FF [#] } {AB ^b } {B ^b B}	{CF [#] } {C [#] G} {DA ^b }	{AB ^b B}	{FF [#] G [#] } {AB ^b C} {B ^b AG}	{E ^b DB}	{F [#] FC}

The formation of trichord-types presents various members as shown in Table 3.4.⁴⁵ Especially, the presentation of the same sonorities using the pitches outside the row is a particular feature of section A. In addition, the vocal line forms several members of four trichord-types, in spite of only partly employing row pitches. Particularly important is the creation of the repeated [012], $b_4b^b_4a_4$, which connects two rows, I_4 and I_e . The order number 9 (A) in the I_4 and the first trichord {BB^bA} in the row I_e make two overlapping occurrences of the same member in mm. 16–17 (Example 3.6). The use of techniques in connecting two rows and forming the same sonority reflects the text; the two words having the same meaning also have the same members. A detailed discussion is presented later this chapter.

⁴⁵ The reasons to select those four kinds of trichords ([012], [013], [014] and [016]) are that (1) they are prepared in the end of the first movement, (2) they are repeated in the beginning of the second movement, and (3) they are formed frequently in the instrumental line vertically consisting of the pitches based on the row or not based on the row.

Example 3.6 Two Occurrences of [012] in the Vocal Line (mm. 16-18)

In total, six members of [012] ($\{C^\sharp DE^b\}$, $\{DE^bE\}$, $\{E^bEF\}$, $\{GG^\sharp A\}$, $\{AB^bB\}$, $\{BCC^\sharp\}$), seven members of [013] ($\{CBA\}$, $\{C^\sharp DE\}$, $\{EE^bC^\sharp\}$, $\{FF^\sharp G^\sharp\}$, $\{F^\sharp FE^b\}$, $\{AB^bC\}$, $\{B^bAG^\sharp\}$), seven members of [014] ($\{CBA^b\}$, $\{DC^\sharp B^b\}$, $\{DE^bF^\sharp\}$, $\{E^bDB\}$, $\{FF^\sharp A\}$, $\{B^bAF^\sharp\}$, $\{BCE^b\}$), and seven members of [016] ($\{C^\sharp DG\}$, $\{EE^bB^b\}$, $\{FF^\sharp B\}$, $\{F^\sharp FC\}$, $\{GG^\sharp C^\sharp\}$, $\{A^bGD\}$, $\{B^bAE\}$) occur in section A.

Implications of Section A

Both instrumental and vocal lines seek the same sonorities by using different techniques; the repeated pitches and long duration produce [01] and [06] in the vocal line and the two vertical pitches consisting of the same rhythmic duration produce the dyad [01] and the two adjacent [01]s show the tritone relation in the instrumental line. For forming these consistent sonorities, the two techniques – the sharing of the row’s pitches between the vocal and instrumental lines and the use of pitches based on the row and not based on the row – are used in section A. Two sonorities formed in the previous movement as well as in previous sections are more apparently exposed and established in both the vocal and instrumental lines through section A.

Transition (mm. 24–27)

The transition consists of four measures, mm. 24–27. Unlike many other transitions in classical song, this section contains both vocal and instrumental lines. Those two parts play the role of bridge between sections A and B. As the meaning of transition implies (the act of passing from one form to another), this section transfers what section A's music means to section B.

Rhythm

Example 3.7a Instrumental Line's Rhythm in the Transition



Example 3.7b Vocal Line's Rhythm in the Transition



Example 3.7c Composite Rhythm in the Transition



The instrumental line's rhythm is independent from that of the vocal line. The strings and clarinets form the same rhythmic pattern, which becomes longer from the dotted quarter duration to six quarter duration (Example 3.7a). On the other hand, the vocal line's rhythm consists of the triplet rhythm. The rhythm is also getting longer from the quarter-note triplet to the half-note triplet like the instrumental line's rhythm

(Example 3.7b). Actually, the voice's triplet rhythm is prepared in the beginning of section A, in which the vocal line provides the triplet rhythm, not only singing several triplet rhythms but also including groups of three notes all having the same duration. The instrumental line also prepares the triplet rhythms by using the shortening rhythmic duration in the end of section A. The lengthening rhythmic pattern is obvious in both the vocal and instrumental lines of the transition.

Example 3.8 Transition (mm. 25–27)

The image shows a musical score for Example 3.8, Transition (mm. 25-27). The score is arranged in a system with seven staves. From top to bottom, the staves are: Clarinet in A (Cl. in A), Flute (Fl.), Clarinet in B-flat (Cl. in Bb), Chorus (Choro), Violin (Vcl.), Viola (Vla.), and Cello/Double Bass (Vcl. c.). The Chorus part includes the lyrics 'homines... homines... ingi...'. The score shows a complex rhythmic structure with triplets and dotted notes. A box labeled '25' is placed above the first staff at the beginning of the transition. The music is in 3/4 time and features a variety of rhythmic patterns, including triplets and dotted notes, which are highlighted in the text as key elements of the composite rhythm.

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In composite rhythm, the vocal and instrumental lines play complementary roles (Examples 3.7c and 3.8). After the voice sings one word, the instruments play a chord; they play notes alternately. This repeats twice. However, the rhythmic unit varies within the transition. In m. 24, the voice's quarter-note triplet (tied with the half note) and the instruments' dotted quarter note (after an eighth rest) continues into m. 25 with the

extension. Then both lines' rhythms augment to the half-note triplet duration in the vocal line and to the six quarter duration (after a quarter rest) in the instrumental line. The augmented rhythm in both lines is one of the techniques to express the text (this technique will be discussed in the section pertaining to the relation between the text and music) and to prepare the music of section B.

Rows and Pitches

Two kinds of pitches occur in the transition: (1) those based on the row, and (2) those based on outside the row. First, only P_1 appears in both instrumental and vocal lines. The voice sings order numbers 0–3, 6–8, t and e (C^\sharp , D, E^b , A, E, B^b , F, B, C) and the other pitches, order numbers 4 (G), 5 (F^\sharp), 9 (G^\sharp), appear in the instrumental line. Second, all the clarinets' pitches and all the strings' pitches except three (G, F^\sharp , G^\sharp) are not members of the row. These two different types of pitch material establish the same sonorities, [01] and [06], in the transition.

Chord-Types

The vocal line forms only two sonorities, [01] and [06]. The first dyad in m. 24 is [01] ($c^\sharp_5-d_5$), the second and third dyads in m. 25 are [06]s ($e^b_5-a_4$, $e_5-b^b_3$), and the last instance is the combination of [01] and [06], which makes the trichord-type [016] ($f_5b_4c_4$). These two kinds of sonorities, [01] and [06], also appear in the instrumental part. Three appearances of chords in the strings and clarinets have the same sonority, tetrachords [0167]. The first appearance consists of all the pitches outside the row, the second

instance contains two pitches (g_3 and $f_4^\#$) based on the row and two pitches outside the row, and the last one has one pitch ($g_4^\#$) based on the row and three pitches outside the row. The tetrachords, [0167], are the combination of two [06]s related by the semitone $B^b-E/B-F$ (m. 24), $C-F^\#/D^b-G$ (m. 25), and $D-G^\#/E^b-A$ (m. 26). The [06] dyads of cello and viola strongly show the [0167] tetrachord as two [06]s related by the semitone rather than two [01]s related by the tritone. This [0167] is already prepared in section A as well as in the first movement. The adjacent two [01] dyads show [0167] in section A and the two axes of the main rows (P_1 and I_0) in the first movement also form [0167]. However, it is the first time a [0167] tetrachord is literally created.

The vocal line's [01] and [06] and the instrumental line's [0167] individually approach and finally produce the [016] and [0167] in m. 26 with the maximum effect. The increasing dynamics from *f* to *ff* strongly supports this formation.

Table 3.5 Dyad and Trichord Types in the Transition

	Dyad		Trichord	Tetrachord
	[01]	[06]	[016]	[0167]
Instruments ⁴⁶	{CD ^b } {DE ^b } {EF} {F [#] G} {G [#] A} {B ^b B}	{CF [#] } {C [#] G} {DG [#] } {E ^b A} {EB ^b } {FB}	{CC [#] F [#] } {C [#] CG} {DE ^b A ^b } {E ^b DA} {EFB ^b } {FEB} {F [#] GC} {GF [#] C [#] } {A ^b AD} {AA ^b E ^b } {B ^b BE} {BB ^b F}	{EFB ^b B} {F [#] GCD ^b } {G [#] ADE ^b }
Voice	{C [#] D} {BC}	{E ^b A} {EB ^b } {FB}	{BCF}	

⁴⁶ Since two instrumental groups create the tetrachord [0167] by the same rhythm, the classification into strings and clarinets disappears.

Table 3.5 displays the examples of dyad-types, trichord-types, and tetrachord-types in the transition. All possible members of [06] occur including two new members ($\{E^bA\}$ and $\{FB\}$) and eight members of [01] ($\{CC^\#\}$, $\{C^\#D\}$, $\{DE^b\}$, $\{EF\}$, $\{F^\#G\}$, $\{G^\#A\}$, $\{B^bB\}$, $\{BC\}$) happen in the transition.

The occurrence of thirteen members in [016] includes twelve new members ($\{CC^\#F^\#\}$, $\{DE^bG^\#\}$, $\{E^bDA\}$, $\{EFB^b\}$, $\{FEB\}$, $\{F^\#GC\}$, $\{GF^\#C^\#\}$, $\{A^bAD\}$, $\{AA^bE^b\}$, $\{B^bBE\}$, $\{BB^bF\}$, $\{BCF\}$). The creation of only [016] without any other trichord-type shows the composer's intent to emphasize this sonority (the reason will be clear later).

Implications of the Transition

Both lines have different techniques for developing the two sonorities. In the vocal line, the repeated [01] and [06] and then their combination arrives at the [016], whereas the instrumental line forms the [0167] by the combination of [01] and [06]. In addition, the techniques of sharing the row's pitches between the vocal and instrumental lines and of employment of both pitches based on the row and outside the row are designated for forming the sonorities. The creation of the consistent sonority implies further development and progression in section B.

Section B (mm. 28–48)

The vocal line's row and instrumental line's sonority divide section B into two sub-sections, sub-section 1 (mm. 28–35) and sub-section 2 (mm. 35–48). Sub-section 1 uses P_e in the vocal line and the [012] trichord-types in the instrumental line. Sub-section

2 employs the I_5 in the voice and [013] in the instruments. Sub-section 2 also contains the closing part (mm. 45–48), which cannot be divided into its own section because of the instrumental line's sustained pitches in the end of piece. The role of the closing part prepares the third movement by using the same rhythmic pattern (septuplet) and the same texture.

Sub-Section 1 (mm. 28–35)

Pitch and Row

Sub-section 1 has obviously divided pitch material; the vocal line uses the row P_e and the instrumental line uses pitches outside the row. The voice does not sing P_e completely. The vocal line sings eight pitches, the order numbers 0–4 and 9–e, and the instrumental line (clarinets and strings) play the remaining four pitches, order numbers 5–8. Example 3.9 shows the music of sub-section 1.

Example 3.9 Sub-Section 1 (mm. 28–33)

In the vocal line, the order numbers 0–4 repeat presenting different sonorities; the order numbers 0–2 make [012] ($b_4c_5d^b_5$) twice in mm. 29–31 and the order numbers 3 and 4 make the dyad [02] (g_4-f_5) twice in m. 33. Between [012] and [02], there is a tritone consisting of order numbers 2 and 3 ($g_4-d^b_5$). The order numbers 9–e are continuous with the order numbers 3 and 4 in mm. 33–35. They make the pentachord [01245], which is not considered important yet but becomes so subsequently in the fourth movement.

The instrumental line prepares the [012] before its occurrence in the vocal line. In the beginning of sub-section 1, four instruments (clarinet, bass clarinet, viola, and cello) play the [012] partition; the cello plays $b_2b^b_2a_2$, the viola plays $f^{\#}_4g_3g^{\#}_3$, the bass clarinet plays $f_2e_2e^b_2$, and the clarinet plays $c_5c^{\#}_4d_4$ in m. 28 (Example 3.9).⁴⁷ They form a twelve-tone aggregate. In terms of pitch, the bass clarinet's pitches ($f_2e_2e^b_2$) are transposed a tritone below the cello's pitches ($b_2b^b_2a_2$) and the clarinet's pitches ($c_5c^{\#}_4d_4$) are transposed a tritone above the violin's pitches ($f^{\#}_4g_3g^{\#}_3$). This forms the T_6 relation between the pairs of instruments that have similar register. There is another I_1 relation between the trichords of the cello $\{BB^bA\}$ and clarinet $\{CC^{\#}D\}$ and between those of the bass clarinet $\{FEE^b\}$ and viola $\{F^{\#}GG^{\#}\}$. The relations of T_6 and I_1 correlate with the [06] and [01].

⁴⁷ See Robert D. Morris and Brian Alegant, "The Even Partitions in Twelve-Tone Music," *Music Spectrum* 10 (1988): 72-103. Morris and Alegant define the term of *partition of the aggregate* as any unordered and disjoint set of pcsets that in union comprise the aggregate.

Chord-Types

All twelve members of dyad [01] and three members ($\{C^\#G\}$, $\{DG^\#\}$, $\{E^bA\}$) of [06] appear in sub-section 1. The instrumental line's [012] partition mainly contributes the formation of all twelve members. In the case of [06], all three members are related by semitone. Table 3.6 shows the examples of dyad- and trichord- types formed vertically and horizontally.

Three types of trichord, [012], [014], [016], occur in sub-section 1. Among them, the [012] and [016] expose several members (seven members in the [012] and four members in the [016]), while the [014] has one member. The [012] have new two members ($\{CC^\#D\}$, $\{F^\#GG^\#\}$) among seven members.

Table 3.6 Dyad and Trichord Type in Sub-Section 1

	Dyads		Trichords		
	[01]	[06]	[012]	[014]	[016]
Instruments ⁴⁸	$\{CC^\#\}$ $\{C^\#D\}$ $\{DE^b\}$ $\{E^bE\}$ $\{EF\}$ $\{F^\#G\}$ $\{GG^\#\}$ $\{G^\#A\}$ $\{AB^b\}$ $\{B^bB\}$	$\{DG^\#\}$ $\{E^bA\}$	$\{CC^\#D\}$ $\{DE^bE\}$ $\{E^bEF\}$ $\{F^\#GG^\#\}$ $\{ABB^b\}$	$\{B^bAF^\#\}$	$\{DE^bG^\#\}$ $\{E^bDA\}$ $\{G^\#AD\}$ $\{AG^\#E^b\}$
Voice	$\{CD^b\}$ $\{FF^\#\}$ $\{AB^b\}$ $\{BC\}$	$\{C^\#G\}$	$\{BC C^\#\}$ $\{FF^\#G\}$		

⁴⁸ Since four [012]s are related to each other in rhythm and pitch range, it is no longer useful to classify two instrumental groups, strings and clarinets.

As the [012] trichords' last pitches sustain until the end of sub-section 1, they make a vertical tetrachord in mm. 29–30 (Example 3.9). This is [0167] ($a_2-g^\#_3-e^b_2-d_4$), which is the same type formed in the transition of the instrumental line.

Texture

Sub-section 1 starts with a change in texture. The vertical texture in the prelude, section A, and the transition suddenly changes to the horizontal in the beginning of sub-section 1, especially in the horizontal [012]s. Even though the [0167] tetrachord is formed vertically, its effect is not as strong than the horizontal [012] partitions.

Rhythm

Four members of the [012] trichord in the instrumental line are played one after another rather than simultaneously. These four [012]s have different rhythms as shown in Example 3.10a. The rhythm of the first [012] trichord by the cello consists of the half note and the second instance by the viola is in quarter notes. The rhythm of the third trichord by the bass clarinet consists of the eighth note and that of the last trichord by the clarinet is in the quarter-note triplet. Until the third appearance, each rhythmic pattern decreases to the half duration of the previous (the half note - the quarter note - the eighth note).

Example 3.10a Instrumental Line's Rhythm in Sub-Section 1

The image shows two staves of musical notation. The top staff is labeled '28' and the bottom staff is labeled '31'. The top staff contains four measures of music. The first measure has a half note, the second has two quarter notes, the third has an eighth note, and the fourth has a quarter-note triplet. The bottom staff also contains four measures. The first measure has a half note, the second has two quarter notes, the third has an eighth note, and the fourth has a quarter-note triplet. Both staves have a dynamic marking 's' (sforzando) under the eighth note and the quarter-note triplet respectively.

Example 3.10b Vocal Line's Rhythm in Sub-Section 1

Musical notation for Example 3.10b, showing vocal line rhythm in measures 29 and 32. The notation is on a single staff with a treble clef and a 3/4 time signature. Measure 29 starts with a whole rest, followed by a quarter note, a half note, and a quarter note. Measure 32 starts with a quarter note, followed by a half note, a quarter note, and a quarter note. There are slurs and accents over the notes in both measures.

Example 3.10c Composite Rhythm in Sub-Section 1

Musical notation for Example 3.10c, showing composite rhythm in measures 28, 31, and 34. The notation is on a single staff with a treble clef and a 3/4 time signature. Measure 28 starts with a quarter note, followed by a half note, a quarter note, and a quarter note. Measure 31 starts with a quarter note, followed by a half note, a quarter note, and a quarter note. Measure 34 starts with a quarter note, followed by a half note, a quarter note, and a quarter note. There are slurs and accents over the notes in all three measures.

On the other hand, the vocal line's rhythm consists of the duplet, triplet, and quintuplet rhythms. This shows a different rhythmic development. The quintuplet rhythm is created by the combination duplet and triplet based on two things: (1) after formation of the duplet and triplet rhythms in mm. 29–30, the quintuplet is created in m. 31; and (2) the pitches in the quintuplet ($b_4c_5d^b_5$) are the exactly same as the pitches in the duplet ($c_5-d^b_5$) and the triplet (b_4) (Example 3.9). This vocal line's rhythmic contraction to the quintuplet (while presenting the same sonority) is continued from the instrumental line, the four [012]s have the shortening rhythmic pattern from the three half notes in m. 28 to the eighth-note quintuplet in m. 31. This decreasing rhythmic pattern of the [012] in both vocal and instrumental lines describes the meaning of the text (discussed later in this chapter).

Sub-Section 2 (mm. 35–48)

Rhythm

Example 3.11 Instrumental Line's Rhythm in Sub-Section 2

The vocal line's rhythm consists of the alternation between duplets and triplets. The rhythmic unit of sub-section 2 is longer than that of sub-section 1. It consists of the quarter note, dotted quarter note, the quarter-note triplet, and the half-note triplet as shown in Example 3.11. The instrumental line's rhythm consists of the duplet. In the end of sub-section 2, the septuplet and triplet rhythms appear to prepare for the third movement. The septuplet may be considered a rhythmic development from the quintuplet (the details of rhythmic development through the piece as a whole will be examined in Chapter 6).

Rows and Pitch

As shown in Example 3.12, the vocal line uses the row I_5 and the instrumental line uses P_2 , P_0 , and RI_0 , as well as pitches outside the row. The vocal line does not sing

all pitches of I₅. Eight pitches (order numbers 0–4 and 9–e) occur in the vocal line and other pitches (order numbers 5–8) take place in the instrumental line as was seen in sub-section 1.

Example 3.12 Sub-Section 2 (mm. 34–40)

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Before arriving at order numbers t and e in the vocal line, there are many repetitions occurring in order numbers 0–4. The order numbers 0–2 make the [012] in the beginning of sub-section 2 (m. 37) and order numbers 1 and 2 are repeated to make a [01] dyad in m. 38. After order numbers 3 and 4 make a dyad [02] in m. 39 (this division is based on the rest, which corresponds to the text’s comma), the order numbers 2 and 3 make a [06] dyad in m. 40. The order numbers 4 (B) and 9 (B^b) make the [01] in mm. 42–43. This particular consecutive [01] dyad does not appear in the row itself. The employment of order numbers 5–8 in the instrumental line makes it possible to form two

consecutive [01] dyads by 4 and 9 ($\{B^bB\}$) in the vocal line. The order numbers t and e then make another [01]. Thus, the beginning and end of the vocal line emphasize the [01]s by the order numbers 0–1, 4 and 9, and t–e. In addition, the tritone appears in the middle of the vocal line. The order numbers 2 and 3 form the [06] with a long duration, a dotted half note and dotted quarter note, in m. 40. The vocal line emphasizes the dyads [01] and [06] in the beginning, middle, and end of sub-section 2 by the long held and repeated notes.

While the voice sings the row I_5 , the instrumental line plays pitches outside the row before playing the rows. The pitches form four horizontal [013]s in the violin, viola, clarinet, and piccolo clarinet; the violin plays $e_6f^\#_5g_5$, the viola plays $b_3a_4g^\#_4$, the piccolo clarinet plays $b^b_4c_5c^\#_5$, and the bass clarinet forms $f_3e^b_3d_3$ in mm. 35–36. These four members of [013] trichord-type make a twelve-tone aggregate. Even though the four chords have the same chord-type, [013], the interval classes are different. The bass clarinet and piccolo clarinet play the [013] related by the I_1 and the violin and viola make a pair with I_1 relation (Example 3.12). In addition, the viola and bass clarinet make a pair with T_6 relation and the violin and piccolo clarinet also make a pair with T_6 having the same interval succession.⁴⁹ The same instrumental group makes up an I_1 relationship and the instrumental pairs relate by T_6 . Since the formation of [013] partitions occurs before

⁴⁹ Morris defines Interval Succession of a Segment in *Class Notes for Atonal Music Theory* (Hanover, NH: Frog Peak Music, 1991), 6. Interval succession of a segment (INT) is the series of interval given by a segment can be listed in order in another segment called the INT of the first. The INT has one less element than the segment from which it is derived. Thus rows have 11 element INTs. If $pcseg \underline{K}$ is $\langle 4, 9, 7, 2 \rangle$, the $INT(\underline{K})$ is $\langle 9-4, 7-9, 2-7 \rangle$ or $\langle 5, 10(T), 7 \rangle$. The $INT(\underline{viola})$ is $\langle 6-4, 7-6 \rangle$, the $INT(\underline{piccolo\ clarinet})$ is $\langle 0-t, 1-0 \rangle$ or $\langle 2, 1 \rangle$, the $INT(\underline{violin})$ is $\langle 9-e, 8-9 \rangle$ or $\langle t, e \rangle$ and the $INT(\underline{bass\ clarinet})$ is $\langle 3-5, 2-3 \rangle$ or $\langle t, e \rangle$. Thus the INT of the violin and piccolo is the same as $\langle 2, 1 \rangle$ and that of the bass clarinet and viola is also the same as $\langle t, e \rangle$.

the vocal line enters, the instrumental lines prepare the vocal line's emphasis on [01] and [06] with the I_1 and T_6 relation.

Chord-Type

Table 3.7 Dyad and Trichord Type in Sub-Section 2

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Instruments ⁵⁰	{CC [#] } {C [#] D} {DE ^b } {E ^b E} {F [#] } {F [#] G} {GG [#] } {G [#] A} {B ^b B} {BC}	{DA ^b } {E ^b A} {EB ^b } {FB} {F [#] C}	{CC [#] D} {DE ^b E} {B ^b BC} {BCC [#] }	{CBA} {C [#] CB ^b } {DE ^b F} {FF [#] G [#] } {F [#] GA} {GF [#] E} {GA ^b B ^b } {G [#] AB}	{C [#] CA} {C [#] DF} {E ^b EG} {FF [#] A} {GF [#] E ^b } {A ^b GE} {BB ^b G}	{CC [#] F [#] } {CBF [#] } {C [#] CG} {C [#] DG} {DC [#] G [#] } {DE ^b A ^b } {E ^b EA} {EE ^b B ^b } {FF [#] B} {F [#] FC} {GG [#] C [#] } {G [#] GD} {B ^b BE} {BCF}
Voice	{D [#] E} {EF} {F [#] G} {B ^b B}	{D [#] A}	{D [#] EF}			

Table 3.7 displays the examples of dyad- and trichord-type formed in sub-section 2. The instrumental line's [013] partition and the vocal line's emphasis on [01] by the connection of non-adjacent row pitches contribute to the formation of all twelve members of [01] except {AB^b}. Five members of [06] occur in sub-section 2. All five members are related to each other by semitone. While the instrumental line has four types of trichord with several members, the vocal line contains only one appearance of [012], {D[#]EF}. In

⁵⁰ Since four [013]s are related to each other in rhythm and pitch range, it is no longer useful to classify two instrumental groups, strings and clarinets.

total, five members of [012], eight members of [013], seven members of [014], and fourteen members of [016] happen in sub-section 2.

The [013] partitions make a vertical [0167] tetrachord $\{GG^\#C^\#D\}$ by taking the last pitch of each [013] as in sub-section 1. They form the [0167] in mm. 36–39 and then change the chord-type to the [01267] pentachord with the addition of the cello's c_3 . The formation of [01267] plays a preparatory role, since its chord-type will be used in the fourth movement.

After the [013] partitions in mm. 35–40, the instrumental line prepares the music of the third movement by using the same texture and rhythm (Example 3.13). The row P_2 forms two hexachords in mm. 40–41, the row P_0 makes four trichords in mm. 41–42, and the row RI_0 creates three tetrachords in mm. 43–44. Rhythmically, not only the triplet but also the septuplet are employed in mm. 45–47. The tetrachord and the septuplet rhythms are the main features of the third movement.

Example 3.13 Closing Part (mm. 41–48)

Implications of Sub-Sections 1 and 2

Sub-sections 1 and 2 have several common features in both the vocal and instrumental parts. First, each sub-section has the same technique in formation of pitches in both lines. Second, the two sub-sections have the same texture, starting with the four horizontal trichords in the instrumental line before the entrance of the vocal line.

Row and Pitch

In each sub-section, the vocal line uses one row, P_e in sub-section 1 and I_5 in sub-section 2. The vocal and instrumental lines share all twelve pitches – order numbers 0-4 and 9-e in the vocal line and the other pitches, and order numbers 5-8 in the instrumental line.

Example 3.14 Rows P_e and I_5 in Section B

P_e : B C C[#] G F (E D A^b E^b) F[#] A B^b

I_5 : F E E^b A B (C D A^b D^b) B^b G F[#]

Sharing the row between vocal and instrumental lines produces the pitch combination by non-adjacent pitches. In particular, the connection of order numbers 4 and 9 in the vocal line makes the [01] – F and F[#] in sub-section 1 and B and B^b in sub-section 2. Actually, these two dyads, {FF[#]} and {BB^b}, are the first and last pitches of each row. This pitch relationship suggests a reason for Dallapiccola's row choice and why he connects the order numbers 4 and 9 in each row, P_e and I_5 . In addition, these two invariants show the tritone relation similar to the two rows' relationship, P_e and I_5 , tritone

inversion (T_6I). This is one of the composer's powerful and creative techniques to make the [01] and [06] dyads.

Chord-Types

The instrumental line plays different types of trichord partition in each sub-section, the [012] in sub-section 1 and the [013] in sub-section 2. In spite of different chord-types, the technique used is the same such as forming an aggregate and presenting I_1 and T_6 relation.

Table 3.8a Dyad Types in Section B

	[01]				[06]		
	Sub 1	Sub 2	Section B		Sub 1	Sub 2	Section B
{CC [#] }	✓	✓	✓	{CF [#] }		✓	✓
{C [#] D}	✓	✓	✓		{C [#] G}	✓	
{DD [#] }	✓	✓	✓	{DA ^b }		✓	✓
{D [#] E}	✓	✓	✓		{E ^b A}	✓	✓
{EF}	✓	✓	✓	{EB ^b }			✓
{FF [#] }	✓	✓	✓		{FB}		✓
{F [#] G}	✓	✓	✓				
{GG [#] }	✓	✓	✓				
{G [#] A}	✓	✓	✓				
{AB ^b }	✓		✓				
{B ^b B}	✓	✓	✓				
{BC}	✓	✓	✓				

Table 3.8b [012] and [013] Trichord Types in Section B

	[012]				[013]		
	Sub 1	Sub 2	Section B		Sub 1	Sub 2	Section B
{CC [#] D}	V	V	V	{CC [#] E ^b }			
				{C [#] DE}			
{C [#] DE ^b }				{DE ^b F}		V	V
				{E ^b EF [#] }			
{DE ^b E}	V	V	V	{EFG}			
				{FF [#] G [#] }		V	V
{E ^b EF}	V	V	V	{F [#] GA}		V	V
				{GG [#] A [#] }		V	V
{EFF [#] }				{G [#] AB}		V	V
				{AB ^b C}			
{FF [#] G}	V		V	{B ^b BC [#] }			
				{BCD}			
{F [#] GG [#] }	V		V	{CBA}		V	V
				{C [#] CB ^b }		V	V
{GG [#] A}				{DC [#] B}			
				{E ^b DC}			
{G [#] AB ^b }				{EE ^b C [#] }			
				{FED}			
{AB ^b B}	V		V	{F [#] FE ^b }			
				{GF [#] E ^b }		V	V
{B ^b BC}		V	V	{A ^b GF}			
				{AG [#] F [#] }			
{BCC [#] }	V	V	V	{B ^b AG}			
				{BB ^b G [#] }			

Table 3.8c [014] and [016] Trichord Types in Section B

	[014]				[016]		
	Sub 1	Sub 2	Section B		Sub 1	Sub 2	Section B
{CC [#] E}				{CC [#] F [#] }		V	V
{C [#] DF}		V	V	{C [#] DG}		V	V
{DE ^b F [#] }				{DE ^b G [#] }	V	V	V
{E ^b EG}		V	V	{E ^b EA}		V	V
{EFG [#] }				{EFB ^b }			
{FF [#] A}		V	V	{FF [#] B}		V	V
{F [#] GB ^b }				{F [#] GC}			
{GG [#] B}				{GG [#] C [#] }		V	V
{G [#] AC}				{A ^b AD}	V		V
{AB ^b C [#] }				{AB ^b E ^b }			
{B ^b BD}				{B ^b BE}		V	V
{BCE ^b }				{BCF}		V	V
{CBA ^b }				{CBF [#] }		V	V
{C [#] CA}		V	V	{C [#] CG}		V	V
{DC [#] B ^b }				{DC [#] G [#] }		V	V
{E ^b DB}				{E ^b DA}	V		V
{EE ^b C}				{EE ^b B ^b }		V	V
{FEC [#] }				{FEB}			
{F [#] FD}				{F [#] FC}		V	V
{GF [#] E ^b }		V	V	{GF [#] C [#] }			
{G [#] GE}		V	V	{A ^b GD}		V	V
{AG [#] F}				{AA ^b E ^b }	V		V
{B ^b AF [#] }	V		V	{B ^b AE}			
{BB ^b G}		V	V	{BB ^b F}			

The different chord partitions in both sub-sections form the same tetrachord-type [0167] at the end of each sub-section. The consistent pitches held in sub-section 1 are {DE^bG[#]A} and those of [0167] in sub-section 2 are {C[#]DGG[#]}. The second [0167] tetrachord is a semitone below the first tetrachord.

Tables 3.8a-3.8c show the examples of dyad and trichord-types appearing in section B. All twelve members of [01] and all six members of [06] occur in section B. In total, eight members of [012], eight members of [013], eight members of [014], and seventeen members of [016] occur in all of section B. In sub-section 1, the [012] type occurs more frequently than in sub-section 2 due to the [012] partitions in sub-section 1.

Among the five members ($\{CC^\#D\}$, $\{DE^bE\}$, $\{E^bEF\}$, $\{B^bBC\}$, $\{BCC^\#\}$) in sub-section 2, four of the five have already appeared in sub-section 1. The new one ($\{B^bBC\}$) has a semitone relation from the $\{AB^bB\}$ and $\{BCC^\#\}$ in sub-section 1.

All eight members of [013] happen in sub-section 2 due to the [013] partition in sub-section 2. Among the eight members of [014], one member occurs in sub-section 1 and the remaining seven members are in sub-section 2. The $\{B^bAF^\#\}$ in sub-section 1 develops to $\{BB^bG\}$, a semitone above, in sub-section 2.

The seventeen members of [016] occur in section B, mostly in sub-section 2. Sub-section 1 has four members and sub-section 2 has fourteen members. Both two sub-sections contain one common member, $\{DE^bG^\#\}$. The continuous development of trichord-types throughout the movement will be discussed later in this chapter.

Implications of the Movement (Prelude, Section A, Transition, and Section B)

Rhythm

The duplet and triplet rhythms dominate both in the vocal and instrumental lines throughout the second movement. The one appearance of quintuplet and septuplet rhythms in the end of section B prepares the third movement. Except in section A, the instrumental line's rhythm is independent from the vocal line's rhythm. Neither part ever forms the same rhythmic pattern in the transition or section B (there is no vocal line in the prelude), but rather they play complementary roles, sounding one after another.

While the alternation of duplet and triplet rhythms dominate through the piece, the rhythmic pattern forms two distinguished features: (1) the extending rhythmic pattern

in the prelude and transition, and (2) the shortening rhythmic pattern in sections A and B. In the prelude, the rests in particular get longer from the sixteenth-note duration to quarter-note duration between mm. 12–13 (Examples 3.1 and 3.2). The lengthening rhythmic process also occurs in the transition. The vocal line's rhythm is getting longer from the quarter-note triplet to the half-note triplet through the transition. The instrumental line also gets longer from the dotted quarter duration to five-and-half quarter duration (Examples 3.7a-3.7c).

On the other hand, the rhythmic pattern of sections A and B forms a shortening pattern. In section A, the vocal line's triplet rhythm decreases from three dotted quarter notes to the eighth-note triplet. The instrumental line also forms the decreasing rhythmic pattern within the vertical [01]s forming the second aggregate in mm. 20–22 (Examples 3.3a–3.3c and 3.5). In section B, the trichord partitions ([012] and [013]) have the decreasing rhythmic pattern like section A (Examples 3.9, 3.10a-3.10c, and 3.12). The rhythmic patterns alternating between contracting and expanding clearly support the sectional division as well as the text.

Pitch and Chord-Types

In spite of using the twelve-note system in this movement, not all pitches are based on the row. As mentioned in each section, the pitch material divides into two: (1) the pitches based on the row, and (2) the pitches outside the row. Except for the prelude, all other sections employ both pitches, especially in the instrumental line. As the piece progresses, the portion of pitches outside the row increases – section B has more pitches than section A.

The pitches outside the row do follow a consistent pattern; they gradually build a [0167] sonority from section A to section B. In section A, the adjacent vertical [01]s consist of the same rhythmic duration and T_6 relation. It creates the obvious [0167] chord-type, although this does not yet sound simultaneously in section A. The two [01]s related by T_6 develop to a vertical [0167] tetrachord in the transition with the same rhythmic duration. The [0167] in the transition consists of two [06]s related by semitone (rather than two [01]s related by T_6 in section A). The viola's [06] and the cello's [06] strongly demonstrate this relation. In section B, the vertical [0167]s continue to occur with the last pitches of the horizontal [012] and [013] partitions. Thus, several [01] dyads (two adjacent [01]s showing T_6) in section A, the tetrachord [0167] consisting of two [06]s related by T_1 in the transition, and the tetrachord [0167] by the last pitches of four trichords, [012] or [013], all form the chord-type [0167] using outside row pitches. In addition, the four [012] and [013] partitions in sub-sections 1 and 2 also show the relation of [01] and [06] with T_6 and I_1 .

On the other hand, the pitches based on the row also present the [01] and [06] sonorities. Especially in the transition, the vocal line forms only the two sonorities of [01] and [06] by order numbers 0–1, 2–3, 6–7, and 8–t-e of P_1 . In section B, the association of non-adjacent order numbers 4 and 9 makes the [01] in the rows I_5 and P_e . Two rows, I_5 and P_e , used in section B show the tritone inversion (T_6I) and are thus related, again, by tritone. Along with his careful choice of rows, the sharing of the row's pitches between vocal and instrumental lines is one of Dallapiccola's techniques to create specific sonorities, [01] and [06].

Tables 3.9a-3.9f show the examples of dyad- and trichord types throughout the second movement. All members of [01] and [06] occur in this movement. No single section contains all twelve possible members of [01] except sub-section 1. As the movement progresses, the added members of [01] complete all twelve possible [01]s: eight members in the prelude, ten members in section A, eight members in the transition, twelve members in sub-section 1 (section B), and eleven members in sub-section 2 (section B). After the prelude, all four new members ($\{EF\}$, $\{GG^\#\}$, $\{AB^b\}$, $\{BC\}$) have a semitone relation from the prelude's [01] type.

In the case of [06], two members in the prelude increase the number of members in section A to four, and then two more expose all six members in the transition. Two new members in section A ($\{CF^\#\}$, $\{DG^\#\}$) and two new members in the transition ($\{E^bA\}$, $\{FB\}$) have a semitone relation from the previous section's trichords. As shown in Table 3.9a, the new members have a semitone relation from the previous section. The reason for employing only two dyads is to reflect a contrast expressed in the text. This will be addressed in detail later in this chapter.

As shown in Tables 3.9b-3.9e, the number of trichord-type is added as the piece progresses. Throughout the piece, ten members of [012], fifteen members of [013], fourteen members of [014], and twenty-three members of [016] occur.

Table 3.9a Dyad Types in the Second Movement

		Prelude	Section A	Transition	Section B		Whole Movement
					Sub 1	Sub 2	
[01]	{CC [#] }	✓	✓	✓	✓	✓	✓
	{C [#] D}	✓	✓	✓	✓	✓	✓
	{DE ^b }	✓	✓	✓	✓	✓	✓
	{E ^b E}	✓	✓		✓	✓	✓
	{EF}		✓	✓	✓	✓	✓
	{FF [#] }	✓	✓		✓	✓	✓
	{F [#] G}	✓		✓	✓	✓	✓
	{GG [#] }		✓		✓	✓	✓
	{G [#] A}	✓		✓	✓	✓	✓
	{AB ^b }		✓		✓		✓
	{B ^b B}	✓	✓	✓	✓	✓	✓
{BC}		✓	✓	✓	✓	✓	
[06]	{CF [#] }		✓	✓		✓	✓
	{C [#] G}	✓	✓	✓	✓		✓
	{DG [#] }		✓	✓	✓	✓	✓
	{E ^b A}			✓	✓	✓	✓
	{EB ^b }	✓	✓	✓		✓	✓
	{FB}			✓		✓	✓

Table 3.9b [012] Trichord Type in the Second Movement

	Prelude	Section A	Transition	Section B		Whole Movement
				Sub 1	Sub 2	
{CC [#] D}				✓	✓	✓
{C [#] DE ^b }		✓				✓
{DE ^b E}	✓	✓		✓	✓	✓
{E ^b EF}		✓		✓	✓	✓
{EFF [#] }						
{FF [#] G}	✓			✓		✓
{F [#] GG [#] }				✓		✓
{GG [#] A}		✓				✓
{G [#] AB ^b }						
{AB ^b B}		✓		✓		✓
{B ^b BC}					✓	✓
{BCC [#] }		✓		✓	✓	✓

In the [012], ten members excluding {EFF[#]} and {G[#]AB^b} occur throughout the movement. The four new members ({C[#]DE^b}, {E^bEF}, {GG[#]A}, {AB^bB}, {BCC[#]}) occur in section A. The {C[#]DE^b} and {E^bEF} are a semitone above and below the

{DE^bE} presented in the prelude, but the other three new members do not have any semitone relation. The {CC[#]D} is formed a semitone above the {BCC[#]} as well as the semitone below the {C[#]DE^b} both of which are created in section A. In addition, the {F[#]GG[#]} is semitone below the {GG[#]A} formed in section A. Since there is no formation of the [012] in the transition, two new members contain a semitone relation from the previous section's trichord. In sub-section 2, among five members of [012] ({CC[#]D}, {DE^bE}, {E^bEF}, {B^bBC}, {BCC[#]}), there is one new members, {B^bBC}. It has a semitone relation between {AB^bB} and {BCC[#]} created in sub-section 1.

For the emphasis of [013] in sub-section 2, Dallapiccola uses two techniques: first, no [013]s occur in the transition and sub-section 1 and second, the most frequent occurrence, eight members, comes in sub-section 2 through the use of this trichord partition to generate outside row. Two members in the prelude develop to seven members in section A. All seven members are new; the {B^bAG} has a semitone relation from the {BB^bG[#]} that occurred in the prelude. Section A's new members do not have semitone relations except the {B^bAG}, but most of the new members in sub-section 2 have a semitone relation from one of section A's trichords – all except the {GG[#]A[#]}. The occurrence of eight [013]s in sub-section 2 contains six new members ({C[#]CB^b}, {DE^bF}, {F[#]GA}, {GG[#]A[#]}, {GF[#]E}, {G[#]AB}), which have a semitone relation from a trichord created in section A. The {GF[#]E} is a semitone above the {F[#]FE^b} and the {C[#]CB^b} shows semitone relation above the {CBA}. The {DE^bF} is a semitone above the {C[#]DE}.

Table 3.9c [013] Trichord Type in the Second Movement

	Prelude	Section A	Transition	Section B		Whole Movement
				Sub 1	Sub 2	
{CC [#] E ^b }						
{C [#] DE}		V				V
{DE ^b F}					V	V
{E ^b EF [#] }						
{EFG}						
{FF [#] G [#] }		V			V	V
{F [#] GA}					V	V
{GG [#] A [#] }					V	V
{G [#] AB}					V	V
{AB ^b C}		V				V
{B ^b BC [#] }						
{BCD}						
{CBA}		V			V	V
{C [#] CB ^b }					V	V
{DC [#] B}	V					V
{E ^b DC}						
{EE ^b C [#] }		V				V
{FED}						
{F [#] FE ^b }		V				V
{GF [#] E}					V	V
{A ^b GF}						
{AG [#] F [#] }						
{B ^b AG}		V				V
{BB ^b G [#] }	V					V

The {G[#]AB} is semitone below the {AB^bC} and two trichords, {GG[#]A[#]} and {F[#]GA}, are related to themselves by the semitones as shown in Table 3.9c. Since there is no [013] in the transition and sub-section 1, these trichords are compared to section A and show the continuation of introducing new member by the semitone relation.

In the [014] chord-type, two members in the prelude increase the number of members to seven including six new members in section A shown in Table 3.9d. None of the six new members appearing in section A have a semitone relation, while most of the new members occurring in sub-section 2 have a semitone relation from section A's [014]s.

Table 3.9d [014] Trichord Type in the Second Movement

	Prelude	Section A	Transition	Section B		Whole Movement
				Sub 1	Sub 2	
{CC [#] E}						
{C [#] DF}					V	V
{DE ^b F [#] }		V				V
{E ^b EG}					V	V
{EFG [#] }						
{FF [#] A}	V	V			V	V
{F [#] GB ^b }						
{GG [#] B}						
{G [#] AC}	V					V
{AB ^b C [#] }						
{B ^b BD}						
{BCE ^b }		V				V
{CBA ^b }		V				V
{C [#] CA}					V	V
{DC [#] B ^b }		V				V
{E ^b DB}		V				V
{EE ^b C}						
{FEC [#] }						
{F [#] FD}						
{GF [#] E ^b }					V	V
{G [#] GE}					V	V
{AG [#] F}						
{B ^b AF [#] }		V		V		V
{BB ^b G}					V	V

All seven members of the [014] are new except the {FF[#]A}. The {C[#]DF} and {E^bEG} show the semitone relation above and below the {DE^bF} formed in section A. The {C[#]CA} is also a semitone above the {CBA^b} created in section A and semitone below the {DC[#]B^b} in section A. The {BB^bG} is a semitone above the {B^bAF[#]} appearing in sub-section 1. Two members ({GF[#]E^b}, {GG[#]E}) do not have a semitone relation from the previous section's trichords, but those relate by a semitone to each other. Since there is one trichord [014] in sub-section 1 (section B) and no [014] in the transition, most of the new members are related to section A's trichords.

Table 3.9e [016] Trichord Type in the Second Movement

	Prelude	Section A	Transition	Section B		Whole Movement
				Sub 1	Sub 2	
{CC [#] F [#] }			√		√	√
{C [#] DG}		√			√	√
{DE ^b G [#] }			√	√	√	√
{E ^b EA}					√	√
{EFB ^b }			√			√
{FF [#] B}		√			√	√
{F [#] GC}			√			√
{GG [#] C [#] }		√			√	√
{A ^b AD}			√	√		√
{AB ^b E ^b }						
{B ^b BE}			√		√	√
{BCF}			√		√	√
{CBF [#] }					√	√
{C [#] CG}	√		√		√	√
{DC [#] G [#] }					√	√
{E ^b DA}			√	√		√
{EE ^b B ^b }	√	√			√	√
{FEB}			√			√
{F [#] FC}		√			√	√
{GF [#] C [#] }			√			√
{A ^b GD}		√			√	√
{AA ^b E ^b }			√	√		√
{B ^b AE}		√				√
{BB ^b F}			√			√

In the [016] chord-type, two members in the prelude develop to seven members in section A including six new members (except {EE^bB^b}) without any semitone relation. In the transition, except two members ({B^bBF} and {BCF} having a semitone relation themselves), all have a semitone relation from the previous sections' [016]. The {CC[#]F[#]} and {DE^bG[#]} are a semitone below and above the {C[#]DG} created in section A. The {EFB^b} and {F[#]GC} have a semitone below and above the {FF[#]B} created in section A. The {A^bAD} is a semitone above the {GG[#]C[#]} created in section A. The {E^bDA} and {FEB} are a semitone below and above the {EE^bB^b}, the {GF[#]C[#]} and {AA^bE^b} are a

semitone below and above the $\{A^bGD\}$, and the $\{BB^bF\}$ is a semitone above the $\{B^bAE\}$.

In sub-section 2, the occurrence of fourteen members includes three new members. All three new show a semitone relation from [016]s created in the previous sections. The $\{E^bEA\}$ is a semitone above the $\{DE^bG^\#\}$ appearing in sub-section 1 (section B). The $\{DC^\#G^\#\}$ is a semitone below the $\{E^bDA\}$ formed in sub-section 1 as well as in the transition. The $\{CBF^\#\}$ shows the semitone relation between the $\{BCF\}$ and $\{C^\#CG\}$ appearing in the transition. The emphasis on the [016] sonority, especially in the transition, is apparent in the number.

Table 3.9f Tetrachord Types in the Second Movement

	Prelude	Section A	Transition	Section B		Whole Movement
				Sub 1	Sub 2	
$\{CD^bF^\#G\}$			V			V
$\{C^\#DGG^\#\}$					V	V
$\{DE^bG^\#A\}$			V	V		V
$\{EFB^bB\}$			V			V

Texture

As the movement progresses, the texture clearly changes from vertical to horizontal. Considering the trichord's texture, the prelude and section A consist of vertical texture with different formation. In the prelude, two instrumental groups, strings and clarinets, form trichords, respectively, and in section A, both the vocal and instrumental lines create the vertical trichords. This vertical texture changes to horizontal texture in section B. The transition plays an important role in texture change; the vertical texture having a long sustained rhythm mitigates the abrupt texture change from vertical

to horizontal. The change of texture expresses the implications of the text, which will be discussed later in the chapter.

Pitch Range

Table 3.10 Pitch Range of the Second Movement

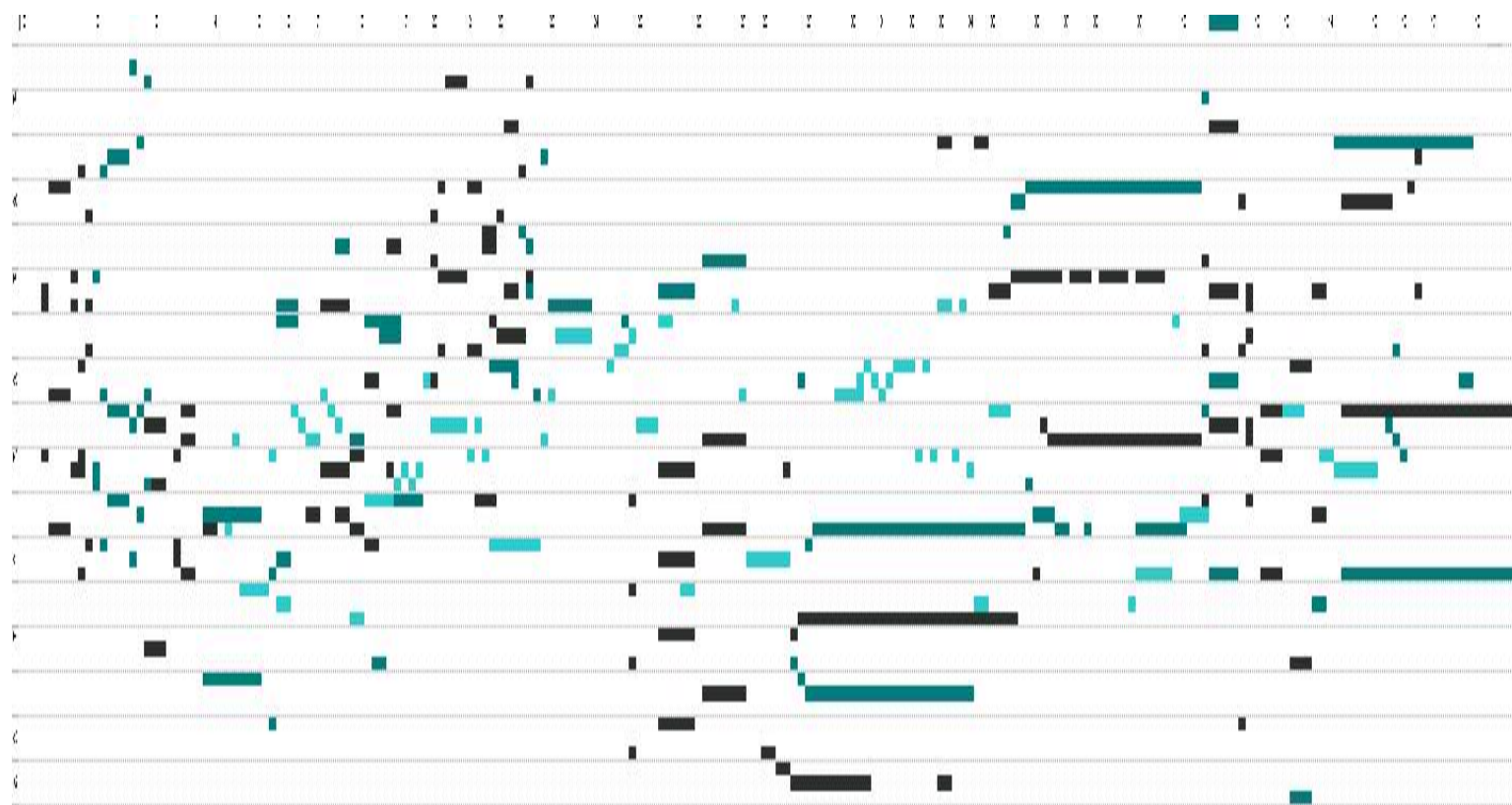
	Instrumental Line	Vocal Line	Center Pitch
Prelude	$f^{\#}_3$ - a_6		
Section A	$c^{\#}_3$ - $g^{\#}_6$	a_3 - f_5	b^b_4 - b_4
Transition	b_2 - $g^{\#}_5$	b_3 - f_5	e^b_4 - e_4
Section B	a_2 - $c^{\#}_7$	a_3 - f_5	b^b_4 - b_4

As shown in Table 3.10, the vocal line's pitch range in sections A and B covers the same space, a_3 - f_5 and in the transition it covers b_3 - f_5 . Thus, the pitch range in three sections is almost the same. Within this similar overall pitch range, the vocal line shows a focus on the ascending aspects of its pitch range (this will be discussed in the section pertaining to the relation between the text and pitch range). Example 3.15 provides the pitch graph in the second movement.

In the instrumental line, section A has a pitch range from $c^{\#}_3$ to $g^{\#}_6$, which portrays an ascending curve; the lowest pitch $c^{\#}_3$ appears in the beginning of section A (m. 15) and the highest pitch $g^{\#}_6$ occurs in the end of section A (m. 20 and 22). Section B also has an ascending pitch range; in the beginning of section B (m. 28), there is the low pitch a_2 (since the lowest pitch, $g^{\#}_2$, is included in the closing passage rather than in section B proper, the a_2 could be regarded as the lowest pitch in section B) and the highest pitch $c^{\#}_7$ appears in the end of section B (m. 40). The degree to which the pitch range ascends is wider in section B than it is in section A. Sections A and B both show the ascending pitch range, which assumes a relation to the text. In spite of having

different pitch range, both sections A and B have the same center pitches b_4^b - b_4 . The cello emphasizes its center pitch b_4 by sustaining it until the end of the piece (mm. 44–48). The bass clarinet also holds the pitch b_2 – same pitch class but the different register (mm. 44–48). The wide spread of the pitch range in the two main sections, A and B, merges to the center pitch at the end of the movement. The broadening of the pitch range, not only between sections A and B but also through the entire piece, is one of Dallapiccola's ways of incorporating the text, which will be discussed later in this chapter.

Example 3.15 Pitch Graph of the Second Movement



Relation between Text and Music

As I mentioned in the beginning of this chapter, the first stanza of the text contains the repeated forgetfulness and the hope that it will be a liberator in the present time. This hope is represented in detail in the third stanza – the description of a peaceful moment set in the future. The second stanza is a turning point from present tense to future tense. In the text, the forgetfulness has described positive rather than negative things. The forgetfulness brings freedom from something restricting rather than any attempt or struggle to remember. In addition, the forgetfulness is the result of the process of memory appearing and disappearing, and changing in each repeated occurrence.

The above observations of rhythm, texture, pitch, chord, and pitch range show continued development through the piece. Their developments are one of the techniques to express the text, especially the idea of forgetfulness. In the case of rhythm, the shortened rhythmic pattern in sections A and B describes the disappearing memory, forgetfulness. Within the short rhythmic pattern, the rhythm has expanded or shortened, which reflects the process leading to forgetfulness. Especially, the [01] in section A and the [012] and [013] partitions in section B clearly show the shortened rhythm. On the other hand, the sustained last notes in the [012] and [013] partitions express the peaceful condition, which results from the forgetfulness. The long duration stands for peace and the variable shortened rhythms symbolize the struggles of memory.

In the texture, section A has the vertical trichords representing the present tense. On the other hand, the horizontal trichords in section B represent the future tense. The change of the texture from vertical to horizontal corresponds to the tense's change in the text. Through the rhythm and texture, the repeated vertical trichords using the shortened

rhythmic pattern express the actuality of the present, repeated disappearing and appearing memory, and the horizontal trichords with the long duration describes the future, which the narrator hopes with last for a long time.

In the case of pitch, as the movement proceeds, the employment of more pitches outside the row describes the transformation relating to the forgetfulness, which involves alternation of memories as time goes by.

The reason for using those two dyads ([01] and [06]) among six dyads is for the contrast. To express the contradiction that forgetfulness is a liberator, both the vocal and instrumental lines emphasize the contrasting sonorities [01] and [06]. In particular, the occurrence of only these two contrasting sonorities in the transition maximizes the impact of the poet's passion during this middle stanza.

The four types of trichord also imply an aspect of the forgetfulness. The forgetfulness does not happen suddenly. It takes some time through repeated appearances and disappearances, which gradually change in shape. This change from memory to forgetfulness matches the exposure of members. The use of the same sonority, but changing its members and eventually exhausting all of the possible members, is enough to describe the blurring of a specific memory into different various varieties, which ultimately completes the process of forgetfulness.

In the pitch range, not only each section but also the entire movement has the curve from the lowest pitch to highest pitch. These ascending pitches represent the liberation caused by the forgetfulness. Since the third stanza depicts the peace and freedom from the restriction and the first stanza expresses the process of the forgetfulness, the highest pitch in section B is higher than that of in section A. In

addition, the degree from the lowest to highest pitch in section B is wider than that of section A, thus expressing the maximum effect of liberty by the widest range. The constriction before the forgetfulness fits with the low register and the high register expresses the liberty caused by the forgetfulness.

In the prelude, bipartition foreshadows the music and the text of sections A and B. Section A (the first stanza) depicts forgetfulness in the present tense, emphasizing this through repetition. This matches the repetition of vertical trichords in the row I_7 . Section B (the third stanza) expresses the peaceful condition that is the result of the forgetfulness. The delayed beat with the long duration and no occurrence of repetition in the RI_4 articulates and portrays this peaceful condition.

The second stanza of the text consists of an exclamation, which accompanies the moment where forgetfulness changes. The second stanza is the repetition of ‘Hombres’ (men) three times and ends with the exclamation ‘ay’ (Oh). The poet’s feeling of passion is represented in pitch range, rhythm, and specific sonorities in music. In each repetition (‘hombres’), the pitch becomes higher than in the previous one and the intervals of the dyad become broader than in the previous one. As shown in Example 3.16, the first ‘hombres’ begins with $c^{\#}_5$, the second one begins on e^b_5 , the third one is e_5 , and the last one, ‘ay’, begins on f_5 . In addition, the interval of the first dyad is semitone ($c^{\#}_5-d_5$), the second is tritone ($e^b_5-a_4$), and the third one is tritone including octave ($e_5-b^b_3$). Then the climax of this passion reaches the exclamation, ‘ay’ (oh), with strong dynamics, *ff*. Actually, the dynamics are getting stronger through the transition from *f* to *ff*. As the pitches are ascending, the interval becomes broader, the dynamics are getting stronger

and the rhythmic unit becomes longer; all of these emphasize this point of release between the ugly time of the first stanza and the peaceful future of the second.

Example 3.16 Vocal Line in the Transition

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Conclusion

The development of the musical elements of rhythm, texture, pitch materials, pitch range, and the certain chord-type with the added members all contribute to an important process in the music. Dallapiccola plans and then uses individual musical elements for describing the text as well as shaping the musical form. His manipulation of musical materials is excellent and shows a wonderful understanding of the text. He achieves a unified whole built up from the diversity of all of the musical materials.

The music and text complement one another and expand each other, I think, to define the form. As the elements interact and evolve, the formal design emerges. Therefore, the form and the text are inseparable. They are indeed one. Thus, the developing musical elements based on the text bring out the composition's expressive design and the creation of musical design symbolizes the text by the same process.

Chapter 4. Analysis of the Third Movement

Introduction

The third movement of *Sicut Umbra* is written for three strings (violin, viola, and cello), three clarinets (piccolo clarinet in E^b, clarinet in B^b, and bass clarinet in B^b), three flutes (piccolo, flute, and alto flute in G) and voice, soprano. This instrumentation is an expansion of the previous movement, which consists of strings, clarinets, and voice. This instrumentation further expands in the fourth movement to include strings, clarinets, flutes, voice, and an ensemble of vibraphone, celesta, and harp. The duration of the third movement is 2', which is slightly shortened from the second movement, 2'28", but the duration of the fourth movement lengthens as the instrumentation expands.

As previously shown in the second movement, each song is linked to its predecessor through the use of the same musical elements. The end of the second movement gives an indication as to the material to be used in the third movement: the same rhythmic pattern (the quintuplet and septuplet), the vertical trichords ([012], [013], [014], [016]), and the delayed beat by the rest. The septuplet rhythm briefly introduced at the end of the second movement (m. 45) is the main rhythmic pattern in the third movement. The four types of trichords heard at the beginning of the third movement appear previously in the beginning (mm. 10–13) and the end (mm. 41–42) of the second movement. The continuous use of measure numbers is another way of showing the musical continuity.

These shared musical surfaces are used to show the connection between the texts of the second and the third movements and to give musical continuity. In spite of the

different source of texts in the second and third movements, the poems have some connection in meaning; forgetfulness is the subject of the second movement and remembrance is the subject of the third. As previously stated, the source of the text is ‘El Recuerdo’ (Memories), a poem by Juan Ramon Jimenez. Table 4.1 shows the original poem and its translation.

Table 4.1 Text in the Third Movement

El recuerdo

Come Medanos de oro,
que vienen que van, son los recuerdos.

El viento se los lleva,
y donde estan, estan,
y estan donde estuvieron,
y donde habran de estar...
— Medanos de oro —.

Lo llenan todo, mar
total de oro ineffable,
con todo el viento en el...
— son los recuerdos —.

Memories

Like golden sand-dunes,
that come and go, such are remembrances.

The wind carries them away,
and where they are, they are,
and they are where they were,
and where they ought to be...
— Golden sand-dunes —.

They permeate all,
absolute sea of ineffable gold,
with the wind ever present..
— such are remembrances —.

The poem consists of three stanzas. Memories are compared to golden sand dunes; as the golden sand dunes have continuously changed their shape, shifted by the wind, the poet describes that memories come and go, appearing and disappearing constantly through time. By their repeated process of appearing and disappearing, memories eventually permeate all things and finally remain as the remembrances.

The musical surface expresses the continuously changing shape in important ways; some words associated with each other such as ‘golden sand-dunes’ (‘medanos de oro’) and ‘remembrance’ (‘recuerdos’) are repeated. The composer sets these

words with the same rows or similar rhythms to reflect the same meaning. Yet these rhythmic patterns and interval patterns are slightly different each time, thus expressing their changeable nature. Reshaping, the themes of the poem, is articulated in a way that it is related to the material such as rhythm, interval, and rows through material that is often repeated although not exactly.

This analysis of the third movement begins with the fundamental musical elements such as rhythm, rows used, pitch, chords (dyad, trichord, and tetrachord), texture, and others, individually. These elements in each section (or sub-section) show the process of development and the results producing the unity. In addition, they demonstrate the depiction of the text. As a result, we will examine how the musical factors and techniques express the text effectively and how Dallapiccola creates the unity.

Form

The piece may be partitioned into three sections on the basis of surface characteristics such as meter changes, tempo changes, texture, and rhythm. The three sections are section A (mm. 49⁵¹–95), section B (mm. 96–106), and section A' (mm. 107–138). These three sections match the three stanzas, respectively. Table 4.2 provides a formal overview.

⁵¹ Due to continuous measure numbers, the third movement begins with measure number 49.

Table 4.2 Formal Overview

Section	Measure	Text	Used Row	Characteristics
Section A	mm. 49–95	stanza 1	RI ₀ , R ₅ , P _e , RI _e , R ₆ , R _e , I ₀ , I ₆ , I ₁ , P ₉ , RI ₂ , R ₅ , I _e , P _t	no meter change (1/2) no tempo change (♩ = 72)
Section B	mm. 96–106	stanza 2	RI ₄ , RI ₈ , RI _e , RI ₃ , I ₃ , I _e , I ₆ , I ₃ , P ₅ , P ₂	meter change (2/2, 3/2, 4/2) no tempo change (♩ = 72)
Section A'	mm. 107–138	stanza 3	P ₃ , I ₈ , I ₃ , I ₅ , I ₂ , I _t , I ₉ , R ₃ , RI _t , R ₅ , I ₃ , RI ₉ , P _t , I ₃ , P _e	tempo change (♩ = 54 and ♩ = 72) meter change (3/2, 2/2, 1/2)

The distinctive change in the texture between sections A and A' and section B involves variance in the presentation of the trichords. In section B, the four trichord types ([012], [013], [014], [016]) are continuous as vertical sonorities; however, in sections A and A', they are not usually found vertically. Moreover, these sections include tetrachords.

In terms of melody, sections A and A' have inversionsal melodies in the flutes, while section B does not contain any flute melody. Two inversionsal melodies in section A appear separately one after the other. In section A', however, they appear simultaneously, which plays a crucial role in the beginning of section A'.

In terms of meter, section A consists of a single meter, 1/2, and a single tempo, ♩ = 72. Section B has many meter changes (2/2, 3/2, 5/4, 4/3), but no tempo changes. Furthermore, section A' has meter change (beginning with 4/2 and then changing to 3/2 and 2/2) and tempo changes from ♩ = 54 to ♩ = 72. The trichord's

texture, the inversionsal melodies in the flute's line, and the changes in tempo and meter divide the third movement into three sections, sections A, B, and A'.

Musical Analysis

Section A (mm. 49–95)

Section A is divided into three sub-sections based on the appearance of the vocal line: sub-section 1 (mm. 49–73), sub-section 2 (mm. 74–87), and sub-section 3 (mm. 88–95) (Table 4.3). While sub-sections 1 and 3 employ the instrumental line without the vocal line, sub-section 2 has the vocal line with the flutes. As mentioned, no changes in meter and tempo occur between these three sub-sections within the section.

Table 4.3 Formal Overview of Section A

Sub-Section	Phrase	Measure	Instrumentation
1	P1	mm. 49–52	strings, flute and clarinets
	P2	mm. 53–56	
	P3	mm. 57–63	
	P4	mm. 64–73	
2	P5	mm. 74–79	voice and flutes
	P6	mm. 80–87	
3	P7	mm. 88–92	strings, flute and clarinets

As shown in Table 4.3, each sub-section is also divided into several phrases: four phrases in sub-section 1, two phrases in sub-section 2, and two phrases in sub-section 3. Such division is based on the chord, texture, and rhythm.

The strings' vertical trichords in phrases 1 and 2 develop to tetrachords in phrases 3 and 4. The strings form chords once every measure through sub-section 1. In phrases 3 and 4, the inversional melodies occur in the flute's line (phrase 3) and in the alto flute's line (phrase 4). This inversional melodic relation repeats in sub-section 2 and divides sub-section 2 into two phrases: phrases 5 and 6. In phrase 5, the melody begins in the alto flute's line and then switches to the flute's line; in phrase 6, the melody begins in the flute's line and then changes to the alto flute's line. The phrases have different lengths, six measures (mm. 74–79) in phrase 5 and eight measures (mm. 80–87) in phrase 6. In sub-section 3, the texture inversion divides the sub-section into two phrases, phrases 7 and 8. The woodwinds' texture in phrase 7 switches to the strings' texture in phrase 8 and vice versa. Phrase 7 has five measures (mm. 88–92) and phrase 8 has three measures (mm. 93–95).

In summary, section A has three sub-sections which are divided into eight phrases; the strings' use of chord and the inversional melodies divide sub-section 1 into four phrases (phrases 1–4), the inversional melodies divide sub-section 2 into two phrases (phrases 5–6), and texture inversion divides sub-section 3 into two phrases (phrases 7–8).

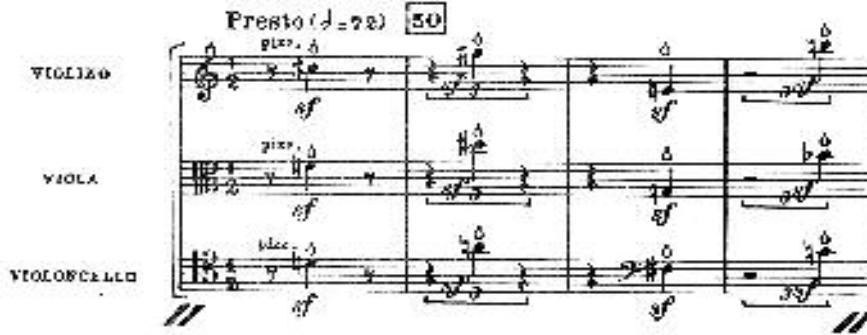
Sub-Section 1 (mm. 49–73)

Phrase 1 (mm. 49–52)

The strings play four vertical trichords in each measure. The four trichords alternate two rhythmic patterns, duplet and triplet. Within the alternation, the entrance

of each beat is delayed by the duration of a sixteenth-rest. They have the same articulation, *snap pizzicato* and the same dynamics, *sf* (Example 4.1).

Example 4.1 Four Trichord Types in Phrase 1 (mm. 49–52)



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The trichords come from the partition of RI_0 , forming [014], [016], [013], and [012]. Table 4.4 provides a list of the dyad and trichord types found in phrase 1.

Table 4.4 Dyad and Trichord Types in Phrase 1

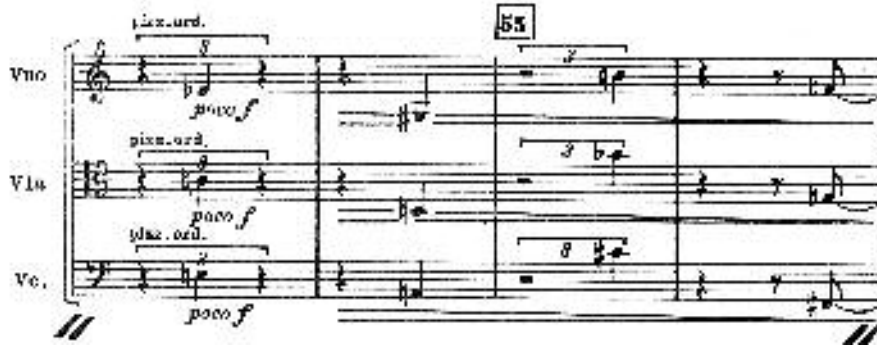
	Dyad		Trichord			
	[01]	[06]	[012]	[013]	[014]	[016]
m. 49	{C#D}				{C#DF}	
m. 50	{G#A}	{AD#}				{AG#D#}
m. 51	{F#G}			{GF#E}		
m. 52	{BC}		{BbBC}			
	{BbB}					

Phrase 2 (mm. 53–56)

The rhythmic alternation between duplet and triplet continues in phrase 2, in the order of the triplet-duplet-triplet-duplet. The delayed beat by the sixteenth rest also occurs consistently. The strings play R_5 with the formation of four trichords

occurring one per measure. The articulation is *ordinary pizzicato* and the dynamics are *poco f*.

Example 4.2 Four Trichord Types in Phrase 2 (mm. 53–56)



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The trichord partitions, similar to those found in phrase 1, are [014], [016], [013], and [012]. Table 4.5 gives the dyad and trichord types found in phrase 2.

Table 4.5 Dyad and Trichord Types in Phrase 2

	Dyad		Trichord			
	[01]	[06]	[012]	[013]	[014]	[016]
m. 53	{E ^b E}				{EE ^b C}	
m. 54	{G [#] A}	{DG [#] }				{G [#] AD}
m. 55	{B ^b B}			{B ^b BC [#] }		
m. 56	{FF [#] }		{FF [#] G}			
	{F [#] G}					

Phrase 3 (mm. 57–63)

Rhythm

As shown in Example 4.3, the strings form a regular pattern, playing on the second beat in mm. 57–60 and then on the first beat in mm. 61–63. The flute and clarinets form the eighth-note quintuplet rhythm through phrase 3. While a single

flute makes the quintuplet rhythm in mm. 57–60, the two clarinets share the quintuplets in mm. 61–63. The different formation of the quintuplet corresponds to the change in the strings' regularity from the second beat to the first beat.

Instrumentation, Texture, Dynamics, and Articulation

Example 4.3 Phrase 3 (mm. 56–64)

The musical score for Example 4.3 Phrase 3 (mm. 56–64) is presented in two systems. The first system features the Flute (Fl.), Violin (Vln.), Viola (Vla.), and Violoncello (Vcl.). The Flute part begins with a quintuplet in measures 57–60, marked with a box containing the number 80. The Violin and Viola parts play a continuous string line, while the Violoncello part provides a harmonic foundation. The second system includes the Clarinet in E-flat (Cl. Eb), Clarinet in B-flat (Cl. Bb), Clarinet in A (Cl. A), Bassoon (Fag.), Violin (Vln.), Viola (Vla.), and Violoncello (Vcl.). The Clarinet in E-flat and Clarinet in B-flat parts play quintuplets in measures 61–63. The Bassoon part is marked with *ppp* and *sfz*. The Violin and Viola parts continue their string line, and the Violoncello part provides a harmonic foundation. The score includes various dynamics and articulation markings, such as *p*, *ppp*, *sfz*, and *sfz; esad.*

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Along with the continuous string line forming a vertical texture, trichords (mm. 57–60) and tetrachords (mm. 61–63), the instrumentation changes from the

flute (mm. 57–60) to the clarinets (mm. 61–63) forming the horizontal texture. This horizontal texture also changes from a single line in mm. 57–60 to two overlapping lines in mm. 61–63. The texture gets thicker along with the instrumental change. Example 4.3 shows the music in phrase 3. The strings have two articulations, *ordinary pizzicato* (mm. 57–60) and *arco*. (mm. 61–63). Two articulations accompany two dynamics, *p* and *pp*. All of these changes occur at the same point, m. 61.

Row and Pitch

Phrase 3 has two pitch structures: one based on the row and the other based on [012] partition. First, the strings form RI_2 (mm. 57–60) and RI_e (mm. 61–63) and the flute plays P_e . The three rows have different formation based on the texture. The vertical texture forms the rows without any repetition. The strings play two rows as four trichords and three tetrachords. On the other hand, the horizontal texture forms a row with repetition. The flute plays one row, P_e for four measures (mm. 57–60). Second, the clarinets play the [012] partitions, which form two twelve-tone aggregates. Each aggregate has different instrumental group such as bass clarinet-clarinet in the first appearance (mm. 61–62) and clarinet-piccolo clarinet in the second instance (mm. 63–64). This provides a change of tone color from the low pitch range to the high pitch range. This has important implications in relation to the text, which will be discussed later.

The repetition in the flute line using P_e produces the [012] (m. 57) and [0136] (mm. 59–60). The formation of [012] not only prepares the [012] partitions in the clarinets (mm. 61–64) but also has relation to the strings' vertical trichords in phrase 2; the last [012] in phrase 2 is tied while the flute repeats the [012] in the beginning of phrase 3. This tied [012] mitigates the abrupt texture change from vertical (strings) to horizontal (flute) containing the same [012] type. After the change to the horizontal [012] in the flute's line, the clarinets play several members of horizontal [012]s. The pitch relationship between two [012]s ($\{GF^\#F\}$ (strings) and $\{BCC^\#\}$ (flute)) implies an I_4 relationship, which continues through the [012]s created by the partitions aggregate. Either an I_4 or I_8 relation occurs continuously in the two adjacent [012] partitions. The use of I_4 (I_8) is to produce the sonority, [06] on the third note of the quintuplet note, the entrance of the second trichord (the detailed discussion of the role of [06] will be dealt with in the latter section on dyads). The flute's [012] repetition moderates the texture change from the vertical to horizontal and prepares the frequent occurrence of [012] with the same interval relation (Example 4.3).

On the other hand, the flute's repeated tetrachord in mm. 59–60 prepares the strings' vertical tetrachord formed in mm. 61–63. It also mitigates the texture's change from trichord to tetrachord.

Chord-Types

The [012] partitions and the strings' chord types contain a lot of [01] dyads.

All twelve possible members occur in phrase 3. Since two [012] partitions occur within the quintuplet rhythm, the third place of quintuplet has two pitches forming the [06]. The use of I_4 (I_8) relation enables to have a vertical [06] dyad between two adjacent [012] partitions. Three consecutive [06]s in mm. 61–63 are a semitone apart: b_2-f_3 (m. 61), $c_3-f_4^\#$ (m. 62), and $c_5^\#-g_4$ (m. 63). The flute's melody contains two [06]s, $c_5^\#-g_5$ (m. 58) and $d_6-g_4^\#$ (m. 59), a semitone apart. The formation of the [06]

Table 4.6 Dyad, Trichord, and Tetrachord Types in Phrase 3

	Dyads		Trichords				Tetrachords
	[01]	[06]	[012]	[013]	[014]	[016]	
Strings	{CC [#] } {C [#] D} {E ^b E} {FG ^b } {G [#] A} {AB ^b } {B ^b B}	{BF} {C [#] G} {DA ^b } {E ^b A}	{CC [#] D} {AB ^b B}	{FF [#] A ^b } {AG [#] F [#] }	{CC [#] E} {E ^b EG} {B ^b AF [#] }	{C [#] CG} {AB ^b E ^b } {BB ^b F}	{CC [#] EG} {FF [#] A ^b D} {A ^b F [#] FD} {AB ^b BD [#] }
Flutes	{CC [#] } {EF} {G [#] A} {AA [#] } {BC}	{C [#] G} {DG [#] }	{BCC [#] }	{EFG} {FED} {AG [#] F [#] }	{B ^b AF [#] }	{C [#] CG} {DD [#] G [#] } {AG [#] D [#] }	{G [#] AD [#] F [#] }
Clarinets	{CC [#] } {C [#] D} {DE ^b } {E ^b E} {EF} {F [#] G} {GG [#] } {G [#] A} {AB ^b } {B ^b B} {BC}	{BF} {CF [#] } {C [#] G}	{CC [#] D} {C [#] DE ^b } {E ^b EF} {EFF [#] } {F [#] GG [#] } {GG [#] A} {AB ^b B} {B ^b BC}				

dyad strongly suggests the [01] relation in the development of members. Five members, all of them except $\{EB^b\}$, occur in phrase 3. Table 4.6 displays all the examples of dyad and trichord types in phrase 3.

The four types of trichords occur continuously in phrase 3. Nine members of [012] ($\{CC^\#D\}$, $\{C^\#DE\}$, $\{E^bEF\}$, $\{EFF^\#\}$, $\{F^\#GG^\#\}$, $\{GG^\#A\}$, $\{AB^bB\}$, $\{B^bBC\}$, $\{BCC^\#\}$), four members of [013] ($\{EFG\}$, $\{FF^\#G^\#\}$, $\{FED\}$, $\{AG^\#F^\#\}$), three members of [014] ($\{CC^\#E\}$, $\{E^bEG\}$, $\{B^bAF^\#\}$), and five members of [016] ($\{C^\#CG\}$, $\{DE^bG^\#\}$, $\{AB^bE^b\}$, $\{AG^\#E^b\}$, $\{BB^bF\}$) are formed. In spite of the occurrence of increased number in members, the trichordal formation still operates as the basis of sonority in phrase 3.

Form (Phrase Structure)

Using the previous trichord types found previously in phrases 1 and 2, phrase 3 continues using the trichord pattern of four measures with adding the tetrachords for three measures, forming the phrase length of seven measures. The strings' chord change from trichord to tetrachord, the instrumental change from the flute to the clarinets, the changes of dynamics and articulation, and the two kinds of formation of the quintuplet rhythm strongly support a seven (4 + 3) measure structure. However, the clarinets articulate their lines beyond the end of phrase 3, from m. 61 to m. 64 (Example 4.3). This does not correspond to phrase 3. The last measure of the clarinet overlaps with the flute in the first measure of phrase 4. Particularly, the piccolo

clarinet in m. 64 forms the same melody as the flute with the same rhythm and register, $c_5b_4b^b_4$. Furthermore, in the overlapping melody in m. 64, the dynamics of two lines are different, *piu pp* in the clarinet's line and *p* in the flute's line. The clarinet's softer dynamics imply that they are finishing and that m. 64 is the beginning of phrase 4 rather than the end of phrase 3. The clarinet's 4-measure structure overlaps with the phrase structure, which is an important aspect in expressing the text (it will be discussed later).

Phrase 4 (mm. 64–73)

Rhythm and Texture

Example 4.4 Phrase 4 (mm. 65–72)

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The phrase 4's texture and rhythm are based on the phrase 3's texture and rhythm. Texturally, there are continuous vertical chords (trichords and tetrachords) in the strings and a horizontal line in the winds. Rhythmically, the strings play regularly on the second beat in mm. 64–67 and then change to the first beat in mm. 67–73. Through phrase 4, the eighth-note quintuplet rhythm continues.

Instrumentation, Dynamics, and Articulation

An instrumental change occurs from the flute (mm. 64–67) to the clarinets (mm. 68–73) along with the continuous strings' line. This instrumental change carries a change in dynamics: *p* (mm. 64–67) to *pp* (mm. 68–73).

Based on the change in rhythmic pattern and instrumentation, the dynamics and articulation are also changed. Trichords playing on the second beat have *p* and those of tetrachords playing on the first beat are *pp*. The articulation is changed from *ordinary arco* with *sostenuto* to *arco (tast.)*. Corresponding with the dynamics in the strings, the flute's dynamics are *p* and the clarinets' dynamics are *pp*.

Pitch and Row

Two pitch materials occur in phrase 4. First, there are four rows, R_6 , RI_1 , I_6 , and I_0 . The texture and instrument divide these four rows into two different formations: the strings play three rows, R_6 , RI_1 , I_6 vertically without any repeated pitches and the flute forms one row, I_0 horizontally with repeated pitches. The R_6 has

four trichords (mm. 65–67) and the RI_1 and I_6 have three tetrachords (mm. 68–73), respectively. On the other hand, the clarinets form the [012] partitions in mm. 68–73. Twelve occurrences of the [012] partition make three twelve-tone aggregates, once every two measures. The first aggregate consists of the bass clarinet-clarinet (mm. 68–69), the second occurrence (mm. 70–71) is the clarinet-piccolo clarinet (due to the pitch range, the piccolo participates in the second aggregate briefly), and the third instance has all three clarinets (mm. 72–73). The arrangement of two adjacent [012]s is the same as phrase 3's formation.

Chord-Types

Phrase 4 has all twelve members of [01] as well as all six of [06]. The occurrence of [012] partitions have all twelve members in the clarinets' line. In the [06], the strings build four members of [06], $\{DG^\#\}$, $\{E^bA\}$, $\{EB^b\}$, $\{FB\}$, and the flute forms two [06]s, $\{AE^b\}$ and $\{B^bE\}$. All [06]s within strings and flute have a semitone relation. In the [012] partitions, two adjacent [012]s create [06]s vertically such as $\{CF^\#\}$, $\{C^\#G\}$, $\{E^bA\}$, and $\{EB^b\}$. Table 4.7 shows the formation of chord types in phrase 4.

In the case of trichords, all twelve members of [012], six members of [013] ($\{CC^\#E^b\}$, $\{DE^bF\}$, $\{F^\#GA\}$, $\{GF^\#E\}$, $\{GG^\#A^\#\}$, $\{BCD\}$), six members of [014] ($\{C^\#DF\}$, $\{C^\#CA\}$, $\{DE^bF^\#\}$, $\{FEC^\#\}$, $\{GG^\#B\}$, $\{A^bGE\}$), and eight members of

[016] ($\{DE^bG^\#\}$, $\{E^bDA\}$, $\{EFB^b\}$, $\{G^\#GD\}$, $\{AG^\#E^b\}$, $\{AB^bE^b\}$, $\{B^bBE\}$, $\{BCF\}$)

occur throughout phrase 4.

Table 4.7 Dyad, Trichord, and Tetrachord Types in Phrase 4

	Dyads		Trichords				Tetrachords
	[01]	[06]	[012]	[013]	[014]	[016]	
Strings	$\{CD^b\}$ $\{DE^b\}$ $\{EF\}$ $\{F^\#G\}$ $\{GG^\#\}$ $\{AB^b\}$ $\{BC\}$	$\{DG^\#\}$ $\{E^bA\}$ $\{EB^b\}$ $\{FB\}$	$\{EFG^b\}$ $\{F^\#GG^\#\}$ $\{BCD^b\}$	$\{CD^bE^b\}$ $\{GA^bB^b\}$ $\{BCD\}$	$\{D^bCA\}$ $\{DE^bF^\#\}$ $\{FED^b\}$ $\{GA^bB\}$ $\{A^bGE\}$	$\{E^bDA\}$ $\{EFB^b\}$ $\{A^bGD\}$ $\{AB^bE^b\}$ $\{BCF\}$	$\{DE^bF^\#A\}$ $\{EFG^bB^b\}$ $\{E^bD^bCA\}$ $\{GA^bBD\}$ $\{B^bA^bG^bE\}$ $\{BCD^bF\}$
Flutes	$\{C^\#D\}$ $\{DE^b\}$ $\{F^\#G\}$ $\{B^bB\}$ $\{BC\}$	$\{B^bE\}$ $\{AE^b\}$	$\{B^bBC\}$ $\{F^\#GG^\#\}$	$\{DE^bF\}$ $\{F^\#GA\}$ $\{GF^\#E\}$	$\{D^bDF\}$	$\{DE^bA^b\}$ $\{AA^bE^b\}$ $\{B^bBE\}$	$\{E^bA^bFD\}$
Clarinets	$\{CC^\#\}$ $\{C^\#D\}$ $\{DE^b\}$ $\{E^bE\}$ $\{EF\}$ $\{FF^\#\}$ $\{F^\#G\}$ $\{GG^\#\}$ $\{G^\#A\}$ $\{AB^b\}$ $\{B^bB\}$ $\{BC\}$	$\{CF^\#\}$ $\{C^\#G\}$ $\{E^bA\}$ $\{EB^b\}$	$\{CC^\#D\}$ $\{C^\#DE^b\}$ $\{DE^bE\}$ $\{E^bEF\}$ $\{EFF^\#\}$ $\{FF^\#G\}$ $\{GG^\#A\}$ $\{G^\#AB^b\}$ $\{AB^bB\}$ $\{B^bBC\}$ $\{BCC^\#\}$				

Form

Using the previously established trichord and tetrachord types, phrase 4 is a continuation of the trichord and tetrachord patterns of phrase 3 with adding the tetrachords for another three measures, to form a phrase length of ten measures. The additional three tetrachords in the strings, the expanded [012] partitions, and the use of the same dynamics and articulation strongly support this extended 3-measure

structure. Phrase 4 has a 4 + 3 + 3 structure based on the 4 + 3 structure in phrase 3, a 3-measure unit is added.

All of Four Phrases (Sub-Section 1)

Rhythm

Example 4.5 Composite Rhythm in Sub-Section 1

The musical score consists of five staves. The first staff (measures 49-54) shows a sequence of notes with brackets indicating duplets and triplets. The second staff (measures 55-60) continues with duplets and triplets, and introduces quintuplets. The third, fourth, and fifth staves (measures 61-74) consist of continuous quintuplets. Measure numbers 49, 54, 59, 64, and 69 are marked at the beginning of their respective staves.

The alternation of duplet and triplet in phrases 1 and 2 provides both regularity and irregularity. The simple alternation of duplet and triplet is a regular rhythmic pattern. The beat delayed by the rest in each measure, however, brings about irregularity. This irregularity arrives on the regularity in phrases 3 and 4, where there are regular attacks on the first and second beats. Furthermore, this delayed beat brings about an expectation of the quintuplet rhythm. The alternation between duplet and triplet in phrases 1 and 2 reaches the quintuplet, which continues in phrases 3 and 4. While the quintuplet rhythms are continuous, the alternation between duplet and

triplet occurs based on the 4-measure structure. This produces the overlapping rhythm, 5:2. Example 4.5 displays the composite rhythm in sub-section 1. It shows the rhythmic developments from duplet rhythm to quintuplet rhythm.

Texture

Coordinated with the strings' texture (from trichord to tetrachord), an instrumental change happens in phrases 3 and 4 from the flute to the clarinets. As the strings' texture becomes thicker from the trichord to the tetrachord, the woodwind instruments also become thicker from a single to double. Through sub-section 1, the thickening texture is obvious.

Form

The strings (trichords and tetrachords) cause an extension of the phrase length; $4 + 4 + 7 + 10$. This structure starts with the basic phrase length, 4-measures, but the number of added measures is odd rather than even.

On the other hand, the clarinets' [012] partitions create some confusion in the phrase's division in phrase 3. The [012] partitions transfer smoothly to the next phrase, forming a 4-measure (2 + 2) structure. In phrase 4, the [012]s also form a 2-measure structure. The clarinets form three twelve-note aggregates. They provide a 6-measure (2 + 2 + 2) structure, maintaining a correspondence to the 6-measure (3 + 3) structure of the tetrachords in the strings. The reasons that the clarinets form a 2 + 2

(or 2 + 2 + 2) phrasing structure and overlap into the next phrase are to depict the text (this will be discussed later in the relation between text and music).

Row and Pitch

Nine rows and five occurrences of the twelve-tone aggregate happen in sub-section 1. Between phrases 1 and 2, the strings' two rows RI_0 - R_5 have an inversive relation. This inversive relation continues between phrases 2 and 3 (R_5 - RI_2) and between the end of phrases 3 and the beginning of phrase 4 (RI_e - R_6). Within phrase 4, there is another inversive relation between R_6 and RI_1 in the strings. The flute's melody in phrases 3 and 4 also forms an inversive relation. These pervading inversive relations have the same rhythmic pattern and the same interval relation between P_e and I_0 .

They occur in a different texture: the strings' last trichord $\{GF^\#F\}$ in phrase 2 and the flute's horizontal trichord $\{BCC^\#\}$ in the beginning of phrase 3 show the I_4 relation. Two adjacent partitions occurring within the quintuplet rhythm consist of I_4 vertically. Throughout sub-section 1, inversive relations pervade in several shapes: in the connection of two phrases by the strings' inversive rows, in the transfer of texture change (vertical to horizontal) by the two simultaneous $[012]$ s in the flute and strings' lines, in the relationship of $[012]$ partitions, and in the flute's melodies in phrases 3 and 4.

Chord-Types

Tables 4.8a-4.8g display the members of chords in sub-section 1. In the dyads, all possible [01] and [06] occur. A few members in phrases 1 and 2 are the basis for increasing the number of members through the semitone relation. The occurrence of [012] partitions in phrases 3 and 4 carries twelve [01]s and six [06]s.

After five members in phrase 1 as shown in Table 4.8a, phrase 2 provides five members including two more new members, $\{E^bE\}$ and $\{FF^\#\}$. The $\{FF^\#\}$ is a semitone relation from the $\{F^\#G\}$. Phrase 3 has all twelve members including five new members ($\{CC^\#\}$, $\{DE^b\}$, $\{EF\}$, $\{GG^\#\}$, $\{AB^b\}$). The $\{CC^\#\}$ and $\{DE^b\}$ are semitones below and above from the $\{C^\#D\}$ played in phrase 1. The $\{EF\}$ is a semitone above from the $\{E^bE\}$ and $\{GG^\#\}$ and $\{AB^b\}$ have a semitone relation from the $\{G^\#A\}$. Except the $\{E^bE\}$ in phrase 2, other new members have a semitone relationship.

Table 4.8a [01] Dyad Type in Sub-Section 1

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	All
$\{CC^\#\}$			✓	✓	✓
$\{C^\#D\}$	✓		✓	✓	✓
$\{DE^b\}$			✓	✓	✓
$\{E^bE\}$		✓	✓	✓	✓
$\{EF\}$			✓	✓	✓
$\{FF^\#\}$		✓	✓	✓	✓
$\{F^\#G\}$	✓	✓	✓	✓	✓
$\{GG^\#\}$			✓	✓	✓
$\{G^\#A\}$	✓	✓	✓	✓	✓
$\{AB^b\}$			✓	✓	✓
$\{B^bB\}$	✓	✓	✓	✓	✓
$\{BC\}$	✓		✓	✓	✓

Table 4.8b [06] Dyad Type in Sub-Section 1

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	All
{CF [#] }			√	√	√
{C [#] G}			√	√	√
{DA ^b }		√	√	√	√
{E ^b A}	√		√	√	√
{EB ^b }				√	√
{FB}			√	√	√

As shown in Table 4.8b, the {DA^b} in phrase 2 has a semitone relation from the {E^bA} in phrase 1. Suddenly increased number of [06] members in phrase 3 keeps also the semitone relation. The {C[#]G} is the semitone below the {DA^b} formed in phrase 2 and then {C[#]G} transfers the semitone below like {CF[#]} and {FB}. The last {EB^b} in phrase 4 also has a semitone relation from the {E^bA} and {FB} in phrase 3. All six members of [06] have a semitone relation in sub-section 1.

Table 4.8c [012] Trichord Type in Sub-Section 1

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	All
{CC [#] D}			√	√	√
{C [#] DE ^b }			√	√	√
{DE ^b E}				√	√
{E ^b EF}			√	√	√
{EFF [#] }			√	√	√
{FF [#] G}		√		√	√
{F [#] GG [#] }			√	√	√
{GG [#] A}			√	√	√
{G [#] AB ^b }				√	√
{AB ^b B}			√	√	√
{B ^b BC}	√		√	√	√
{BCC [#] }			√	√	√

Sub-section 1 has all twelve members of [012], eleven members of [013], ten members of [014], and eleven members of [016] as shown in Tables 4.8c-4.8f. In the case of [012], after one member in each phrase 1 and 2, phrase 3 forms eight members. The $\{EFF^\#\}$ and $\{F^\#GG^\#\}$ have a semitone relation from the $\{FF^\#G\}$ in phrase 2 and then develop to further semitone relation to $\{E^bEF\}$ and $\{GG^\#A\}$, respectively. The $\{AB^bB\}$ and $\{BCC^\#\}$ are also the semitone above and below the $\{B^bBC\}$ formed in phrase 1 and then develop to $\{CC^\#D\}$ and $\{C^\#DE^b\}$. Two new members in phrase 4 contain also the semitone relationship. The $\{DE^bE\}$ is a semitone between $\{C^\#DE^b\}$ and $\{E^bEF\}$ and the $\{G^\#AB^b\}$ is a semitone between $\{GG^\#A\}$ and $\{AB^bB\}$. All new members in phrases 3 and 4 have a semitone relation. The clarinets play all members of [012] horizontally in phrase 4 due to their [012] partitions, which are carefully prepared. The strings' vertical [012] in phrase 2 prepares the flute's horizontal [012] in the beginning of phrase 3. And then this flute's [012] prepares for the clarinets' [012] partitions with the same rhythmic pattern, the eighth-note quintuplet.

Table 4.8d [013] Trichord Type in Sub-Section 1

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	All
{CC [#] E ^b }				✓	✓
{C [#] DE}					
{DE ^b F}				✓	✓
{E ^b EF [#] }					
{EFG}			✓		✓
{FF [#] G [#] }			✓		✓
{F [#] GA}				✓	✓
{GG [#] A [#] }				✓	✓
{G [#] AB}					
{AB ^b C}					
{B ^b BC [#] }		✓			✓
{BCD}				✓	✓
{CBA}					
{C [#] CB ^b }					
{DC [#] B}					
{E ^b DC}					
{EE ^b C [#] }					
{FED}			✓		✓
{F [#] FE ^b }					
{GF [#] E}	✓			✓	✓
{A ^b GF}					
{AG [#] F [#] }			✓		✓
{B ^b AG}					
{BB ^b A ^b }					

Twelve members of [013] type occur in sub-section 1. Except two adjacent members {EFG} and {FF[#]G[#]}, there is no semitone relation until phrase 3. Phrase 4 has five new members ({CC[#]E^b}, {DE^bF}, {F[#]GA}, {GG[#]A[#]}, {BCD}) among the formations of six members. The two of the five ({F[#]GA}, {BCD}) have a semitone relation from previous occurrence of [013] type. The {F[#]GA} is a semitone above the {FF[#]G[#]} appearing in phrase 3 and the {BCD} is a semitone above the {B^bBC[#]} formed in phrase 2.

Table 4.8e [014] Trichord Type in Sub-Section 1

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	All
{CC [#] E}			√		√
{C [#] DF}	√			√	√
{DE ^b F [#] }				√	√
{E ^b EG}			√		√
{EFA ^b }					
{FF [#] A}					
{F [#] GB ^b }					
{GG [#] B}				√	√
{G [#] AC}					
{AB ^b C [#] }					
{B ^b BC}					
{BCE ^b }					
{CBA ^b }					
{C [#] CA}				√	√
{DC [#] B ^b }					
{E ^b DB}					
{EE ^b C}		√			√
{FEC [#] }				√	√
{F [#] FD}					
{GF [#] E ^b }					
{A ^b GE}				√	√
{AG [#] F}					
{B ^b AF [#] }			√		√
{BB ^b G}					

Ten members occur in sub-section 1 as shown in Table 4.8e. The {CC[#]E} in phrase 3 is a semitone below the {C[#]DF} in phrase 1 and other two members in phrase 3 does not any semitone relationship. In phrase 4, there are five new members ({C[#]CA}, {DE^bF[#]}, {FEC[#]}, {GG[#]B}, {A^bGE}) among the six members. Two of five have a semitone relation: the {DE^bF[#]} is a semitone below the {E^bEG} appeared in phrase 3 and the {FEC[#]} is a semitone above the {EE^bC} formed in phrase 2.

Table 4.8f [016] Trichord Type in Sub-Section 1

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	All
{CC [#] F [#] }					
{C [#] DG}					
{DE ^b G [#] }			✓	✓	✓
{E ^b EA}					
{EFB ^b }				✓	✓
{FF [#] B}					
{F [#] GC}					
{GG [#] C [#] }					
{G [#] AD}		✓			✓
{AB ^b E ^b }			✓	✓	✓
{B ^b BE}				✓	✓
{BCF}				✓	✓
{CBF [#] }					
{C [#] CG}			✓		✓
{DC [#] G [#] }					
{E ^b DA}				✓	✓
{EE ^b B ^b }					
{FEB}					
{F [#] FC}					
{GF [#] C [#] }					
{G [#] GD}				✓	✓
{AG [#] E ^b }	✓		✓	✓	✓
{B ^b AE}					
{BB ^b F}			✓		✓

As shown in Table 4.8f, eleven members occur in sub-section 1. Among five new members ({E^bDA}, {EFB^b}, {G[#]GD}, {B^bBE}, {BCF}) in phrase 4, three of five contain a semitone relation: the {B^bBE} and {BCF} are related by a semitone to each other and the {B^bBE} is a semitone above the {AB^bE^b} that appeared in phrase 3. The {G[#]GD} is a semitone below the {AG[#]E^b} formed in phrase 3. Most new members have developed through a semitone relation. This relationship will become stronger as the composition progresses.

Table 4.8g Tetrachord Types in Sub-Section 1

		[0136]						[0147]			
		P1	P2	P3	P4			P1	P2	P3	P4
Strings						strings			{CD ^b EG}	{DE ^b F [#] A}	
Flutes				{AG [#] F [#] D [#] }	{DE ^b FA ^b }	flutes				{GA ^b BD}	
		[0236]						[0126]			
		P1	P2	P3	P4			P1	P2	P3	P4
Strings				{A ^b F [#] FD}	{B ^b A ^b GE}	strings			{AB ^b BD [#] }	{BCC [#] F}	
Flutes					{E ^b D ^b CA}	flutes				{EFF [#] B ^b }	

Implications of Sub-Section 1

Sub-section 1 does not contain the voice. To prepare the voice, which enters in sub-section 2, sub-section 1 plays the role of a prelude. Several musical developments happen: the rhythmic alternation between duplet and triplet develops to the quintuplet rhythm and then the quintuplet is established through repetition. The strings' vertical trichord texture in the beginning of sub-section 1 adds the vertical tetrachords, coordinated with the change from the flute's line to the clarinet's [012] partitions. This added texture and instrumentation carry the extended phrase length from 4-measure structure in phrases 1 and 2 to a 4 + 3 structure in phrase 3 and to a 4 + 3 + 3 structure in phrase 4.

Sub-Section 2 (mm. 74–87)

Sub-section 2 is divided into two phrases (phrases 5 (mm. 74–79) and 6 (mm. 80–87)) based on the flutes' inversionsal melodies. Each phrase consists of the vocal and flutes' lines. The flutes' line contains instrumental changes between the alto flute and flute from the alto flute to the flute in phrase 5 and the flute to the alto

flute in phrase 6. The vocal line has the first stanza consisting of two lines. Each line corresponds to each phrase.

Phrase 5 (mm. 74–79)

Rhythm

Example 4.6a Instrumental Line's Rhythm in Phrase 5

Example 4.6b Vocal Line's Rhythm in Phrase 5

Example 4.6c Composite Rhythm in Phrase 5

The instrumental line has two rhythmic patterns: the flute forms the eighth-note septuplet (mm. 74–77) and then the alto flute forms the quarter-note triplet (mm. 78–79). In the septuplet rhythm, only five notes are played instead of seven

notes. After five eighth notes within the septuplet, there is the rest having two septuplet durations. These five note structures continue into the triplet rhythm in mm. 78–79. For two measures, the two quarter-note triplets contain only five notes. The phrasing mark shows the formation of five note structures by two triplet rhythms (Examples 4.6a and 4.7). On the other hand, the vocal line's rhythm consists of the alternation between duplet and triplet. The sum of duplet and triplet creates another type of five-note structure in addition to the five note structure in the triplet of the instrumental line and the septuplet rhythm in the instrumental line. This shows a rhythmic development from the quintuplet in phrases 3 and 4. Examples 4.6a-4.6c display the rhythms in instrumental and vocal lines as well as composite rhythm.

The composite rhythm given in Example 4.6c shows the rhythmic changes: the occurrence of overlapping rhythms 7:2 and 7:3 twice arrive at the 2:3 rhythmic pattern in the end of phrase 5. This creates a deep connection between the rhythm of the previous and next phrases. It will be discussed later under section A's rhythm. Rhythmic formation (from the septuplet to triplet) makes a 4 + 2 structure (mm. 74–77 + 78–79).

Row and Pitch

Two rows occur in phrase 5; the instrumental line employs the entire I_1 with a repetition and the vocal line sings the first five notes of P_t (the other seven pitches of P_t appear in the vocal line of phrase 6). The vocal line sings these five notes with repetition, especially of order numbers 0–3; the first two notes (order numbers 0 and

1) have long durations for the [01], {A[#]B}. The repeated order number 2 (C) after the order number 3 (F[#]) forms and emphasizes the [06], {CF[#]}.

Example 4.7 Phrase 5 (mm. 74–79)

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The instrumental line also repeats the pitches of I₁: As I mentioned in the rhythm section, the flutes play five notes within the septuplet. The first five-note group consisting of order numbers 0-2 has two [01]s or [012]. The second five-note group (m. 75) consisting of order numbers 2–6 contains one [01] {GG[#]} and one [06] {BF}. The third five-note group structure (m. 76), order numbers 3–7, also has one [01] {GG[#]} and [06] {B^bE}. The fourth five-note group (m. 77) contains one [01] {GG[#]} and one [06] {B^bE}. The last five-note group (m. 78–79) contains only [01], {DE^b}. The techniques of repetition and long duration emphasize the [01] and [06] in both lines.

Chord-Types

Phrase 5 has five members of [01] ($\{CC^\#\}$, $\{DE^b\}$, $\{GA^b\}$, $\{A^\#B\}$, $\{BC\}$) and three members of [06] ($\{B^bE\}$, $\{BF\}$, $\{CF^\#\}$). Three [06]s are a semitone apart. Table 4.9 provides examples of chord-types formed in phrase 5.

Table 4.9 Dyad, Trichord, and Tetrachord Types in Phrase 5

	Dyad		Trichord			
	[01]	[06]	[012]	[013]	[014]	[016]
Flute	$\{CD^b\}$ $\{DE^b\}$ $\{GA^b\}$ $\{BC\}$	$\{BF\}$ $\{B^bE\}$	$\{BCC^\#\}$	$\{GA^bB^b\}$ $\{A^bGF\}$	$\{DE^bF^\#\}$	$\{B^bAE\}$
Voice	$\{A^\#B\}$ $\{BC\}$	$\{CF^\#\}$	$\{A^\#BC\}$			$\{CBF^\#\}$
	Tetrachord					
	[0147]		[0236]		[0126]	
Flutes	$\{DE^bF^\#A\}$		$\{B^bA^bGE\}$		$\{B^bAA^bE\}$	
Voice					$\{CBA^\#F^\#\}$	

In spite of the change to horizontal texture in phrase 5, the two melodies in the flutes and vocal line contain these four types of trichords. Phrase 5 has two members of [012] ($\{B^bBC\}$, $\{BCC^\#\}$), two members of [013] ($\{GA^bB^b\}$, $\{A^bGF\}$), one [014] $\{DE^bF\}$, and two [016]s ($\{CBF^\#\}$, $\{B^bAE\}$).

Phrase 6 (mm. 80–87)

Rhythm

The instrumental line's rhythm is the same as phrase 5 except for the final $g^{\#}_3$, which is sustained for two measures. The vocal line's rhythm, however, is changed. It starts with the eighth-note quintuplet and alters to the quarter-note triplet and then to

the duplet rhythm. Both lines' rhythmic patterns become slower. Example 4.8b shows the composite rhythm in phrase 6. The instrumental line's rhythmic change, corresponding to the instrumental change from the flute to the alto flute, shows that phrase 6 has a 4 + 4 structure (mm. 80–83 + 84–87).

Example 4.8a Vocal Line's Rhythm in Phrase 6



Example 4.8b Composite Rhythm in Phrase 6



The instrumental line's five-note structure continues to the vocal line; the quintuplet rhythm in m. 80 makes the first five-note group. Two triplet rhythms containing the rest in the first beat form the second occurrence of five-note group in mm. 81–82. The triplet and duplet rhythms in mm. 83–84 make the third five-note group. The continuous use of five-note groups expresses the text as well as creates certain sonorities (both issues will be discussed under sonority and the relation between text and music).

Pitch

Example 4.9 Phrase 6 (mm. 80–84)

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The instrumental line utilizes the row P_9 and the vocal line sings P_t (order numbers 2–e). In the continuation of P_t from phrase 5, order numbers 2–5 already formed in phrase 5 are repeated before introducing order numbers 6–e. After repeating this five-note group, the second five-note group makes the trichord consisting of 6–8 $\{C^\#GD\}$ in mm. 81–82 and the third five-note group forms the trichord with the order numbers 9–e $\{FG^\#A\}$ in mm. 83–84. In each five-note group, two pitches are repeated to make a trichord; G and $C^\#$ are repeated in the second group and $G^\#$ and A in the third group. Those repeated notes present the sonorities of

[01] and [06]. As shown in Example 4.9, the first five-note group also contains two specific dyad-types; $\{F^\sharp C\}$ [06] and $\{EE^b\}$ [01].

The P_9 in the instrumental line has repeated pitches as in phrase 5 (the repeated order number and the resulting sonorities are the same as phrase 5). Within the five-note groups in the both lines, the technique of repetition is for the formation of [01] and [06].

Chord-Types

Table 4.10 Dyad, Trichord, and Tetrachord Types in Phrase 6

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Flutes	$\{D-E^b\}$ $\{G-G^\sharp\}$ $\{A-A^\sharp\}$ $\{A^\sharp-B\}$	$\{B-F\}$ $\{C-F^\sharp\}$	$\{AB^bB\}$	$\{DE^bF\}$ $\{E^bDC\}$	$\{G^\sharp GE\}$	$\{CC^\sharp F^\sharp\}$
Voices	$\{E^b-E\}$ $\{G^\sharp-A\}$	$\{C-F^\sharp\}$ $\{C^\sharp-G\}$		$\{E^bEF^\sharp\}$	$\{AG^\sharp F\}$	$\{C^\sharp DG\}$
	Tetrachord					
	[0126]			[0236]		
Flutes	$\{CC^\sharp DF^\sharp\}$			$\{FE^bDB\}$ $\{CDE^bF^\sharp\}$		
Voice				$\{F^\sharp EE^bC\}$		

Phrase 6 contains six members of [01] ($\{DE^b\}$, $\{E^bE\}$, $\{GG^\sharp\}$, $\{G^\sharp A\}$, $\{AB^b\}$, $\{B^bB\}$) and three members of [06] ($\{CF^\sharp\}$, $\{C^\sharp G\}$, $\{FB\}$). Three [06]s are each a semitone apart. Table 4.10 shows the chord-types found in phrase 6.

In the trichords, one [012] ($\{AB^bB\}$), three members of [013] ($\{DE^bF\}$, $\{E^bDC\}$, $\{E^bEF^\#\}$), two members of [014] ($\{G^\#GE\}$, $\{AG^\#F\}$), and two members of [016] ($\{CC^\#F^\#\}$, $\{C^\#DG\}$) occur in phrase 6.

All of Two Phrases (Sub-Section 2)

Rhythm

The two phrases have a same rhythm in the instrumental lines containing five-note groupings. The vocal line's rhythmic pattern is different in each phrase. The alternation of the duplet and triplet rhythmic pattern in phrase 5 changes to the quintuplet (2 + 3) rhythm in the beginning of phrase 6 and then returns to the alternation between the duplet and triplet in the end of phrase 6.

Example 4.10 Composite Rhythm in Sub-Section 2

The image displays four staves of musical notation, likely for a vocal line and three instrumental lines. The notation includes various rhythmic groupings and time signatures. The first staff starts at measure 74 and features a 7:2 time signature and a quintuplet (5 notes) with a 'γ' symbol. The second staff starts at measure 77 and features a 7:3 time signature and a 3:2 time signature. The third staff starts at measure 80 and features a 7:5 time signature and a 7:3 time signature. The fourth staff starts at measure 83 and features a 7:3 time signature and a 3:2 time signature. The notation includes various rhythmic groupings, including quintuplets and duplets, and is marked with 'γ' symbols.

Both lines have a similar rhythmic pattern, five-note grouping. This note-grouping plays three roles: (1) supporting the quintuplet rhythm, (2) emphasizing specific sonorities [01] and [06] with the repetition, and (3) expressing the text. The

third reason will be dealt with later. Example 4.10 shows the composite rhythm in sub-section 2.

The composite rhythm above shows the rhythmic release from the septuplet to the duplet. It also shows the vertical combination of these rhythms. The septuplet rhythm becomes the quintuplet rhythm combined with the alternation between duplet and triplet. And the quintuplet rhythm becomes the combination triplet and duplet at the end of sub-section 2. It shows $7 - 2 = 5$ and $5 = 2 + 3$.

Texture, Dynamics, and Articulation

Phrase 5 has the alternation from the alto flute to the flute with the vocal line and phrase 6 consists of the alternation from the flute to the alto flute with vocal line. The end of phrase 6 has an addition of strings (viola and cello) to prepare the next phrase. As the instrumentation is small, the dynamics are soft as *pp*, *leggero*, which continues to the end of sub-section 2.

Rows, Pitch, and Chord-Types

The two instruments (flute and alto flute) form two rows I_1 and P_9 in each phrase. The two rows show an inversion at I_4 already suggested in sub-section 1. The formation of the same rhythmic pattern and the inversional contour emphasize the inverted two rows.

Table 4.11 Two Rows, I₁ and P₉, in Sub-Section 2

I ₁ :	C [#]	C	<u>B</u>	<u>F</u>	<u>G</u>	<u>G[#]</u>	B ^b	E	A	F [#]	<u>E^b</u>	<u>D</u>
P ₉ :	A	B ^b	<u>B</u>	<u>F</u>	<u>E^b</u>	<u>D</u>	C	F [#]	C [#]	E	<u>G</u>	<u>A^b</u>

As shown in Table 4.11, there are three dyad invariants: B-F, G-G[#], and D-E^b between the two rows. Each phrase emphasizes those dyads through repetition as shown in Tables 4.12a. Dallapiccola chooses two rows having invariance of [01] and [06] dyads and he sets two rows as an inversion and repeats pitches within the row, all to emphasize the sonorities [01] and [06]. Two axes (B and F) occupy the same order positions 2 and 3 as well as one of invariants, but two melodies are not occurred simultaneously. These axes are not important yet in sub-section 2.

The vocal line forms only one row, P₁. The use of one row through sub-section 2 involves lots of repetition, which directly forms the dyads of [01] and [06]. Throughout sub-section 2, eight members of [01] ({C[#]C}, {D^bE}, {E^bE}, {G[#]G}, {G[#]A}, {A^bB}, {B^bB}, {BC}) and four members of [06] type ({B^bE}, {BF}, {C[#]F}, {C[#]G}) occur. The four members of [06] are a semitone apart.

Table 4.12a [01] and [06] Types in Sub-Section 2

	[01]				[06]		
	Phrase 5	Phrase 6	All		Phrase 5	Phrase 6	All
{CC [#] }	V		V	{CF [#] }	V	V	V
{C [#] D}					{C [#] G}		V
{DE ^b }	V	V	V	{DG [#] }			
{E ^b E}		V	V		{E ^b A}		
{EF}				{EB ^b }		V	
{FF [#] }					{FB}	V	V
{F [#] G}							
{GG [#] }	V	V	V				
{G [#] A}		V	V				
{AB ^b }		V	V				
{B ^b B}	V	V	V				
{BC}	V		V				

Table 4.12b [012] and [013] Trichord Types in Sub-Section 2

	[012]				[013]		
	Phrase 5	Phrase 6	All		Phrase 5	Phrase 6	All
{CC [#] D}				{CC [#] E ^b }			
				{C [#] DE}			
{C [#] DD [#] }				{DE ^b F}		V	V
				{E ^b EF [#] }		V	V
{DD [#] E}				{EFG}			
				{FF [#] G [#] }			
{D [#] EF}				{F [#] GA}			
				{GG [#] A [#] }	V		V
{EFF [#] }				{G [#] AB}			
				{AB ^b C}			
{FF [#] G}				{B ^b BC [#] }			
				{BCD}			
{F [#] GG [#] }				{CBA}			
				{C [#] CB ^b }			
{GG [#] A}				{DC [#] B}			
				{E ^b DC}		V	V
{G [#] AB ^b }				{EE ^b C [#] }			
				{FED}			
{AB ^b B}		V	V	{F [#] FE ^b }			
				{GF [#] E}			
{B ^b BC}	V		V	{G [#] GF}	V		V
				{AG [#] F [#] }			
{BCC [#] }	V		V	{B ^b AG}			
				{BB ^b G [#] }			

Table 4.12c [014] and [016] Trichord Types in Sub-Section 2

	[014]				[016]		
	Phrase 5	Phrase 6	all		Phrase 5	Phrase 6	All
{CC [#] E}				{CC [#] F [#] }		✓	✓
{C [#] DF}				{C [#] DG}		✓	✓
{DE ^b F [#] }	✓		✓	{DE ^b G [#] }			
{E ^b EG}				{E ^b EA}			
{EFA ^b }				{EFB ^b }			
{FF [#] A}				{FF [#] B}			
{F [#] GB ^b }				{F [#] GC}			
{GG [#] B}				{GG [#] C [#] }			
{G [#] AC}				{G [#] AD}			
{AB ^b C [#] }				{AB ^b E ^b }			
{B ^b BC}				{B ^b BE}			
{BCE ^b }				{BCF}			
{CBA ^b }				{CBF [#] }	✓		✓
{C [#] CA}				{C [#] CG}			
{DC [#] B ^b }				{DC [#] G [#] }			
{E ^b DB}				{E ^b DA}			
{EE ^b C}				{EE ^b B ^b }			
{FEC [#] }				{FEB}			
{F [#] FD}				{F [#] FC}			
{GF [#] E ^b }				{GF [#] C [#] }			
{A ^b GE}		✓	✓	{G [#] GD}			
{AG [#] F}		✓	✓	{AG [#] E ^b }			
{B ^b AF [#] }				{B ^b AE}	✓		✓
{BB ^b G}				{BB ^b F}			

Table 4.12d Tetrachord Types in Sub-Section 2

	[0126]		[0236]		[0147]	
	Phrase 5	Phrase 6	Phrase 5	Phrase 6	Phrase 5	Phrase 6
Flutes	{B ^b AA ^b E}	{CC [#] DF [#] }	{B ^b A ^b GE}	{FE ^b DB} {CDE ^b F [#] }	{DE ^b F [#] A}	
Voice	{CBA [#] F [#] }			{F [#] EE ^b C}		

In the case of the trichord-types, three members of [012], five members of [013], three members of [014], and three members [016] occur in sub-section 2 as shown in Tables 4.12b and 4.12c.

Form

The changes of instrument from the alto flute to flute or vice versa, inversional rows used (I_1 and P_9), and the changing rhythmic pattern from septuplet to triplet divides sub-section 2 into two phrases. In the vocal line, phrase 6 starts from order numbers 2–5, which are the combination of pitches played in phrase 5 (order numbers 2–4) and those newly introduced in phrase 6 (order number 5). This vocal phrasing division strongly supports the text. The overlapping phrase and repeated pitches are used for expressing the text (the detailed discussion of the text will be dealt with later).

Implications of Sub-Section 2

The 4 + 2 structure in phrase 5 expands to a 4 + 4 (2 + 2) structure in phrase 6. The number two, playing a role of expansion, is also employed in the rhythmic development. The duplet and triplet produces the quintuplet and quintuplet with the duplet reaches to the septuplet. On the other hand, both lines, vocal and flute, stick to five-note groups throughout sub-section 2 in spite of the changes in rhythmic pattern. The regularity of the number two as an additive value and the continuation of five-note groups is also one of the techniques Dallapiccola to represent the text.

Sub-Section 3 (mm. 88–95)

Sub-section 3 has a similar formation to sub-section 1 in texture and articulation, returning to the instrumentation of strings and winds without the vocal

line, the strings' trichord-types, the [012] partition, and the occurrence of tetrachords. Within sub-section 3, an inversion of texture occurs: the strings' trichords in mm. 88–92 transfers to the woodwind's tetrachords in mm. 93–95 and the wind's [012] partitions in mm. 88–92 inverts to the strings in mm. 93–95. These textural inversion divides sub-section 3 into two phrases, phrase 7 (mm. 88–92) and phrase 8 (mm. 93–95).

Phrase 7 (mm. 88–92)

Rhythm, Articulation, and Dynamics

Example 4.11 Texture Inversion in Phrase 7 (mm. 89–92)

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The alternation between duplet and triplet is found in the instrumental line. This alternation does not have any regularity. Based on the rhythmic pattern, the strings change their articulation alternating between *arco.* and *pizz.* The triplet

rhythm's articulations are *arco*. and the duplet rhythm's articulations are *pizz.*. On the basis of this change in articulation, the dynamics are also changed: *sf* (*pizz*), *f* and *sf* (*arco*), *sff* (*pizz*) and *f* (*arco*).

Texture, Pitch, and Chord-Types

Two textures involve two formations of pitch material. The vertical texture in the strings' line forms pitch based on the row and the horizontal texture in the wind's line has the [012] partitions. Two rows RI_2 , R_5 form eight trichords as in sub-section 1. Two occurrences of [012] partitions (mm. 89 and 91) use different instrumental pair. The flute and piccolo clarinet play the first [012] $\{DD^\#E\}$ (m. 98) and the alto flute and clarinet form the second [012] $\{B^bAA^b\}$ (m. 91). They show the I_4 relation, which occurs previously in sub-sections 1 and 2. This partition does not form an aggregate yet, however it will form the twelve-note aggregate with the [012] partitions in phrase 8. Table 4.13 shows the examples of dyad and trichord types formed in phrase 7. Nine members of [01] ($\{CC^\#\}$, $\{C^\#D\}$, $\{DD^\#\}$, $\{E^bE\}$, $\{FF^\#\}$, $\{F^\#G\}$, $\{G^\#A\}$, $\{AB^b\}$, $\{B^bB\}$) and two members of [06] type ($\{BF\}$, $\{DG^\#\}$) occur in phrase 7.

The strings' vertical trichords and the [012] partitions expose four members of [012], two members of [013], two members of [014], and two members of [016] in phrase 7. All trichords created in phrase 7 have already occurred in previous phrases.

Table 4.13 Dyad and Trichord Types in Phrase 7

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{CC#} {C#D} {E ^b E} {FF#} {F#G} {G#A} {B ^b B}	{DG#} {BF}	{CC#D} {FF#G}	{AG#F#} {B ^b BC#}	{E ^b EG} {EE ^b C}	{BB ^b F} {G#AD}
Flutes	{DD#} {D#E} {A ^b A} {AB ^b }		{DD#E} {A ^b AB ^b }			
Clarinets	{DD#} {D#E} {A ^b A} {AB ^b }		{DD#E} {A ^b AB ^b }			

Phrase 8 (mm. 93–95)

Rhythm

Example 4.12 Phrase 8 (mm. 93–95)

The image shows a musical score for Phrase 8 (mm. 93-95). The score is written for multiple instruments: Violin I, Violin II, Viola, Flute, Clarinet, Bassoon, and Cello/Double Bass. The notation includes various rhythmic values, accidentals, and dynamic markings. A specific chord structure is highlighted in a box above the Flute staff, showing the notes E and G.

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The continuous quintuplet rhythm occurs in the strings' line through phrase 8. The winds form a regular pattern, appearing on the first beats of each measure (Example 4.12).

Texture, Pitch, and Dynamics

Phrase 8 has two kinds of texture, vertical and horizontal. The vertical texture has tetrachord types based on the row I_e in the winds' line. The four different instruments (the flute, alto flute, clarinet, and bass clarinet) make one tetrachord. The horizontal texture has the [012] partition, which appears six times through phrase 8. As in sub-section 1, two adjacent [012]s make a pair within the quintuplet rhythm. Each pair has a different instrumental group such as violin-violin, violin-cello, and viola-cello. This shows the constant change in tone color, which is one of the techniques for expressing the text (it will be discussed later).

The six [012] partitions involve creating a twelve-tone aggregate: the last four [012] partitions make an aggregate (mm. 94–95) and the first two [012]s and the previous two [012]s in phrase 7 make another aggregate. The dynamics are soft, *pp* in all instruments. These soft dynamics prepare the closing of section A as well as sub-section 3.

Chord-Types

The two adjacent [012]s make a vertical [06] as well as horizontal [01]s. Ten members of [01] ($\{CC^\#\}$, $\{C^\#D\}$, $\{E^bE\}$, $\{EF\}$, $\{FF^\#\}$, $\{F^\#G\}$, $\{GG^\#\}$, $\{AA^\#\}$, $\{A^\#B\}$, $\{BC\}$) and two members [06] ($\{FB\}$, $\{DG^\#\}$) occur in phrase 8. The occurrence of [01] in winds' line is obvious, since the tetrachord emphasizes the [01] sonority with the long duration, an half-note duration: the $\{AB^b\}$ in m. 93, the $\{FF^\#\}$ in m. 94 and the $\{CC^\#\}$ in m. 95 (Example 4.12). Table 4.14 shows the members of chords formed in phrase 8. Six members of [012], one [013], two members of [014], and two members of [016] type occur in phrase 8.

Table 4.14 Dyad, Trichord, and Tetrachord Types in Phrase 8

	Dyads		Trichord			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	$\{CC^\#\}$ $\{C^\#D\}$ $\{E^bE\}$ $\{EF\}$ $\{FF^\#\}$ $\{F^\#G\}$ $\{GG^\#\}$ $\{AA^\#\}$ $\{A^\#B\}$ $\{BC\}$	$\{FB\}$ $\{DG^\#\}$	$\{CC^\#D\}$ $\{E^bEF\}$ $\{FF^\#G\}$ $\{F^\#GG^\#\}$ $\{AB^bB\}$ $\{BCC^\#\}$			
Flutes and Clarinets	$\{CC^\#\}$ $\{FF^\#\}$ $\{AB^b\}$	$\{DG^\#\}$	$\{AB^bB\}$	$\{FF^\#A^b\}$	$\{F^\#FD\}$ $\{CC^\#E\}$	$\{AB^bE^b\}$ $\{C^\#CG\}$
	Tetrachord					
	[0126]		[0236]		[0147]	
Flutes and clarinets	$\{AB^bBE^b\}$		$\{A^bF^\#FD\}$		$\{CC^\#EG\}$	

All of Two Phrases (Sub-Section 3)

Rhythm

The rhythmic patterns show continuation through phrases 7 and 8. The alternation of duplet and triplet in phrase 7 becomes the quintuplet rhythm in phrase 8. The rhythmic pattern dividing a quarter-note triplet into two eighth notes in phrase 7 (m. 89, 91) prepares the strings' eighth-note quintuplet in phrase 8. The composite rhythm suggested in Example 4.13 shows the rhythmic development to the quintuplet and the preparation of the eighth-note quintuplet rhythm.

Example 4.13 Composite Rhythm in Sub-Section 3

The image shows two staves of musical notation. The top staff is labeled with the number 88 and contains four measures of music. The bottom staff is labeled with the number 92 and contains four measures of music. Both staves feature rhythmic groupings indicated by brackets and the letter 'g' below them. The top staff shows a sequence of notes with brackets under the first two notes of each measure, and the bottom staff shows a sequence of notes with brackets under the first two notes of each measure, illustrating the development of a quintuplet rhythm.

Texture, Articulation, and Dynamics

A texture inversion occurs between phrases 7 and 8. The strings' vertical texture in phrase 7 inverts to the winds' line in phrase 8 and the wind's horizontal texture in phrase 7 inverts to the strings' line in phrase 8. In vertical textures, the trichord type in phrase 7 develops to the tetrachord type in phrase 8. In the horizontal texture, the [012] partition shows development both in number occurrence and in shape: there are two occurrence of [012] using two instruments in phrase 7 and the six occurrences of [012] in phrase 8 have a different instrumentation but are also formed

by continuously overlapping the instruments. The texture inversion accompanies the textural development.

Corresponding to this texture inversion, the dynamics alter from strong, *sf, f, sff* (mm. 88–92) to soft, *pp* (mm. 93–95). The string's articulation also changes from the alternation between *pizz.* and *arco* (mm. 88–92) to *arco* (mm. 93–95).

Rows, Pitch, and Chord-Types

Sub-section 3 has two kinds of pitch: based on the row and outside the row. The rows utilized in sub-section 3 are RI_2 , R_5 (phrase 7) and I_e (phrase 8). These rows participate in creating trichord and tetrachord types. The pitches outside the row create [012] partitions. The formation of aggregates and especially the first aggregate (two in phrase 7 and two in phrase 8) shows the connection between phrases 7 and 8 within sub-section 3.

As shown in Tables 4.15a and 4.15b, all twelve members of [01] occur in sub-section 3. Phrase 7 provides nine members ($\{CC^\#\}$, $\{C^\#D\}$, $\{DD^\#\}$, $\{D^\#E\}$, $\{FF^\#\}$, $\{F^\#G\}$, $\{G^\#A\}$, $\{AB^b\}$, $\{B^bB\}$) and phrase 8 suggests ten members ($\{CC^\#\}$, $\{C^\#D\}$, $\{D^\#E\}$, $\{EF\}$, $\{FF^\#\}$, $\{F^\#G\}$, $\{GG^\#\}$, $\{AB^b\}$, $\{B^bB\}$, $\{BC\}$) playing a complementary role in forming twelve members through sub-section 3. In the case of the dyad [06], each phrase forms two [06]s ($\{BF\}$ and $\{DG^\#\}$) with several repetitions. The repetition of two members of [06] implies something which will be discussed later this chapter.

Table 4.15a [01] and [06] Dyad Types in Sub-Section 3

	[01]				[06]		
	Phrase 7	Phrase 8	All		Phrase 7	Phrase 8	All
{CC [#] }	V	V	V	{CF [#] }			
{C [#] D}	V	V	V				
{DE ^b }	V		V	{C [#] G}			
{E ^b E}	V	V	V				
{EF}		V	V	{DG [#] }	V	V	V
{FF [#] }	V	V	V				
{F [#] G}	V	V	V	{E ^b A}			
{GG [#] }		V	V				
{G [#] A}	V		V	{EB ^b }			
{AB ^b }	V	V	V				
{B ^b B}	V	V	V	{FB}	V	V	V
{BC}		V	V				

In the case of the trichords, eight members of [012], three members of [013], four members of [014], and four members of [016] occur throughout sub-section 3 as shown in Table 4.15b and 4.15c.

In the [012] type, there is a semitone relation between phrases 7 and 8. Besides the common members, {CC[#]D} and {FF[#]G}, four members in phrase 8 show the development based on the semitone. The {E^bEF} is a semitone above the {DE^bE}, the {F[#]GG[#]} is the semitone above the {FF[#]G}, the {AB^bB} is a semitone above the {G[#]AB^b}, and the {BCC[#]} is a semitone below the {CC[#]D}. In the [013] and [014] types, there are no semitone relation between phrases 7 and 8. In the [016] type, the {AB^bE^b} is a semitone above the {G[#]AD}. Throughout sub-section 3, one member of [014] ({F[#]FD}) is a new member, which never forms in the previous sub-section.

Table 4.15b [012] and [013] Trichord Types in Sub-Section 3

	[012]				[013]		
	Phrase 7	Phrase 8	All		Phrase 7	Phrase 8	All
{CC [#] D}	V	V	V	{CC [#] E ^b }			
				{C [#] DE}			
{C [#] DE ^b }				{DE ^b F}			
				{E ^b EF [#] }			
{DE ^b E}	V		V	{EFG}			
				{FF [#] G [#] }		V	V
{E ^b EF}		V	V	{F [#] GA}			
				{GG [#] A [#] }			
{EFF [#] }				{G [#] AB}			
				{AB ^b C}			
{FF [#] G}	V	V	V	{B ^b BC [#] }	V		V
				{BCD}			
{F [#] GG [#] }		V	V	{CBA}			
				{C [#] CB ^b }			
{GG [#] A}				{DC [#] B}			
				{E ^b DC}			
{G [#] AB ^b }	V		V	{EE ^b C [#] }			
				{FED}			
{AB ^b B}		V	V	{F [#] FE ^b }			
				{GF [#] E}			
{B ^b BC}				{G [#] GF}			
				{AG [#] F [#] }			
{BCC [#] }		V	V	{B ^b AG}	V		V
				{BB ^b G [#] }			

Table 4.15c [014] and [016] Trichord Types in Sub-Section 3

	[014]				[016]		
	Phrase 7	Phrase 8	All		Phrase 7	Phrase 8	All
{CC [#] E}		V	V	{CC [#] F [#] }			
{C [#] DF}				{C [#] DG}			
{DE ^b F [#] }				{DE ^b G [#] }			
{E ^b EG}	V		V	{E ^b EA}			
{EFA ^b }				{EFB ^b }			
{FF [#] A}				{FF [#] B}			
{F [#] GB ^b }				{F [#] GC}			
{GG [#] B}				{GG [#] C [#] }			
{G [#] AC}				{G [#] AD}	V		V
{AB ^b C [#] }				{AB ^b E ^b }		V	V
{B ^b BC}				{B ^b BE}			
{BCE ^b }				{BCF}			
{CBA ^b }				{CBF [#] }			
{C [#] CA}				{C [#] CG}		V	V
{DC [#] B ^b }				{DC [#] G [#] }			
{E ^b DB}				{E ^b DA}			
{EE ^b C}	V		V	{EE ^b B ^b }			
{FEC [#] }				{FEB}			
{F [#] FD}		V	V	{F [#] FC}			
{GF [#] E ^b }				{GF [#] C [#] }			
{A ^b GE}				{G [#] GD}			
{AG [#] F}				{AG [#] E ^b }			
{B ^b AF [#] }				{B ^b AE}			
{BB ^b G}				{BB ^b F}	V		V

Table 4.15d Tetrachord-Types in Sub-Section 3

	[0126]		[0236]		[0147]	
	Phrase 7	Phrase 8	Phrase 7	Phrase 8	Phrase 7	Phrase 8
Flutes and Clarinet		{AB ^b BE ^b }		{A ^b F [#] FD}		{CC [#] EG}

Form

As we see in the above observations, the rhythmic development, texture inversion, the change of dynamics, and articulation strongly support sub-section 3's division into two phrases 7 and 8. Especially, texture inversion plays an important

role in the division of phrases. In addition, these indicate the return and similarity to sub-section 1.

No phrasing overlap occurs between phrases 7 and 8. But the trichords and the tetrachords playing the regular beat and changing in instrumentation and tone color do help depict the text in spite of not employing the vocal line (this will be discussed later).

All of Three Sub-Sections (Section A)

Rhythm

The rhythmic alternation of duplet and triplet in phrases 1 and 2 develops to the quintuplet ($2 + 3 = 5$) in phrase 3. This simultaneous use of the quintuplet and duplet rhythms in phrases 3 and 4 produces the septuplet ($5 + 2 = 7$) rhythm in phrase 5. The septuplet rhythm accompanies the alternation of the duplet and triplet rhythm in phrases 5 and 6. After the simultaneous use of septuplet and quintuplet in the beginning of phrase 6, the increasing density in rhythmic pattern changes to a decrease in density, the alternation between duplet and triplet and the quintuplet rhythm in phrases 7 and 8. The rhythmic climax occurs in sub-section 2 (phrases 5 and 6).

In the rhythmic development, odd numbers are continuously created; 3, 5 and 7. The sum of the duplet and the previously used rhythms produce these odd numbers; $2 + 3 = 5$, $5 + 2 = 7$. Thus, the use of duplet rhythm plays an important role in developing the rhythmic pattern from the triplet to the septuplet and then in

decreasing the rhythmic pattern from the septuplet to the alternating duplet and triplet; $2 + 3 = 5$, $5 + 2 = 7$, $7 - 2 = 5$, $5 = 2 + 3$.

Texture

The change of texture is coordinated with changing instrumentation throughout section A. Sub-section 2's employment of the vocal and flutes lines contains the horizontal texture and the instrumental line without the vocal line in sub-sections 1 and 3 forms the vertical texture. Sub-sections 1 and 3 employ the two vertical chord types, trichord and tetrachord, and [012] partitions, while sub-section 2 does not utilize the techniques used in sub-sections 1 and 3. In spite of the difference in texture, the sonorities presented in each sub-section are the same (this will be discussed later under pitch and chord-type).

Row and Pitch

The two different pitch materials have different techniques in formation, row and outside the row. The employment of the row's pitch takes two different approaches. First, the rows created in sub-sections 1 and 3 provide vertical sonorities through trichords or tetrachords, which do not have any repeated pitches. In the other approach, the rows provide lots of repetitions, appearing in horizontal lines of sub-sections 1 and 2. On the other hand, the [012] partitions, outside the row, create twelve-tone aggregates in a specific way with all adjacent two [012]s related by I_4 . This inversional relation also occurs in the flutes' melodies of sub-sections 1 and 2.

In sub-sections 1 and 2, the flute and the alto flute form an inversionsal relation, P_e-I_0 (sub-section 1) and I_1-P_9 (sub-section 2). Two inversionsal melodies have both common and different characteristics. The different things are (1) the different rhythmic pattern—the inversionsal melodies in sub-section 1 consist of the quintuplet rhythm and those in sub-section 2 are the septuplet rhythm, and (2) the instrumentation—in sub-section 1, the flute plays the prime form P_e in phrase 3 and then the alto flute plays the inversionsal form I_0 in phrase 4. But in sub-section 2, the one row, prime or inversion, keeps changing in instrumentation: I_1 changes from alto flute to flute in phrase 5 and P_9 changes from flute back to alto flute in phrase 6. The common features are (1) the flute and alto flute are employed and (2) the melodies contain lots of repeated notes. In spite of their different rhythmic pattern and row used, the repeated notes present the same sonority.

Chord-Types

Tables 4.16a-4.16f provide the chord type formed in section A. In the [01] type, the instrumental and vocal lines have the different formation and moreover, the three instrumental lines form the [01]s differently: the strings make all twelve members through phrases 1–4 and the clarinets build ten [01]s in phrase 3 and make all twelve members in phrase 4. Thus, sub-section 1 has two sets of all twelve [01]s in the strings' and clarinets' lines, respectively. Nine members of [01] type ($\{CC^\#\}$, $\{C^\#\#D\}$, $\{DE^b\}$, $\{EF\}$, $\{F^\#\#G\}$, $\{G^\#\#A\}$, $\{AA^\#\}$, $\{B^b\#B\}$, $\{BC\}$) occur in sub-section 1's

Table 4.16a [01] Dyad Type in Section A

		Sub-Section 1				Sub-Section 2		Sub-Section 3		All
		Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	
Strings	{CC [#] }			V	V			V	V	V
	{C [#] D}	V		V				V	V	V
	{DE ^b }				V					V
	{E ^b E}		V	V				V	V	V
	{EF}				V				V	V
	{F [#] F [#] }		V	V				V	V	V
	{F [#] G}	V	V		V			V	V	V
	{GG [#] }				V				V	V
	{G [#] A}	V	V	V				V		V
	{AB ^b }				V				V	V
	{B ^b B}	V	V	V				V	V	V
{BC}	V			V				V	V	
Flute	{CC [#] }			V						V
	{C [#] D}				V	V				V
	{DE ^b }				V	V	V	V		V
	{E ^b E}							V		V
	{EF}			V						V
	{F [#] F [#] }								V	V
	{F [#] G}				V					V
	{GG [#] }					V	V			V
	{G [#] A}			V				V		V
	{AB ^b }			V			V	V	V	V
	{B ^b B}				V		V			V
{BC}			V	V	V				V	
Clarinet	{CC [#] }			V	V					V
	{C [#] D}			V	V					V
	{DE ^b }			V	V			V		V
	{E ^b E}			V	V			V		V
	{EF}			V	V					V
	{F [#] F [#] }				V					V
	{F [#] G}			V	V					V
	{GG [#] }			V	V					V
	{G [#] A}			V	V			V		V
	{AB ^b }			V	V			V		V
	{B ^b B}			V	V					V
{BC}				V					V	
Voice	{CC [#] }									
	{C [#] D}									
	{DE ^b }									
	{E ^b E}						V			V
	{EF}									
	{F [#] F [#] }									
	{F [#] G}									
	{GG [#] }									
	{G [#] A}						V			V
	{AB ^b }									
	{B ^b B}					V				V
{BC}					V				V	

flute line. The remaining three members gradually occur; the $\{GG^\#\}$ in sub-section 2 (phrases 5 and 6) and $\{E^bE\}$ and $\{FF^\#\}$ in sub-section 3 (phrase 7 and 8, respectively). Finally, the flute has all twelve members of [01] through section A. As the result, the strings and clarinets complete all twelve members of [01] within sub-section 1 abruptly, while the flutes gradually complete all twelve transpositions throughout section A.

The technique of completing the members of dyad [06] is different from that of [01]. The strings introduce five members of [06] (all except $\{CF^\#\}$) through section A, but the flutes and clarinets complete all six [06]s throughout section A (the different technique used to create all members [01] and [06] will be obvious later on). The strings' five members show a semitone relationship: $\{E^bA\}$ in phrase 1, $\{DG^\#\}$ in phrase 2, $\{C^\#G\}$ in phrase 3, and $\{EB^b\}$ and $\{FB\}$ in phrase 4, which connected by semitone from the $\{E^bA\}$. The flute' six members also develop using the semitone: $\{C^\#G\}$ and $\{DG^\#\}$ in phrase 3, $\{E^bA\}$ and $\{EB^b\}$ in phrase 4, $\{BF\}$ in phrase 5, and $\{CF^\#\}$ in phrase 6. The clarinets form six [06]s in phrases 3, 4, and 8: $\{BF\}$, $\{CF^\#\}$, and $\{C^\#G\}$ in phrase 3, $\{E^bA\}$ and $\{EB^b\}$ in phrase 4, and $\{DG^\#\}$ and $\{BF\}$ in phrase 8. In spite of the absence of clarinets' melodies in phrases 5 and 6 (sub-section 2), the dyad [06] shows the continuation of development by the semitone.

Table 4.16b [06] Dyad Type in Section A

		Sub-Section 1				Sub-Section 2		Sub-section 3		All
		Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	
Strings	{CF [#] }									
	{C [#] G}			✓						✓
	{DA ^b }		✓	✓	✓			✓	✓	✓
	{E ^b A}	✓		✓	✓					✓
	{EB ^b }				✓					✓
	{FB}			✓	✓			✓	✓	✓
Flute	{CF [#] }						✓			✓
	{C [#] G}			✓						✓
	{DA ^b }			✓						✓
	{E ^b A}				✓				✓	✓
	{EB ^b }				✓	✓				✓
	{FB}					✓	✓			✓
Clarinet	{CF [#] }			✓	✓					✓
	{C [#] G}			✓	✓					✓
	{DA ^b }							✓		✓
	{E ^b A}				✓					✓
	{EB ^b }				✓					✓
	{FB}			✓					✓	✓
Voice	{CF [#] }					✓	✓			✓
	{C [#] G}						✓			✓
	{DA ^b }									
	{E ^b A}									
	{EB ^b }									
	{FB}									

Table 4.16c [012] Trichord Type in Section A

	Sub-Section 1				Sub-Section 2		Sub-Section 3		All
	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	
{CC [#] D}			✓	✓			✓	✓	✓
{C [#] DE ^b }			✓	✓					✓
{DE ^b E}				✓			✓		✓
{E ^b EF}			✓	✓				✓	✓
{EFF [#] }			✓	✓					✓
{FF [#] G}		✓		✓			✓	✓	✓
{F [#] GG [#] }			✓	✓				✓	✓
{GG [#] A}			✓	✓					✓
{G [#] AB ^b }				✓			✓		✓
{AB ^b B}			✓	✓		✓		✓	✓
{B ^b BC}	✓		✓	✓	✓				✓
{BCC [#] }			✓	✓	✓			✓	✓

Table 4.16d [013] Trichord Type in Section A

	Sub-Section 1				Sub-Section 2		Sub-Section 3		All
	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	
{CC [#] E ^b }				✓					✓
{C [#] DE}									
{DE ^b F}				✓		✓			✓
{E ^b EF [#] }						✓			✓
{EFG}			✓						✓
{FF [#] G [#] }			✓					✓	✓
{F [#] GA}				✓					✓
{GG [#] A [#] }				✓	✓				✓
{G [#] AB}									
{AB ^b C}									
{B ^b BC [#] }		✓					✓		✓
{BCD}				✓					✓
{CBA}									
{C [#] CB ^b }									
{DC [#] B}									
{E ^b DC}						✓			✓
{EE ^b C [#] }									
{FED}			✓						✓
{F [#] FE ^b }									
{GF [#] E}	✓			✓					✓
{G [#] GF}					✓				✓
{AG [#] F [#] }			✓				✓		✓
{B ^b AG}									
{BB ^b G [#] }									

Table 4.16e [014] Trichord Type in Section A

	Sub-Section 1				Sub-Section 2		Sub-Section 3		All
	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	
{CC [#] E}			V					V	V
{C [#] DF}	V			V					V
{DE ^b F [#] }				V	V				V
{E ^b EG}			V				V		V
{EFA ^b }									
{FF [#] A}									
{F [#] GB ^b }									
{GG [#] B}				V					V
{G [#] AC}									
{AB ^b C [#] }									
{B ^b BC}									
{BCE ^b }									
{CBA ^b }									
{C [#] CA}				V					V
{DC [#] B ^b }									
{E ^b DB}									
{EE ^b C}		V					V		V
{FEC [#] }				V					V
{F [#] FD}								V	V
{GF [#] E ^b }									
{A ^b GE}				V		V			V
{AG [#] F}						V			V
{B ^b AF [#] }			V						V
{BB ^b G}									

Table 4.16f [016] Trichord Type in Section A

	Sub-section 1				Sub-section 2		Sub-section 3		All
	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	
{CC [#] F [#] }						√			√
{C [#] DG}						√			√
{DE ^b G [#] }			√	√					√
{E ^b EA}									
{EFB ^b }				√					√
{FF [#] B}									
{F [#] GC}									
{GG [#] C [#] }									
{G [#] AD}		√					√		√
{AB ^b E ^b }			√	√				√	√
{B ^b BE}				√					√
{BCF}				√					√
{CBF [#] }					√				√
{C [#] CG}			√					√	√
{DC [#] G [#] }									
{E ^b DA}				√					√
{EE ^b B ^b }									
{FEB}									
{F [#] FC}									
{GF [#] C [#] }									
{G [#] GD}				√					√
{AG [#] E ^b }	√		√	√					√
{B ^b AE}					√				√
{BB ^b F}			√				√		√

Section A contains all twelve members of [012], especially in phrase 4 which has all twelve members, itself. Fourteen members of [013], twelve members of [014], and fifteen members of [016] are included in section A.

New introduced member in each chord-type has the semitone relation from not only previous phrase but also the previous sub-section. Especially, the members not containing any semitone relation within sub-section show the semitone relation between sub-sections. In the [013] type, the {AG[#]F[#]} is a semitone above the {G[#]GF} created in phrase 4 and the {E^bEF[#]} is a semitone above the {E^bEF[#]}. In the

[014], the $\{F^{\#}FD\}$ in sub-section 3 is a semitone above the $\{FEC^{\#}\}$ formed in sub-section 1. In the [016] type, all four members in sub-section 2 have a semitone relation from the members in sub-section 1. Most new members, especially those occurring in phrases 5–8, have a semitone relationship from the previous phrases' as well as sub-sections' trichords. Based on the few trichords displayed in sub-section 1, new members develop by semitone.

Form

The changing texture (horizontal and vertical), the changing instrumentation, rhythmic pattern used (quintuplet and septuplet), and articulation divide section A into three sub-sections. Sub-sections 1 and 3 are quite different from sub-section 2 textually, instrumentally, and rhythmically as examined above.

In spite of clear sectional divisions, several features such as sustaining pitches, overlapping phrase structure or slightly different phrasing structure confuse the boundary of sub-sections. The overlapping phrase is an important technique for depicting the text, which will be discussed later.

The length of the phrase in sub-section 1 is based on a 4-measure structure and the addition of a 3-measure unit extends the phrasing length to 7 (4 + 3) in phrase 3, and to 10 (4 + 3 + 3) in phrase 4. In sub-section 2, based on a 4-measure structure, a 2-measure unit is added, 6 (4 + 2) in phrase 5 and 8 (4 + 2 + 2) in phrase 6. On the other hand, in sub-section 3, the structure of the phrase length is changed to 5 measures in phrase 7 and 3 measures in phrase 8. As shown in Table 4.17, the 4-

measure structure in sub-section 1 extends to a 5-measure structure in sub-section 3 and the added 3-measure unit in sub-section 1 contracts to the added 2-measure unit in sub-section 2 and then returns to a 3-measure structure (phrase 8) at the end of sub-section 3. The seven-measure structure in sub-section 1 expands to an eight-measure structure in sub-section 3. Between sub-sections 1 and 2, the four measure structure is common and the three measure structure between sub-sections 1 and 3 is held in common. There is no common measure structure between sub-sections 2 and 3.

Table 4.17 Measure Structure in Each Phrase

					length of added unit	
Sub-section 1	phrase 1 4	phrase 2 4	phrase 3 4 + 3	phrase 4 4 + 3 + 3	4	3
Sub-section 2	phrase 5 4 + 2		phrase 6 4 + 2 + 2		4	2
Sub-section 3	phrase 7 5		phrase 8 3		5	3

Implications of Section A

In spite of the difference between sub-sections 1 and 2, the flute's melody suggests a unity. The inversionsal melody in sub-section 1 repeats in sub-section 2 having a different rhythm but keeping the same interval relationship. Consequently, the beginning of phrases 3, 4, 5, and 6 present the same melodic pattern using P_t , I_e , I_0 , and P_8 in spite of the difference in texture and the length of the phrase. This shared melodic pattern between sub-sections 1 and 2 is related to the common phrasing length, four measure structure. It clearly shows that sub-section 1 plays an introductory role for the vocal line in sub-section 2 and sub-section 3 returning to sub-section 1

plays the role of postlude. Thus, section A contains the musical characteristics, ABA', according to three sub-sections.

Section B (mm. 96–106)

Seven times of meter change in eleven measures such as 2/2, 3/2, 5/4, 3/4 without any tempo change is significant in section B. The dynamics start at *ff* and end at *pp*. All instruments as well as the voice are employed through section B, but all of them never occur simultaneously. The trichordal development and the vocal line's row divide section B into two sub-sections as sub-section 4 (mm. 96–104) and sub-section 5 (mm. 105–107). The sub-section 4 builds two hexachord types [012478] or [012367] by overlapping the trichords. In sub-section 5, no overlapping occurs. In addition, the rows used in the vocal line correspond to this sub-sectional division; I₃ and P₅ in sub-section 4 and P₂ in sub-section 5. I define sub-sections 4 and 5 as phrases 9 and 10, respectively.

Sub-Section 4 (phrase 9, mm. 96–104)

Rhythm

In spite of lots of meter changes (alternating duple and triple), the perceived meter is duple which continues to the end of sub-section 4. The use of dotted rhythm within the triple meter such as 3/2 (m. 97), 5/4 (m. 102) and 3/4 (m. 103) enable the music to keep the feeling of a duple rhythmic pattern. Based on the continuous duple

meter through sub-section 4 (phrase 9), the rhythmic unit becomes shorter. As shown in examples 4.14a and 4.14b, the rhythmic duration of half- or dotted half-note in the beginning of sub-section 4 becomes shorter to the dotted quarter-note duration (m. 103) and quarter-note duration (m. 104) in the end of sub-section 4.

Example 4.14a Instrumental Line's Rhythm in Sub-Section 4

Example 4.14b Vocal Line's Rhythm in Sub-Section 4

Example 4.14c Composite Rhythm in Sub-Section 4

The vocal line's rhythm is quite independent from the instrumental line, but also keeping the feeling of duple meter; the occurrence of dotted rhythms in m. 97 and m. 103 maintains the duple meter along with the instrumental line's dotted rhythms. The dotted quarter-note duration in the beginning of sub-phrase 4 becomes shorter to the dotted eighth-note at the end. Overall, rhythmic activity increases throughout sub-section 4, creating an *accelerando*. The continuation of duplet rhythm throughout sub-section 4 in spite of shortened rhythmic patterns in both parts is one of the techniques used to express the text, which will be dealt with later.

Dynamics and Articulation

Based on the rhythmic development, the dynamics also change. The strings start with *sf* and *ff*, continuing with the dynamics of *sf* > *f* at the end of sub-section 4. The clarinet's dynamics are similar to those of the strings as *sf*, *f* or *sf* and become soft as *mf* and *p* at the end. The softer dynamics occur in the shortened rhythmic durations. Until m. 101, the rhythm is the half-note duration and the dynamics are sustained as *sf* or *f*. As the rhythm develops into shorter units to dotted eighths, the dynamics becomes soft. Finally, the flutes' dynamics are *p* in m. 104. The vocal line's dynamics also follows the instrumental line's, starting with *ff* and ending *p* (Example 4.15).

The articulation of the strings is an alternation between *tremolo* and *arco* based on the dynamics. The dynamics of *sf* > *f* accompany the articulation of *tremolo* in m. 100 and 101.

Example 4.15 Formation with Two Trichords in Sub-Section 4

The image displays a complex musical score for Example 4.15, consisting of two systems of staves. The left system includes staves for strings (Violins I, Violins II, Violas, Cellos, and Double Basses) and a vocal line. The right system includes staves for woodwinds (Flutes, Clarinets, Bassoons) and strings (Violins I, Violins II, Violas, Cellos, and Double Basses). The score is annotated with various musical symbols, including trichord labels (RI₄, RI_c, RI₈, RI₃, I₃, P₅) and hexachord labels ([012367], [012478]). A box labeled '100' is present at the top of the first system. The notation includes notes, rests, and dynamic markings, with vertical dashed lines indicating the alignment of trichords across different parts of the ensemble.

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As shown in Example 4.15, through sub-section 4, the strings form the RI₄ (mm. 96–98) and RI_c (mm. 100–102) and the clarinets play the rows RI₈ (mm. 98–100) and RI₃ (mm. 102–104), while the vocal line articulates the I₃ and P₅. The strings and clarinets form the vertical trichords and continue the trichords keeping overlap two adjacent trichords. The strings' last trichord in mm. 96–97 sustains through the articulation of the clarinet's first trichord in m. 98. The same technique happens in m. 100 between the clarinets' last and strings' trichords and in m. 102 between the strings' last and clarinets' first trichords. These two overlapping trichords make the two types of hexachord, [012367] and [012478], alternately. The clarinets' last trichord (m. 104) occurs at the same time as the flute; first trichord forming a

notable change from the overlapping method employed previously. This differentiation in the articulation of the final trichords causes their sum to change from hexachords (m. 98, 100, and 102) to the trichord (m. 104), since the two trichords played by the clarinets and flutes consist of the same pitches. This changed formation will continue in sub-section 5. The formation of hexachords in sub-section 4 depicts the text, which will be discussed later.

While the instrumental line does not contain any repetition, the vocal line has repeated pitches, especially in P_5 , which is shared with the piccolo. The piccolo plays the order numbers 4 and 5. The repetition and sharing of the row with the piccolo are for forming dyad-types, [01] and [06].

Chord-Types

The vocal line's formation of the dyad-types, [01] and [06], occurs in three ways: (1) the slur provides the [06] type. The order numbers 2–3 $\{C^\#G\}$ and 6–7 $\{CF^\#\}$ in the I_3 and 2–3 $\{C^\#G\}$ and 6–7 $\{DA^b\}$ in the row P_5 . Among them, the pitches $\{GC^\#\}$ are held in common having the same order numbers. Three tritones are a semitone apart. (2) The repeated notes create [01] dyads: the order numbers 0–1 $\{E^bD\}$ and t–e $\{FE\}$ are repeated to make [01]s in I_3 . Furthermore, the t–e $\{FE\}$ in the I_3 and the first note F of P_5 create the dyad [01] continuously in m. 100. (3) Employing piccolo in m. 101 is also for making [01]. This provides not only the [01] in higher pitch range, but it also emphasizes the two [06] types right before and after

piccolo's [01] and the semitone relation between these two tritones. The piccolo's b_5 - b_5 is in between $g_4-c_5^\#$ (m. 100) and $g_4^\#-d_4$ (mm. 101-102) of the vocal line (Example 4.15). Table 4.18a shows the dyads formed in sub-section 4. In total, eleven members of [01] ($\{CC^\#\}$, $\{C^\#D\}$, $\{DE^b\}$, $\{E^bE\}$, $\{EF\}$, $\{FF^\#\}$, $\{F^\#G\}$, $\{GG^\#\}$, $\{AB^b\}$, $\{B^bB\}$, $\{BC\}$) and four members of [06] ($\{BF\}$, $\{CF^\#\}$, $\{C^\#G\}$, $\{DG^\#\}$) occur in sub-section 4. Especially, the four [06]s show the semitone relation.

Table 4.18a Dyad and Trichord Types in Sub-Section 4

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	$\{CC^\#\}$ $\{DE^b\}$ $\{E^bE\}$ $\{FF^\#\}$ $\{GG^\#\}$ $\{AB^b\}$ $\{B^bB\}$	$\{C^\#G\}$ $\{DG^\#\}$	$\{DE^bE\}$ $\{AB^bB\}$	$\{F^\#FE^b\}$ $\{BB^bG^\#\}$	$\{CC^\#E\}$ $\{FF^\#A\}$	$\{C^\#CG\}$ $\{G^\#GD\}$
Flutes	$\{B^bB\}$					
Clarinets	$\{C^\#D\}$ $\{DE^b\}$ $\{EF\}$ $\{F^\#G\}$ $\{GA^b\}$ $\{AB^b\}$ $\{BC\}$	$\{CF^\#\}$ $\{FB\}$	$\{C^\#DE^b\}$ $\{F^\#GG^\#\}$	$\{E^bDC\}$	$\{EFG^\#\}$ $\{AB^bC^\#\}$	$\{CBF^\#\}$ $\{FEB\}$
Voice	$\{C^\#D\}$ $\{DE^b\}$ $\{D^\#E\}$ $\{EF\}$ $\{F^\#G\}$	$\{CF^\#\}$ $\{C^\#G\}$ $\{DG^\#\}$			$\{EFG^\#\}$ $\{ED^\#C\}$	$\{CBF^\#\}$ $\{GF^\#C^\#\}$

Table 4.18b Tetrachord and Hexachord Types in Sub-Section 4

	Tetrachords				Hexachords	
	[0126]	[0157]	[0257]	[0247]	[012367]	[012478]
Strings	{E ^b DC [#] A}	{D ^b DF [#] A ^b }	{FE ^b CB ^b } {FGB ^b C}	{BAGE} {EF [#] G [#] B}	{EE ^b D -C [#] B ^b A} {BB ^b A -A ^b FE}	{A ^b GF [#] -EC [#] C}
Clarinets	{CBB ^b F [#] } {GF [#] FC [#] }		{DEGA} {EDBA}	{C [#] E ^b FA ^b } {A ^b B ^b CE ^b }		

In the trichords, there are four members of [012], three members of [013], five members of [014], and five members of [016] throughout sub-section 4.

All vertical trichords formed in the strings and clarinets do not consist of the same arrangement of order numbers; the first trichord of each group (m. 96, 97, 100 and 102) consists of order numbers e, t, 9 from the higher range to the lower range. The third and fourth (last) trichords of each group consist of order numbers 4, 3, 5 and 1, 2, 0 from higher to lower, respectively. However, the constituent order numbers in the second trichords are slightly different. The strings' second trichord (m. 97) has order numbers as 8, 6, 7, while the other trichords of the second group consist of order number 8, 7, 6 from high to low.

These changing order numbers in the vertical trichord produce different types of tetrachords horizontally (4 vertical trichords make 3 horizontal tetrachords⁵²). The

⁵² See Brian Alegant, "Cross Partitions as Harmony and Voice Leading in Twelve-Tone Music", *Music Theory Spectrum*, (23/1, 2001), p.1–40. According Alegant, like traditional 12-tone composers, Dallapiccola often uses rows in a linear fashion, presenting them as one-dimensional strings. In addition to that, Dallapiccola is equally fond of projecting rows as two-dimensional configurations. One way to build a 3 x 4 cross-partition is to divide a row into segments of equal size (such as four trichords), verticalize these segments, then arrange the pitch classes within the columns to yield the desired horizontal lines. This technique allows us to project row segments and invent new melodies: it affords both harmonic

horizontal tetrachords of the strings in m. 96–98 are [0257], [0157] and [0247]. The other horizontal tetrachord types are [0257], [0126] and [0247]. Except [0126], the rest of three tetrachord-types are created for the first time. As the piece goes by, the numbers of tetrachord members are added and they become important later in the piece.

Sub-Section 5 (Phrase 10, mm. 105–107)

Texture

The instrumental line still articulates the trichordal texture continued from sub-section 4. After the flute's trichords in mm. 104–105, the clarinets and strings take over the trichords one after the other in mm. 105–106. Each group of trichords does not overlap with the previous trichord or next one (unlike sub-section 4), but the trichords are smoothly connected rhythmically.

Rhythm

The alternating rhythms between duplet and triplet develop to the quintuplet the combination of duplet and triplet with the formation of a shortening rhythmic pattern from the quarter-note triplet duration to the eighth-note quintuplet as shown in Example 4.16a.

consistency and motivic variety. In this context, harmony refers to the simultaneous presentation of pitch classes that are taken from the discrete segments of rows, and voice leading denotes the horizontal lines that are produced by these pitch. Alegant calls these “cross-partition.” In two recent conference presentations, Alegant has advanced a theory of cross-partitions and used this theory to analyze the underlying organization in movements from two of Dallapiccola's works.

The vocal line's rhythm does not become shorter; its rhythm alternates between duplet and triplet corresponding to the instrumental line's rhythm (Example 4.16b).

Example 4.16a Instrumental Line's Rhythm in Sub-Section 5



Example 4.16b Vocal Line's Rhythm in Sub-Section 5



Dynamics and Articulation

As the rhythmic duration becomes shorter, the dynamics become softer from *molto p* to *ppp*. Each trichord group has a different dynamic; the flutes' trichords (mm. 104–5) are *p*, the strings' trichords (m. 105) are *molto p*, the clarinets' (m. 105–6) are *pp*, and the strings' trichords (m. 106) are *ppp*. The dynamics of the voice just follow the instrumental line's dynamics from *p* to *pp*. While the instruments change tone color in each trichord group, the voice provides the same timbre keeping the same rhythmic pattern and dynamics of the instrumental line.

Example 4.17 Sub-Section 5 (mm. 105–106)

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Row and Pitch

The instrumental lines utilize four rows, I_3 in the flutes' line (m. 104), I_e in the strings' line (m. 105), I_6 in the clarinets' line (m. 106), and I_2 in the strings' line (m. 106). Since all rows form four trichords, there are no repeated notes. On the other hand, the vocal line's employment of the P_2 contains repeated notes. The repeated notes emphasize $[01]$, $g^\#_4$ - a_3 with order numbers 4–5 (m. 105). The formation of three $[01]$ s present the increasing interval class: d_5 - $c^\#_5$ (semitone) in m.104, $g^\#_4$ - a_3 (interval class 11) in m. 105, and e_5 - $d^\#_4$ (interval class 13) in m. 106.

Chord-Types

Table 4.19a Dyad and Trichord Types in Sub-Section 5

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{CC [#] } {D ^b D} {E ^b E} {FF [#] } {GG [#] } {A ^b A} {AB ^b } {B ^b B}	{DG [#] } {FB}	{CD ^b D} {AB ^b B}	{F [#] FE ^b } {AA ^b G ^b }	{CC [#] E} {E ^b EG}	{G [#] GD} {BB ^b F}
Flute	{C [#] D} {DE ^b } {EF} {AB ^b } {B ^b B} {BC}	{CF [#] }	{C [#] DE ^b }		{EFA ^b }	{BCF}
Clarinets	{CC [#] } {DE ^b } {EF} {FF [#] } {GA ^b }	{E ^b A}	{EFF [#] }	{C [#] CB ^b } {G [#] AB}	{GA ^b B}	{E ^b DA}
Voice	{G [#] A} {D [#] E}	{BF}		{G [#] AB}	{D [#] EG}	{BB ^b F}

Table 4.19b Tetrachord Types in Sub-Section 5

	Tetrachord		
	[0257]	[0126]	[0247]
Strings	{CB ^b GF} {E ^b D ^b B ^b A ^b }	{E ^b DC [#] A} {G ^b FEC}	{EF [#] G [#] B} {BABD}
Flute	{EDBA}	{GF [#] FC [#] }	{A ^b B ^b CE ^b }
Clarinets	{GFDC}	{B ^b AA ^b E}	{BC [#] E ^b F [#] }

Tables 4.19a and 4.19b show the chords found in sub-section 5. There are eleven members of [01] ({CC[#]}, {C[#]D}, {DE^b}, {E^bE}, {EF}, {FF[#]}, {GG[#]}, {G[#]A}, {AB^b}, {B^bB}) and four members of [06] ({DG[#]}, {E^bA}, {FB}, {F[#]C}) through sub-section 5. Two of the four members of [06] are a semitone apart.

In the trichords, there are four [012] members, four [013] members, four [014] members, and four [016] members.

All of Two Sub-Sections (Section B)

Rhythm

Example 4.18 Composite Rhythm in Section B

The musical score for Example 4.18 is divided into four staves, each starting with a measure number:

- Staff 1 (96):** Starts with a 3/2 time signature. It contains a half-note or dotted quarter note followed by a quarter note, then a quarter note, and finally a quarter note.
- Staff 2 (99):** Starts with a 3/4 time signature. It contains a quarter note, followed by a quarter note, then a quarter note, and finally a quarter note.
- Staff 3 (102):** Starts with a 2/4 time signature. It contains a quarter note, followed by a quarter note, then a quarter note, and finally a quarter note.
- Staff 4 (105):** Starts with a 3/2 time signature. It contains a quarter note, followed by a quarter note, then a quarter note, and finally a quarter note.

Two prominent rhythmic patterns occur throughout section B. First, the accelerating rhythmic pattern occurs. As shown in example 4.18, the half-note or dotted quarter note in the beginning of sub-section 4 becomes shorter to the eighth-note quintuplet in the end of sub-section 5. Second, in spite of frequent meter changes, the use of dotted rhythms within the triplet meter continues the perceived duple meter.

The rhythm and duration are closely related to the dynamics; the longer rhythms correspond to the louder dynamics and the shorter rhythms to softer ones. The dynamics progress from *ff* to *ppp* throughout section B.

Texture

The unique texture, the vertical trichord, is continuous through section B. However, the technique in changing trichords between two different instrumental groups is different between the two sub-sections: the hexachord by overlapping two different trichord types in sub-section 4 and the trichord without overlapping two trichords in sub-section 5.

The constant texture in section B shows Dallapiccola's intention to present a unity, which contains various diversities in tone color, sonorities, articulation and dynamics. This also deeply connects to the text.

Rows and Pitches

Based on the sub-sections, two different row types occur; sub-section 4 has a retrograde-inversion row types (RI_4 , RI_8 , RI_e , RI_3) and sub-section 5 contains inversionsal row types (I_3 , I_e , I_6 , I_2). This retrograde relation between two sub-sections is obvious in the end of sub-section 4 and in the beginning of sub-section 5 by the use of same transposition, RI_3 and I_3 . It mitigates the row type's change and connects the two sub-sections 4 and 5.

In addition, the vocal line also contains an inversionsal row relation in using row types, I_3 , P_5 (sub-section 4) and P_2 (sub-section 5). Unlike the rows in the instrumental line, the inversionsal relation occurs within sub-section 4. The employment of row's inversionsal and retrograde relations is another technique to express the text (which will be discussed later in the text).

Chord-Types

As provided in Tables 4.20a-4.20f, several members of dyad and trichord types occur. In the [01] type, the eleven members (all except $\{G^\#A\}$) in sub-section 4 and eleven members (all except $\{F^\#G\}$) in sub-section 5 form all twelve [01]s throughout section B. In the [06], four members ($\{BF\}$, $\{CF^\#\}$, $\{C^\#G\}$, $\{DA^b\}$) in sub-section 4 and four members ($\{BF\}$, $\{CF^\#\}$, $\{DA^b\}$, $\{E^bB\}$) in sub-section 5 make five (all except $\{EB^b\}$) throughout section B.

Table 4.20a [01] Dyad Type in Section B

	Sub-Section 4	Sub-Section 5	All
$\{CC^\#\}$	✓	✓	✓
$\{C^\#D\}$	✓	✓	✓
$\{DE^b\}$	✓	✓	✓
$\{E^bE\}$	✓	✓	✓
$\{EF\}$	✓	✓	✓
$\{FF^\#\}$	✓	✓	✓
$\{F^\#G\}$	✓		✓
$\{GG^\#\}$	✓	✓	✓
$\{G^\#A\}$	✓	✓	✓
$\{AB^b\}$	✓	✓	✓
$\{B^bB\}$	✓	✓	✓
$\{BC\}$		✓	✓

Table 4.20b [06] Dyad Type in Section B

	Sub-Section 4	Sub-Section 5	All
$\{CF^\#\}$	✓	✓	✓
$\{C^\#G\}$	✓		✓
$\{DA^b\}$	✓	✓	✓
$\{E^bA\}$		✓	✓
$\{EB^b\}$			
$\{FB\}$	✓	✓	✓

Table 4.20c [012] Trichord Type in Section B

	Sub-Section 1	Sub-Section 2	All
{CC [#] D}		✓	✓
{C [#] DE ^b }	✓	✓	✓
{DE ^b E}	✓		✓
{E ^b EF}			
{EFF [#] }		✓	✓
{FF [#] G}			
{F [#] GG [#] }	✓		✓
{GG [#] A}			
{G [#] AB ^b }			
{AB ^b B}	✓	✓	✓
{B ^b BC}			
{BCC [#] }			

Table 4.20d [013] Trichord Type in Section B

	Sub-Section 4	Sub-Section 5	All
{CC [#] E ^b }			
{C [#] DE}			
{DE ^b F}			
{E ^b EF [#] }			
{EFG}			
{FF [#] G [#] }			
{F [#] GA}			
{GG [#] B ^b }			
{G [#] AB}		✓	✓
{AB ^b C}			
{B ^b BC [#] }			
{BCD}			
{CBA}			
{C [#] CB ^b }		✓	✓
{DCB}			
{E ^b DC}	✓		✓
{EE ^b C [#] }			
{FED}			
{F [#] FE ^b }	✓	✓	✓
{GF [#] E}			
{G [#] GF}			
{AG [#] F [#] }		✓	✓
{B ^b AG}			
{BB ^b G [#] }	✓		✓

Table 4.20e [014] Trichord Type in Section B

	Sub-Section 4	Sub-Section 5	All
{CC [#] E}	✓	✓	✓
{C [#] DF}			
{DE ^b F [#] }			
{E ^b EG}		✓	✓
{EFG [#] }	✓	✓	✓
{FF [#] A}	✓		
{F [#] GB ^b }			
{GA ^b B}		✓	✓
{G [#] AC}			
{AB ^b C [#] }	✓		✓
{B ^b BD}			
{BCE ^b }			
{CBG [#] }			
{C [#] CA}			
{DC [#] B ^b }			
{E ^b DB}			
{EE ^b C}	✓		✓
{FEC [#] }			
{F [#] FD}			
{GF [#] E ^b }			
{G [#] GE}			
{AG [#] F}			
{B ^b AF [#] }			
{BB ^b G}			

Table 4.20f [016] Trichord Type in Section B

	Sub-Section 4	Sub-Section 5	All
{CC [#] F [#] }			
{C [#] DG}			
{DE ^b G [#] }			
{E ^b EA}			
{EFB ^b }			
{FF [#] B}			
{F [#] GC}			
{GG [#] C [#] }			
{G [#] AD}			
{AB ^b E ^b }			
{B ^b BE}			
{BCF}		✓	✓
{CBF [#] }	✓		✓
{C [#] CG}	✓		✓
{DC [#] G [#] }			
{E ^b DA}		✓	✓
{EE ^b B ^b }			
{FEB}	✓		✓
{F [#] FC}			
{GF [#] C [#] }	✓		✓
{G [#] GD}	✓	✓	✓
{AG [#] E ^b }			
{B ^b AE}			
{BB ^b F}		✓	✓

The four types of trichord add numbers of members through section B. In the [013] trichords, there are three new members ($\{C^{\#}CB^b\}$, $\{G^{\#}AB\}$, $\{BB^bG^{\#}\}$) among six members ($\{C^{\#}CB^b\}$, $\{E^bDC\}$, $\{F^{\#}FE^b\}$, $\{G^{\#}AB\}$, $\{AG^{\#}F^{\#}\}$, $\{BB^bG^{\#}\}$). Among seven members of [014] in section B, there are three new members ($\{EFA^b\}$, $\{FF^{\#}A\}$, $\{AB^bC^{\#}\}$). Eight members of [016] contain two new members ($\{FEB\}$, $\{GF^{\#}C^{\#}\}$). Four trichord types occurred between two sub-sections 4 and 5 do not show the

semitone relation. But later compared part between sections will explain the obvious development in sonority keeping a semitone relation.

Form

The above observations of rhythm, the use of row types, and texture indicate the division of two sub-sections 4 and 5 within section B. However, the vocal melody is continuous over the border of the two sub-sections, mm. 103–104. The new row P_2 begins in m. 103, before sub-section 5 starts. While the row P_2 begins in the end of m. 103, the text ends in the middle of m. 104. Not only does the beginning of row P_2 not correspond with the text, but also the beginning of sub-section 5 does not match the beginning of the new row. These complicated phrasing divisions between two sub-sections are one of technique for dealing with the text (it will be discussed later).

Section A' (mm. 107–138)

Section A' is divided on the basis of texture, meter change, and tempo change into three sub-sections: sub-sections 6 (mm. 107–113), 7 (mm. 114–120), and 8 (mm. 121–138). The tempo changes to $\text{♩} = 54$ in sub-section 6 and returns to $\text{♩} = 72$ in sub-sections 7 and 8. In addition to that, lots of meter changes happen in sub-section 6 such as $4/2$, $3/2$, $2/2$ and $3/2$, but there are no meter changes in sub-sections 7 and 8. Texturally, the regular appearance of vertical trichord returns in sub-section 7 from the irregular trichords (sub-section 6). Those constant features such as no meter or

tempo changes and the unchanging tempo ($\downarrow = 72$) in sub-sections 7 and 8 are the same as those of section A. The use of the continuous quintuplet rhythm with the regular vertical trichords from m. 121 is another basis for the division of sub-sections 7 and 8.

The frequent meter and tempo changes in sub-section 6 are similar features to those of section B. However, the occurrence of simultaneous inversive melodies in the beginning of sub-section 6 shows the close connection to section A rather than section B, in spite of a difference in technique used to create these inversive melodies. Furthermore, the row used in the voice in sub-section 6 is P_t , the same as in sub-section 2 (in section A) although forming a different rhythm. Based on the similarities of inversive melodies in the instrumental line and the same rows used in the vocal part, sub-section 6 is regarded as the beginning of section A'.

Sub-Section 6 (phrase 11, mm. 107–113)

Rhythm

Sub-section 6 provides all the rhythmic patterns formed in previous sub-sections. As shown in Example 4.19, the septuplet rhythm releases (m. 108), decreasing the rhythmic pattern to the quintuplet, triplet and then duplet through sub-section 6. The septuplet's note formation, divided five eighth-notes/two eighth notes within the septuplet, implies the rhythmic decrease: $7 - 2 = 5$, $5 - 2 = 3$. The number, two, plays the role of changing the rhythmic pattern from septuplet to triplet.

Example 4.19 Composite Rhythm in Sub-Section 6

Texture and Dynamics

Sub-section 6 has an expanding texture: It starts with the thin texture, two flutes' melodies. While the flutes' melodies continue through all of sub-section 6, other instruments are added: the vocal line in m. 107, the piccolo clarinets in m. 109, the strings in m. 110, and then finally all instruments except the piccolo participate in the end of sub-section 6. The two-voice texture becomes a nine-voice texture at the end of sub-section 6.

The gradual texture additions accompany a dynamic change. The thin texture accompanies soft dynamics, *pp* or *ppp*. These soft dynamics become stronger, *p*, *mf*, *f*, *ff*, corresponding to the thickening texture. The dynamic of *ff* in m. 113 is the strongest in this third movement.

Row and Pitch

There are two pitch materials: one based on the row and the other based on outside the row. The rows used in the instrumental line are P_3 , I_8 , I_3 , and P_t . Except

P_3 , several instruments share the other rows: the row I_8 consists of the alto flute (order numbers 0–5), clarinet (order numbers 2–e), and the cello (order numbers 5–e), I_3 is the piccolo clarinet (order numbers 0–5), piccolo (order numbers 6–8), and the piccolo clarinet and violin (order numbers 9–e), and P_e consists of the voice (order numbers 0–5) and the viola (order numbers 6–e). The instrumental changes enable the employment of all instruments as well as the creation of a broader texture. It has a relation to the text (which will be discussed later).

The inversional two rows, P_3 and I_8 , appear in the beginning of sub-section 6. As shown in Table 4.21, they have three invariants, $F-B$, $F^\#-C$ and $B^b-C^\#$ (marked underline). Among them, two invariants, $F^\#-C$ and $F-B$ exchange their locations, order number 2–3 and 6–7. The $B^b-C^\#$ has the same position, order numbers 9 and t. In addition, their axes are $F-F^\#$ and $B-C$ (marked vertical line) occurring in order numbers 2–3 and 6–7. The formation of the same pitches and the same position between axes and invariant dyads produce their simultaneous occurrence, both vertically and horizontally. The order numbers 2–3 repeat three times in m. 108 and 111, and the order numbers 6–7 also repeat twice in mm. 112–113. Those repetitions

Table 4.21 Two Inversional Rows, P_3 and I_8 in Sub-Section 6

P_3 :	$D^\#$	E	<u>F</u>	<u>B</u>	A	$G^\#$	<u>F[#]</u>	<u>C</u>	G	<u>B^b</u>	<u>C[#]</u>	D
I_8 :	A^b	G	<u>F[#]</u>	<u>C</u>	D	E^b	<u>F</u>	<u>B</u>	E	<u>C[#]</u>	<u>B^b</u>	A

Example 4.20 Flutes' Inversional Melodies (mm. 108–113)

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accompany long durations, the five-quarter note duration in m. 108 and the half-note duration in mm. 112–113. The flute line's repetition strongly supports the emphasis of invariants and axes at the same time. In addition to that, the vocal line also supports the simultaneous use of axes and invariants. While the F-B and F[#]-C occur in the flutes' lines, the vocal line sings the C-F[#], the order numbers 2–3 in P_t, with the same rhythmic pattern; their constituent pitches are reversed, F[#]-C (I₈) and C-F[#] (P_t).

On the other hand, the other invariance, B^b-C[#], occurs in order positions 9-t in both rows, B^b-C[#] in P₃ and C[#]-B^b in I₈. Their constituent pitches are reversed in each row. Thus, the invariance B^b-C[#] occurs vertically in order number 9 (B^b-C[#]) and t (C[#]-B^b) and arises horizontally in order numbers 9-t as well. As the result, the use of two inversional rows, P₃ and I₈, is for underscoring the axes and invariant dyads with the same rhythmic presentation and repetition.

Chord-Types

The simultaneous occurrence of axes and invariance contains vertical [01] and horizontal [06] dyads. The vertical [01] occurs in order numbers 2–3 of the two rows; the horizontal [01] by the long rhythmic duration and repetition in order numbers 0–2 prepares the vertical [01] in m. 107. Another vertical [01] between the two rows occurs in the order numbers 6–7; the horizontal [01] with the long durations also prepares the vertical [01] in m. 110. The vocal line forms the [01] with the repetition; the recurrence of order numbers 0–1 and 4–5 provide the [01].

Table 4.22 Dyad, Trichord, and Tetrachord Types in Sub-Section 6

	Dyad		Trichord				Tetrachord
	[01]	[06]	[012]	[013]	[014]	[016]	[0167]
Strings	{C [#] D} {E ^b E} {FG ^b } {GA ^b } {AB ^b } {BC}	{C [#] G} {EA [#] } {F [#] C} {BF}				{C [#] DG}	{EE ^b B ^b A}
Flutes and Clarinets ⁵³	{C [#] D} {DD [#] } {D [#] E} {EF}	{FB} {F [#] C}	{D [#] EF} {F [#] GA ^b }	{D [#] DC} {G [#] AB}		{EFB ^b } {F [#] GC} {CBF [#] }	
	{F [#] G} {GA ^b } {G [#] A} {AB ^b }	{CF [#] } {C [#] G} {EB ^b }	{C [#] DE ^b }	{B ^b AG} {E ^b DC} {BCD}	{AA ^b F}	{C [#] DG} {A ^b AD}	
Voice	{D [#] E} {A [#] B} {BC}	{CF [#] }	{A [#] BC}	{E ^b EF [#] }		{CBF [#] }	

On the other hand, the vertical [01]s in order numbers 2–3 and 6–7 between two rows provide horizontal [06]s, {FB} and {F[#]C}. The interrelated dyad types [01] and [06] show the planning involved row's choice and manipulation. As shown in Table 4.22, eleven members of [01] (all except {CC[#]}) and four members of [06] ({CF[#]}, {C[#]G}, {EB^b}, {FB}) occur in sub-section 6.

In the case of the trichords, four members of [012], five members of [013], one [014], and five members of [016] occur through sub-section 6.

⁵³ Since the flutes and clarinet create vertical sonorities, the cells of flutes and clarinets are merged in this table.

Sub-Section 7 (phrase 12, mm. 114–120)

Sub-section 7 consists of seven measures, mm. 114–120. The tempo returns to $\text{♩} = 72$ and there are meter changes to 2/2 (mm. 114–118), 3/2 (m. 119), and 1/2 (m. 120).

Rhythm

The strings' rhythm is simple consisting of duplets except for one triplet in m. 115. It forms a regular pattern, sounding every half-note duration in mm. 114–117. The clarinets' rhythm is almost the same as to the strings' rhythm consisting of regular half-note durations in mm. 114–116. The flutes' rhythm is also similar to the clarinets' rhythm. Overall, the instrumental line has similar rhythmic pattern keeping with the duple rhythmic pattern.

The vocal line has a different rhythm from the instrumental line. It starts with the quintuplet in m. 116 and alternates between duplet and triplet in mm. 117–120. The composite rhythm shown in Example 4.21 displays the rhythmic development; the alternation between duplet and triplet in the instrumental line (mm. 114–115) reaches the quintuplet in the vocal (m. 116) and then returns to the alternation.

Example 4.21 Composite Rhythm in Sub-Section 7

The image shows two staves of musical notation. The top staff is labeled '114' and contains three measures. The first measure is in 2/2 time and contains two half notes. The second measure is in 2/2 time and contains a half note followed by a triplet of eighth notes. The third measure is in 2/2 time and contains a triplet of eighth notes followed by a half note. The bottom staff is labeled '117' and contains four measures. The first measure is in 2/2 time and contains two half notes. The second measure is in 2/2 time and contains a half note followed by a triplet of eighth notes. The third measure is in 3/2 time and contains a half note followed by a triplet of eighth notes. The fourth measure is in 1/2 time and contains a half note.

Texture, Articulation, and Dynamics

Sub-section 7 is textures thicker; the continuous vertical trichords start with the two instrumental group (strings and clarinets) and end with all three instrumental groups. The continuous trichords change their articulation; the first four trichords (mm. 114–115) have an articulation with an accent, the second trichords (mm. 115–118) contain the alternation of *arco* and *tremolo* (strings) without any accent. The third trichord group (mm. 118–120) has an accent and the alternation between *pizz.* and *arco* (strings).

Example 4.22 Sub-Section 7 (mm. 114–120)

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The first trichord group in string is *sf*, the second is the alternation of *ff* and *sf*, and the third starts *sf* and then decreases to *mp* in m. 120. The vocal line also starts with *ff*, sustains and then abruptly decreases to *p* in m. 121 (the beginning of sub-

section 8). Subsequently, the dynamic level of sub-section 7 is loud as *sf*, *ff* and *molto f*. Its loud dynamics are caused by the thick texture.

Pitch and Row

All instruments use the same row type, I_5 (mm. 114–115), I_2 (mm. 115–117) and I_t (mm. 117–120) due to their simultaneously formed trichords. The strings and clarinet create the row I_5 , the strings form the I_2 , and all three instrumental groups form the I_t . The vocal line sings I_3 , which is the same row as in the beginning of section B, although rhythm and pitch range are different. These differences will be dealt with in a later section.

Chord-Types

In total, ten members of [01], all excluding two, $\{FF^\#\}$ and $\{GG^\#\}$, and three members of [06], $\{C^\#G\}$, $\{DA^b\}$, $\{FB\}$, occur in phrase 7. Table 4.23 provides the members of chord types in sub-section 7.

There are five members of [012], three members of [013], five [014]s, and three [016]s in sub-section 7 including new members of one [013] ($\{CBA\}$), three [014]s ($\{CBA^b\}$, $\{F^\#\text{GB}^b\}$, $\{BCE^b\}$), and one [016] ($\{DC^\#\text{A}^b\}$).

Table 4.23 Dyad, Trichord, Tetrachord, and Hexachord Types in Sub-Section 7

	Dyad		Trchord			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{C [#] C [#] } {C [#] D} {D [#] E} {EF} {F [#] G} {A ^b A} {B ^b B} {BC}	{C [#] G} {DA ^b } {FB}	{D [#] EF} {CD ^b D}	{CBA} {AA ^b F [#] } {FED}	{D [#] EG} {BCD [#] }	{DC [#] A ^b } {BB ^b F} {GF [#] C [#] }
Flutes	{F [#] G} {G [#] A} {AB ^b }	{D ^b G} ⁵⁴	{G [#] AB ^b }		{F [#] GB ^b }	
Clarinets	{C [#] D} {D [#] E} {EF} {F [#] G} {G [#] A} {AB ^b } {BC}	{DA ^b }	{E ^b EF} {G [#] AB ^b }	{CBA} {FED}	{F [#] GB ^b } {BCE ^b } ⁵⁵	{DC [#] A ^b } {GF [#] C [#] } ⁵⁶
Voice	{C [#] D} {DE ^b } {BC}	{C [#] G}	{C [#] DE ^b } {B ^b BC}		{CBG [#] } {EFG [#] }	
		Tetrachord			Hexachord	
		[0126]	[0247]	[0257]	[012478]	[012367]
Strings		{F [#] FEC}	{GABD}	{A ^b B ^b D ^b D [#] }	{DC [#] CB ^b GF [#] }	{B ^b AA ^b GED [#] }
Clarinets		{AA ^b GD [#] }	{B ^b CDF} {EF [#] AB}	{BC [#] EF [#] } {CB ^b GF}		

Sub-Section 8 (mm. 121–138)

Sub-section 8 is divided into three phrases: phrase 13 (mm. 121–127), phrase 14 (mm. 128–131), and phrase 15 (mm. 132–138) on the basis of the chord type, texture, and the rhythmic patterns; in phrases 13 and 14, there are trichords and

⁵⁴ The alto flute and bass clarinet make this dyad in m. 119.

⁵⁵ The alto flute, piccolo clarinet and bass clarinet make this trichord in mm. 119–120.

⁵⁶ The alto flute, piccolo clarinet and bass clarinet make this trichord in m. 119.

tetrachords, while only trichord texture exists in phrase 15. The texture inversion and rhythmic contraction divide these into two phrases, 13 and 14. The four measures containing four trichords (mm. 121–124) in phrase 13 contract to one measure having four trichords (m. 128) in phrase 14 and the strings' tetrachords in phrase 13 (mm. 125–127) change instrumentation to the wind' tetrachords in phrase 14 (mm. 129–131). In addition to that, [012] partition formed in the clarinets' line in phrase 13 changes to the strings' line in phrase 14. Each phrase has the different orchestration: the clarinets, strings, and voice in phrase 13, the strings, flutes, and voice in phrase 14, and the voice, violin, and viola in phrase 15.

Phrase 13 (mm. 121–127)

Rhythm

Example 4.23 Phrase 13 (mm. 121–127)

The image displays a musical score for Example 4.23, Phrase 13 (mm. 121–127). The score is presented in two systems. The left system shows measures 121-124, and the right system shows measures 125-127. The instrumentation includes voice, strings, and clarinets. The score features complex rhythmic patterns and trichord textures.

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As shown in Example 4.23, the strings attack on every second beat in mm. 121–124 and then change to attack on every first beat in mm. 125–7. The clarinets form the quintuplet rhythm through phrase 13. The quintuplet has two formations; the quintuplet by a single line (mm. 121–124) and the quintuplet by double lines (mm. 125–127) with the two pairs of clarinets such as piccolo clarinet-bass clarinet, clarinet-bass clarinet, and clarinet-piccolo clarinet.

In addition, the vocal line has the alternation between duplet and triplet in mm. 124–128. The beginning of phrase 13 has sustained over from sub-section 7 (phrase 12) in the vocal line. The composite rhythm shown in Example 4.24 shows the alternation between the duplet and triplet with the continuous quintuplet rhythm. The alternating duplet and triplet in the vocal line and quintuplet rhythm in the instrumental line occur simultaneously creating rhythmic patterns, 5:2 and 5:3. This occurrence of overlapping rhythm suggests the returning to section A, especially phrases 3 and 4. The comparative analysis between section A and A' will explain this in detail.

Example 4.24 Composite Rhythm in Phrase 13

The image shows two staves of musical notation. The top staff starts at measure 121 and contains three measures of music. Above the first measure is the number '121'. Above the second and third measures are the ratios '5:2'. Below each measure is a quintuplet bracket with the number '5' underneath. The bottom staff starts at measure 124 and contains four measures of music. Above the first and third measures is the number '124'. Above the second and fourth measures are the ratios '5:3'. Below each measure is a quintuplet bracket with the number '5' underneath.

Texture and Dynamics

The strings' line shows the textural development from the trichord (mm. 121–124) to the tetrachords (mm. 125–127). This change of texture accompanies the change of dynamics from *p* in mm. 121–124 to *pp* in mm. 125–127 and also the change of pitches and instruments making up the quintuplet. The change of texture and dynamics as well as two different formations of the quintuplet rhythm divide these seven measures into a 4 + 3 structure.

Pitch and Chord-Types

The employment of two pitch materials is apparent in phrase 13. First, the use of four rows, I_9 , R_3 , RI_t , and P_e , has two different formations. The I_9 has horizontal texture and repeats pitches, the same technique used in sub-section 1. Two rows R_3 and RI_t have vertical texture without any repeated pitches. Secondly, the [012] partition appears six times. Among the six [012] partitions, the first four [012]s form a twelve-tone aggregate in mm. 125–126. The remaining two [012]s make an aggregate with the two [012]s created in phrase 14. The vocal line sings eight pitches (order numbers 0–7) of the row P_e (the rest of them are sung on phrases 14 and 15).

All twelve members of [01] and four members of [06] (all except $\{E^bA\}$ and $\{FB\}$) occur in phrase 13. The [012] partitions in the clarinets' line articulate all members of [01]. The vocal line also emphasizes the two dyad types within the text

setting. The words, to-do (all) forms the [01] type (b_4-c_4) and vien-to (wind), $c^{\#}_4-g_4$, and el (it), $d_5-g^{\#}_4$ make two [06] members.

Table 4.24 Dyad, Trichord, and Tetrachord Types in Phrase 13

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{C [#] D} {E ^b E} {EF} {GG [#] } {G [#] A} {AB ^b } {BC}	{CF [#] } {C [#] G} {DG [#] }	{E ^b EF} {G [#] AB ^b }	{G [#] AB} {EFG}	{DC [#] B ^b } {BCD [#] } {FEC [#] } {E ^b EG}	{GF [#] D ^b } {CBF [#] } {G [#] AD}
Clarinets	{CC [#] } {C [#] D} {DE ^b } {E ^b E} {FF [#] } {F [#] G} {GA ^b } {G [#] A} {AB ^b } {B ^b B} {BC}	{CF [#] } {C [#] G} {EB ^b }	{CD ^b D} {DE ^b E} {FF [#] G} {F [#] GG [#] } {A ^b AB ^b } {BCC [#] }	{C [#] CB ^b } {CC [#] E ^b } {G [#] AB}	{GG [#] B}	{G [#] AD}
Voice	{CC [#] } {EF} {BC}	{C [#] G} {DG [#] }	{BCC [#] }	{EFG}		{C [#] CG}
	Tetrachord					
		[0126]	[0236]	[0147]		
Strings		{G [#] AB ^b D}	{GFEC [#] }	{BCD [#] F [#] }		
Clarinets		{GG [#] AC [#] }		{B ^b BDF}		
Voice		{C [#] CBG}				

In addition to that, seven members of [012], four members of [013], five members of [014], and four members of [016] occur in phrase 13. Among them, [014] has one new member, {DC[#]B^b}.

Phrase 14 (mm. 128–131)

Rhythm

The strings have the eighth note in m. 128 and the eighth-note quintuplet in mm. 129–131. This quintuplet rhythm comes from the clarinets in phrase 13. On the other hand, the wind (clarinets and flutes) have regular attacks on every first beat in mm. 129–131. This shows a rhythmic inversion between phrases 13 and 14. The instrumental line shows the continuation of the quintuplet rhythm, except for the eighth note rhythm in m. 128. The vocal line has the quarter-note triplet in mm. 130–131. Thus the composite rhythm shown in Example 4.25 forms the 5:3 overlapping rhythm.

Example 4.25 Composite Rhythm in Phrase 14



Texture, Articulation, and Dynamics

The texture is the same as in phrase 13, trichords and tetrachords with the [012] partition. The strings' trichords in m. 128 develop to the tetrachords in the winds' line (mm. 129–131). And the strings form the [012] partition in mm. 129–131. Based on the change of chord type, the articulation changes—the *staccato* in the trichord and the *tenutàn* the tetrachord. The dynamic level remains *pp*, which starts in m. 125 and then decreases to *ppp* in m. 131. The four measures of phrase 14 form a 1 + 3 structure on the basis of the textural inversion and development of trichord (m. 128) and tetrachord (m. 129–131).

Row, Pitch, and Chord-Types

The employment of three rows puts R_5 in the strings (m. 128), I_3 in the winds (mm. 129–131), and P_t (order number 8–t) in the vocal line (mm. 130–131). And the six [012] partitions (mm. 129–131) occur in the strings' line. Among the six, the last four [012]s form a twelve-note aggregate (mm. 130–131) and the first two [012]s make another twelve-note aggregate with the last two [012]s in phrase 13.

Table 4.25 Dyad and Trichord Types in Phrase 14

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{C [#] D} {DE ^b } {D [#] E} {EF} {FF [#] } {F [#] G} {GG [#] } {G [#] A} {AB ^b } {B ^b B} {BC}	{CF [#] } {DG [#] } {D [#] A}	{C [#] DE ^b } {D [#] EF} {EFF [#] } {FF [#] G} {GA ^b A} {AB ^b B} {A [#] BC}	{B ^b BC [#] }	{ED [#] C}	{G [#] AD}
Flutes and Clarinets	{C [#] D} {DE ^b } {EF} {AB ^b }	{BF} {CF [#] } {C [#] G}	{C [#] DE ^b }	{AB ^b C}	{F [#] GB ^b } {EFG [#] }	{C [#] DG} {FEB}
Voice	{AB ^b }				{B ^b AF [#] }	

In the chord-types, phrase 14 contains eleven members of [01] (all except {CC[#]}) and five [06]s (all except {EB^b}). In the trichord-types, seven members of [012], two members of [013], four members of [014], and three members of [016] occur in phrase 14.

Phrase 15 (mm. 132–138)

The strings' rhythms consist of the alternation between the duplet and triplet, of which are delayed by the sixteenth-rest. The strings play four trichords with the articulation of *pizz*, using the row RI₉. On the other hand, the vocal line sustains one pitch b^b_4 , which is the last order of P_e with the articulation of *tenut* and the dynamics of *pp*.

Example 4.26 Phrase 15 (mm. 132–138)

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Table 4.26 Dyad and Trichord Types in Phrase 15

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{E ^b E} {FF [#] } {GG [#] } {G [#] A} {B ^b B}	{C-F [#] }	{GG [#] A}	{EE ^b C [#] }	{B ^b BD}	{F [#] FC}

The length of phrase 15 returns to a 7-measure structure (mm. 132–8) containing a 4 + 3 structure based on the strings' appearance and disappearance. The orchestration is small consisting of the violin viola, and voice. The dynamics continue the *ppp* from the end of the phrase 14 to the end of movement with the vocal's dynamics, *piu pp*.

All of Three Phrases (Sub-Section 8)

Rhythm

Example 4.27 Composite Rhythm in Sub-Section 8

The musical notation for Example 4.27 consists of five staves. The first four staves show rhythmic patterns with annotations: 121 (5:2), 124 (5:2, 5:3, 5:2), 127 (5:3), and 130 (5:3, 5:3). The fifth staff starts at 134 and shows a triplet rhythm. Brackets and the number 5 are used to group notes in the first four staves, and a bracket with a 3 is used for the triplet in the fifth staff.

Throughout sub-section 8, the quintuplet and the alternation between duplet and triplet are continuous; the quintuplet occurs in phrases 13 and 14 and the alternation of duplet and triplet happens in phrases 13 and 15. Thus, two simultaneously occurring rhythmic patterns, the quintuplet and the alternation in phrase 13 become a less complex pattern, the quintuplet with the triplet rhythm in

phrase 14 and the alternation of duplet and triplet in phrase 15. The rhythmic pattern of alternation between duplet and triplet (phrase 15) after the quintuplet rhythm (phrase 14) shows the rhythmic release by subtraction ($5 = 2 + 3$). Example 4.27 displays the composite rhythm in sub-section 8. The dynamics also support this change to a simpler rhythmic pattern by getting softer, from *p* (phrase 13) to *ppp* (phrases 14–15).

Texture

Two textures, vertical and horizontal, are apparent in sub-section 8 with the occurrence of inversion. First, the horizontal texture has the quintuplet rhythm forming in two different ways: the single line using the row's pitches and the two instrumental lines using [012] partitions. Phrases 13 and 14 contain those two textures. Second, the vertical texture has two different chords, the trichord and tetrachord. In phrases 13 and 14, a texture inversion occurs between the strings and the winds.

Along with the texture inversion, the [012] partitions show a retrograde relation in orchestration. In phrase 13, the highest and lowest instruments (the piccolo and bass clarinet) form the first two [012]s (m.125), the middle and lowest instruments (clarinet in B^b and bass clarinet) create the second two [012]s (m.126), and the middle and highest instruments (clarinet in B^b and piccolo clarinet) form the third (m. 127). This relation is reversed in phrase 14: the middle and highest instruments (the viola and violin) form the first two [012]s (m. 129), the middle and

lowest instruments (the viola and cello) provide the second (m. 130), and the highest and lowest instruments (the cello and violin) create the third (m. 131).

This retrograde situation is further supported by the rows used in forming the tetrachords between phrases 13 and 14 — RI_t in phrase 13 and I_3 in phrase 14. The texture inversions between tetrachords and the [012] partition, the [012] partition's retrograde orchestration, and the retrograde relation in rows used are all techniques to express the text (which will be discussed later).

Form (Phrase Length)

The length of phrases 13–15 shows a 7-4-7 structure: the 7-measure structure (4 + 3) in phrase 13, the 4-measure structure (1 + 3) in phrase 14, and a 7-measure structure (4 + 3) in phrase 15. While the 3-measure structure is continued in three phrases 13–15, the 4-measure structure contracts to 1-measure and then returns to the 4-measure structure. The number three consistently plays a role in the phrase structure's added and subtracted measures as well as being a continuous unit of phrase structure.

The vocal line connects these divisions of three phrases playing one row, P_e , through sub-section 8 and overlaps the boundaries between phrases 13 and 14, and 14 and 15. The order number 7 is sustained between phrases 13 and 14 (mm. 127–8) and the order number 9 is repeated and sustained between phrases 14 and 15 (mm. 131–132). This overlapping phrase strongly addresses the meaning of the text in sub-section 8. The relation between text and overlapping phrase will be dealt with later.

Pitch and Chord-Types

As shown in Tables 4.27a-4.27g, various members of chord-types occur in all of sub-section 8. In the dyad-types, all twelve members of [01] occur: eleven members in phrases 13 and 14 and five members in phrase 15. The {B^bB} in phrase 14 has a semitone relation in developed sonority.

All six members of [06] occur in sub-section 8: four in phrase 13, five in phrase 14, and one in phrase 15. The {E^bA} and {FB} occurred in phrase 14 contain the semitone development from the {EB^b} in phrase 13.

Table 4.27a [01] Dyad Type in Sub-Section 8

	Phrase 13	Phrase 14	Phrase 15	All
{CC [#] }	✓			✓
{C [#] D}	✓	✓		✓
{DD [#] }	✓	✓		✓
{D [#] E}	✓	✓	✓	✓
{EF}	✓	✓		✓
{FF [#] }	✓	✓	✓	✓
{F [#] G}	✓	✓		✓
{GG [#] }	✓	✓	✓	✓
{G [#] A}	✓	✓	✓	✓
{AB ^b }	✓	✓		✓
{B ^b B}		✓	✓	✓
{BC}	✓	✓		✓

Table 4.27b [06] Dyad Type in Sub-Section 8

	Phrase 13	Phrase 14	Phrase 15	All
{CF [#] }	✓	✓	✓	✓
{C [#] G}	✓	✓		✓
{DG [#] }	✓	✓		✓
{E ^b A}		✓		✓
{EB ^b }	✓			✓
{FB}		✓		✓

Table 4.27c [012] Trichord Type in Sub-Section 8

	Phrase 13	Phrase 14	Phrase 15	All
{CC [#] D}	✓			✓
{C [#] DE ^b }		✓		✓
{DE ^b E}	✓			✓
{E ^b EF}	✓	✓		✓
{EFF [#] }		✓		✓
{FF [#] G}	✓	✓		✓
{F [#] GG [#] }	✓			✓
{GG [#] A}		✓	✓	✓
{G [#] AB ^b }	✓			✓
{AB ^b B}		✓		✓
{B ^b BC}		✓		✓
{BCC [#] }	✓			✓

Table 4.27d [013] Trichord Type in Sub-Section 8

	Phrase 13	Phrase 14	Phrase 15	All
{CC [#] E ^b }				
{C [#] DE}	✓			✓
{DE ^b F}				
{E ^b EF [#] }				
{EFG}	✓			✓
{FF [#] G [#] }				
{F [#] GA}				
{GG [#] B ^b }				
{G [#] AB}	✓			✓
{AB ^b C}		✓		✓
{B ^b BC [#] }		✓		✓
{BCD}				
{CBA}				
{C [#] CB ^b }	✓			✓
{DCB}				
{E ^b DC}				
{EE ^b C [#] }			✓	✓
{FED}				
{F [#] FE ^b }				
{GF [#] E}				
{G [#] GF}				
{AG [#] F [#] }				
{B ^b AG}				
{BB ^b G [#] }				

Table 4.27e [014] Trichord Type in Sub-Section 8

	Phrase 13	Phrase 14	Phrase 15	Al
{CC [#] E}				
{C [#] DF}				
{DE ^b F [#] }				
{E ^b EG}	✓			✓
{EFG [#] }		✓		✓
{FF [#] A}				
{F [#] GB ^b }		✓		✓
{GA ^b B}	✓			✓
{G [#] AC}				
{AB ^b C [#] }				
{B ^b BD}			✓	✓
{BCE ^b }	✓			
{CBG [#] }				
{C [#] CA}				
{DC [#] B ^b }	✓			✓
{E ^b DB}				
{EE ^b C}		✓		✓
{FEC [#] }	✓			✓
{F [#] FD}				
{GF [#] E ^b }				
{G [#] GE}				
{AG [#] F}				
{B ^b AF [#] }				
{BB ^b G}				

Table 4.27f [016] Trichord Type in Sub-Section 8

	Phrase 13	Phrase 14	Phrase 15	All
{CC [#] F [#] }				
{C [#] DG}		V		V
{DE ^b G [#] }				
{E ^b EA}				
{EFB ^b }				
{FF [#] B}				
{F [#] GC}				
{GG [#] C [#] }				
{G [#] AD}	V	V		V
{AB ^b D [#] }				
{B ^b BE}				
{BCF}				
{CBF [#] }	V			V
{C [#] CG}	V			V
{DC [#] G [#] }				
{E ^b DA}				
{EE ^b B ^b }				
{FEB}		V		V
{F [#] FC}			V	V
{GF [#] C [#] }	V			V
{G [#] GD}				
{AG [#] E ^b }				
{B ^b AE}				
{BB ^b F}				

In addition, there are all twelve members of [012] trichord-type, seven members of [013], ten members of [014], and six members of [016] through sub-section 8. In the [012] type, after seven members in phrase 13, five members occurred in phrase 14 keep the semitone relation from the members in phrase 15. In the [013] type, there are four members in phrase 13, two members in phrase 14 and one in phrase 15. Two members in phrase 14 have a semitone relation in each other as well as show the semitone development from the {G[#]AB} occurred in phrase 14.

In the [014] type, all three members in phrase 14 have a semitone relation from the members in phrase 13; one member {B^bBD} in phrase 15 is a semitone below the {BCE^b} in phrase 13. In the [016], the {F[#]FC} occurred in phrase 15 is a semitone above and below the {FEB} and {GF[#]C[#]} in phrases 13 and 14, respectively. The semitone relation appears between phrases 13 and 14, between phrases 14 and 15 even between phrases 13 and 15.

All of Three Sub-Sections (Section A')

Rhythm

The three sub-sections have no common rhythmic pattern. However, the rhythmic patterns are interconnected. The rhythm of the sub-section 6 is the most complex containing the triplet, duple, quintuplet, and septuplet. Sub-section 7 has a simpler rhythmic pattern than sub-section 6, due to the disappearance of the septuplet. Finally, sub-section 8 has a regular alternation between duplet and triplet based on the quintuplet rhythm. The irregular rhythmic pattern becomes more regular in sub-section 8. Furthermore, sub-section 8, itself, becomes simpler in its rhythmic pattern from the alternation of duplet and triplet with the quintuplet (phrase 13) to the alternation of duplet and triplet without the quintuplet rhythm (phrase 15).

Texture, Dynamics, and Changes of Meter and Tempo

The texture of the beginning of section A' is thin, two flutes' melodies and the vocal line. Its texture gets thicker by adding the strings and clarinets in the end of

sub-section 6, where all instruments are employed remaining in sub-section 7. Finally, sub-section 8 returns to the thin texture; the strings and a few woodwind instruments accompany the vocal line in the beginning of sub-section 8 (phrase 13) and the single vocal line remains at the end of sub-section 8 (phrase 15). This arch form of texture (thin-thick-thin) is enhanced by the dynamics which also form an arch; the dynamics start *ppp* in sub-section 6. After reaching *ff* in the end of sub-section 6, they return to *pp* at the end of sub-section 8. The soft dynamics correspond to the thin texture and the strong dynamics accompany the thick texture. The change of meter and tempo has deep relation to the changes of dynamics and texture; lots of meter changes and tempo changes (sub-section 6) form the thick texture and strong dynamics and no tempo and no meter changes (sub-section 8) accompany the simpler texture and soft dynamics. The changes and interconnection between texture and dynamics are one of techniques to express text, which will be discussed later.

Form

The division of three sub-sections within section A' is based on the row used, texture (trichords and tetrachords), the meter and tempo changes, and melody as shown in the above observations. The phrase structures in sub-sections 6, 7, and 8 are $7 + 7 + 18$ ($7 + 4 + 7$). Sub-section 8 has an extended phrase structure based on the 7-measure configuration. Basically, the phrase unit in section A' is seven measures; the 7-measure phrasing length in sub-sections 6 and 7 does not break into any smaller units based on the texture, but sub-section 8 contains further divisions of phrasing

structure, 7 (4+3) + 4 (1+3) + 7 (4+3). Within the extended phrase length in sub-section 8, the three divided phrases show a contraction in the basic phrase's length. The unbreaking 7-measure phrases length in sub-sections 6 and 7 and breaking phrase length in sub-section 8 are deeply related to the text, which will be dealt with later.

In spite of the clear division into three sub-sections, the vocal line combines these three sub-sections into one section by overlapping with the phrasing structure. The sustained pitch e^b_5 between sub-sections 6 and 7 and the held pitches f_4 and e_4 between sub-sections 7 and 8 create continuity between sub-sections. These overlapped phrasing structures also happen within sub-section 8, between phrases 13 and 14, and 14 and 15 as I mentioned in discussing sub-section 8. In section A', the vocal line plays a role in the formation of the overlapping phrase boundaries, which are a way of depicting the text.

Chord-Types

All twelve members of [01] and six members of [06] occur in section A'. As shown in Tables 4.28a and 4.28b, the eleven members in sub-sections 6 and 7 respectively become the occurrence of twelve members in sub-section 8. Four members of [06] in sub-section 6 and three [06]s in sub-section 7 achieve all six members in sub-section 8. The simultaneous occurrence of invariance and axes in two inversions emphasizes the two dyad-types. In addition to that, the vocal line's repeated pitches and long duration are for emphasizing [01] and [06].

Table 4.28a [01] Dyad Type in Section A'

	Sub-Section 6	Sub-Section 7	Sub-Section 8	All
{CC [#] }		✓	✓	✓
{C [#] D}	✓	✓	✓	✓
{DD [#] }	✓	✓	✓	✓
{D [#] E}	✓	✓	✓	✓
{EF}	✓	✓	✓	✓
{FF [#] }	✓		✓	✓
{F [#] G}	✓	✓	✓	✓
{GG [#] }	✓		✓	✓
{G [#] A}	✓	✓	✓	✓
{AB ^b }	✓	✓	✓	✓
{B ^b B}	✓	✓	✓	✓
{BC}	✓	✓	✓	✓

Table 4.28b [06] Dyad Type in Section A'

	Sub-Section 6	Sub-Section 7	Sub-Section 8	All
{CF [#] }	✓		✓	✓
{C [#] G}	✓	✓	✓	✓
{DG [#] }		✓	✓	✓
{E ^b A}			✓	✓
{EB ^b }	✓		✓	✓
{FB}	✓	✓	✓	✓

Table 4.28c [012] Trichord Type in Section A'

	Sub-Section 6	Sub-Section 7	Sub-Section 8	All
{CC [#] D}		✓	✓	✓
{C [#] DE ^b }	✓	✓	✓	✓
{DE ^b E}			✓	✓
{E ^b EF}	✓	✓	✓	✓
{EFF [#] }			✓	✓
{FF [#] G}			✓	✓
{F [#] GG [#] }	✓		✓	✓
{GG [#] A}			✓	✓
{G [#] AB ^b }		✓	✓	✓
{AB ^b B}			✓	✓
{B ^b BC}	✓	✓	✓	✓
{BCC [#] }			✓	✓

Table 4.28d [013] Trichord Type in Section A'

	Sub-Section 6	Sub-Section 7	Sub-Section 8	All
{CC [#] E ^b }			✓	✓
{C [#] DE}				
{DE ^b F}				
{E ^b EF [#] }	✓			✓
{EFG}			✓	✓
{FF [#] G [#] }				
{F [#] GA}				
{GG [#] B ^b }				
{G [#] AB}	✓		✓	✓
{AB ^b C}			✓	✓
{B ^b BC [#] }			✓	✓
{BCD}	✓			✓
{CBA}		✓		✓
{C [#] CB ^b }			✓	✓
{DCB}				
{E ^b DC}	✓			✓
{EE ^b C [#] }			✓	✓
{FED}		✓		✓
{F [#] FE ^b }				
{GF [#] E}				
{G [#] GF}				
{AG [#] F ^{#v} }		✓		✓
{B ^b AG}	✓			✓
{BB ^b G [#] }				

Table 4.28e [014] Trichord Type in Section A'

	Sub-Section 6	Sub-Section 7	Sub-Section 8	All
{CC [#] E}				
{C [#] DF}				
{DE ^b F [#] }				
{E ^b EG}		✓	✓	✓
{EFG [#] }		✓	✓	✓
{FF [#] A}				
{F [#] GB ^b }		✓	✓	✓
{GA ^b B}			✓	✓
{G [#] AC}				
{AB ^b C [#] }				
{B ^b BD}			✓	✓
{BCE ^b }		✓	✓	✓
{CBG [#] }		✓		✓
{C [#] CA}				
{DC [#] B ^b }			✓	✓
{E ^b DB}				
{EE ^b C}			✓	✓
{FEC [#] }			✓	✓
{F [#] FD}				
{GF [#] E ^b }				
{G [#] GE}				
{AG [#] F}	✓			✓
{B ^b AF [#] }			✓	✓
{BB ^b G}				

Table 4.28f [016] Trichord Type in Section A'

	Sub-Section 6	Sub-Section 7	Sub-Section 8	All
{CC [#] F [#] }				
{C [#] DG}	✓		✓	✓
{DE ^b G [#] }				
{E ^b EA}				
{EFB ^b }	✓			✓
{FF [#] B}				
{F [#] GC}	✓			✓
{GG [#] C [#] }				
{G [#] AD}	✓		✓	✓
{AB ^b D [#] }				
{B ^b BE}				
{BCF}				
{CBF [#] }	✓		✓	✓
{C [#] CG}			✓	✓
{DC [#] G [#] }		✓		✓
{E ^b DA}				
{EE ^b B ^b }				
{FEB}			✓	✓
{F [#] FC}			✓	✓
{GF [#] C [#] }		✓	✓	✓
{G [#] GD}				
{AG [#] E ^b }				
{B ^b AE}				
{BB ^b F}		✓		✓

Table 4.28g Tetrachord Types in Section A'

	[0126]			[0147]			[0236]		
	6	7	8	6	7	8	6	7	8
Instruments		{AA ^b GD [#] } {F [#] FEC} {AA ^b GD [#] } {D ^b DE ^b G [#] }	{G [#] AB ^b D} {GA ^b AC [#] } {C [#] DE ^b G} ⁵⁷			{BCD [#] F [#] } {B ^b BDF} {EFA ^b B} ⁵⁸			{GFEC [#] } {CB ^b AF [#] }
Voice			{C [#] CBG}			{BAF [#] E ^b }			

⁵⁷ This tetrachord is made with the clarinet.

⁵⁸ This tetrachord is made with the clarinet.

In the case of the trichord-types, all twelve members of [012], fourteen members of [013], twelve members of [014], and eleven members of [016] occur through section A'. In the [012], except the $\{G^\#AB^b\}$, one added members $\{CC^\#D\}$ in sub-sections 7 has a semitone relation from sub-section 6' [012] and every added [012]s ($\{DE^bE\}$, $\{EFF^\#\}$, $\{FF^\#G\}$, $\{GG^\#A\}$, $\{AB^bB\}$, $\{BCC^\#\}$) in sub-section 8 also has a semitone relation from sub-section 7's [012].

In the [013] type, two new members ($\{CBA\}$, $\{AG^\#F^\#\}$) among three members in sub-section 7 have a semitone relation from the members in sub-section 6. Among six new added members in sub-section 8, two members ($\{C^\#CB^b\}$, $\{EE^bC^\#\}$) have a semitone relation from the $\{CBA\}$ and $\{FED\}$ in sub-section 7 and the other three ($\{EFG\}$, $\{AB^bC\}$, $\{B^bBC^\#\}$) show a semitone development from the members of $\{G^\#AB\}$, $\{BCD\}$, $\{EFG\}$ occurred in sub-section 6.

In the [014] type, three added members ($\{GA^bB\}$, $\{B^bBD\}$, $\{B^bAF^\#\}$) in sub-section 8 show a semitone development from the $\{F^\#GB^b\}$ and $\{BCE^b\}$ in sub-section 7 and from the $\{AG^\#F\}$ in sub-section 6. In the [016] type, all three added members ($\{C^\#CG\}$, $\{FEB\}$, $\{F^\#GC\}$) occurred in sub-section 8 have the semitone relation from the $\{GF^\#C^\#\}$ and $\{DC^\#G^\#\}$ in sub-section 7, while no semitone relation happens between sub-sections 6 and 7. Three trichord types, [013], [014], [016], do not form all members within section A', but the increased number of members in each trichord is obvious.

All of Three Sections (Sections A, B, and A')

As I analyzed above, this third movement is divided into three parts, ABA'. In spite of these divisions, parts of section B contains a similar musical surface to parts of section A or A', and section A' has the elements of section A as well as some of section B. On the other hand, there are some differences between sections A and A'. These sectional similarities and differences are for expressing the meaning of text effectively. Below observations explaining the similarities and differences between the three sections help us in understanding the formation of this piece.

The Relation between Sections A and A'

Similarity

The designation of sections A and A' is based on similarities of rhythm, melodies, texture, articulation, phrasing structure, and the pitches including the rows used and the chords (dyad, trichord, and tetrachord). The technique of creating similar sonorities is especially important in the consideration of how sections A and A' are divided.

Rhythm

The use of the quintuplet rhythm is the same in both sections, especially subsections 1 and 8 along with the alternation of triplet and duplet, creating 5:2 and 5:3. These rhythmic patterns provide regularity as shown in Examples 4.5 and 4.27. In addition to the 5:2 and 5:3 rhythmic patterns, the alternation of duplet and triplet with

beats delayed by the sixteenth rest also occurs in both sub-sections 1 and 8. This delayed beat occurs before the 5:2 and 5:3 rhythmic patterns in sub-section 1 and after 5:2 and 5:3 patterns in sub-section 8. Thus, the delayed alternation between the duplet and triplet anticipates and produces the quintuplet rhythm in the beginning of movement and releases the rhythmic pattern as the conclusion. This indicates the rhythmic development.

Texture

The three instrumental and vocal groups have three textures (chords, quintuplet rhythms, and melody line). (1) In the chordal texture, the trichord develops to the tetrachord in sub-sections 1 (phrases 3 and 4) and 8 (phrases 13 and 14). In addition, the texture inversion of chords occurs between phrases 3 and 4 and between phrases 13 and 14. Thus, the textures are held in common between phrases 3 and 13 and phrases 4 and 14. (2) The quintuplet rhythms have two types: single line and double lines. First, the flute or clarinet forms a single quintuplet in both sections A (phrases 3 and 4) and A' (phrase 13). Second, two instruments form the quintuplet rhythms: clarinets in phrases 3, 4, and 13 and the strings in phrases 4 and 14. Both textures (the chords and the quintuplet rhythm) occur in sub-sections 1 and 8 and have the same soft dynamics, *p* or *pp*.

Phrasing Structure

The measure structure of sub-section 1 (section A) is $4 + 4 + 7 + 10$, while that of entire section A' is $7 + 7 + (7 + 4 + 7)$. In sub-section 1, the unit of three measures is continuously added and extends the phrases from four measures to ten. The same length, three measures, is also used in section A', especially in sub-section 8: 7-measure ($4 + 3$) in phrase 13 contracts to 4-measure ($1 + 3$) and returns to 7-measure ($4 + 3$). Thus, the number of three plays a role as the unit for extending and contracting the length of the phrase. In addition, the number of sub-sections in each section is the same, three; section A has three sub-sections, 1, 2, and 3 and section A' also consists of three sub-sections, 6, 7, and 8. The use of the number three and its use on connection to phrase length is deeply related to the text.

Melody and Row

Two types of melody occur; the melody played by the instruments and the melody of the vocal line. (1) Inversional melodies occur in the instrumental line. In phrases 3 and 4 (sub-section 1), the rows P_e (flute) and I_0 (alto flute) sound one after another and in phrases 5 and 6 (sub-section 2), inversionally related two rows, I_1 and P_9 , one after another. The inversional melody repeats in the beginning of section A' with the P_3 and I_8 . While the inversional melodies in section A do play one after another: the melodies in section A' are formed simultaneously. This process maximizes the effect of inversion by its preparation through consecutive statements and then its more condensed simultaneous statement.

Table 4.29 Two Inversional Rows in Sections A and A'

Sub-Section 1 (Section A)

$$\begin{array}{cccccccccccc}
 P_e : & \underline{B} & \underline{C} & C^\# & G & F & E & D & \underline{G^\#} & \underline{D^\#} & F^\# & A & A^\# \\
 & | & | & & & | & & & & & | & & \\
 I_0 : & \underline{C} & \underline{B} & B^b & E & F^\# & G & A & \underline{E^b} & \underline{A^b} & F & D & C^\#
 \end{array}$$

Sub-Section 2 (Section A)

$$\begin{array}{cccccccccccc}
 I_1 : & D^b & C & \underline{B} & \underline{F} & \underline{G} & \underline{G^\#} & B^b & E & A & F^\# & \underline{E^b} & \underline{D} \\
 & & & | & | & & & & & & & & \\
 P_9 : & A & B^b & \underline{B} & \underline{F} & \underline{E^b} & \underline{D} & C & F^\# & D^b & E & \underline{G} & \underline{A^b}
 \end{array}$$

Sub-Section 6 (Section A')

$$\begin{array}{cccccccccccc}
 P_3 : & E^b & E & \underline{F} & \underline{B} & A & G^\# & \underline{F^\#} & \underline{C} & G & \underline{B^b} & \underline{C^\#} & D \\
 & & & | & | & & & | & | & & & & \\
 I_8 : & G^\# & G & \underline{F^\#} & \underline{C} & D & E^b & \underline{F} & \underline{B} & E & \underline{C^\#} & \underline{B^b} & A
 \end{array}$$

These three inversional melodies have another common element with respect to invariance and axis. As shown in Table 4.29, the two rows P_e and I_0 in sub-section 1 have two axes (marked vertical line), B-C and F-F[#], and two invariances (marked underline), B-C and E^b-A^b. The rows I_1 and P_9 in sub-section 2 have one axis (B and F) and three invariants, B-F, G-G[#], and D-E^b. In each pair, one of the axes is also a part of the invariants—B-C in sub-section 1 and B-F in sub-section 2. In addition, they occupy the same order positions.

On the other hand, the two rows P_3 and I_8 in section A' have two axes (F-F[#] and B-C) and three invariants (F-B, F[#]-C, C[#]-B^b). Unlike the inversional rows used in

section A, the invariance and axis do not share the same members. However, two axes of $F-F^\sharp$ and B-C and two of the three invariants (F-B and $F^\sharp-C$) have some connection sharing the same constituent pitches. In addition to that, the positions of the two invariances, F-B and $F^\sharp-C$, exchange with each other; F-B occupies order numbers 2–3 and $F^\sharp-C$ are in order numbers 6–7 in the row P_3 and $F^\sharp-C$ in order numbers 2–3 and F-B in order numbers 6–7 in the row I_8 . The exchanging positions of invariance between two rows and exchangeable constituent pitches between axis ($F-F^\sharp$, B-C) and invariants (F-B, $F^\sharp-C$) are one of the techniques for expressing the simultaneous inversionsal melodies effectively. Since the inversionsal melodies in section A do not occur simultaneously, the same consisting of pitches of axis and invariants are the best ways to emphasize the inversionsal relationship horizontally. However, in section A', the different technique of exchanging not only the positions but also the constituent pitches between axis and invariance is the best way to emphasize the simultaneous inversionsal melodies.

(2) The vocal melodies have common thing, the row being used. Section A has one row P_t and section A' has three rows, P_t , I_3 , P_e . The employment of the same row P_t , in the beginning of sections A and A' strongly suggests this sectional division. The different technique of developing the same row in each section will be dealt with in the differences between sections A and A'.

Difference

On the other hand, there are some differences between sections A and A' regarding the rhythm, texture, the length of the phrase, and articulation.

Rhythm

The rhythmic development is different between the two sections: section A displays regularity in process of rhythmic development. However, section A' has an irregularity in its use of rhythmic patterns, especially in sub-sections 6 and 7. The irregularity changes to regularity in sub-section 8 from the quintuplet to the alternation of duplet and triplet.

Texture

Section A contains two textures, the combination of the vertical chords with the quintuplet rhythm (sub-sections 1 and 3) and the horizontal melodies (sub-section 2). The texture of sub-section 2 does not occur in section A', which contains only the texture of sub-sections 1 and 3. The texture of sub-sections 6 and 7 are closely related to section B, which will be discussed under similarities between section A (A') and B.

Phrasing Structure

The phrasing structure is different between sections A and A' in spite of having same 3-measure added structure. In section A, the three sub-sections have different phrasing units; 4 + 4 + 7 (4 + 3) + 10 (4 + 3 + 3) in sub-section 1, 6 (4 + 2) +

8 (4 + 2 + 2) structure in sub-section 2, and a 5 + 3 structure in sub-section 3. The 4-measure unit in sub-section 1 extends to a 5-measure unit in sub-section 3 and the addition of a 3-measure structure in sub-section 1 contracts to a 2-measure addition in sub-section 2 and then returns to a 3-measure addition in sub-section 3. Thus, 7-measure structure (4 + 3) in sub-section 1 extends to an 8-measure structure (5 + 3) in sub-section 3.

However, the three sub-sections of section A' have the same phrasing structure, $7 + 7 + 18 (7 (4 + 3) + 4 (1 + 3) + 7(4 + 3))$. The 7-measure structure in sub-sections 6 and 7 does not divide into any sub-structure. But sub-section 8 contains the contraction from a 7-measure to a 4-measure structure rather than the extension as in section A.

Vocal Line

The employment of the same row P_t in sub-sections 2 (section A) and 6 (section A') shows different features, due to the different rhythmic patterns and the technique of dealing with the rows. In sub-section 2, the vocal line consists of the alternation between duplet and triplet and plays all twelve pitches completely. Sub-section 6 has duplet and septuplet rhythms without the triplet rhythm and there are lots of repetitions in the vocal line in using the first hexachord (order numbers 0–5).

The Relation between Sections B and A (A')

Similarity

In spite of the sectional division A (A') and B, the sections contain some common musical surfaces, especially between sections B (sub-sections 4 and 5) and A' (sub-section 7).

Rhythm

The irregular rhythmic development is held in common. In this irregularity, the same characteristics exist—the alternation of duplet and triplet and the quintuplet rhythm produced by the sum ($2 + 3 = 5$). In section A' (A), the rhythmic development (alternation of duplet and triplet relating to the quintuplet rhythm) occurs vertically with simultaneous use of quintuplet and duplet or triplet creating 5:2 and 5:3. However, these simultaneous rhythmic patterns, 5:2 or 5:3, do not happen in sub-sections 4 and 5 (section B) or in sub-section 7. These sub-sections' rhythmic patterns just show the alternating duplet, triplet, and the quintuplet rhythm, which all proceed horizontally. Lots of meter change occurs between sub-sections 4 and 5 (section B) and sub-sections 6 and 7 (section A').

Texture and Row

The continuous trichords are the same in section B and sub-section 7 (section A'). In section B, each instrumental group makes four vertical trichords and plays them one after another. These alternating trichords reach into the higher register,

which is accompanied by decreasing dynamics. In section A', these alternating trichords also occur especially between the strings and clarinets. The articulation shows the same dynamic trend, *decrescendo*, starting loud as *ff* or *sf* and ending soft as *pp* and *p*. The row used in the voice is exactly the same, I₂ in both section B and sub-section 7 (section A'), although it uses different techniques to play the pitches.

Difference

The techniques of playing trichords in both sections (section B and sub-section 7) are quite different. In section B, after one instrumental group plays four trichords, the next instrumental group plays four trichords. The simultaneous occurrence of two different trichord forms hexachords. However, in the beginning of sub-section 7, two instrumental groups play the same notes and thus double the trichords rather than producing hexachords.

This different technique of forming trichords produces different rhythmic patterns; the continuous trichords in section B have a getting shorter rhythmic pattern, while those in sub-section 7 (section A') get longer in their rhythmic pattern. The longer rhythmic pattern in sub-section 7 is for the thick texture to express the text as well as for preparing the boundary with sub-section 8, which starts with the short rhythmic pattern. In the end of section B, the shortening rhythmic patterns prepare for the rhythm of the beginning of section A', starting with long durations in its rhythmic pattern.

Phrasing Structure

Table 4.30 Phrasing Structure in the Third Movement

Section	Sub-Section	Phrase	Phrase Structure	Phrasing Unit
A	1	1	4	4, 3 (7)
		2	4	
		3	4 + 3	
		4	4 + 3 + 3	
	2	5	4 + 2	4, 2
		6	4 + 2 + 2	
	3	7	5	5, 3 (8)
		8	3	
B	4	9	9, 2	
	5	10		
A'	6	11	7	7
	7	12	7	7
	8	13	4 + 3	4(1), 3
		14	1 + 3	
		15	4 + 3	

According to the sectional divisions, the phrasing structure is different, but it is developed based on the previous structures like the rhythmic patterns. For the expansion of 4 + 3 structure to 5 + 3 within section A, each phrase within sub-section continuously expands its phrase length by the addition of measures like 4 + 3 + 3 in phrase 4 (the end of sub-section 1) and 4 + 2 + 2 in phrase 6 (the end of sub-section 2). The expansion from seven measures (4 + 3) in sub-section 1 to eight measures (5 + 3) in sub-section 3 results in nine measures in section B. Section B has a 9 + 2 phrasing structure. Thus the addition of 2-measure structure also happens in section B. In section A', the measure structures returns to seven at the beginning creating a strong similarity to section A. The 7-measure structure remains through sub-sections 6 and 7 (the beginning of section A') and breaks into 4 + 3 structure in sub-section 8.

As a result, the phrasing structure continuously expands from seven and eight measures length in section A to a nine bar structure in section B, and finally to an eighteen measure structure in sub-section 15 of section A'. Furthermore, the added 2-measure and 3-measure structure continuously employ in expanded phrasing structure.

One of the significant things in this piece is the use of lines overlapping phrase boundaries and using sustained notes between sections, between the sub-sections, and between the phrases. Between sections B and A', the bass clarinet plays a sustained note in spite of the change of section (between section A and B, the sectional division is made clear by *corta* (,) among other things). Within section A, overlapping happens in between sub-sections and phrases. In between sub-sections 1 and 2, the violin plays over the phrase boundary and the alto flute plays the same role in between sub-sections 2 and 3. Within section B, the flute overlaps the phrase between sub-sections 4 and 5. In section A' the voice plays an overlapping phrase between sub-sections 6 and 7 and between sub-sections 7 and 8. Thus, all instruments and vocal line participate in the occurrence of overlapping between phrases, sub-sections, or sections. This implies that all instrumental and vocal lines utilize this technique to express the text.

Inversional Relation

The continuous inversional melodies are important in shaping and developing the form. The clarinet's [012] partitions in sub-section 1, the flutes' two inversional

melodies in sub-section 2, and the strings' [012] partitions in sub-section 3 all show I_4 relationship. The simultaneous two flutes' melodies at the beginning of section A' show the I_4 relation. Thus, individual melodies creating inversive relation, I_4 , in section A develop to simultaneous melodies forming I_4 in section A'.

Section B demonstrates a similar relation in the rows used: retrograde-inversion forms (RI_4, RI_8, RI_e, RI_3) in sub-section 4 and inversion form (I_3, I_e, I_5, I_2) in sub-section 5.

Chord-Types

The repeated notes in the rows are one of composer's main techniques of manipulating the row; through this technique along with the invariants and axes between two inversive rows and the phrasing mark, Dallapiccola consistently creates certain sonorities: dyad-types ([01] and [06]) and trichord-types ([012], [013], [014], [016]). Throughout the entire piece, all members of [01] and [06] occur, especially in each section. In the case of [01], the three instrumental groups play all members of [01]s, but each instrument uses a different technique to complete all twelve [01]s. The strings form all members [01] in sub-section 1 (section A) and section A' (throughout sub-sections 6–8) and the clarinets also provide twelve [01]s in sub-section 1 (section A) and sub-section 8 (section A'); the flutes create twelve [01]s through section A. While the flutes play all members gradually through section A (sub-sections 1–3), the clarinets provide twelve [01]s quickly within sub-sections 1 and 8. The strings form twelve [01]s using both techniques, quickly creating [01]s in

sub-section 1 and gradually providing [01]s through section A' (sub-sections 6-8). In total, section A contains three sets of twelve [01]s through three different instrumental groups and section A' has two sets of twelve [01]s formed through the strings and clarinets. Table 4.31a shows the process of [01] formation.

In section B, all members of [01] appear through all instrumental and vocal lines. Thus, the technique of providing twelve [01]s changes from horizontal in sections A and A' to vertical in section B. As the result, the formation of all members of [01] shows the sectional division between sections A and A', and B through the vertical and horizontal formations.

In case of [06] dyad-type, there is a different technique of introducing all members from those used in the creation of [01] type. The flutes play six members of [06] in section A (through sub-sections 1–3), while the strings and clarinets provide all members of [06] through the entire piece; the strings and clarinets complete six [06]s in the beginning of section A' (sub-section 6). The flutes create all members of [06] abruptly in sub-section 1, while the strings and clarinets form six [06]s gradually through sections A, B and A'. This technique is the opposite of the procedure introducing the [01] dyad-type. Thus, the procedure of introducing dyad-types between [01] and [06] is both similar and different. Table 4.31b shows the process of the formation of [06] type.

Among the trichords, only the [012] trichord-type contains all members in the entire piece. The strings form all [012]s gradually through the whole piece, while the clarinets play all [012] trichord-types within sub-section 1. This shows the contraction

and expansion of what we observe dyad-types of [01] and [06] above. The clarinet's [012] formation in sub-section 1 closely relates to the creation of [01] type in sub-section 1's strings and clarinets, since those dyads are created in a short time. And the strings' [012] formation through the entire piece uses the same technique to introduce the [06] in the clarinets and the strings lines through the whole piece. The flute plays only eight members of [012] ($\{C^\#DE^b\}$, $\{DE^bE\}$, $\{E^bEF\}$, $\{F^\#GG^\#\}$, $\{G^\#AB^b\}$, $\{AB^bB\}$, $\{B^bBC\}$, $\{BCC^\#\}$) and the vocal line plays three members ($\{C^\#DE^b\}$, $\{B^bBC\}$, $\{BCC^\#\}$) through the piece. In addition, sections A and A' contain all twelve [012]s, while section B has only seven members ($\{CC^\#D\}$, $\{C^\#DE^b\}$, $\{DE^bE\}$, $\{EFF^\#\}$, $\{F^\#GG^\#\}$, $\{AB^bB\}$, $\{B^bBC\}$) (See Table 4.31d).

In the [013] trichord-type, twenty-two members occur through the movement: fourteen members in section A, six members in section B, and thirteen members in section A'. After the occurrence of fourteen members in section A, every newly added member, except the $\{C^\#CB^b\}$ and $\{E^bDC\}$, has a semitone relation from the previous sections' [013]s (Tables 4.32e-f). In section B, the $\{F^\#FE^b\}$ is a semitone above and below the $\{FED\}$ and $\{GF^\#E\}$ occurred in section A and the $\{G^\#AB\}$ is also a semitone above the $\{GA^bB^b\}$ formed in section A. In section A', the $\{B^bAG\}$ is a semitone above and below the $\{AG^\#F^\#\}$ and $\{BB^bG^\#\}$ formed in section B. Other new added members occurred in the middle or end of section is dealt within the section of comparing sub-sections.

In the case of [014], all members are not provided in this movement. Twelve members in section A, seven members in section B, and twelve members in section A' form twenty members throughout the movement. Except the $\{AB^bC^\#\}$, every newly added member in sections B and A' contains a semitone relation (See Tables 4.31g-h). In section B, the $\{EFA^b\}$ and $\{FF^\#A\}$ not only are related a semitone but also have a semitone development from the $\{E^bEG\}$ occurred in section A. In section A', the $\{F^\#GB^b\}$ is a semitone below the $\{GG^\#B\}$ occurred in section B, the $\{BCE^b\}$ is a semitone below the $\{CC^\#E\}$ occurred in section B, and the $\{CBA^b\}$ is a semitone below the $\{C^\#CA\}$ occurred in section A. The $\{DC^\#B^b\}$ is related a semitone with the $\{C^\#CA\}$ occurred in section A.

In the [016] type, twenty members occur: fifteen members in section A, eight members in section B, and eleven members in section A'. Except two $\{F^\#GC\}$ and $\{FEB\}$, all new members have a semitone relation (Tables 4.31i-j). The $\{DC^\#A^b\}$ occurred in section A' (sub-section 7) is related a semitone with the $\{E^bDA\}$ occurred in section B (sub-section 5).

Table 4.31a Formation of [01] Type based on Section

	Section A						
	Sub-Section 1			Sub-Section 2		Sub-Section 3	
	mm. 49–56	mm. 57–63	mm. 64–73	mm. 74–79	mm. 80–87	mm. 88–92	mm. 93–95
Strings	{C [#] D} {E ^b E} {FF [#] } {F [#] G}(2) {G [#] A}(2) {B ^b B}(2) {BC}	{CC [#] } {C [#] D}(2) {E ^b E} {FF [#] } {G [#] A} {B ^b B}	{CC [#] } {DE ^b } {EF}(2) {F [#] G} {GG [#] }(3) {AB ^b } {BC}(2)			{CC [#] } {C [#] D} {E ^b E}(2) {FF [#] } {F [#] G} {G [#] A}(2) {B ^b B}(2)	{CC [#] } {C [#] D} {E ^b E} {EF} {FF [#] } {F [#] G} {GG [#] } {AA [#] } {A [#] B} {BC}
Flutes		{CC [#] }(2) {EF} {G [#] A} {AA [#] } {BC}(2)	{C [#] D} {DE ^b } {F [#] G} {B ^b B}(2) {BC}(2)	{C [#] D} {DE ^b } {F [#] G} {B ^b B}(2) {BC}(2)	{DE ^b }(3) {GG [#] } {AA [#] }(2) {A [#] B}	{DE ^b } {E ^b E} {G [#] A} {AA [#] }	{CC [#] } {FF [#] }
Clarinets		{CC [#] } {C [#] D}(2) {DE ^b } {E ^b E} {EF} {F [#] G} {GG [#] }(2) {G [#] A} {AB ^b } {B ^b B}	{CC [#] }(2) {C [#] D}(2) {DE ^b }(2) {E ^b E}(2) {EF}(2) {FF [#] }(2) {F [#] G}(2) {GG [#] }(2) {G [#] A}(2) {AB ^b }(2) {B ^b B}(2) {BC}(2)			{DE ^b } {E ^b E} {G [#] A} {AA [#] }	
voice				{EE ^b } {A [#] B} {BC}	{E-E ^b } {G [#] A}		

	Section B		Section A'				
	Sub-Section 4	Sub-Section 5	Sub-Section 6	Sub-Section 7	Sub-Section 8		
	mm. 96–104	mm. 105–106	mm. 107–113	mm. 114–120	mm. 121–127	mm. 128–131	mm. 132–138
String	{C [#] D} {DE ^b } {E ^b E}	{CC [#] } {C [#] D} {DE ^b }	{C [#] D} {E ^b E}	{CC [#] } {C [#] D} {DE ^b }	{C [#] D}	{C [#] D} {DE ^b } {E ^b E}	{E ^b E}
	{FF [#] } {GG [#] }	{FF [#] } {GG [#] }	{FF [#] } {GG [#] }	{F [#] G}	{F [#] G}	{FF [#] } {F [#] G}	{FF [#] }
	{AB ^b } {B ^b B}	{G [#] A} {AB ^b } {B ^b B}	{G [#] A} {AB ^b } {B ^b B}	{G [#] A}	{G [#] A}	{G [#] A} {AB ^b } {B ^b B}	{G [#] A} {B ^b B}
			{BC}	{BC}	{BC}	{BC}	
Flute	{C [#] D} {DE ^b } {EF}		{DE ^b } {E ^b E}			{C [#] D}	
			{EF}				
			{FF [#] }	{F [#] G}			
	{AB ^b } {B ^b B}		{F [#] G}				
	{BC}		{GG [#] }	{G [#] A}			
			{G [#] A}	{AB ^b }			
			{BC}				
Clarinet	{C [#] D} {DE ^b }	{CC [#] } {DE ^b }		{C [#] D}	{CC [#] } {C [#] D}		
	{EF}	{EF}		{E ^b E}	{DE ^b } {E ^b E}	{DE ^b }	
	{F [#] G}	{FF [#] }		{EF}	{FF [#] }	{EF}	
	{GG [#] }	{GG [#] }		{F [#] G}	{F [#] G}		
	{AB ^b }			{G [#] A}	{GG [#] }		
	{BC}			{AB ^b }	{G [#] A}	{AB ^b }	
				{BC}	{B ^b B}		
					{BC}		
Voice	{C [#] D} {DE ^b } {E ^b E}	{E ^b E}	{E ^b E}	{C [#] D}	{CC [#] }		
	{EF}	{G [#] A}	{A [#] B}	{DE ^b }	{EF}	{AB ^b }	
	{F [#] G}			{BC}	{BC}		

Table 4.31b Formation of [06] Type based on Section

	Section A						
	Sub-Section 1			Sub-Section 2		Sub-Section 3	
	mm. 49–56	mm. 57–63	mm. 64–73	mm. 74–79	mm. 80–87	mm. 88–92	mm. 93–95
Strings (vertical)	{AE ^b } {DG [#] }	{E ^b A} {DG [#] } {C [#] G}	{BF} {B ^b E} {AE ^b } {DG [#] }			{BF} {DG [#] }	{BF} {DG [#] }
Flutes (horizontal)		{DG [#] } {C [#] G}	{B ^b E} {AE ^b }	{BF} {B ^b E}	{CF [#] } {BF}		{DG [#] }
Clarinet (vertical)		{C [#] G} {CF [#] } {BF}	{C [#] G} {CF [#] }				{DG [#] }
Voice (horizontal)				{CF [#] }	{C [#] G}		

Table 4.31b (continued)

	Section B		Section A'				
	Sub-Section 4	Sub-Section 5	Sub-Section 6	Sub-Section 7	Sub-Section 8		
	mm. 96–104	mm. 105–106	mm. 107–113	mm. 114–120	mm. 121–127	mm. 128–131	mm. 132–138
Strings	{C [#] G} {DG [#] }	{DG [#] } {BF}	{CF [#] } {BF} {EA [#] } {C [#] G}	{DA ^b } {BF} {C [#] G}	{DA ^b } {CF [#] } {C [#] G}	{DG [#] } {E ^b A} {CF [#] }	{CF [#] }
Flutes	{CF [#] }		{FB} {F [#] C}			{C [#] G} {CF [#] }	
Clarinets	{FB} {CF [#] }	{E ^b A}	{C [#] G} {CF [#] } {BF} {A [#] E}	{DA ^b } {C [#] G}	{C [#] G} {CF [#] } {EA [#] }	{FB}	
Voice	{C [#] G} {CF [#] } {DG [#] }	{BF}	{CF [#] }	{C [#] G}	{C [#] G} {DG [#] }		

Table 4.31c Formation of [012] Type based on Instruments

	Section A						
	Sub-Section 1			Sub-Section 2		Sub-Section 3	
	mm. 49–56	mm. 57–63	mm. 64–73	mm. 74–79	mm. 80–87	mm. 88–92	mm. 93–95
Strings	{B ^b BC} {FF [#] G}	{CC [#] D} {AB ^b B}	{EFF [#] } {F [#] GG [#] } {BCC [#] }			{CC [#] D} {FF [#] G}	{FF [#] G} {BCC [#] } {F [#] GG [#] } {CC [#] D} {AA [#] B} {E ^b EF}
Flutes		{BCC [#] }	{B ^b BC} {F [#] GG [#] }	{BCC [#] }	{AA [#] B}	{DD [#] E} {G [#] AB ^b }	{G [#] AB ^b }
Clarinets		{EFF [#] } {AB ^b B} {E ^b EF} {B ^b BC}	{EFF [#] } {BCC [#] } {FF [#] G} {G [#] AB ^b } {DE ^b E} {EE ^b F} {AB ^b B} {CC [#] D} {C [#] DE ^b } {GG [#] A} {B ^b BC}			{DD [#] E} {G [#] AB ^b }	
Voice				{A [#] BC}			

Table 4.31c (continued)

	Section B		Section A'				
	Sub-Section 4	Sub-Section 5	Sub-Section 6	Sub-Section 7	Sub-Section 8		
	mm. 96–104	mm. 105–106	mm. 107–113	mm. 114–120	mm. 121–127	mm. 128–131	mm. 131–138
Strings	{DE ^b E} {AB ^b B}	{CC [#] D} {AB ^b B}		{CC [#] D} {E ^b EF}	{E ^b EF} {G [#] AB ^b }	{C [#] DE ^b } {E ^b EF} {EFF [#] } {FF [#] G} {GG [#] A} {AB ^b B} {B ^b BC}	{GG [#] A}
Flutes	{C [#] DE ^b }		{D [#] EF}	{G [#] AB ^b }		{C [#] DE ^b }	
Clarinets	{C [#] DE ^b } {GG [#] A}	{EFF [#] }	{C [#] DE ^b } {F [#] GG [#] }	{E ^b EF} {G [#] AB ^b }	{CC [#] D} {DE ^b E} {FF [#] G} {F [#] GG [#] } {GG [#] A} {G [#] AB ^b } {BCC [#] }	{C [#] DE ^b }	
Voice			{B ^b BC}	{C [#] DE ^b } {B ^b BC}	{BCC [#] }		

Table 4.31d Formation of [012] Type based on Section

	Section A			Section B		Section A'			All Sections
	1	2	3	4	5	6	7	8	
{CC [#] D}	V		V		V		V		V
{C [#] DD [#] }	V			V	V	V	V	V	V
{DD [#] E}	V		V	V					V
{D [#] EF}	V		V			V	V	V	V
{EFF [#] }	V				V			V	V
{FF [#] G}	V		V					V	V
{F [#] GG [#] }	V		V	V		V		V	V
{GG [#] A}	V							V	V
{G [#] AB ^b }	V		V				V	V	V
{AB ^b B}	V	V	V	V	V			V	V
{B ^b BC}	V	V				V	V	V	V
{BCC [#] }	V	V	V					V	V

Table 4.31e Formation of [013] Type based on Instruments

	Section A						
	Sub-Section 1			Sub-Section 2		Sub-Section 3	
	mm. 49–56	mm. 57–63	mm. 64–73	mm. 74–79	mm. 80–87	mm. 88–92	mm. 93–95
Strings	{G [#] F [#] E} {B ^b BC [#] }	{AG [#] F [#] }	{BCD} {CC [#] E} {GG [#] A [#] }			{AG [#] F [#] } {B ^b BC [#] }	
Flutes		{AG [#] F [#] } {EFG} {FED}	{DE ^b F} {GF [#] E} {F [#] GA}	{A ^b GF} {GA ^b B ^b }	{DE ^b F} {E ^b DC}		
Clarinets							
Voice					{E ^b EF [#] }		

	Section B			Section A'			
	Sub-Section 4	Sub-Section 5	Sub-Section 6	Sub-Section 7	Sub-Section 8		
	mm. 96–104	mm. 105–106	mm. 107–113	mm. 114–120	mm. 121–127	mm. 128–131	mm. 131–138
Strings	{F [#] FE ^b } {BB ^b G [#] }	{F [#] FE ^b } {AA ^b F [#] }		{CBA} {AG [#] F [#] } {FED}	{EFG} {G [#] AB}	{B ^b BC [#] }	{EE ^b C [#] }
Flutes	{B ^b AG}		{G [#] AB} {D [#] DC}			{AB ^b C}	
Clarinets	{E ^b DC} {B ^b AG}	{C [#] CB ^b } {G [#] AB}	{E ^b DC} {BCD} {B ^b AG}	{FED} {CBA}	{C [#] CB ^b } {CC [#] E ^b } {G [#] AB}		
Voice		{G [#] AB}	{E ^b EF [#] }		{EFG}		

Table 4.31f Formation of [013] Type based on Section

	Section A			Section B		Section A'			All Sections
	1	2	3	4	5	6	7	8	
{CC [#] E ^b }	V							V	V
{C [#] DE}									
{DE ^b F}	V	V							V
{E ^b EF [#] }		V				V			V
{EFG}	V							V	V
{FF [#] A ^b }	V		V						V
{F [#] GA}	V								V
{GA ^b B ^b }	V	V							V
{G [#] AB}					V	V		V	V
{AB ^b C}								V	V
{B ^b BD ^b }	V		V					V	V
{BCD}	V					V			V
{CBA}							V		V
{C [#] CB ^b }					V			V	V
{DC [#] B}									
{E ^b DC}		V		V		V			V
{EE ^b C [#] }								V	V
{FED}	V						V		V
{F [#] FE ^b }				V	V				V
{GF [#] E}	V								V
{G [#] GF}		V							V
{AG [#] F [#] }	V		V		V		V		V
{B ^b AG}						V			V
{BB ^b G [#] }				V					V

Table 4.31g Formation of [014] Type based on Instruments

	Section A						
	Sub-Section 1			Sub-Section 2		Sub-Section 3	
	mm. 49–56	mm. 57–63	mm. 64–73	mm. 74–79	mm. 80–87	mm. 88–92	mm. 93–95
Strings	{C [#] DF} {EE ^b C}	{E ^b EC} {CC [#] E ^b }	{C [#] DF} {C [#] CA} {DE ^b F [#] } {FEC [#] } {GG [#] B} {A ^b GE} {B ^b AF [#] }			{E ^b EG} {EE ^b C}	
Flutes				{DE ^b F [#] }	{G [#] GE}		{CC [#] E}
Clarinets							{FF [#] A}
Voice					{AG [#] F}		

	Section B			Section A'			
	Sub-Section 4	Sub-Section 5	Sub-Section 6	Sub-Section 7	Sub-Section 8		
	mm. 96–104	mm. 105–106	mm. 107–113	mm. 114–120	mm. 121–127	mm. 128–131	mm. 131–138
Strings	{FF [#] A} {CC [#] E}	{CC [#] E} {E ^b EG}		{BCE ^b } {D [#] EG}	{DC [#] B ^b } {E ^b EG} {BCE ^b } {FEC [#] }	{ED [#] C}	{B ^b BD}
Flutes	{EFA ^b }			{F [#] GB ^b }		{B ^b AF [#] }	
Clarinets	{AB ^b C [#] } {EFG [#] }	{GG [#] B}	{AA ^b F}	{F [#] GB ^b } {BCE ^b }	{GG [#] B}		{F [#] GB ^b } {EFG [#] }
Voice	{EFG [#] } {ED [#] C}	{D [#] EG}		{CBG [#] } {EFG [#] }		{B ^b AF [#] }	

Table 4.31h Formation of [014] Type based on Section

	Section A			Section B		Section A'			All Sections
	1	2	3	4	5	6	7	8	
{CC [#] E}	V		V	V	V				V
{C [#] DF}	V								V
{DE ^b F [#] }	V	V							V
{E ^b EG}	V		V		V		V	V	V
{EFA ^b }				V	V		V	V	V
{FF [#] A}				V					V
{F [#] GB ^b }							V	V	V
{GG [#] B}	V				V				V
{G [#] AC}									
{AB ^b C [#] }				V					V
{B ^b BD}								V	V
{BCE ^b }							V	V	V
{CBA ^b }							V		V
{C [#] CA}	V								V
{DC [#] B ^b }								V	V
{E ^b DB}									
{EE ^b C}	V		V	V				V	V
{FEC [#] }	V							V	V
{F [#] FD}			V						V
{GF [#] E ^b }									
{A ^b GE}	V	V							V
{AA ^b F}		V				V			V
{B ^b AF [#] }	V							V	V
{BB ^b G}									

Table 4.31i Formation of [016] Type based on Instruments

	Section A						
	Sub-Section 1			Sub-Section 2		Sub-Section 3	
	mm. 49–56	mm. 57–63	mm. 64–73	mm. 74–79	mm. 80–87	mm. 88–92	mm. 93–95
Strings	{AG [#] E ^b } {G [#] AD}	{C [#] G} {AB ^b E ^b } {BB ^b F}	{C [#] CG} {E ^b DA} {EFB ^b } {G [#] GD} {AB ^b E ^b } {BCF}			{BB ^b F} {A ^b AD}	
Flutes		{C [#] CG} {DD [#] G [#] } {AG [#] E ^b }	{B ^b BE} {AG [#] E ^b } {DE ^b A}	{B ^b AE}	{C [#] F [#] }		
Clarinets							{AB ^b E ^b } {CBF [#] }
Voice				{CBF [#] }	{C [#] DG}		

	Section B			Section A'			
	Sub-Section 4	Sub-Section 5	Sub-Section 6	Sub-Section 7	Sub-Section 8		
	mm. 96–104	mm. 105–106	mm. 107–113	mm. 114–120	mm. 121–127	mm. 128–131	mm. 131–138
Strings	{C [#] CG} {G [#] GD}	{G [#] GD} {BB ^b F}	{C [#] DG}	{DC [#] G [#] } {BB ^b F} {GF [#] C [#] }	{GF [#] C [#] } {CBF [#] } {G [#] AD}	{G [#] AD}	{F [#] FC}
Flutes	{BCF}		{CBF [#] } {EFB} {F [#] GC}			{C [#] DG}	
Clarinets	{FEB} {CBF [#] }	{E ^b DA}	{C [#] DG} {A ^b AD}	{DC [#] G [#] } {GF [#] C [#] }	{G [#] AD}	{FEB}	{C [#] DG}
Voice	{GF [#] C [#] } {BCF [#] }	{BB ^b F}	{CBF [#] }		{C [#] CG}		

Table 4.31j Formation of [016] Type based on Section

	Section A			Section B		Section A'			All Sections
	1	2	3	4	5	6	7	8	
{CC [#] F [#] }		V							V
{C [#] DG}		V				V		V	V
{DE ^b G [#] }	V								V
{E ^b EA}									
{EFB ^b }	V					V			V
{FF [#] B}									
{F [#] GC}						V			V
{GG [#] C [#] }									
{G [#] AD}	V		V			V		V	V
{AB ^b E ^b }	V		V						V
{B ^b BE}	V								V
{BCF}	V				V				V
{CBF [#] }		V		V		V		V	V
{C [#] CG}	V		V	V				V	V
{DC [#] A ^b }							V		V
{E ^b DA}	V				V				V
{EE ^b B ^b }									
{FEB}				V				V	V
{F [#] FC}								V	V
{GF [#] C [#] }				V			V	V	V
{G [#] GD}	V			V	V				V
{AG [#] E ^b }	V								V
{B ^b AE}		V							V
{BB ^b F}	V		V		V		V		V

The Relation between Music and Text

The text addresses memories, which are compared to golden sand dunes. In the text, the wind slightly and constantly changes the golden sand dunes' shape. Like the process of reshaping sand dunes, time changes the shape of memory. Repetition could lead its shape to change gradually and then consequently produce a remembrance in one's mind that is not completely expressible. The process of creating such an indescribable memory, especially this reshaping by repetition over time, is presented in music. The poet assuredly presents different images of memories, while the music reflects these images differently in the musical surface through rhythm, texture, phrasing structure, rows used, and repeated chord types. The following observations show how these musical elements are involved with the text. It will be shown that the composer's intention was to use these very musical elements in the formation of this movement.

A memory is never formed by itself. Time is crucial in creating the memory. In addition to that, the memory never remains the same. Sometimes the intensity of memory can be vivid, but at other times it may be weak. The rhythmic development represents these characteristics: This alternation between duplet and triplet introduces the new rhythmic patterns such as the quintuplet and septuplet by the sum or subtraction of the previous rhythmic pattern and by the simultaneous use of two rhythmic patterns (5: 2 or 5: 3). Those patterns have the rhythmic regularity and irregularity, which are interconnected; regularity advances to irregularity and vice versa. The two rhythmic patterns above are enough to describe memory's

association—appearing and disappearing leading to variable degrees of remembrance and inexact recurrence as the memory is reshaped.

The interconnected phrasing structure also implies memory's associations. As shown in Table 4.30, the interrelated phrasing structure with the added unit of two or three strongly addresses the process of appearing and disappearing memory, which leads to change of memory. The frequent occurrence of overlapping phrases between sections, sub-sections, and phrases expresses continual changing of memory where different version can overlap, appearing and disappearing.

The constantly used sonorities, dyad-types ([01] and [06]) and trichord-types ([012], [013], [014], [016]), concretely represent the memory's appearance and disappearance. The sonorities repeat both vertically and horizontally changing their shapes through the members including new members with a semitone, which depict memory's reformation and memory's nature: the appearing memory by association and the gradual shifting of memory as time goes by.

The vocal line's used row clearly shows the reshaping memory. The same rows, P_t (section A) and I_3 (section B) repeat in section A' having same sonority but different rhythms. On the other hand, the instrumental line does not use the same row type, but shows the inversional relationship such as flutes' melodies in sections A and A', [012] partitions, and the row types consisting of RI type (sub-section 4) and I type (sub-section 5) in section B. This inversional relation containing a similar shape but different direction addresses the image of reformation. The texture also contains this inversional relation. Texture inversion between two instrumental groups frequently

happens through the piece. This texture inversion accompanies a change of dynamics and articulations. The same texture occurring with a different tone color is enough to present the memory's reformation. Containing the same elements but having slightly different shape expresses this process.

These individual elements representing text develop their shapes as the piece proceeds. In section A', sub-section 1 wonderfully prepares the appearance of the text in sub-section 2: The development of the rhythmic pattern to the quintuplet rhythm expresses the constantly changing sand dunes. In addition, the overlapping phrase between phrases 3 and 4 depicts the overlapping memory. The text of sub-section 2 matches to the first stanza. The remembrances keeping their shapes through repetition are depicted by the repeated pitches, which produce two sonorities, [01] and [06]. The regular rhythmic pattern (septuplet) suggests the constant attempt to remember and the inversional melodies within the septuplet depict the change of memory, similar in shape but opposite in direction. In addition, the group of five-notes containing repeated and new pitches also suggests the shifting recollection of remembrances. In spite of the absence of the vocal line in sub-section 3, a number of the musical elements can be seen as depicting the text, especially the image of golden sand dunes which are continually shifting. The change of chord type from the trichord to tetrachord with the change of entry beat and tone color (instrumentations and dynamics) describes this shifting.

While the vocal line sings all of section B, the instrumental lines maintain the same vertical trichord types as [012], [013], [014] and [016] (even though the order is

changed based on sub-section) as well as the same horizontal tetrachord types as [0257], [0126] and [0247] based on the tone color (instrumental) change. This strongly supports the text, depicting shifting sand dunes. Having the same trichord type in spite of shifting tone color is expressive of the text, 'where they are, they are, and they are where they were.' Consequently, the composer describes the poem metaphorically using the articulated trichords as golden sand-dunes and the change of the tone color as the wind. In addition, the formation of two types of hexachord in sub-section 4 depicts the overlapping golden sand dunes described in the text.

In section A', the text of sub-section 6 describes 'golden sand dunes permeate all.' In spite of being separated by stanza, occurring in the second and third, respectively, the words 'medanos de oro' (golden sand dunes) in the end of second stanza and 'lo' (they) in the beginning of third stanza carry the same meaning as well as the same sonorities. 'Medanos de oro' has the repeated sonorities [01] with the pitches $a_{3-b_3}^{\#}$ and $e_5-e_5^b$. Among two [01]s, the [01] $e_5-e_5^b$ duplicates in the expression, 'lo'. The same sonority, especially in the same members, depicts the two words. In addition, the employment of all instruments articulates the word 'all', resulting in a richer texture. Like the golden sand dunes, which fill out everything (analogy with a whole sea full of ineffable gold), memories also fill out everything. Therefore the composer wants to put all the instruments together to fill out the space.

The text of sub-section 7 talks of indescribable memories pervading someone's mind as gold (from the golden sand-dune) filled up the sea. As in the previous sections, the regular trichords are one of the ways to present memories.

Thus, the technique that all three instrumental groups play four types of trichords regularly is for representing the condition of fulfillment. The procedure of changing the trichords' tone color through the changes in dynamics, articulation, and instrumentation is to present the memory having variable shape of the same memories in present, past, and future. The use of the same row type by all instruments emphasizes the fixed memory with the strong dynamics. In sub-section 8, the wind, which is ever present and causes some variation, is represented by the same textures, the continual shifting of the trichord, quintuplet, and [012] partition used in each phrase but with different features such as different rhythms, instruments, articulations, and dynamics. Like the wind moves the golden sand dunes from one place to another, time also moves memories in our collection. Memories came from the past, are present now, and will still be in the future. In addition, to articulate the remembrances, which will disappear, the rhythm of the trichord in phrase 15 is delayed by the sixteenth beat. The extended phrase structure in sub-section 8 (7 + 4 + 7 rather than a single 7-measure structure) expresses the permanence in time shown in the image of the ever present wind.

Two words — golden sand-dunes and remembrances — having the same meaning, are located in the beginning and end of section A', respectively. The simultaneous inversionsal flute's melodies in the beginning of section A' represent the plural words. In addition, the trichords with the all instrumental employment and with the thicker texture of sub-section 7 correspond to the text, 'Lo llenan todo, mar total de oro (they permeate all, absolute sea)'. The employment of all instruments and the

thick texture with strong dynamics depict the idea of ‘premeate’. Actually, the end of sub-section 6 and most of sub-section 7 provide strong dynamics and thick texture in the third movement. This texture becomes thin due to disappearing instruments. Only two instruments, violin and viola, remain in the end of piece like when it started with the two flutes. These pairs of intertwined instruments present the pair of related image in the text, one for the dunes, the other for the memories. The third stanza, which matches to section A’, combines and transforms the previous images, just like previous remembrance blur and overlap. This textual relation shows in music of A’ where previous musical elements of sections A and B are replayed with some variation. Thus, section A’ contains the characters of section A as well as section B.

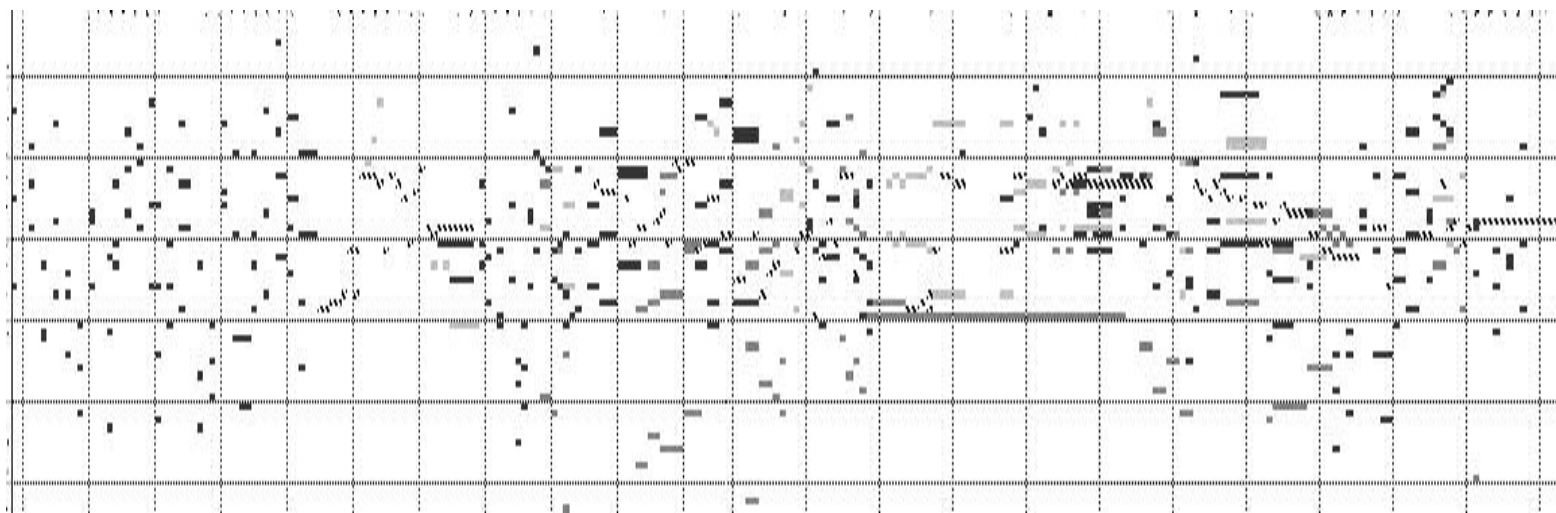
Pitch Range

Table 4.32 Pitch Range of the Third Movement

Section	Sub-Section	Pitch Range ⁵⁹		Section’s Pitch Range
		Instrumental line	Vocal line	
A	1	$f_2-a^b_6 (f^{\#}_4-g_4)$		Instrumental line: $g_1-a^b_6$ ($c^{\#}_4-d_4$) Vocal line: $b^b_3-f_5$ ($g_4-a^b_4$)
	2	$b^b_3-d_6 (c_5)$	$b^b_3-f_5 (g_4-a^b_4)$	
	3	$g_1-f_6 (c_4)$		
B	4	$a^b_1-f_6 (c_4-c^{\#}_4)$	$c_4-f_5 (g^{\#}_4-a_4)$	Instrumental line: $a^b_1-f_6$ ($c^{\#}_4-d_4$) Vocal line: $a_3-f_5 (g_4)$
	5	$b_2-f_6 (g^{\#}_4)$	$a_3-e_5 (f^{\#}_4-g_4)$	
A’	6	$a_3-f^{\#}_6 (c^{\#}_5-d_5)$	$b^b_3-e_5 (g_4)$	Instrumental line: $b_1-g^{\#}_6$ ($d_4-d^{\#}_4$) Vocal line: $b^b_3-e_5 (g_4)$
	7	$f_2-g^{\#}_6 (f^{\#}_4-g_4)$	$e_4-e^b_5 (a_4-b^b_4)$	
	8	$b_1-f_6 (d_4)$	$c_4-e_5 (a^b_4)$	

⁵⁹ The pitches in the parenthesis mean the center pitches.

Example 4.28 Pitch Graph of the Third Movement



As shown in Table 4.32 and Example 4.28, the pitch range of this third movement seems to spread wide without any climatic point. As Table 4.32 displayed, each section's pitch range is almost identical: $g_1-a^b_6$ in section A, $a^b_1-f_6$ in section B, and $b_1-g^{\#}_6$ in section A'. This similar pitch range produces the neighboring center pitch range: $c^{\#}_4-d_4$ in section A, $c^{\#}_4-d_4$ in section B, and $d-d^{\#}_4$ in section A'. In addition to that, the vocal line has the same center pitch range throughout the piece: $g_4-a^b_4$ in section A and g_4 in sections B and A'.

However, there is obvious change in pitch range within each section. In section A, the broad pitch range ($f_2-a^b_6$) in sub-section 1 reduces to a narrow pitch range ($b^b_3-d_6$) in sub-section 2, and then returns to the wide spread pitch range (g_1-a_6) in sub-section 3. Although having similar high pitch range in both sub-sections 1 and 3, sub-section 3 has a lower pitch range than sub-section 1. In returning to a broad pitch range in sub-section 3 from the narrow range in sub-section 2, the final sub-section carries an even broader range than sub-section 1. In section B, the broad pitch range ($a^b_1-f_6$) in sub-section 4 decreases to narrow (b_2-f_6) in sub-section 5. A similar situation occurs in section A and B which have the same high pitch range, but expand or contract in the low register. In section A', sub-section 7 has broader pitch range than sub-section 6, and sub-section 8 has broader range than sub-section 7. The lower pitch range opens a broader range, keeping a similar high pitch: $a_3-f^{\#}_6$ (sub-section 6), $f_2-g^{\#}_6$ (sub-section 7), and b_6-f_6 (sub-section 8). While sections B and A' have one direction of pitch range, decrease in section B and increase in section A', section A contains both increasing and decreasing range. In

addition, the common element keeping a similar high pitch range occurs through all three sections, while still changing the overall pitch range.

These aspects of the pitch range are describing the golden sand dunes' shifting, and by comparison to the appearing and disappearing of memory. Having almost the same center pitch range throughout the piece relates to the memory. In spite of the variable shapes of memory, it is caused by one remembrance, which is depicted by the similar center pitch range.

Conclusion

One of main purpose of music analysis is to find out the unity of the work and within the unity how the composer is providing contrast and opposition. The third movement of Dallapiccola's *Sicut Umbra* beautifully shows the excellence of this control and balance. The unity is abundant as the composer's maintains the musical elements' special relationships in rows used, axes, and invariance. But we also hear the contrast and diversity within the sonority as well as rhythmic development and texture inversion. This unity carrying diversity finally produces the form, ABA'. Section A' contains not only the musical elements in section A but also those in section B and mingles them to create section A' that is itself unique. His technique in balancing unity as well as diversity poignantly echoes the text, where a single memory constantly seeks variation.

Chapter 5. Analysis of the Fourth Movement

Introduction

Just like the previous movements, the fourth movement expands in both instrumentation and duration when compared to its predecessor. At 4'15" in duration, it is the longest in the entire composition. This movement is scored for three flutes (piccolo, flute, alto flute), three clarinets (piccolo clarinet, clarinets in B^b and A (in the beginning of the coda, the clarinet in B^b changes to the clarinet in A), bass clarinet), three strings (violin, viola, cello), voice, and an ensemble of harp, celesta, and vibraphone. It is the addition of the harp, celesta, and vibraphone in this movement that is new to the piece. However, these twelve instruments and the voice are never heard simultaneously in this movement. This movement is also unique to the piece in that Dallapiccola produces a visual aspect to the music by using musical adaptations of nine constellations: those of Volans, Cassiopeia, Ursa Major, Columba, Triangulum Australe, Ursa Minor, Pegasus, Andromeda, and Libra.

Form

The texture, rhythm, melody, the use of musical adoption of constellations, and rows divide this fourth movement into four sections: section A (mm. 139–152), section B (mm. 153–169), section A' (mm. 169–185), and a coda (mm. 185–200). Table 5.1 provides the overall form of the fourth movement.

Table 5.1 Formal Overview

	Measures	Constellation	Rows Used
Section A	mm. 139–152	Volans, Cassiopeia, Columba, Ursa Major, Triangulum Australe	Instruments–P ₆ , P ₇ Voice–R _e
Section B	mm. 153–169	Cassiopeia, Ursa Minor, Pegasus, Andromeda, Libra	Voice–P ₁
Section A'	mm. 169–185	Volans, Cassiopeia, Ursa Major, Triangulum Australe, Columba	Instruments–P ₂ , P ₀ , R ₁ , RI ₄ , I ₉ Voice–R ₉ , I ₉
Coda	mm. 185–200		Instruments–P ₈ , I ₇ , P ₅ , P ₆ , P _t , P ₀ , R _e

The contrasting element found between the sections is the difference in texture. Sections A, B, and A' consist of instruments and the voice, but the coda uses only instruments without voice. In sections A and A', the instrumental parts and vocal line use rows as well as the five constellations; however, in section B, only the vocal line contains the row and the instruments play notes of the constellations without using any row forms.

Text

The poetic lines also support this division of the piece. As stated earlier, the source of the text used in this movement is, 'Epitafio Ideal de un Marinero' (Ideal Epitaph for a Sailor), a poem by Juan Ramon Jimenez (Table 5.2). The poem expresses death related to the sky and stars. Here the composer evokes the delicate tracery of the stars through a direct projection of maps of the night sky into musical figures and a haunting contemplation of death.

Table 5.2 Text in the Fourth Movement

	Epitafio ideal de un marinero	Ideal epitaph for a sailor
Section A	Hay que buscar, para saber tu tumba, por el firmamiento.	We must look, if we want to find your grave, overhead in the sky.
Section B	— Llueve tu muerte de una estrella. La losa no te pesa, que es un universo de ensueño —.	— Your death rains from a star. The tombstone is light upon you, for it is a dream universe —.
Section A'	En la ignorancia, estás En todo (cielo, mar y tierra) muerto	Unknowing, you dwell in all- sky, sea, earth-dead.

Constellations

There are eighty-eight constellations found in the sky. Among them, only nine are symbolized in this fourth movement. In sections A and A', the constellations used are the same: Volans, Cassiopeia, Columba, Ursa Major, and Triangulum Australe; however, the order of these constellations is different. Volans and Cassiopeia are played in the beginning of both sections. Columba, Ursa Major, and Triangulum Australe are heard in that order in section A, but in section A' the order is Ursa Major, Triangulum Australe, and then Columba. In contrast, the constellations used in section B are mostly different from those in sections A and A'; section B uses Cassiopeia, Ursa Minor, Pegasus, Andromeda, and Libra. There are no constellations found within the coda.

According to the section, the constellations used cover different areas of the sky. The stars symbolized and used in sections A and A' cover the whole sky — both the southern and northern hemisphere. As shown in Table 5.3, this is especially clear in the adjacent pairing of constellations like Volans-Cassiopeia, Cassiopeia-Columba, and Ursa Major-Triangulum Australe, which appear in section A. In section A', the

adjacent pairs also cover both the southern and northern hemisphere in spite of the slightly different order of introduction. However, the constellations used in section B cover only the northern hemisphere unlike those found in section A and A' (actually, Italy, where Dallapiccola composed this piece is located in the northern region). The visible latitudes between sections A and A', and B are closely related to the imagery of the poem.

Table 5.3 Visible in Latitudes⁶⁰

Section	Constellation ⁶¹	Visible in latitudes
Section A	Volans (5)	10 ~ -90
	Cassiopeia (5)	90 ~ -20
	Columba (6)	45 ~ -90
	Cassiopeia (5)	90 ~ -20
	Ursa Major (7)	90 ~ -30
	Triangulum Australe (3)	15 ~ -90
Section B	Cassiopeia (5)	90 ~ -20
	Ursa Minor (7)	90 ~ -10
	Pegasus (8)	90 ~ -60
	Andromeda (8)	90 ~ -40
	Libra (4)	60 ~ -90
Section A'	Volans (5)	10 ~ -90
	Cassiopeia (5)	90 ~ -20
	Ursa Major (7)	90 ~ -30
	Triangulum Australe (3)	15 ~ -90
	Cassiopeia (5)	90 ~ -20
	Columba (6)	45 ~ -90

Sections A, B, and A' each employ five constellations creating a balance. The use of five constellations in each section A, B, and A', and the common employment

⁶⁰ The constellation display is based on the order of presentation. Since no constellation is found in the coda, the coda is not included in Table 5.3. The minus (-) represents those latitudes of the southern hemisphere.

⁶¹ The number in the parentheses represents the number of notes constituting each constellation in this movement.

of Cassiopeia (consisting of five notes) in each section show a common number, five. This characteristic number, five, is also significant in formatting pentachords through the fourth movement. In addition, all possible pentachord partitions formed in the row are exposed in this movement. The types of pentachords used in each phrase and their relations will be discussed later in this chapter.

Example 5.1 Cassiopeia’s Rhythm and Interval

The image displays four musical phrases from Example 5.1, each with its corresponding pentachord partition. The phrases are as follows:

- Phrase 1:** Measures 140 and 142. Both phrases are labeled with the pentachord partition [01356].
- Phrase 2:** Measures 149 and 153. Measure 149 is labeled with [01367] and measure 153 with [01246].
- Phrase 3:** Measures 155 and 170. Measure 155 is labeled with [01457] and measure 170 with [01356].
- Phrase 4:** Measure 178, labeled with [01246].

The constellations found at the beginning of sections A and A' clearly define the divisions of the sections. Volans and Cassiopeia are used in the beginning of each section. Volans of section A' is transposed a perfect fifth above that occurring in section A. The instrumentation of Volans is also changed from the three clarinets in section A to the three flutes in section A'. Cassiopeia in section A' is transposed a perfect fifth above that occurring in section A, and the celesta plays Cassiopeia in section A' compared to the vibraphone heard in section A. In spite of different pitches and consistent families of instruments, the same rhythmic pattern is employed in both sections.

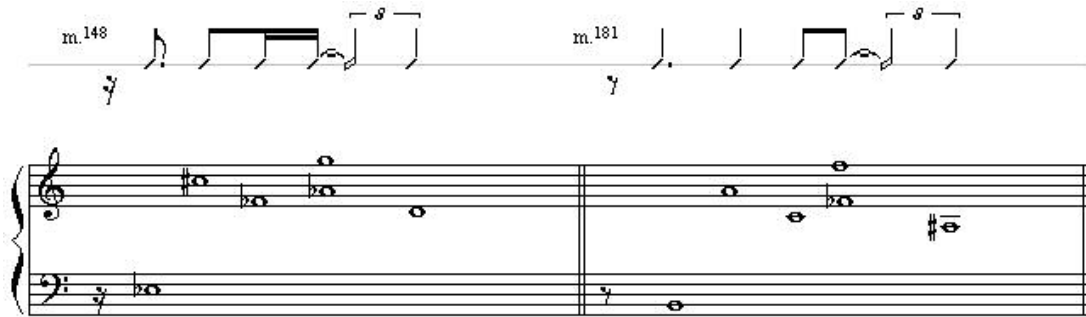
Cassiopeia is recognizable because of its characteristic W shape; this constellation rotates its shape once a year. The composer uses both the characteristic W and the rotation in this piece. Cassiopeia consists of five notes, which outline the W shape, and Cassiopeia itself appears seven times (three times in section A, two times in section B, and two times in section A'). Each time, it rotates by a change of interval and rhythmic pattern. In the case of interval, four types of pentachords, [01246], [01457], [01367], and [01356], are used, as shown in Example 5.1. The first (m.140) and second (m. 142) pentachords in section A and the sixth pentachord (m. 170) in section A' are [01356] types. Among them, the first and second Cassiopeias are related by retrograde-inversion. The third pentachord (m.149) used in section A is [01367], the fourth instance (m. 153) in the beginning of section B is [01246], and the fifth occurrence (m. 155) also appearing in section B is of the type [01457]. The seventh Cassiopeia (m.178) in section A' is the same type of the fourth one as

[01246]. All four of those kinds of pentachords contain the interval classes of 1 and 2 between adjacent notes, and have interval class 3, 4, or 6. In addition, two adjacent pentachords like the second and third ones or the third and fourth ones change their pentachord types by the semitone.

In the case of rhythm, the first Cassiopeia consists of a quintuplet with the last note lengthened. The rhythm of the second Cassiopeia is the same as that of the first one, although with more lengthening of the last note. The rhythm of the third instance is diminution to half duration, as the sixteenth-note quintuplet. Thus, the three Cassiopeias in section A all consist of the quintuplet rhythm. Two Cassiopeias in section B have a different rhythm compared to that of section A. The fourth instance has duplet and triplet rhythms, and the fifth occurrence has a triplet rhythm. In section A', the sixth instance is the same rhythmic pattern as the second occurrence, the eighth-note quintuplet, and the seventh one is similar to the sixth instance as half the duration of the quintuplet. Thus, the quintuplet rhythm of the Cassiopeias in section A changes to triplet rhythm in section B and returns to the quintuplet rhythm in section A'. However, none of the seven Cassiopeia has exactly the same rhythmic pattern except the second and sixth instances. Consequently, although not rotation in the serial sense, these slight changes of interval by semitone and of rhythm represent the slow rotation of Cassiopeia once a year. In the beginning of section A', the sixth Cassiopeia uses the same intervals and a similar rhythmic pattern as found in the beginning of section A, and the seventh Cassiopeia uses the same interval pattern found in the beginning of section B as well as a rhythmic pattern similar to that found

in section A's Cassiopeia. The reshaping of forms presented in the previous sections each expresses Cassiopeia's return to its original position after the completion of rotation.

Example 5.2 Columba in Sections A and A'



Columba symbolizes the dove, which Noah freed after the end of the Deluge. According to this Biblical tale, if the dove came back to the ark, it meant that the water still remained on the land. If the dove did not return, it meant the water had receded and the land was dry. The dove represents a solution to what Noah wanted to know. This Biblical mythology relates to the meaning of the poem. At the point where Columba occurs in this piece within section A, the poem addresses the search for the grave in the sky (*para saber, tu tumba*). The pitches and rhythm of Columba can be seen in Example 5.2. It is used only twice, once in section A and once in section A'. The interval relationship is exactly the same in both sections and the harp plays both. However, Columba in section A' is transposed a major third below that found in section A. In addition, the rhythm in section A' is augmented; it is two times longer than in section A.

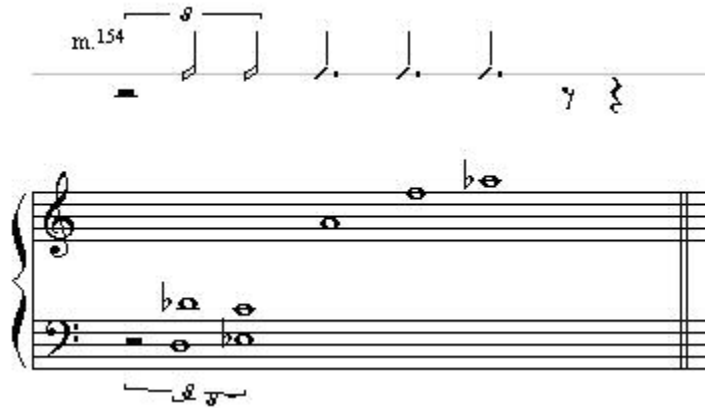
Example 5.3 Ursa Major in Sections A and A'

Like Columba, Ursa Major is also used twice, once in section A and once in section A'. The pitches and rhythm of Ursa Major can be seen in Example 5.3. Both instances have the same interval relationship and the same instrumentation, the vibraphone. However, in section A', Ursa Major is transposed a major second below that of Ursa Major in section A. The rhythm in section A' expands to exactly twice the original.

Ursa Major is a very important constellation found in the northern hemisphere. The shape is the big dipper forming a grouping of seven stars. In comparison with Cassiopeia, it is on the opposite side of the Polar Star. The opposite location between Cassiopeia and Ursa Major around the Polar Star represents the twelve-note aggregate in this movement. The composer makes the twelve-note aggregate by the five notes (FF[#]CBD) of Cassiopeia and seven notes

(A[#]G[#]EGAC[#]D[#]) of Ursa Major in section A (mm.149–152) to represent the complimentary location of Cassiopeia and Ursa Major.

Example 5.4 Ursa Minor in Section B



The constellation of Ursa Minor, through not very brilliant, is important since it also contains the North Polar Star, Polaris, the principal star of the constellation. Ursa Minor appears once in section B played by the celesta; the composer also marks Polaris (a^b₆) in score. The pitch of a^b₆ is almost the highest pitch in this piece. The highest pitch in this piece is f₇, played by the celesta in m. 157 (section B). However, the rhythm is very short – an eighth duration. In addition, there are four higher pitches (c[#]₇ in m.141, a₆ in m. 169, b^b₆ in m.191–2, and e^b₇ in m. 200) than a^b₆ in this piece. Those pitches also consist of shorter durations. However, the rhythm of a^b₆ (Polaris) is the longest among them (violin holds the a^b₆ for seven quarter notes duration). The composer expresses Ursa Minor as not being very brilliant by using the pitches having the long duration and high pitch range with the soft dynamics, *pp*.

Example 5.5 Pegasus and Andromeda in Section B

The image displays two systems of musical notation. The first system, labeled 'm. 157-158', consists of a treble clef staff with a melodic line and a bass clef staff with a harmonic line. The second system, labeled 'm. 166-167', consists of a bass clef staff with a melodic line and a bass clef staff with a harmonic line. The notation includes various note values, accidentals, and dynamic markings such as 'p' and 'pp'.

Pegasus is the seventh one of the whole sky in order of extension, but it does not contain any particularly bright stars. Thus, the dynamics of Pegasus are soft, *pp*, and the sustained last note (e_5 for six measures, mm. 160–165) represents the above character, extension, in the music. Its characteristic feature is a big square, whose angles are shown by stars of the second and third magnitude, although only three of them belong to Pegasus: the fourth star is the first star of Andromeda once also named delta Pegasi. In addition, since one star of Pegasus is in the same position as one star of Andromeda, Dallapiccola uses the same pitch of f_5^b in Pegasus and f_4^b in Andromeda to represent this character and to make a square.

Example 5.6 Volans in Sections A and A'

The image displays musical notation for Example 5.6. The top section shows three staves of music with a half-note triplet in the upper voice. The middle section shows a similar triplet in a different register. The bottom section shows a triplet in a third register, with a measure number 'm. 169, 170' indicated above the first staff.

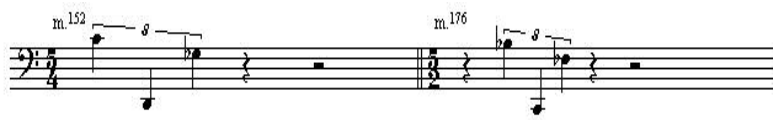
Volans is a small but very bright constellation of the southern polar region. It forms three times in this piece; twice in section A and once in section A'. Two occurrences of Volans in section A show a retrograde-inversion and the Volans in section A' is transposed a perfect fifth above the first Volans in section A. The three Volans have the same rhythmic pattern, the half-note triplet. The character of Volans, which is bright and recognizable in spite of being small, is reflected in its role as a clearly recognizable feature of sections A and A'.

Example 5.7 Libra and Triangulum Australe

Libra

The image displays musical notation for Example 5.7, specifically for the constellation Libra. It shows three staves of music with a half-note triplet in the upper voice. The notation includes a measure number 'm. 169, 170' above the first staff.

Triangulum Australe



The constellation of Libra was considered a symbol of harmony, balance and justice, and order and peace. This symbolism may have led Dallapiccola to form Libra at the end of section B, which is the mid-point of the piece. Triangulum Australe is, like Volans, a small constellation of the southern hemisphere. It is very easy to find because of its characteristic shape, a triangle. The shape of Triangulum Australe in this piece is also the triangle.

My analysis begins with the observation of the fundamental musical elements such as rhythm, rows, chords (dyad, trichord, and pentachord), and texture, as I did in the previous chapters. These examinations give some consideration as to how these elements associate to establish unified sonorities and also to the relation between text and music in this fourth movement. Furthermore, these observations (especially of chords) link the elements found in the previous three movements and play a role of the final movement. In each section (or phrase), I will show examples of chords (dyad-types and trichord-types) that are added as the piece progresses. The examples finally suggest aspects of Dallapiccola's compositional technique. In the end of this chapter, we recognize why the certain chord types are consistently employed not only in the fourth movement but also the whole piece. The text also implies these links to the previous movements. This analysis will show how the composer arranges the

piece to present the meaning of the text and develops this movement as the final statement of the piece.

Musical Analysis

Section A (mm. 139–152)

Section A is divided into two phrases (phrase 1 (mm. 139–142) and phrase 2 (mm. 143–152)) based on rhythm and the appearances of the voice and of Volans; phrases 1 and 2 have the same occurrence of Volans presenting the same rhythmic pattern. The vocal line also starts in phrase 2. Thus, phrase 1 serves an introductory role and phrase 2 serves as a development based on the same constellation, Volans.

Phrase 1 (mm. 139–142)

Rhythm

Example 5.8 Composite Rhythm in Phrase 1

The rhythm alternates between triplets and quintuplets. The quintuplet has the same rhythmic value; the eighth-note quintuplet occurs three times (m. 140, 141, 142) with a different prolongation of the last pitch each time. In the first (m. 140) and second (m. 141) occurrences, the last quintuplet note is prolonged with a tied quarter

note, but the third occurrence (m. 142) has twice the length for the prolongation, a half note.

The three triplets have different durations in every instance. The first triplet is the half-note triplet (m. 139), the second occurrence of the triplet is a quarter-note triplet (m. 141), and the third one is an eighth-note triplet (m. 142). The duration of each becomes shorter; each duration is a diminution to half the value of the previous. In the alternation between the triplet and quintuplet, the quintuplet keeps the same rhythmic pattern and duration and the triplet shortens its unit from the half note to the eighth note. Tempo change supports this shorter rhythm. Tempo begins $\text{♩} = 48\sim 52$ and changes to $\text{♩} = 66$ in m. 141, in which the triplet begins to shorten its duration to a half from a whole duration.

Texture

Phrase 1 has ten instruments excluding the harp and celesta. Each instrumental group such as the flutes, clarinets, strings, and vibraphone plays a different texture. The clarinets play the constellation of Volans, the vibraphone forms the constellation of Cassiopeia (twice), the piccolo forms the row P_t , and the strings play the vertical trichords consisting of outside the row. Phrase 1 introduces several textures in the various instrumental timbres.

Pitch

Example 5.9 Phrase 1 (mm. 139–142)

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I find an axis of a^b_4 between the two appearances of Cassiopeia. In addition, the strings form two [014] trichords consisting of outside row pitches. Two trichords, $e_4f_4a^b_4$ in mm. 140–1 and $c_4b_4a^b_4$ in mm. 141–2, form an inversion also around the axis a^b_4 (Example 5.9). The viola holds this axis through the occurrence of the trichord for three measures (mm. 140–142). The viola thus plays the axis of the two inverted Cassiopeias as well. This is significant related to the pitch range in section A. It will be discussed later in this chapter.

The row P_t forms a semi-circle by the pitch range in m. 141. Its formation describes the shape of the sky, which contains the constellations Volans and

Cassiopeia. The P_t 's rhythmic pattern containing rhythms of triplet (like Volans) and quintuplet (like Cassiopeia) shows the connection between the semi-circle shape and the sky.

Chord-Types

In spite of employing one row P_t , phrase 1 exposes several occurrences of trichord partitions caused in the constellation's adjacent pitches. Dallapiccola arranges the row P_t between the constellations Volans and Cassiopeia to create the same consistent sonorities, the four types of trichord. Table 5.4 shows the examples of these trichord-types as well as the dyad-types formed in phrase 1.

Table 5.4 Dyad, Trichord, and Pentachord Types in Phrase 1

	Dyads		Trichords				Pentachords
	[01]	[06]	[012]	[013]	[014]	[016]	
Strings	{EF} {BC}	{E ^b A}			{CBG [#] } {EFA ^b }		
Flutes		{C [#] G}		{ED [#] C [#] }	{AA ^b F}		{AA ^b GFD} -[01247]
Clarinets	{D [#] E} {A ^b A} {AB ^b } {B ^b B} {BC}	{CF [#] } {E ^b A}	{AB ^b B} {B ^b BC}	{D [#] EF [#] }	{BCE ^b }	{CBF [#] } {C [#] DG} {AB ^b E ^b }	
Vibraphone	{C [#] D} {DE ^b } {F [#] G} {AB ^b }	{C [#] G} {E ^b A}		{C [#] DE} {E ^b DC}		{C [#] DG} {E ^b DA} {GF [#] C [#] } {AB ^b E}	{AB ^b BCE ^b } -[01236] {C [#] DEF [#] G} {AB ^b CDE ^b } -[01356]

In Cassiopeia, the adjacent three notes form the same trichords, [016] and [013], in each appearance. The five notes of Volans include one horizontal [014], one

vertical [012], and one vertical [016]. The P_t contains the four types of trichord partition. In total, phrase 1 has two members of [012], four members of [013], four members of [014], and five members of [016].

The constellations' adjacent pitches also contain the dyad-types, [01] and [06]. Volans contains one [01] and one [06] and Cassiopeia also forms two [01]s and one [06] in each appearance. The row P_t and the strings' vertical [014] chords also have the two types of dyad. Consequently, nine members of [01] and three members of [06] occur in phrase 1.

Volans and Cassiopeia consist of five notes. Volans' pentachord type is the same as the row's pentachord occurring in the order numbers 4–8. Even though Volans' pitches are not the members of the row, the use of a pentachord type found in the row gives unity, especially at the beginning of the movement. However, Cassiopeia's pentachord type [01356] is not included in the row's partition.

Phrase 2 (mm. 143–152)

The voice is added in phrase 2, as are the celesta and harp. The vibraphone sounds only in the last two measures of phrase 2. Thus, all twelve instruments and voice are heard in phrase 2 but never simultaneously. The beginning of phrase 2 is the same as that of phrase 1; Volans forms the same rhythmic pattern, the half-note triplet. In addition, the constellations of Columba, Ursa Major, and Triangulum Australe are introduced along with Cassiopeia. Five constellations occur in phrase 2.

Rhythm

Example 5.10 Composite Rhythm of Phrase 2

The musical score for Example 5.10 consists of five staves of music, numbered 142 through 150. The notation includes various rhythmic patterns such as triplets and sextuplets, with some notes marked with a 's' (staccato). The time signature changes from 3/2 to 3/4, then to 9/4, and finally to 2/4. The music is written in a single melodic line on a five-line staff.

As shown in Example 5.10, phrase 2 is a development of those rhythms found in phrase 1. The rhythm consists of the alternation between triplet and sextuplet or quintuplet. The sextuplet rhythms in mm. 144–145 are developed from the quintuplet rhythms in phrase 1; having the same half-note duration and the same rhythmic unit, eighth note. This acceleration in rhythmic development continues to the quintuplet's rhythmic unit, which changes from the eighth-note quintuplet to the sixteenth-note quintuplet. Those rhythmic developments lead to the process from the half-note triplet to the quarter-note triplet through phrase 2. The overall trend of phrase 2 is to shorten the rhythmic pattern.

The regular rhythmic contraction, the triplet lasting an half-note duration, sextuplet of half-note duration and quintuplet of quarter duration, change to an irregular rhythmic pattern, when the constellations Columba and Ursa Major appear

(mm. 148–151). The reason for changing the rhythmic pattern will be discussed in summarizing rhythmic pattern of the whole section.

Texture

Example 5.11 Phrase 2 (mm. 146–150)

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Among five constellations' employment in phrase 2, four constellations have the common feature of being played by a single instrument (or single instrumental family); the three flutes (Volans), the celesta (Cassiopeia), the vibraphone (Ursa Major), and the harp (Triangulum Australe). One constellation, Columba, consists of several instruments: the three strings and three clarinets along with the harp. The harp

plays all the pitches of Columba and the other instruments partially form Columba by playing one or two pitches (Example 5.11).

This difference in instrumentation represents a different technique in the formation of constellations. Dallapiccola forms Volans, Cassiopeia, Triangulum Australe, and Ursa Major based on their physical shape and Columba based on psychological aspect, its character, and the meaning it contains. Columba represents the dove's far-reaching search symbolized by the use of several instruments.

Pitches, Row, and Dynamics

Not only the number of instruments playing constellations, but also the type of pitches used also changes based on the introduction of Columba in m. 148. Before the appearance of Columba, the strings, clarinets, and flutes play pitches based on the row P₇. After Columba (m.148), the pitches change to the pitches outside row; the harp and celesta play the constellations of Columba and Cassiopeia and the strings form the trichords without employing any rows. Since the timbre of the celesta, vibraphone, and harp is soft and mysterious, these instruments play the constellations having similarity to the character (containing no bright star but are seen dimly). The dynamics of the instruments are soft as *molto p* and *ppp* while voice keeps *molto p*. The instruments support the voice by the softer dynamics. The voice sings the row R_e containing lots of repeated notes through phrase 2.

Chord-Types

Table 5.5 Dyad, Trichord, and Pentachord Types in Phrase 2

	Dyads		Trichords				Pentachords
	[01]	[06]	[012]	[013]	[014]	[016]	
Strings	{CD ^b } {C [#] D} {FF [#] } {GG [#] } {G [#] A} {B ^b B} {BC}	{C [#] G} {DA ^b } {E ^b A} {EB ^b } {FB}	{GG [#] A}	{CD ^b E ^b }	{CD ^b E} {G ^b FD} {B ^b AF [#] }	{BCF} {GG [#] C [#] } {DC [#] G [#] } {AG [#] E ^b } {B ^b BE}	
Flutes	{F [#] G}	{C [#] G} {EB ^b }		{GF [#] E}	{FEC [#] }	{GF [#] C [#] } {B ^b BE}	{C [#] EFF [#] G} -[01236]
Clarinets	{E ^b E} {GG [#] } {G [#] A}	{E ^b A} {EB ^b }	{GG [#] A}	{D ^b CB ^b }	{E ^b EG}	{AG [#] E ^b } {B ^b BE}	{AA ^b GE ^b C [#] } } -[01268]
Vibraph -one, Celesta, Harp	{FF [#] } {GG [#] } {BC}	{CF [#] } {DA ^b }		{BCD}	{G [#] GE}	{F [#] FC} {CBF [#] }	{BCDFF [#] } -[01367]
Voice	{CC [#] } {AB ^b } {BC}	{D ^b G} {DA ^b }	{BCD ^b }	{EFG}	{B ^b AG ^b }	{DE ^b A ^b }	{AA ^b GF ^b E ^b D} } -[01367]

The constellations contain the four trichord-types, [012], [013], [014], and [016]. Especially, Columba makes trichords not only with adjacent but also with non-adjacent pitches since it consists of several instruments: the clarinets play the first, third, and fifth notes of Columba and the strings play the second, fifth, and sixth notes, which form [014] and [016], respectively. As shown in Table 5.5, two members of [012], five members of [013], six members of [014], and nine members of [016] occur in phrase 2. All members except two [016]s, {GF[#]C[#]} and {CBF[#]}, are new members introduced in phrase 2.

On the other hand, adjacent pairing of notes in Volans, Cassiopeia, and Columba make the dyads of [01] and [06]. Volans forms one [01] ($f^{\#}_4-g_3$), Cassiopeia forms two [01]s ($f_5-f^{\#}_6, c_5-b_5$) and one [06] ($f^{\#}_6-c_5$), and Columba makes three [01]s ($e^b_2-e_4, a^b_4-g_5, c^{\#}_5-d_4$) and one [06] ($d_4-a^b_4$). The strings in mm. 149–150 and the row of P_7 also contain the dyads, [01] and [06]. In the vocal line, two members of [06] are sung as $a^b_4-d_4$ and $g_4-d^b_4$ with the long duration and repetition.

In total, there are ten members of [01] and six members of [06] including three new members of [01] ($\{CD^b\}, \{FF^{\#}\}, \{GG^{\#}\}$) and three [06]s ($\{DA^b\}, \{EB^b\}, \{FB\}$). The [06] shows a semitone relation in introducing new members. After the repetition $\{C^{\#}G\}$ and $\{E^bA\}$ already formed in phrase 1, the dyad $\{E^bA\}$ develops to $\{EB^b\}$ (m. 146), to $\{FB\}$ (m. 149) in the strings, and then to $\{F^{\#}C\}$ (m. 149) in the celesta's line. Before achieving the dyads of $\{FB\}$ and $\{F^{\#}C\}$ in m. 149, the strings pick up the dyad of $\{C^{\#}G\}$ and continue with $\{DA^b\}$ in m. 148. Consequently, the $\{C^{\#}G\}$ develops to $\{DA^b\}$ and the $\{E^bA\}$ develops to $\{F^{\#}C\}$ through the semitone relationship, respectively.

In phrase 2, Cassiopeia appears once in m. 149 forming pentachord type [01367]. This pentachord is the same type as the pentachord partition found in order numbers 6–t. Volans uses the pentachord [01236], which is the same type as the pentachord partition consisting of order numbers 4–8. The vocal line also contains one pentachord, [01367], in m. 145–148. Before the occurrence of Cassiopeia in

m. 149, the vocal line sings the same pentachord type as found in Cassiopeia, but in different rhythmic pattern and pitch range. The formatting the same pentachord-type shows the interrelation between the vocal line and Cassiopeia.

All of Two Phrases (Section A)

Rhythm

Example 5.12 Composite Rhythm in Section A

The image displays a musical score for six staves, numbered 139 through 151. The score illustrates various rhythmic patterns and time signatures. Staff 139 is in 3/4 time and features a half-note triplet followed by an eighth-note triplet. Staff 141 is in 7/4 time and shows a half-note triplet transitioning to an eighth-note triplet. Staff 143 is in 3/4 time and includes a half-note triplet and an eighth-note quintuplet. Staff 146 is in 3/4 time and features a half-note triplet and an eighth-note quintuplet. Staff 149 is in 9/4 time and shows a half-note triplet and an eighth-note quintuplet. Staff 151 is in 5/4 time and includes a half-note triplet and an eighth-note quintuplet. The score uses various time signatures (3/4, 7/4, 9/4, 5/4) and rhythmic markings such as triplets and quintuplets to illustrate the composite rhythm.

The beginning of each phrase is similar due to the emphasis on Volans giving a sense of unity, but each phrase has a different rhythmic development. In phrase 1, the half-note triplet is shortened to the eighth-note triplet at the end of phrase 1 and the eighth-note quintuplet keeps the same rhythmic unit and duration. In phrase 2, the quintuplet rhythm becomes shortened to the sixteenth-note quintuplet. The eighth-note sextuplet in phrase 2 comes from the eighth-note quintuplet in phrase 1 containing the same rhythmic duration, half-note duration, and occurring as part of

the same rhythmic development. Thus, after giving a sense of unity in the beginning of each phrase with the repetition, the eighth-note quintuplet becomes shortened to the sixteenth-note quintuplet in phrase 2 via the eighth-note sextuplet. In its entirety, section A's rhythm shortens from the triplet-half note (whole-note duration) to the quintuplet-sixteenth note (quarter-note duration).

Texture, Constellations used, Dynamics, and Articulation

Phrase 2 is an expansion of phrase 1 based on the number of constellations used, two constellations in phrase 1 and five in phrase 2. The second occurrence of Volans and Cassiopeia suggest a basis for development not only in number of constellations but also in pitch range. The latter Volans formed by three flutes provides a higher range than the former Volans formed by three clarinets. The latter Cassiopeia created in the celesta also expands its pitch range from the former Cassiopeia in the vibraphone. Sticking to the same instrumental family, Volans and Cassiopeia expand their pitch range.

Besides Volans and Cassiopeia, the vibraphone, celesta, and harp provide three more constellations in phrase 2. The instruments used, vibraphone, celesta, harp, and woodwind — especially the three keyboard instruments (including harp) — are capable for expressing the constellations based on the timbre.

While the texture and instruments expand in phrase 2, the dynamics becomes softer as *molto p* and *ppp*, compared to *molto p* and *pp* in phrase 1. The soft dynamics of phrase 2 prepare for the appearance of the vocal line. The instrumentation in

phrase 2 is also an expansion of phrase 1 as the number of used constellations: three clarinets, three strings, piccolo, and vibraphone in phrase 1 and the addition of three flutes, celesta, harp, and voice in phrase 2. Thus, the texture in phrase 2 is also an expansion of phrase 1, as the instrumentation and constellations used in phrase 2 are expanded from phrase 1. Those changes and expansions occurring in the texture, instruments used, and numbers of constellations represent the continuous change and rotation of the constellations through the firmament.

Form

The two phrases' division in section A is made obvious by the appearance of Volans in the beginning of each phrase having the same rhythm each time. The rhythmic pattern (the triplet and quintuplet) mentioned above shows continuous development and interconnection between phrases 1 and 2. The number of constellations used, instrumentation, and pitch range also demonstrate the expansion and development. The higher pitch range in phrase 2's Volans and Cassiopeia also represents phrase 1's introductory role and phrase 2's role as an expansion. In addition, the vocal line starting in phrase 2 apparently suggests that phrase 1 is an introductory phrase before the text appears in phrase 2. This introductory phrase 1 prepares not only the vocal line, rhythm, and pitch range in phrase 2 but also the sonorities.

Row

Section A employs three rows, P_t , P_7 , and R_e . Among the three rows, the instrumental line plays two prime rows, P_t and P_7 , and the vocal line sings the row R_e . The two prime rows, P_t and P_7 , occur in each phrase. Both rows have two common characteristics: (1) several instruments play one row form (P_t by the piccolo clarinet and piccolo and P_7 by the three clarinets and strings), and (2) the row's pitches create an arch shape in the pitch range. The reason for having this common character is for expressing the stars' rotation. The slightly different transposition, minor third below (T_3), articulates the change of position, which accompanies the slightly changing elements such as rhythm, pitch range, and instrumentation.

Chord-Types

Throughout the row's pitches and constellations, not only dyad-types but also trichord-types suggested in previous movements are formed in section A. All twelve members of [01] occur through section A, nine members in phrase 1 and ten members in phrase 2. The frequency of nineteen times in phrase 2 is greater than that of eleven times in phrase 1. This increased frequency also shows the expansion. Table 5.6a shows the members of [01] and [06] formed in section A.

Table 5.6a [01] and [06] Dyad Types in Section A

	[01]				[06]		
	Ph 1	Ph 2	All		Ph 1	Ph 2	All
{CC [#] }		✓	✓	{CF [#] }	✓	✓	✓
{C [#] D}	✓	✓	✓				
{DE ^b }	✓		✓	{C [#] G}	✓	✓	✓
{E ^b E}	✓	✓	✓				
{EF}	✓		✓	{DA ^b }		✓	✓
{FF [#] }		✓	✓				
{F [#] G}	✓	✓	✓	{E ^b A}	✓	✓	✓
{GG [#] }		✓	✓				
{G [#] A}	✓	✓	✓	{EB ^b }		✓	✓
{AB ^b }	✓	✓	✓				
{B ^b B}	✓	✓	✓	{FB}		✓	✓
{BC}	✓	✓	✓				

In the [06], three members ($\{CF^\#\}$, $\{C^\#G\}$, $\{E^bA\}$) occur in phrase 1 and all six members occur in phrase 2. The dyad $\{E^bA\}$ by the strings in phrase 1 develops by semitone relations — the $\{E^bA\}$ reaches to $\{C^\#G\}$ passing downward through $\{DG^\#\}$ and to $\{FB\}$ passing upward through $\{EB^b\}$. Occurring thirteen times in phrase 2, the [06] is heard more often than the six times in phrase 1. The increased frequency carries more members in phrase 2. Consequently, the dyad-types [01] and [06] expand through all their members using semitone relations in phrase 2, after suggesting several dyads in phrase 1.

Table 5.6b [012] and [013] Trichord Types in Section A

	Ph 1	Ph 2	All		Ph 1	Ph 2	All
{CC [#] D}				{CC [#] E ^b }		V	V
				{C [#] DE}	V		V
{C [#] DD [#] }				{DD [#] F}			
				{E ^b EF [#] }	V		V
{DE ^b E}				{EFG}		V	V
				{FF [#] A ^b }			
{E ^b EF}				{F [#] GA}			
				{GA ^b B ^b }			
{EFF [#] }				{G [#] AB}			
				{AB ^b C}			
{FF [#] G}				{B ^b BC [#] }			
				{BCD}		V	V
{F [#] GG [#] }				{C [#] CB ^b }		V	V
				{DC [#] B}			
{GG [#] A}		V	V	{E ^b DC}	V		V
				{EE ^b C [#] }	V		V
{G [#] AB ^b }				{FED}			
				{F [#] FE ^b }			
{AB ^b B}	V		V	{GF [#] E}		V	V
				{A ^b GE}			
{B ^b BC}	V		V	{AA ^b F [#] }			
				{B ^b AG}			
{BCC [#] }		V	V	{BB ^b A ^b }			
				{CBA}			

Table 5.6c [014] and [016] Trichord Types in Section A

	Ph 1	Ph 2	All		Ph 1	Ph 2	All
{CC [#] E}		V	V	{CC [#] F [#] }			
{C [#] DF}				{C [#] DG}	V		V
{DE ^b F [#] }				{DE ^b G [#] }		V	V
{E ^b EG}		V	V	{E ^b EA}			
{EFA ^b }	V		V	{EFB ^b }			
{FF [#] A}				{FF [#] B}			
{F [#] GB ^b }				{F [#] GC}			
{GG [#] B}				{GA ^b C [#] }		V	V
{A ^b AC}				{A ^b AD}			
{AB ^b C [#] }				{AB ^b E ^b }	V		V
{B ^b BD}				{B ^b BE}		V	V
{BCE ^b }	V		V	{BCF}		V	V
{C [#] CA}				{C [#] CG}			
{DC [#] B ^b }				{DC [#] G [#] }		V	V
{E ^b DB}				{E ^b DA}	V		V
{EE ^b C}				{EE ^b B ^b }			
{FEC [#] }		V	V	{FEB}			
{F [#] FD}		V	V	{F [#] FC}		V	V
{GF [#] E ^b }				{GF [#] C [#] }	V	V	V
{A ^b GE}		V	V	{G [#] GD}			
{AA ^b F}	V		V	{AG [#] E ^b }		V	V
{B ^b AF [#] }		V	V	{B ^b AE}			
{BB ^b G}				{BB ^b F}			
{CBA ^b }	V		V	{CBF [#] }	V	V	V

Table 5.6d Pentachord Types in Section A

	[01236]		[01356]		[01367]	
	Phrase 1	Phrase 2	Phrase 1	Phrase 2	Phrase 1	Phrase 2
Volans	{AB ^b BCE ^b }	{GF [#] FEC [#] }				
Cassiopeia			{C [#] DEF [#] G}			{BCDFF [#] }
Voice			{AB ^b CDE ^b }			{AA ^b G ^b E ^b D}
Others						{FEDBB ^b }
	[01247]		[01268]			
Others	{AA ^b GFD}			{AA ^b GE ^b C [#] }		

Section A has several members of four types of trichord. In the [012], each phrase has two members, $\{AB^bB\}$ and $\{B^bBC\}$ in phrase 1 and $\{GG^\#A\}$ and $\{BCC^\#\}$ in phrase 2. While the $\{BCC^\#\}$ appears by the semitone relationship from the $\{B^bBC\}$ in phrase 2, the $\{GA^bB\}$ does not have any semitone relationship.

Nine members of [013] occur through section A, four members in phrase 1 and five members in phrase 2. The $\{CC^\#E\}$ is a semitone below the $\{C^\#DE\}$ and the $\{EFG\}$ is a semitone above the $\{E^bEF^\#\}$. The other three members in phrase 2 do not have any semitone relation between phrases 1 and 2.

In trichord [014], four members appear in phrase 1 and six members come about in phrase 2. Three new members ($\{CC^\#E\}$, $\{FEC^\#\}$, $\{F^\#FD\}$) do not have any semitone relationship, while the remaining three members ($\{E^bEG\}$, $\{A^bGE\}$, $\{B^bAF^\#\}$) show the semitone relation. The $\{E^bEG\}$ is a semitone below the $\{EFA^b\}$ in phrase 1 and the $\{A^bGE\}$ and $\{B^bAF^\#\}$ are a semitone above and below the $\{AA^bF\}$ in phrase 1.

In the [016], phrase 1 has five members and phrase 2 contains nine members. Among the seven new members occurring in phrase 2, four members ($\{DE^bG^\#\}$, $\{DC^\#G^\#\}$, $\{F^\#FC\}$, $\{B^bBE\}$) have a semitone relationship from the previous phrase's trichord. As seen in Tables 5.6a and 5.6b, the number of members is added in each of the four trichord-types.

Five members of the pentachords take place in section A. The two Volans in phrases 1 and 2 have the same pentachord-type [01236], having a retrograde inversion relationship based on the axis of A^b. The reason to play the same pentachord-type in Volans is to represent the basis for dividing two phrases, since Volans' location, Southern polar, implies the basis. Three occurrences of Cassiopeia have two types as [01356] in phrase 1 and [01367] in phrase 2. The reason to use different pentachord-type in the Cassiopeias (phrases 1 and 2) is to represent the characteristics rotation once a year. The different pentachord type changing by two semitones represents this rotation. Among these, the [01236] and [01367] are also found in the pentachord partitions of the row; the [01236] is created by the order numbers 4–8 and the [01367] is by 6–t.

Implications of Section A

The development of phrase 2 based on the musical elements in phrase 1 is obvious in the above observations of rhythm, texture, pitch range, row used, and the occurrence of chord-types. Each phrase's development keeps the sense of unity by several techniques: (1) the use of two particular rhythms (triplet and quintuplet), (2) the formation of chords forming row's partitions in the constellations, and (3) the use of the same musical image at the beginning of each phrase, Volans.

Section B (mm. 153–169)

Section B is divided into two phrases, phrase 3 (mm. 153–56) and phrase 4 (mm. 156–169). These phrases' divisions are based on the inclusion of the voice and the difference in musical surface. Phrase 3 contains the predominant triplet rhythm in the instrumental line, the employment of two constellations (Cassiopeia and Ursa Minor), no row used, and no vocal line, whereas phrase 4 has predominantly dotted rhythms in the vocal line, the employment of three constellations (Pegasus, Andromeda, and Libra), and the appearance of row. Thus, phrases 3 and 4 have different musical languages influencing both rhythm and texture.

Phrase 3 (mm. 153–155)

Rhythm and Pitch

Example 5.13 Composite Rhythm in Phrase 3

The musical notation for Example 5.13 consists of two staves. The top staff, labeled '153', shows a sequence of quarter-note triplets in 3/4 time, with a 'p' dynamic marking. The bottom staff, labeled '155', shows a sequence of quarter-note triplets in 3/4 time, with a 'p' dynamic marking, followed by a half-note triplet in 3/4 time, and then a quarter-note triplet in 4/4 time. The notation includes various rhythmic markings such as brackets and slurs.

Phrase 3's rhythm is simple consisting of repeated triplets. As shown in Example 5.13, the quarter-note triplet in m. 153 expands to the half-note triplet in m. 154, and then returns to the quarter-note triplet in m. 155 after the three dotted quarter notes in m. 154. The three dotted quarter notes play a role of the triplet rhythm between the other triplets and foreshadow the rhythm of phrase 4, in which a

dotted rhythm dominates. Thus the rhythm expands up to m. 154 and then becomes shorter in mm. 154–155.

The triplet occurs in the two constellations used, Cassiopeia and Ursa Minor. Ursa Minor occurs once in m. 154 between the repeated Cassiopeias (m. 153 and m. 155). Cassiopeia's rhythm in m. 153 consists of two eighth notes and the triplet rhythm (a half-note duration); Ursa Minor's rhythm consists of the half-note triplet and three dotted quarter notes in m. 154. Then the second appearance of Cassiopeia in m. 155 consists of two triplets in a half-note duration. The rhythmic pattern in phrase 3 forms an arch shape in duration, the half (m. 153), whole (m. 154) and half duration (m. 155). The peak of this arch shape happens in the constellation Ursa Minor containing Polaris (m. 154).

To emphasize this Polaris, the arch shape is formed by the pitch as well as rhythm. Polaris, which Dallapiccola marks in the score, is the highest pitch in phrase 3, a^b₆. Toward Polaris, the pitches are ascending and then descending after Polaris. The detailed observations will be discussed in the section, Pitch Range.

Texture

The texture is divided into two based on the number of instruments forming the constellations. The employment of a single instrument or of several instruments to form the constellations distinguishes the contrasting textures. The harp alone forms Cassiopeia in m. 153, whereas Ursa Minor has three strings, two clarinets, and the piccolo along with the celesta in m. 154, and the second Cassiopeia has three strings,

clarinet in E^b, and piccolo along with the harp. The texture change is obvious in the number of instruments comprising the constellation. Example 5.14 shows the texture's change. This texture change has two implications: (1) the texture change occurs suddenly at the same point as the appearance of Ursa Minor to emphasize Polaris, and (2) this prepares the next phrase, in which the texture becomes thicker than that in phrase 3 and whose texture represents something important relating to the text.

Example 5.14 Phrase 3 (mm. 153–155)

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Chord-Types

The formation of [01] and [06] happens in the constellations Cassiopeia and Ursa Minor. Since several instruments form one constellation and hold out all the pitches, not only pairs of adjacent pitches but also non-adjacent pitches make [01] and [06] dyad-types. In the [01] type, there are five members formed by two adjacent pitches and two members by non-adjacent pitches in these two constellations. In the case of [06], there are two occurrences by adjacent pitches and two instances by non-adjacent pitches. In total, eight members of [01] ($\{CC^\#\}$, $\{C^\#D\}$, $\{DE^b\}$, $\{EF\}$, $\{F^\#G\}$, $\{GG^\#\}$, $\{AB^b\}$, $\{B^bB\}$) and one members of [06] ($\{E^bA\}$) occur in phrase 3.

Table 5.7 Dyad, Trichord, and Pentachord Types in Phrase 3

	Dyads		Trichords				Pentachords
	[01]	[06]	[012]	[013]	[014]	[016]	
Strings	$\{D^bD\}$ $\{B^bB\}$	$\{E^bA\}$	$\{C^\#DE^b\}$ $\{CC^\#D\}$	$\{BB^bA^b\}$	$\{AA^bF\}$	$\{D^bDG\}$	
Flutes	$\{EF\}$ $\{GA^b\}$ $\{AB^b\}$		$\{GA^bA\}$		$\{A^bAC\}$	$\{EFB^b\}$ $\{GA^bD^b\}$ $\{A^bGD\}$ $\{AA^bE^b\}$	
Clarinet	$\{CD^b\}$ $\{D^bD\}$ $\{DE^b\}$			$\{CC^\#E^b\}$ $\{E^bDC\}$			
Celesta and Harp	$\{CD^b\}$ $\{D^bD\}$ $\{DE^b\}$ $\{F^\#G\}$ $\{B^bB\}$	$\{E^bA\}$	$\{C^\#DE^b\}$ $\{CC^\#D\}$	$\{GF^\#E\}$ $\{B^bBD^b\}$	$\{C^\#CA\}$ $\{DC^\#B^b\}$ $\{BB^bG\}$	$\{D^bDG\}$	$\{AB^bBD^bE^b\}$ -[01246] $\{BB^bGF^\#E\}$ -[01457]

The constellations also form the trichord-types, [012], [013], [014], and [016], which are created both by the adjacent notes and by non-adjacent pitches. In total, three members of [012] including two new members ($\{CC^\#D\}$, $\{C^\#DE^b\}$), five

members of [013] including two new members ($\{B^bBD^b\}$, $\{BB^bA^b\}$), five members of [014] including of four new members ($\{C^\#CA\}$, $\{DC^\#B^b\}$, $\{A^bAC\}$, $\{BB^bG\}$), and five members of [016] including two new members ($\{EFB^b\}$, $\{A^bGD\}$) happen in phrase 3 (Table 5.7).

Two appearances of Cassiopeia form two pentachord-types, [01246] in m. 153 and [01457] in m. 155. The [01246] is the same pentachord-type occurring in order numbers 5–9 in the row and [01457] is the same pentachord-type forming order numbers 1–5. As in previous phrases, the pentachord-types produced in the constellation are the same as chord-types found in the row's partition in spite of being formed apart from the row.

Ursa Minor consists of seven notes similar to that of Ursa Major in section A. This Ursa Minor and the second Cassiopeia in m. 155 form the aggregate. The creation of the twelve-note aggregate between Ursa Minor and Cassiopeia is one of the composer's techniques to express the physical features of the two constellations, which are located in complementary positions on opposite sides of the Polar Star.

Phrase 4 (mm. 156–168)

The voice and twelve instruments are utilized in phrase 4, but all of them never play simultaneously. Three new constellations, Pegasus, Andromeda, and Libra, are employed in phrase 4.

Rhythm

Example 5.15a Vocal Line's Rhythm in Phrase 4

156

158

161

164

Example 5.15b Instrumental Line's Rhythm in Phrase 4

157

160

163

166

Example 5.15c Composite Rhythm in Phrase 4

156

158

161

164

167

The vocal line mainly consists of the dotted rhythm; after four dotted eighth notes in m. 156, its rhythmic unit expands to dotted quarter notes in m. 157. A slight rhythmic expansion occurs in two measures, mm. 157–158. After the alternation between dotted quarter note and dotted eighth note (the three eighth notes in m. 163 are regarded as a dotted quarter note) in mm. 161–164, the dotted eighth note contracts to the dotted sixteenth note from m. 164. The vocal line shows the rhythmic expansion to the dotted quarter note and then contraction to the dotted sixteenth notes within phrase 4. This dotted rhythm comes from the strings' dotted rhythm in phrase 3. Example 5.15a shows the vocal line's rhythm.

On the other hand, as shown in Example 5.15b, the instrumental line does not contain any consistent rhythmic development. The rhythmic pattern alternating between duplet and triplet abruptly contracts to the sixteenth or dotted sixteenth rhythm in the middle of the phrase and then returns to the same rhythmic pattern as the beginning of phrase 4.

Both the vocal and instrumental lines' rhythmic patterns and developments seem different; the vocal line has a rhythmic pattern that gets shorter and the instrumental line has a rhythmic pattern that gets shorter but then expands. However, the instrumental line supports the vocal line's rhythmic progression by using rhythmic patterns that coincide with points in the vocal line. The instrumental line's divided rhythms are included in the vocal line's rhythm without hindering or breaking the vocal line's rhythmic progression. Both lines' rhythms become shortened to the dotted sixteenth note and then the instrumental line expands its rhythmic pattern to

the half duration (Example 5.15c). This shortened rhythmic pattern strongly reflects the text, which will be discussed later in this chapter.

Texture

Since no rows are employed in the instrumental line, the discussion of texture will focus on the constellations. Three constellations are classified into two gaps, Pegasus and Andromeda together, and Libra, based on their different textures: Pegasus and Andromeda have eight instruments, three strings, two clarinets (clarinet and bass clarinet), and two flutes (flute and alto flute) along with the harp, while Libra has a single instrumental family, the three strings.

The employment of eight instruments playing all the constituent pitches of Pegasus and Andromeda produces the densest textures in phrase 4 as well as this movement, since all eight pitches sound simultaneously at the end of these constellations. On the other hand, a sparse texture occurs between the two densest textures (Pegasus and Andromeda); the flute (or piccolo) holds e_5 and the bass clarinet holds d_3 along with the vocal line and the celesta playing a few chords in mm. 160–165. This is the thinnest texture in phrase 4 as well as in this movement. Thus, the densest and sparsest textures occur within phrase 4. The two contrasting textures have a strong connection to the text, which will be discussed later in the chapter.

As I mentioned earlier in the Introduction, Pegasus exists for extension. In addition, one of Pegasus' stars and one of Andromeda's stars occupy the same

Example 5.16 Pegasus, Andromeda and its Prolongation (mm. 157–170)

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position physically. This feature appears in mm. 161–165 through the pitches sustained through the appearances of Pegasus and Andromeda. In the pitches' arrangement in drawing the stars' physical location, the E is the fourth star of Pegasus and is also the first star in Andromeda and the pitch D is the third star in Pegasus,

which also appears in *Andromeda*. Based on the pitches' location, the pitch e_5 by the flute (or piccolo) and the d_3 (or d_4) by the bass clarinet (or alto flute) sustain for five measures (mm. 161–165) to connect two constellations (Example 5.16).

Actually, the first pitch range in *Andromeda* is e_4 rather than e_5 . The pitch below an octave represents the different latitudes between Pegasus and Andromeda. The visible latitudes of Pegasus and Andromeda are quite wide at $90^\circ \sim -60^\circ$ and $90^\circ \sim -40^\circ$, respectively. Those latitudes are related to the pitch range (this will be examined at the end of the discussion of section B).

Row and Pitch

Example 5.17 Vocal Line in Phrase 4 (mm. 156–165)

The image displays a musical score for four vocal parts: Soprano, Alto, Tenor, and Bass. The Soprano part is at the top left, Alto at the top right, Tenor at the bottom left, and Bass at the bottom right. The Soprano line includes the lyrics "miserere de uero re. No. No." and "La lo - so - no te pe - sa, que". The Alto line includes the lyrics "es tu x-ul - ter - so de cu". The Tenor line includes the lyrics "miserere de uero re. No. No.". The Bass line includes the lyrics "miserere de uero re. No. No.". The score is in 4/4 time and features various musical notations such as slurs, accents, and dynamic markings like *sempre sognatamente* and *travagliato*.

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The vocal line forms the row P_1 in phrase 4. This row could be divided into two groups as order numbers 0–5 (mm. 156–158) and 6–e (mm. 160–65) based on the

rest and texture. The text also supports this division, since a sentence break occurs at this point. In the first group (order numbers 0–5), the rest also divides the hexachord into two trichords, [012] and [013]. In each trichord, there are repeated notes $c_4^\#$ and d_4 in [012] $c_4^\#d_4e_4^b$ (m. 156) and g_4 and $f_3^\#$ in [013] $a_4g_4f_3^\#$ (m. 158). These repeated notes occur within each trichord-type. Example 5.17 shows the vocal line of phrase 4.

However, the technique of using repeated notes in the second group (order numbers 6–e) differs from that of the first group (first hexachord). After the trichord (order numbers 6–8) in mm. 160–61, the tetrachord (order numbers 6–9) appears carrying the previous trichord, order numbers 6–8 ($e_5b_4^bf_4$) and adding order number 9 (a_3^b) in mm. 161–62. Another tetrachord occurs in mm. 162–164 including the previous trichord (order numbers 7–9) and the order number t . Then, the tetrachord consisting of order numbers 8–e carries the previous trichord, order numbers 8– t ($f_4a_3^bb_3$) with the pitch c_4 (order number e) in mm. 164–65. Three tetrachords carrying three repeated pitches and one new pitch bring about an abundance of repeated notes in the second hexachord of P_1 . In addition, they change their chord-type in every instance: [0146] in the first appearance (mm. 161–162), [0136] in the second instance (m. 164), and [0147] in the third occurrence (mm. 164–165).

The slightly changed tetrachord-type represents the connections between the two sustained constellations, Pegasus and Andromeda, by the use of complementary chord-types; Pegasus' octachord type is 8-Z29, [01235679] and its complementary set is 4-Z29, [0137], which occurs in m. 157 in the celesta while Pegasus occurs simultaneously. After the simultaneous occurrence of the octachord of Pegasus and its

complementary tetrachord, the vocal line forms the three tetrachord-types, [0146], [0136], and [0147]. After reaching tetrachord [0147], Andromeda (octachord-type 8-18 [01235689]) is heard. Now, Andromeda's octachord appears after its complementary tetrachord, 4-18 [0147]. Consequently, the vocal line's changing tetrachord-types connect the two constellations by providing the complementary chord-types. This smoothly connects the two constellations.

Chord-Types

Pegasus contains one [01] and one [06] and Andromeda has one [01] found by adjacent notes. Since the eight notes are sustained and sound simultaneously at the end of the constellations, an additional five members of [01] and three members of [06] are produced by the non-adjacent notes. In addition, the celesta, vibraphone, and strings (violin and cello) play six members of [01] type in mm. 160–65. Those six members of [01] type have a tritone relation between adjacent pairs such as $d^{\#}_6 e_5 - a_5 b^b_4$ (mm. 160–161), $c_4 b_4 - f_5 f^{\#}_4$ (m. 162), and $c^{\#}_5 d_4 - g_5 a^b_4$ (mm. 163–164). The same six dyads consisting of the same pitch range repeat in m. 165, one measure later. This strongly shows the composer's intention to emphasize two dyad-types, [01] and [06] (the reasons why the composer consistently uses those two dyads are revealed later in this dissertation). Consequently, ten members of [01] ($\{C^{\#}D\}$, $\{DE^b\}$, $\{E^bE\}$, $\{FF^{\#}\}$, $\{F^{\#}G\}$, $\{GG^{\#}\}$, $\{G^{\#}A\}$, $\{AB^b\}$, $\{B^bB\}$, $\{BC\}$) and all six members of [06] ($\{CF^{\#}\}$,

Table 5.8 Dyad and Trichord Types in Phrase 4

	Dyads		Trichords ⁶²			
	[01]	[06]	[012]	[013]	[014]	[016]
Strings	{C [#] D} {D [#] E} {FG ^b } {F [#] G} {GA ^b } {A ^b A} {AB ^b } {B ^b B} {BC}	{A ^b D} {AE ^b } {BF} {CF [#] }	{DE ^b E} {EFG ^b } {AB ^b B} {B ^b BC}	{CBA} {C [#] DE} {E ^b DC} {E ^b EF [#] } {F [#] GA} {GF [#] E} {A ^b AB} {AB ^b C} {B ^b AG} {BCD}	{DE ^b G ^b } {E ^b DB} {E ^b EG} {EE ^b C} {F [#] GA [#] } {G ^b FD} {GF [#] E ^b } {A ^b GE} {AB ^b C [#] } {B ^b AF [#] } {B ^b BD} {BCE ^b } {BB ^b G}	{CBF [#] } {E ^b EA} {E ^b DA} {EE ^b B ^b } {F [#] GC} {A ^b GD} {AB ^b E ^b } {B ^b AE} {B ^b BE}
Flutes	{DE ^b } {E ^b E} {AB ^b } {B ^b B}	{B ^b E}				{DC [#] A ^b } ⁶³ {C [#] DG} ⁶⁴
Clarinets		{CG ^b } {A ^b D} {AE ^b } {B ^b E}				
Celesta and Harp	{C [#] D} {D [#] E} {FG ^b } {GA ^b } {AB ^b } {BC}	{CG ^b } {C [#] G} {DA ^b } {D [#] A} {EB ^b } {BF}	{AB ^b B}	{E ^b DC} {F [#] GA}		
Voice	{C [#] D} {DE ^b } {F [#] G} {BC}	{EB ^b }	{C [#] DE ^b }	{F [#] GA}	{CBA ^b }	{EFB ^b }

In the trichord-types, the adjacent notes and non-adjacent pitches produce a high frequency and several members. In total, five members of [012] including two new members ({DE^bE}, {EFF[#]}), ten members of [013] including five new members

⁶² Since the pitches of Pegasus and Andromeda are sounded by eight instruments, some trichords are made by three different instruments. Thus there is no division between the instruments.

⁶³ This trichord is made only by the strings.

⁶⁴ This trichord is made only by the strings.

({CBA}, {F[#]GA}, {A^bAB}, {AB^bC}, {B^bAG}), fourteen members of [014]
 including seven new members ({DE^bF[#]}, {E^bDB}, {EE^bC}, {F[#]GA[#]}, {GF[#]E^b},
 {AB^bC[#]}, {B^bBD}), and twelve members of [016] including four new members
 ({E^bEA}, {EE^bA[#]}, {F[#]GC}, {B^bAE}) are formed in phrase 4.

All of Two Phrases (Section B)

Rhythm

Example 5.19 Composite Rhythm in Section B

The musical score consists of six staves of music, numbered 153 through 167. The staves are arranged vertically. The first staff (153) starts with a treble clef and a 3/4 time signature, followed by a 2/4 time signature, and ends with a 4/4 time signature. The second staff (156) starts with a 4/4 time signature, followed by a 6/4 time signature, and ends with a 4/4 time signature. The third staff (159) starts with a 4/4 time signature, followed by a 3/4 time signature, and ends with a 6/4 time signature. The fourth staff (162) starts with a 4/4 time signature, followed by a 3/4 time signature, and ends with a 2/4 time signature. The fifth staff (165) starts with a 3/4 time signature, followed by a 3/4 time signature, and ends with a 3/4 time signature. The sixth staff (167) starts with a 4/4 time signature and ends with a double bar line. The music features various rhythmic patterns, including triplets and dotted rhythms, and is marked with accents and slurs.

The rhythmic pattern employed in each phrase is different; the triplet rhythm in phrase 3 and the dotted rhythm in phrase 4. The triplet rhythm in phrase 3 comes from section A, in which the triplet and quintuplet rhythms typically dominate. On the other hand, the dotted rhythm in phrase 4 comes from phrase 3, in which the

dotted rhythm appears once (m. 154) by the celesta and violin (Ursa Minor).

However, the same arch-shaped form occurs in both lines, through containing different rhythmic patterns and occurring different in phrases.

The instrumental line's rhythm in phrase 3 forms an arch shape—the quarter-note triplet—the half-note triplet—the quarter-note triplet. This arch shape of rhythmic pattern is also found in the vocal line of phrase 4 — the dotted eighth note—the dotted quarter note—the dotted sixteenth note. Example 5.19 provides the composite rhythm of section B.

Texture

Phrases 3 and 4 have quite different textures: the instrumental line using two constellations in phrase 3 and both the vocal and instrumental lines using three constellations in phrase 4.

Among the constellations in section B, Ursa Minor, Pegasus, and Andromeda increase the number of pitches used in each constellation seven notes in Ursa Minor and eight notes in Pegasus and Andromeda. This creates a thick texture, since all constituent pitches are sounded simultaneously. Through the piece, the texture in section B is the densest. On the other hand, the sparsest texture also occurs within section B. Between the two constellations, Pegasus and Andromeda, there is a thin texture consisting of the vocal, celesta, and piccolo lines. This clearly shows contrasting textures, the thinnest texture between the thickest textures. This contrast is

one of the techniques used to express the text (which will be discussed later in this chapter).

Chord-Types

Table 5.9a [01] Dyad Type in Section B

Phrase	Strings			Flutes			Clarinets			Celesta			Voice			All
	3	4	All	3	4	All	3	4	All	3	4	All	3	4	All	
{CC [#] }							V		V	V		V				V
{C [#] D}	V	V	V				V		V	V	V	V		V	V	V
{DE ^b }					V	V	V		V	V		V		V	V	V
{E ^b E}		V	V		V	V					V	V				V
{EF}				V		V										V
{FF [#] }		V	V								V	V				V
{F [#] G}		V	V							V		V		V	V	V
{GG [#] }		V	V	V		V					V	V				V
{G [#] A}		V	V													V
{AB ^b }		V	V	V	V	V					V	V				V
{B ^b B}	V	V	V		V	V				V		V				V
{BC}		V	V								V	V		V	V	V

Table 5.9b [06] Dyad Type in Section B

Phrase	Strings			Flutes			Clarinets			Celesta			Voica			All
	3	4	All	3	4	All	3	4	All	3	4	All	3	4	All	
{CF [#] }		V	V					V	V		V	V				V
{C [#] G}											V	V				V
{DA ^b }		V	V					V	V		V	V				V
{E ^b A}	V	V	V					V	V	V	V	V				V
{EB ^b }					V	V		V	V		V	V		V	V	V
{FB}		V	V								V	V				V

As shown in Tables 5.9a and 5.9b, various members of the dyad-types, [01] and [06], are heard in both lines. All twelve members of [01] are formed: eight members ({CC[#]}, {C[#]D}, {DE^b}, {EF}, {F[#]G}, {GA^b}, {AB^b}, {B^bB}) in phrase 3

and ten members ($\{C^\#D\}$, $\{DE^b\}$, $\{E^bE\}$, $\{FF^\#\}$, $\{F^\#G\}$, $\{GG^\#\}$, $\{G^\#A\}$, $\{AB^b\}$, $\{B^bB\}$, $\{BC\}$) in phrase 4. In the case of [06] type, all six members are formed, one member ($\{E^bA\}$) in phrase 3 and all six members in phrase 4.

The strings, in particular, repeat the dyads of $\{C^\#D\}$ and $\{B^bB\}$ in phrase 3 and establish semitone relationships above and below in constructing the nine members of [01] in phrase 4. The $\{B^bB\}$ in phrase 3 expands downward to the $\{FF^\#\}$ and upward to $\{BC\}$. In the flutes, the $\{EF\}$ develops by a semitone down to $\{E^bE\}$ and $\{DE^b\}$ and the $\{AB^b\}$ develops up to $\{B^bB\}$ through the semitone. Like the strings and flutes, the vibraphone, harp, and celesta develop the dyad-types by semitone relationships from the previous dyads.

This semitone relationship also appears in the dyad [06] type. Phrase 3 has one member $\{E^bA\}$ formed in the strings and celesta. The harp repeats this same member $\{E^bA\}$ in the beginning of phrase 4 and then develops all six members through semitone relationships.

Table 5.9c [012] and [013] Trichord Types in Section B

Phrase	3	4	All	Phrase	3	4	All
{CC [#] D}	V			{CC [#] E ^b }	V		V
				{C [#] DE}		V	V
{C [#] DE ^b }	V	V		{DD [#] F}			
				{E ^b EF [#] }		V	V
{DE ^b E}		V		{EFG}			
				{FF [#] A ^b }			
{E ^b EF}				{F [#] GA}		V	V
				{GA ^b B ^b }			
{EFF [#] }		V	V	{G [#] AB}		V	V
				{AB ^b C}		V	V
{FF [#] G}				{B ^b BC [#] }	V		V
				{BCD}		V	V
{F [#] GG [#] }				{C [#] CB ^b }			
				{DC [#] B}			
{GG [#] A}	V		V	{E ^b DC}	V	V	V
				{EE ^b C [#] }			
{G [#] AB ^b }				{FED}			
				{F [#] FE ^b }			
{AB ^b B}		V	V	{GF [#] E}	V	V	V
				{G [#] GF}			
{B ^b BC}		V	V	{AG [#] F [#] }			
				{B ^b AG}		V	V
{BCC [#] }				{BB ^b G [#] }	V		V
				{CBA}		V	V

Table 5.9d [014] and [016] Trichord Types in Section B

Phrase	3	4	All	Phrase	3	4	All
{CC [#] E}				{CC [#] F [#] }			
{C [#] DF}				{C [#] DG}	✓	✓	✓
{DE ^b F [#] }		✓	✓	{DE ^b G [#] }			
{E ^b EG}		✓	✓	{E ^b EA}		✓	✓
{EFA ^b }				{EFB ^b }	✓	✓	✓
{FF [#] A}				{FF [#] B}			
{F [#] GB ^b }		✓	✓	{F [#] GC}		✓	✓
{GG [#] B}				{GA ^b C [#] }	✓		✓
{A ^b AC}	✓		✓	{A ^b AD}			
{AB ^b C [#] }		✓	✓	{AB ^b E ^b }		✓	✓
{B ^b BD}		✓	✓	{B ^b BE}		✓	✓
{BCE ^b }		✓	✓	{BCF}			
{C [#] CA}	✓		✓	{C [#] CG}			
{DC [#] B ^b }	✓		✓	{DC [#] G [#] }	✓	✓	✓
{E ^b DB}		✓	✓	{E ^b DA}		✓	✓
{EE ^b C}		✓	✓	{EE ^b B ^b }		✓	✓
{FEC [#] }				{FEB}			
{F [#] FD}		✓	✓	{F [#] FC}			
{GF [#] E ^b }		✓	✓	{GF [#] C [#] }			
{A ^b GE}		✓	✓	{G [#] GD}	✓	✓	✓
{AA ^b F}	✓		✓	{AG [#] E ^b }	✓		✓
{B ^b AF [#] }		✓	✓	{B ^b AE}		✓	✓
{BB ^b G}	✓	✓	✓	{BB ^b F}			
{CBA ^b }		✓	✓	{CBF [#] }		✓	✓

Among the four types of trichord, [012], [013], [014] and [016], in section B, the trichord [014] occurs with the most frequency and with the largest number of members.

Seven members of [012] happen in section B, three in phrase 3 and five in phrase 4 with a common member, {C[#]DE^b}. Between phrases 3 and 4, a semitone development occurs in the {DE^bE}; other members in phrase 4 do not have any

semitone relation, but they show a semitone development when compared to section A.

Among thirteen members of [013] in section B, there are two new members in phrase 3 and five new members in phrase 4. Between phrases 3 and 4, a semitone relation occurs: the $\{C^\#DE\}$, $\{AB^bC\}$, $\{G^\#AB\}$, $\{B^bAG\}$ and $\{CBA\}$ in phrase 4 have a semitone relation from the members in phrase 3.

In total, eighteen members of [014] occur in section B: five members in phrase 3 and fourteen members in phrase 4 having one common member, $\{BB^bG\}$. Most members occurring phrase 4 have a semitone relation; the $\{AB^bC^\#\}$ is a semitone above the $\{A^bAC\}$ and develops to the $\{B^bBD\}$ and $\{BCE^b\}$ within phrase 4. The $\{E^bDB\}$ and $\{EE^bC\}$ are related by a semitone as well as developed from the $\{DC^\#B^b\}$ in phrase 3. The $\{F^\#FD\}$, $\{GF^\#E^b\}$, and $\{A^bGE\}$ not only are related by a semitone but also are developed from the $\{AA^bF\}$ with a semitone relation. The $\{B^bAF^\#\}$ and $\{CBA^b\}$ are a semitone above and below from the $\{BB^bG\}$.

In addition, fourteen members of [016] are created, six members in phrase 3 and twelve members in phrase 4 (three members ($\{C^\#DG\}$, $\{EFB^b\}$, $\{A^bGD\}$ are overlapping). Between phrases 3 and 4, a semitone relation is obvious: the $\{E^bEA\}$ is a semitone below the $\{EFB^b\}$ in phrase 3, the $\{GA^bC^\#\}$ is a semitone below the $\{F^\#GC\}$ in phrase 3, the $\{E^bDA\}$ and $\{EE^bB^b\}$ are a semitone below the $\{DC^\#G^\#\}$ in

phrase 3, and the $\{B^b AE\}$ is related from the $\{AG^{\#}E^b\}$ having a semitone relation in phrase 3.

Section A' (mm. 169–185)

The significant change in section A' is the alteration of instrumentation from the clarinet in B^b to the clarinet in A in the beginning of the coda (m. 184). The constellations appearing in section A are also used in section A', however, the order of the appearance of the constellations is slightly different. After the two constellations of Volans and Cassiopeia, three constellations (Ursa Major, Triangulum Australe, Columba) are used whereas in section A, Columba appeared before Ursa Major and Triangulum Australe. In addition to having the same constellations as section A, the rhythm of Volans and Cassiopeia in section A' is also the same as that of Volans and Cassiopeia in section A for marking the beginning of section A'.

The appearance of the vocal line and the use of rhythmic patterns divide section A' into two phrases, phrase 5 (mm. 169–176) and phrase 6 (mm. 177–185). In phrase 5, there is no voice. Only the instrumental line (consisting of three flutes, three clarinets, three strings, celesta, harp, and vibraphone) plays in phrase 5. The rhythm consists of the triplet, quintuplet, and sextuplet. On the other hand, phrase 6 consists of both the instrumental line (three flutes, piccolo clarinet, clarinet, three strings, celesta, and harp) as well as the vocal line. The rhythms of both lines are different.

The vocal line's rhythm is the dotted rhythm, which is used in section B, while the instrumental line's rhythm is mainly the triplet and quintuplet, which are the rhythmic patterns of section A. Those two lines' rhythmic patterns, which employ the rhythmic patterns of sections A and B, also suggest the division of phrases within section A'. Furthermore, the fermata at the end of phrase 5 divides section A' into two.

Phrase 5 (mm. 169–176)

Rhythm

Example 5.20 Composite Rhythm in Phrase 5

The musical score for Example 5.20 consists of three staves. The first staff begins at measure 169 with a tempo marking of ♩ = 48 and a 3/4 time signature. It features a half-note triplet in measure 169 and an eighth-note quintuplet in measure 170. The second staff starts at measure 172 with a tempo marking of ♩ = 66 and a 3/8 time signature. It contains an eighth-note quintuplet in measure 170, an eighth-note sextuplet in measure 171, and a quarter-note triplet and an eighth-note quintuplet in measure 172. The third staff begins at measure 175 with a 3/4 time signature and shows a quarter-note triplet in measure 172. The score includes various rhythmic notations such as triplets, quintuplets, and sextuplets, along with fermatas and slurs.

As shown in Example 5.20, the rhythm starts with the half-note triplet in m. 169 and changes to the eighth-note quintuplet in m. 170. The larger beat of the whole-note duration changes to the half-note duration in the first two measures. After changing the duration, the half-note duration remains for four measures (mm. 170–173) having various rhythmic subdivisions: the quintuplet in m. 170, the eighth-note sextuplet in m. 171, the quarter-note triplet and the eighth-note quintuplet in m. 172. In particular, simultaneous use of the triplet and quintuplet in m. 172 forms an

overlapping rhythm (5:3) for the first time in the fourth movement. Its overlapping rhythm is significant containing the rhythmic patterns of section A (phrases 1 and 2) within phrase 5. The triplet, quintuplet, and sextuplet all occur within phrase 5 just as section A has all three rhythmic patterns. In contrast, phrase 6 has a different rhythmic development.

The rhythmic pattern in phrase 5 has two characters, regular contraction and irregular expansion. The regular rhythmic contraction occurs in the constellations of Volans and Cassiopeia and the irregular rhythmic expansion happens in the constellations of Ursa Major and Triangulum Australe. There are three reasons for using a regular rhythmic pattern in Volans and Cassiopeia: (1) the two constellations' order among the five constellations remains the same between sections A and A', (2) they play a role in dividing section A', and (3) the number of constituent pitches in each constellation (five) is important in this movement.

Texture

The texture alternates between constellations and rows; a single instrument (or single instrumental group) plays the constellations (mm. 169–170, mm. 174–176) such as three flutes (Volans), the celesta (Cassiopeia), the vibraphone (Ursa Major), and the cello (Triangulum Australe) and several instruments form the rows (mm. 171–173) like the flute and cello play the row P₂, the violin, piccolo clarinet, and bass clarinet form the row P₀, and celesta, B^b clarinet, and cello use the row R₁.

The texture in phrase 5 clearly divides into two based on the use of constellations and rows.

Example 5.21 Phrase 5 (mm. 169–173)

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Pitch

Example 5.22 Row of P_2 , P_0 , and R_1 (mm. 171–73)

P_2 : D D[#] E B^b A^b G F B F[#] A C D^b

P_0 : C C[#] D A^b G^b F E^b A E G B^b B

R_1 : C B G[#] F A[#] E F[#] G A E^b D C[#]

The three rows, P_2 , P_0 , and R_1 , have some invariance. Example 5.22 displays three rows formed in mm. 171-173 (also see Example 5.21). Between P_2 and P_0 , the dyad of $\{CC^\#\}$ is invariant and between P_0 and R_1 , the dyads of $\{DC^\#\}$ and $\{E^bA\}$ are invariant. All invariance consists of the dyad-types [01] and [06]. In between P_2 and P_0 , the dyad $\{CC^\#\}$ occurs as the last two pitches (order numbers t and e) in the row P_2 and the first two pitches (order numbers 0 and 1) in the row P_0 . Since the two rows start simultaneously (the ending is different due to different rhythmic patterns, the eighth note sextuplet in P_2 and the quarter-note triplet in P_0), the invariance $\{CC^\#\}$ does not sound side by side. In between P_0 and R_1 , the dyad of $\{C^\#D\}$ is located in the last two pitches (order numbers t and e) of the row R_1 and in the order numbers 2 and 3 in the row P_0 . Since the rows consist of two different rhythmic patterns (the quarter-note triplet in P_0 and the eighth note quintuplet in R_1), these invariants do not form any particular relationship.

However, two invariants do have a consistent location among the three rows. The last dyad of P_2 and R_1 is invariant and the first three pitches in P_0 contain two overlapping invariant' dyads, $\{CC^\#\}$, $\{C^\#D\}$. The three intertwined rows in different rhythmic patterns in mm. 171-173 still emphasize these invariants by using the same timbre, especially in the strings. The cello plays the last dyads of P_2 $\{CC^\#\}$ in m. 172 and of R_1 $\{DC^\#\}$ in m. 173. The violin plays the first three pitches of P_0 $\{CC^\#D\}$ making two overlapping invariant dyads in m. 171. After forming the two invariants

consecutively in the violin, each invariant appears one after the other in the cello.

This shows Dallapiccola's manipulation of rhythm and timbre to emphasize the [01] invariance.

Chord-Types

Table 5.10 Dyad and Trichord Types in Phrase 5

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Flutes	{DD [#] } {D [#] E} {EF} {FG ^b } {GA ^b }	{EB ^b } {FB} {CF [#] }	{DD [#] E} {EFF [#] }	{GA ^b B ^b } {A ^b GF}	{G ^b GB ^b }	{EFB ^b } {ED [#] B ^b } {FF [#] B}
Clarinets	{F [#] G} {B ^b B}			{F [#] GA} {GF [#] E}		
Celesta and Vibraphone	{C [#] D} {G [#] A} {BC}	{CF [#] } {DG [#] }			{F [#] FD}	{EFA [#] }
Strings	{CC [#] } {C [#] D} {D [#] E} {FG ^b } {AB ^b }	{DA ^b } {D [#] A} {EB ^b }	{CC [#] D}	{AB ^b C} {FF [#] A ^b } {AA ^b F [#] }	{BCE ^b } {ED [#] C}	{DC [#] A ^b } {AB ^b E ^b } {B ^b AE} {E ^b EA}

The dyad-types [01] and [06] presented in invariance are also formed in the adjacent pitches of the constellations (Volans and Cassiopeia). In Volans, the flute and alto flute form two [01]s (e₅-f₄ and f₄-g^b₆ (m. 169)) having a semitone relation and one [06] (e₅-b^b₆ (m. 169)). In Cassiopeia, the celesta plays one dyad [01], c[#]₅-d₄, and [06], d₄-g[#]₄ (m. 170). After this, the flute then forms the row P₂, which begins with the pitches of d₄-d[#]₄-e₄. Its arrangement shows the semitone relations within the [01] dyad relation, c[#]₅-d₄ and d₄-d[#]₄-e₄. Thus, all five members of [01] types are

related to each other by the semitone. Table 5.10 displays the examples of dyad- and trichord-types in phrase 5.

The dyad-type of [06] has five members ($\{C^\#G\}$ is missing). The flute and piccolo play $e_5-b_6^b$ (m. 169) and develop the f_6-b_5 (m. 171) by the semitone relation. On the other hand, the strings form the $d_4-a_4^b$ (m. 171) within the row P_0 . This $d_4-a_4^b$ is transposed to become higher by semitones to $d_5^\#-a_4$ and $e_4-b_3^b$ in m. 174–5. After the strings play three members of [06] types in mm. 171–74, the flute and vibraphone form the dyad $c_6-f_5^\#$ in m. 175. Thus, the strings form three dyads chromatically from $\{DA^b\}$ to $\{EB^b\}$, and the flutes form three dyads from $\{EB^b\}$ to $\{F^\#C\}$. All five dyads from $\{DA^b\}$ to $\{F^\#C\}$ show the semitone relationship.

The constellations' adjacent pitches form the four trichord-types. Volans contains the [014] ($g_6^b g_6^b b_6^b$), [016] ($e_5 f_4 b_6^b$), and [012] ($e_5 f_4 g_6^b$) in m. 169 by three flutes. Cassiopeia also has two [016]s ($d_5 c_6^\# g_5^\#$ and $g_5^\# a_4 d_5$) and one [013] ($g_5^\# a_4 b_5$) in the celesta (m. 170). Ursa Major forms one [014] ($f_5^\# f_5 d_5$) in m. 175. Aside from the trichords in the constellations, the rows of P_2 , P_0 , and R_1 contain many of these trichord partitions in the flutes, clarinets, strings, and celesta.

In the case of trichord [012], there is no new member in phrase 5. The three members are already introduced in the previous phrases 3 and 4. Two [012]s ($d_4 d_4^\# e_4$ and $e_5 f_4 g_6^b$) by the flutes are related by inversion around the pitch E. In addition, two

[012]s in the flute ($d_4d^{\#}_4e_4$) and in the strings ($d_4c^{\#}_4c_4$) are also related by inversion based on the pitch D. All [012] trichord-types in phrase 5 are related by inversion.

In the case of [013] type, four new members ($\{FF^{\#}A^b\}$, $\{GA^bB^b\}$, $\{A^bGF\}$, $\{AA^bF^{\#}\}$) occur among seven members in phrase 5. In the [014] type, four members occur, which are already formed in phrase 4. In the [016] type, the $\{FF^{\#}B\}$ is a new member among seven total members.

Phrase 6 (mm. 177–185)

The employment of the clarinet in A instead of the clarinet in B^b is an obvious change in phrase 6. The changing instrument to clarinet in A is to emphasize not only the invariants but also the center pitch in this piece (this will be discussed in the conclusion). Instrumentation consists of all twelve instruments with the vocal line, but all of the voices never sound simultaneously. Phrase 6 has two constellations, Cassiopeia in the celesta and Columba in the strings and three flutes along with the harp.

Rhythm

The instrumental and vocal lines have different rhythmic patterns. The instrumental line's rhythm mainly consists of the triplet and the quintuplet (Example 5.23a). After faster rhythms such as sixteenth notes and a dotted eighth note in m. 177, the triplet and quintuplet with a half-note duration

Example 5.23a Instrumental Line's Rhythm in Phrase 6

Example 5.23b Vocal Line's Rhythm in Phrase 6

Example 5.23c Composite Rhythm in Phrase 6

appear in m. 178. After m. 179, the quintuplet disappears and only the triplet rhythm continues with a rhythmic pattern that gets longer through the use of a tie in the last note (mm. 180–181).

On the other hand, the vocal line's rhythm primarily consists of the dotted rhythms (Example 5.23b). This dotted rhythm is also the main rhythmic pattern in section B. After the dotted rhythms in mm. 177–180, the rhythmic pattern changes to

the triplet and quintuplet in mm. 181–185 such as the half-note triplet in m. 181, the eighth-note quintuplet in m. 182, and the quarter-note triplet in m. 182. The duration becomes shorter from the whole-note duration to the half note duration within the triplet.

The composite rhythm between the vocal and instrumental lines shows a deep connection (Example 5.23c). From m. 181, the vocal line takes over the triplet and quintuplet rhythm previously appearing in the instrumental line. The simultaneous occurrence of the quarter-note triplet in both lines (m. 180) plays the role of transferring the rhythmic patterns. This shift in rhythm ensures the continuous triplet rhythm and the preparation of the closing section A' with the lengthening rhythmic patterns.

Texture

Phrase 6 contains two pitch groups – row's pitches and outside the row. Pitches outside the row form two constellations, Cassiopeia and Columba. Those two constellations have different textures; one instrument (celesta) plays Cassiopeia and several instruments (three flutes, strings along with the harp) form Columba. Six instruments introduce the six notes of Columba one after another. Thus, the simultaneous sound of six pitches in Columba produces a thick texture in m. 182.

Example 5.24 Phrase 6 (mm. 180–185)

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On the other hand, the pitches based on the row form three rows, RI_4 , I_9 , and R_9 . Of particular interest, the row I_9 is shared by the vocal and instrumental lines (the reason for the row's division will be discussed in invariance); the instrumental line takes order numbers 3–e and the vocal line sings the first trichord (order numbers 0–2). In the instrumental line, the row RI_4 has vertical trichords in the strings (m. 177), and I_9 (order numbers 3–e) contains three vertical trichords in different instruments, [013] by the strings and harp, [016] by the flutes and celesta, and [014] by the clarinets and vibraphone in mm. 183–185. The vocal line sings the row R_9 and then the first three pitches of I_9 .

Invariance

Example 5.25a Invariance between RI₄ and I₉ (the instrumental line)

RI₄ : F F[#] A C G C[#] B B^b A^b D E^b E
I₉ : C[#] E^b E F[#] C F D B B^b

Example 5.25b Invariance between R₉ and I₉ (the vocal line)

R₉ : A^b G E C[#] F[#] C D E^b F B B^b A
I₉ : A A^b G

The main reason for sharing the row I₉ is to create invariance. The sharing of the row makes it possible to create more types of invariance which ultimately play an important role in establishing these continuously emphasized sonorities.

In the instrumental line, two rows, RI₄ and I₉ (order numbers 3–e), have two invariants, E^b-E and B^b-B, as shown in Example 5. 25a. In addition, there is one more contextual invariance, F-F[#]. Since those two rows form vertical trichords, the F and F[#] sound together in a trichord partition containing the first trichord in RI₄ and the third trichord in I₉ (Example 5.24). Consequently, the two rows share the maximum number of invariant semitones. The creation of three [01] invariants by dividing the row and manipulating the texture is one of the composer's techniques to consistently form the sonorities he wants through this piece.

On the other hand, the vocal line has one invariant A^b-G between the two rows, R₉ and I₉ (order numbers 0–2) as shown in Example 5.25b. The invariant has

the same register, $a^b_{4-g_4}$ (m. 177) in R_9 and $a^b_{4-g_4}$ (m. 182-5) in I_9 while appearing three times (Example 5.24). In addition, the continuous melodic line and the connection of two rows, R_9 and I_9 , produce many [01] dyads in mm. 182–5. From order number 9 in R_9 to order number 3 in I_9 , there are four members of [01] ($\{BB^b\}$, $\{B^bA\}$, $\{AA^b\}$, $\{A^bG\}$). The continuous presence of [01] dyads prepares and supports the invariant $a^b_{4-g_4}$ by gradual approach and repetition. The invariance occurs in the beginning and end of the vocal line in phrase 6.

Now the reasons for sharing row I_9 in both lines should be clear. Furthermore, the reason for dividing the row with the first trichord in the vocal line and the remaining pitches in the instrumental line is also apparent. The instrumental line forms three invariants ($\{E^bE\}$, $\{B^bB\}$, and $\{FF^\#\}$) and the vocal line produces one invariant ($\{GA^b\}$) and three more [01] dyads ($\{BB^b\}$, $\{B^bA\}$, $\{AA^b\}$, $\{A^bG\}$) contextually through the connection of the two rows. The reason for creating [01] in invariance and contextual invariance in both lines will be discussed later in a summary of section A'.

Chord-Types

The adjacent pitches of constellations form the dyad-types [01] and [06]. In Cassiopeia, the celesta forms one [01] ($g^\#_{5-a_4}$) and one [06] ($c^\#_{5-g_6}$). In Columba, there are many [01]s and [06]s since six pitches are held and sound simultaneously. Besides the constellations, the rows of RI_4 and I_9 (order numbers 3–e) also form the

Table 5.11 Dyad and Trichord Types in Phrase 6

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Flutes	{FG ^b }	{CF [#] }				{F [#] FC}
Clarinets	{DE ^b } {FF [#] } {B ^b B}				{B ^b BD}	
Celesta, Harp, and Vibraphone	{E ^b E} {FG ^b } {G [#] A} {AA [#] } {B ^b B} {BC}	{CF [#] } {C [#] G}	{B ^b BC} {AB ^b B}	{G [#] AB} {EE ^b C [#] } {CBA} {AA [#] C}	{B ^b BD} {BCE ^b } {EE ^b C}	{E ^b EA} {EE ^b A [#] } {F [#] FC} {A [#] BE} {AA [#] E ^b } {A [#] AE} {CC [#] F [#] }
Strings	{CC [#] } {DD [#] } {D [#] E} {FF [#] } {GA ^b } {A [#] B}	{C [#] G}	{DD [#] E}	{BA [#] G [#] } {EE ^b C [#] }	{FF [#] A} {G ^b FD}	{C [#] CG} {GA ^b D ^b }
Voice	{DE ^b } {GA ^b } {A ^b A} {AB ^b } {B ^b B}	{CF [#] }	{GA ^b A}			

dyad-types [01] and [06] in the instrumental line. The vocal line sings five members of [01] ({DE^b}, {GA^b}, {A^bA}, {AB^b}, {B^bB}) and one member of [06] type ({F[#]G}). Table 5.11 shows the dyads in phrase 6. In total, nine members of [01] type and two members of [06] type occur in phrase 6. The semitone relation is found in two [06]s.

There are no new members in the trichord types [012] and [013]. In the [014] type, there is one new member {FF[#]A} among five members in phrase 6. In the [016] type, there are two new members ({CC[#]F[#]}, {C[#]CG}) among nine members.

All of Two Phrases (Section A')

Rhythm

Example 5.26 Composite Rhythm in Section A'

The musical score consists of six staves, each representing a different measure or phrase. The staves are numbered 169, 172, 175, 178, 181, and 183. The music is written in a single system with a treble clef. The time signatures change throughout: 3/2, 3/2, 3/2, 3/4, 3/4, and 3/4. The notation includes various rhythmic figures such as triplets, quintuplets, and sextuplets, as well as dotted rhythms and slurs. The notes are primarily eighth and sixteenth notes, often grouped together to form complex rhythmic patterns.

While the instrumental line consists of the triplet, quintuplet, and sextuplet, the vocal line mainly forms dotted rhythms. Its dotted rhythm transfers to the triplet rhythm after the simultaneous occurrence of the triplet rhythm in both lines (m. 181). The rhythm of phrases 5 and 6 are closely connected; the instrumental line develops the triplet, quintuplet, and sextuplet rhythm in phrase 5 and then the vocal line takes over this rhythmic pattern in phrase 6.

Comparing the two Cassiopeias in section A', they consist of the same rhythmic pattern, the eighth note quintuplet, but are slightly different. While the quintuplet forms five notes of Cassiopeia in phrase 5 (m. 170), two rhythmic patterns

of the quintuplet and quarter note contain the five notes of Cassiopeia in phrase 6 (m. 178) (Example 5.1). This slightly different rhythmic pattern expresses the rotation of Cassiopeia, which produces a slight change of shape.

As shown in Example 5.26, the rhythmic development shows a connection between phrases 5 and 6 even though each phrase has different rhythmic patterns—through the different speed using the same rhythmic patterns (the triplet, quintuplet, and sextuplet in phrase 5 and the triplet and quintuplet in phrase 6) and expanded rhythmic pattern in phrase 6. This expansion prepares the conclusion of section A' and the beginning of the coda.

Texture

Through section A', the texture alternates between the constellations and the rows. Among the five constellations, there are two different textures single texture in four constellations (Volans (three flutes), Cassiopeia (the celesta), Ursa Major (vibraphone), and Triangulum Australe (cello)) with one instrument or group and thick texture in Columba (three flutes and three strings along with the harp). On the other hand, the six rows occur: five rows, P₂, P₀, R₁, RI₄, and I₉ (order numbers 3–e) in the instrumental line and two rows, R₉ and I₉ (order numbers 0–2) in the vocal line. The two phrases contain the same number of rows, three with pairing rows (P₂-P₀, P₀-R₁ in phrase 5 and RI₄-I₉, (order numbers 3–e), R₉-I₉ (order numbers 0–2) in phrase 6). However, the two phrases employ different techniques in using these rows such as

horizontal lines in phrase 5 and vertical texture in phrases 6 as explained in the analysis of phrases 5 and 6.

Thus, the texture of phrase 6 is thicker than that of phrase 5 and the vocal line is added in phrase 6 as the phrase progresses. The thickening texture is one of the techniques of expressing the text (which will be discussed later in this chapter). The dynamics of phrases 5 and 6 are soft as *pp* to *p*. The dynamics of phrase 6 (*p*) are louder than that of phrase 5 (*pp*). This is also related to the texture of each phrase.

Invariance

In phrase 5, there is the invariance of $\{CC^\#\}$ between two rows, P_2 and P_0 , and of $\{C^\#D\}$ between the rows of P_0 and R_1 . The combination of these three rows emphasizes those two invariants through the timbre, violin and cello.

Among the three rows in phrase 6, there are three invariants, $\{BB^b\}$, $\{EE^b\}$, and $\{GA^b\}$. In addition, there is another contextual invariant $\{FF^\#\}$ between RI_4 and I_9 . Besides those invariants, the rows' connection in the vocal line produces many [01]s, which gradually emphasize the $\{GA^b\}$ invariance by semitone approach and repetition. Through section A', five invariants ($\{CC^\#\}$, $\{C^\#D\}$, $\{E^bE\}$, $\{GA^b\}$, $\{B^bB\}$) as well as one contextual invariant ($\{FF^\#\}$) are semitones [01].

Chord-Types

Tables 5.12a–5.12b provide the examples of dyads in section A'. All twelve members of [01] type happen in section A', twelve members in phrase 5 and nine members in phrase 6. In the case of [06], six members occur in section A', five members in phrase 5 and two members in phrase 6. Within the same instrumental group, a semitone relation introduces the new member: in the strings, three [06]s ($\{DG^\#\}$, $\{E^bA\}$, $\{EB^b\}$) related by semitone in phrase 5 add $\{C^\#G\}$ in phrase 6 and in the ensemble, two distant dyads ($\{CF^\#\}$ and $\{DG^\#\}$) in phrase 5 introduce $\{C^\#G\}$ in phrase 6 forming a semitone connection. This shows the importance of the semitone relationship in forming [06] dyads.

Table 5.12a [01] Dyad Type in Section A'

Phrase	Strings			Flutes			Clarinets			Vibraphone			Voice			All
	5	6	all	5	6	all	5	6	all	5	6	all	5	6	all	
$\{CC^\#\}$	V	V	V													V
$\{C^\#D\}$	V		V							V		V				V
$\{DE^b\}$		V	V	V		V		V	V					V	V	V
$\{E^bE\}$	V	V	V	V		V					V	V				V
$\{EF\}$				V		V										V
$\{FF^\#\}$	V	V	V	V	V	V		V	V		V	V				V
$\{F^\#G\}$							V		V							V
$\{GG^\#\}$		V	V	V		V								V	V	V
$\{G^\#A\}$										V	V	V		V	V	V
$\{AB^b\}$	V		V								V	V		V	V	V
$\{B^bB\}$		V	V				V	V	V		V	V		V	V	V
$\{BC\}$										V	V	V				V

Table 5.12b [06] Dyad Type in Section A'

Phrase	Strings			Flutes			Clarinets			Vibraphone			Voice			All
	5	6	all	5	6	all	5	6	all	5	6	all	5	6	all	
{C [#] F [#] }				V	V	V				V	V	V		V	V	V
{C [#] G [#] }		V	V								V	V				V
{DG [#] }	V		V							V		V				V
{E ^b A}	V		V													V
{EB ^b }	V		V	V		V										V
{FB}				V		V										V

Table 5.12c [012] and [013] Trichord Types in Section A'

Phrase	[012]			phrase	[013]		
	5	6	All		5	6	All
{CC [#] D}	V		V	{CC [#] E ^b }			
				{C [#] DE}			
{C [#] DD [#] }				{DE ^b F}			
				{E ^b EF [#] }			
				{EFG}			
{DD [#] E}	V	V	V	{FF [#] A ^b }	V		V
				{F [#] GA}	V		V
{E ^b EF}				{GG [#] B ^b }	V		V
				{G [#] AB}		V	V
{EFF [#] }	V		V	{AB ^b C}	V	V	V
				{B ^b BC [#] }			
{FF [#] G}				{BCD}			
				{CBA}		V	V
{F [#] GG [#] }				{C [#] CB ^b }			
				{DC [#] B}			
{GG [#] A}		V	V	{E ^b DC}			
				{EE ^b C [#] }		V	V
{G [#] AB ^b }				{FED}			
				{F [#] FE ^b }			
{AB ^b B}		V	V	{GF [#] E}	V		V
				{A ^b GF}	V		V
{B ^b BC}		V	V	{AG [#] F [#] }	V		V
				{B ^b AG}			
{BCC [#] }				{BB ^b G [#] }		V	V

Table 5.12d [014] and [016] Trichord Types in Section A'

Phrase	[014]			Phrase	[016]		
	5	6	All		5	6	All
{CC [#] E}				{CC [#] F [#] }		V	V
{C [#] DF}				{C [#] DG}			
{DE ^b F [#] }				{DE ^b G [#] }			
{E ^b EG}				{E ^b EA}	V	V	V
{EFA ^b }				{EFB ^b }	V		V
{FF [#] A}		V	V	{FF [#] B}	V		V
{F [#] GB ^b }	V		V	{F [#] GC}			
{GG [#] B}				{GA ^b C [#] }		V	V
{A ^b AC}				{A ^b AD}			
{AB ^b C [#] }				{AB ^b E ^b }	V	V	V
{B ^b BD}		V	V	{B ^b BE}		V	V
{BCE ^b }	V	V	V	{BCF}			
{C [#] CA}				{C [#] CG}		V	V
{DC [#] B ^b }				{DC [#] G [#] }	V		V
{E ^b DB}				{E ^b DA}			
{EE ^b C}	V	V	V	{EE ^b B ^b }	V	V	V
{FEC [#] }				{FEB}			
{F [#] FD}	V	V	V	{F [#] FC}		V	V
{GF [#] E ^b }				{GF [#] C [#] }			
{A ^b GE}				{G [#] GD}			
{AA ^b F}				{AG [#] E ^b }			
{B ^b AF [#] }				{B ^b AE}	V	V	V
{BB ^b G}				{BB ^b F}			
{CBA ^b }				{CBF [#] }			

Tables 5.12c–5.12d show the examples of trichord-types formed in section A'.

The trichord [016], a combination of the semitone and tritone, appears the most frequently among the four trichord-types. Twelve members occur in section A' including three new members, {CC[#]F[#]}, {C[#]CG}, and {FF[#]B}. The {CC[#]G} shows a semitone relationship from the {DC[#]G[#]} created in phrases 4 and 5. The [013] type has four new members ({FF[#]A^b}, {GA^bB^b}, {A^bGF}, {AA^bF[#]}) among eleven

members in section A'. Their semitone relation with the previous semitone's or phrase's [013] type will be dealt with later in the section that discusses entire chord-type. The [014] type has one new member {FF[#]A} among six members in section A'. The [012] type, however, has no new members among the occurrence of six members in section A'. A detailed discussion of the semitone relation will be presented later in the section that pertains to the entire movement.

Two kinds of pentachord type, [01356] (m.170) and [01246] (m.178), occur in the constellation, Cassiopeia. The pentachord [01246] already appears in phrase 3 (consisting of order numbers 5–9) and pentachord [01356] is a new chord type that is not a pentachord partition of the row.

Coda (mm. 185–200)

A tempo change occurs in the beginning of the coda from $\text{♩} = 48\text{--}52$ to $\text{♩} = 72$; this, along with other features, helps distinguish the coda from the other sections. The coda is divided into two phrases, phrase 7 (mm. 185–190) and phrase 8 (mm. 190–200) based on the rhythm and texture. In phrase 7, the rhythmic pattern is very short consisting of the sextuplet, quintuplet, and triplet and the texture is polyphonic as several rows are formed simultaneously. Meanwhile the rhythm in phrase 8 consists of longer patterns as whole notes or more and the texture is a monophonic setting consisting of vertical trichord or dyad types. The employment of the row is another feature dividing the coda into two phrases; phrase 7 uses the row, but there is no row

in phrase 8. Thus, there are no constellations and the vocal line is also absent in the coda.

Phrase 7 (mm. 185–190)

Phrase 7 is also divided into two sub-phrases, sub-phrase 1 (mm. 185–87) and sub-phrase 2 (mm. 187–190), based on the rhythm and the rows used. Rhythmically, sub-phrase 1 consists of the sextuplet and triplet while sub-phrase 2 consists of the duplet, triplet, and quintuplet. In addition, the technique in handling the row is quite different in sub-phrases 1 and 2.

Sub-Phrase 1 (mm. 185–187)

Rhythm

Two rhythmic patterns such as the eighth-note sextuplet and the quarter-note triplet constitute sub-phrase 1. Those two rhythmic patterns are clearly divided into two instrumental groups; the strings play the quarter-note triplet rhythm and the winds (flute and clarinet in A) form the eighth-note sextuplet. This division of the rhythmic pattern is for presenting different row forms and invariance.

Row and Invariance

Example 5.27 shows the four rows (I_7 , P_8 , P_6 , and P_5) appearing in the coda. Among them, $I_7 - P_6$ and $P_8 - P_5$ make pairs based on the use of the same rhythmic pattern and the same instrumental group (Example 5.28). The strings play the two

rows P₈ and P₅ with the triplet rhythm and the wind instruments form the two rows I₇ and P₆ with the sextuplet rhythm.

Example 5.27 Rows of I₇, P₈, P₆, and P₅

I₇ : G F[#] F B C[#] D E B^b E^b C A A^b

P₆ : F[#] G G[#] D C B A E^b B^b C[#] E F

P₈ : A^b A B^b E D C[#] B F C E^b F[#] G

P₅ : F F[#] G C[#] B B^b A^b D A C E^b E

There are two invariants {F[#]G} and {B^bE^b} between the two rows, I₇ and P₆.

They have the same order position in both rows; the first two pitches of each row are the invariant {F[#]G} and the order numbers 7 and 8 have {B^bE^b}. When the two rows are put in superposition, the invariance is heard vertically as well as horizontally at the same time. In mm. 185-187, two rows occur one after another rather than simultaneously. Thus, the two invariants do not sound both vertically and horizontally at the same time. Only the {B^bE^b} invariance has the same register, b^b₄-e^b₄ in m. 186 and 187 as shown in Example 5.28.

Between P₈ and P₅, there are three invariants, {F[#]G}, {C[#]B}, and {CE^b}.

Among these three, two invariants occur consecutively, although these occupy different order positions. In P₈, {CE^b} and {F[#]G} occur in order numbers 8-e and in

Example 5.28 Sub-Section 1 (mm. 185-187)

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P_5 , $\{F^\#G\}$ and $\{C^\#B\}$ occur in order numbers 1–4. In mm. 187–189, overlapping two rows (the order numbers 3–e in P_8 and the order numbers of 0–8 in P_5) produces the simultaneous occurrence of the invariant $\{BC^\#\}$ in spite of the different order numbers (Examples 5.27, 5.28 and 5.29). In addition, the invariance of $\{CE^b\}$ in both rows has the same instrument (the viola) and the same register ($c_5-e^b_4$) in mm. 186–87. Through four rows in sub-phrase 1, there is one common invariant, $\{F^\#G\}$. The appearance in every half beat through mm. 185–187 and in several different pitch

ranges, $g_5-f_4^\#$ (m. 185), $f_4^\#-g_4$ (m. 186), $f_3^\#-g_3$ (m. 186), and $f_3^\#-g_2$ (m. 187), continuously and gradually emphasizes this invariance. This common invariance, occurring regularly also produces a contextual invariance.

The first pentachords in I_7 and P_5 are the same, $\{GF^\#FC^\#B\}$ [01268] as shown in Example 5.29. Right after the appearance of the first pentachord in I_7 (m. 185), the same pentachord type occurs in P_5 (m. 186). The rhythmic augmentation from the eighth-note sextuplet to quarter-note triplet makes sure this repetition is audible (Example 5.28). The similar pitch range and matching horizontal texture emphasize its repetition. After this, another [01268] occurs in the second beat of m. 186 having texture change from horizontal to vertical. The two pitches ($C^\#$, B) in P_5 , (B, F) in P_8 , and ($F^\#$, G) in P_6 make the same pentachord type, [01268]. The second and the third appearance of the pentachord overlap slightly in the second beat, which produces simultaneous vertical and horizontal occurrences of this chord. The first horizontal pentachord contains the first appearance of invariance $\{GF^\#\}$, the second horizontal pentachord has the second appearance of $\{F^\#G\}$, and the third vertical pentachord contains the third appearance of $\{F^\#G\}$. The regular occurrence of the invariant dyad thus develops to a contextual invariance. The reason for making pentachordal invariance, especially [01268], will be discussed after explaining another invariance.

Example 5.29 [01268] and [0148] in the Rows of I₇, P₈, and P₅.

I₇: G F[#] F B C[#] D E B^b E^b C A A^b

P₆: F[#] G G[#] D C B A E^b B^b C[#] E F

P₈: A^b A B^b E D C[#] B F C E^b F[#] G

P₅: F F[#] G C[#] B B^b A^b D A C E^b E

The invariant {E^bB^b} having the same pitch range is involved in yet another contextual invariance. In m. 186, b^b₄ and e^b₄ of the flute (I₇), d₅ of the viola (P₈), and f[#]₄ of the violin (P₅) make vertical [0148] (Examples 5.28 and 5.29). Since the rhythm of the violin and viola (quarter-note triplet) is twice that of the flute (eighth triplet), this tetrachord is heard clearly. Another instance of this [0148] appears in the next measure (m. 187). The e^b₄ and b^b₄ of the clarinet in A (P₆), f[#]₃ of the cello (P₈), and d₆ of the violin (P₅) make another vertical [0148]. Two occurrences contain not only the invariant dyad E^b-B^b but also one of the pitches of the invariant (F[#]-G), namely F[#]. These two contextual invariants have two common features: (1) they contain one of the invariants created between two rows, and (2) they consist of three rows vertically.

The reason to make and repeat the [01268] in these invariants is to help complete the presentation of pentachord-types created in the row's partition. Among the seven pentachord partitions ([01268], [01457], [01346], [01236], [01246], [01367], [01247]) in the row, the constellations contain four types, the [01236] in

Volans and the [01457], [01246], and [01367] in Cassiopeia. Three pentachord–types, [01268], [01346], and [01247], do not occur in the constellations. The contextual invariants created vertically and horizontally in the four rows articulate the first pentachord of the row, [01268].

Another reason for making the tetrachord invariance of [0148] is also related to the constellations. Two constellations (Pegasus and Andromeda) share four features: (1) they are located in the middle of the piece, before returning to section A', (2) they frame contrasting textures, the thickest and the thinnest, (3) they are sustained for twelve measures, and (4) the vocal line supports the transfer from Pegasus to Andromda by three tetrachords, which change by semitones. The trichords used in the vocal line also contain the occurrence of the complementary chord. Those important features in the construction of those sonorities reappear in the invariance in the coda. Thus, the composer tried to contain the music of section B in the coda by developing these trichords through semitone relationships.

Sub-Phrase 2 (mm. 187–190)

Rhythm

Phrase 2 consists of the duplet, triplet, and quintuplet. Two duplet rhythmic patterns, the quarter and eighth rhythm, occur simultaneously in mm. 187–188 and the triplet and quintuplet rhythms are synchronized in mm. 189–190. Then, the duplet rhythm returns in m. 190. Thus, the rhythm of sub-phrase 2 alternates between the duplet and the triplet with quintuplet.

Example 5.30 Sub-Phrase 2 (mm. 187-190)

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Row

Example 5.31 Rows of P_0 , P_t , and R_e (mm. 187–190)

$C^\# \quad G \quad D \quad F \quad A^b \quad A$

P_t : $B^b \quad B \quad C \quad F^\# \quad E \quad E^b$

P_0 : $C \quad C^\# \quad D \quad G^\# \quad F^\# \quad F \quad E^b \quad A \quad E \quad G \quad B^b \quad B$

R_e : $B^b \quad A \quad F^\# \quad E^b \quad A^b \quad D \quad E \quad F \quad G \quad C^\# \quad C \quad B$

There are three rows (P_t , P_0 , R_e) in phrase 2 having different rhythms and different instrumentations. Example 5.31 shows the diagram of the three rows based on the rhythm.

All three rows have one common feature, three different instruments complete one row (Example 5.30). Moreover, P_t - P_0 and P_0 - R_e form pairs based on the use of pitches or rhythm. First, P_t - P_0 has the same technique in arranging pitches. Using three different instruments to play one row, the first instrument plays the first hexachord, the second instrument forms order numbers 6–9, and the third instrument contains order numbers 9–e. The second and third instruments overlap playing order number 9 simultaneously. The row R_e has a different arrangement of pitches. The instrumental change (from the first to the second) overlaps the order number 5 and the other change from the second to the third does not involve any overlapping pitches.

Second, P_0 - R_e has the same method of dealing with rhythm. The P_0 consists of the eighth note and the R_e consists of the quintuplet rhythm. Each row has one rhythmic pattern. However, P_t has two different rhythmic patterns, the quarter note in order numbers 0–5 and the eighth-note triplet in order numbers 6–e. This observation plays an important role in the formation of invariance among the three rows.

Invariance

Between two rows P_t and P_0 , there is one invariant, $\{BB^b\}$, located in the first dyad (order numbers 0 and 1) in P_t and the last dyad (order numbers t and e) in P_0 .

Between two rows of P_0 and R_e , there are two invariants, $\{CC^\#\}$ and $\{DA^b\}$. In addition, there are also two invariants between P_t and R_e as $\{BC\}$ and $\{C^\#G\}$. Those invariants of P_t-P_0 , P_0-R_e , and P_t-R_e consist of the semitone $[01]$ ($\{CC^\#\}$, $\{B^bB\}$, $\{BC\}$) and tritone $[06]$ ($\{C^\#G\}$, $\{DA^b\}$) like the previous invariants.

As seen in Example 5.31, the different rhythms in the three rows produce simultaneous vertical and horizontal occurrences of the invariants $\{B^bB\}$ (between P_t and P_0) and $\{DA^b\}$ (between P_0 and R_e) through three rows. After the invariance of $\{B^bB\}$ occurs in P_t (mm. 188–89), the bass clarinet plays the $\{B^bB\}$ in P_0 (m. 189). While B (the last pitch of P_0) sustains as a dotted quarter note in the bass clarinet, the B^b (the first pitch of R_e) appears in the harp in m. 189. These two consecutive invariances having different textures occur in mm. 188–189. Three occurrences approach the lower pitch range, $b^b_3-b_3$ in m. 187, $b^b_2-b_1$ in m. 188, and $b_1-b^b_1$ in m. 189.

Another invariance of $\{DA^b\}$ is formed horizontally by the piccolo clarinet using P_0 (m. 188) and by the harp using R_e (m. 189). The pitch range of a^b_4 is the same between the two invariants, but the pitch range of D is different as d_4 in P_0 (piccolo clarinet) and d_5 in R_e (harp). The second formation of invariance produces another vertical invariance; the pitch a^b_4 in the harp and the d_4 , order number 8 in P_t meet vertically in the end of the first beat in m. 189, right before the occurrence of $\{DA^b\}$ in the harp line. Its creation prepares the horizontal invariance in R_e in the

same pitch range. Consequently, the combination of three rows emphasizes two invariants {B^bB} and {A^bD} by their simultaneous occurrence vertically and horizontally. For creating invariance in two-dimensions, Dallapiccola uses three techniques: (1) the use of several rhythmic patterns, (2) the change in instruments, and (3) the use of overlapping pitches. All of these are manipulated in creating each row.

All of Two Sub-Phrases (Phrase 7)

Rhythm

The rhythmic pattern starts with the sextuplet and changes to the quintuplet, triplet, and duplet. In sub-phrase 1, no rhythmic conflict occurs since the eighth-note sextuplet and the quarter-note triplet are used. After this, rhythmic conflict occurs in sub-phrase 2 by the simultaneous use of triplet and quintuplet. In addition, rhythmic conflict between duplet and triplet also occurs in the end of sub-phrase 1 and the beginning of sub-phrase 2 (the second beat of m. 187). The occurrence of rhythmic conflict has a significant effect on the sonorities.

Example 5.32 Rhythm in Phrase 7

The image shows two staves of musical notation. The first staff begins at measure 185 and contains three measures. The first measure has a sextuplet of eighth notes. The second measure contains a quintuplet of eighth notes followed by a triplet of eighth notes. The third measure contains a sextuplet of eighth notes followed by a duplet of eighth notes. The second staff begins at measure 188 and contains three measures. The first measure has a sextuplet of eighth notes. The second measure contains a duplet of eighth notes followed by a quintuplet of eighth notes. The third measure contains a triplet of eighth notes followed by a duplet of eighth notes. The notation includes stems, beams, and various rhythmic markings such as '6' for sextuplets, '5' for quintuplets, and '3' for triplets.

Invariance

In phrase 7, several invariances occur not only through the relation of the two rows but also through contextual invariance. The technique of creating contextual invariance is the same in both sub-phrases, but the constituent pitches are different. The technique involves the simultaneous occurrence of a chord both vertically and horizontally. For these occurrences to coincide, different rhythmic patterns, a polyphonic texture, changing instruments within one row, and the simultaneous sounding of the same pitches in two different instruments must be carefully planned. Through these techniques, sub-phrase 1 produces two contextual invariants, the pentachord [01268] and tetrachord [0148] as well as letting the common invariant dyads of the four rows appear. Sub-phrase 2 creates the [01] and [06] invariances vertically and horizontally through three rows. The reason for presenting the invariance in two-dimension (horizontally and vertically) is related to the previous formation of [01] and [06].

Chord-Types

Phrase 7 has all twelve members of [01] and all six members of [06]. Table 5.13 shows the examples of dyad-types in phrase 7. In exposing [06] dyads, the flutes and clarinets use the semitone relationship. The strings also partly contain two semitone relations, $\{C^{\#}G\}$ and $\{DA^b\}$, and $\{EB^b\}$ and $\{FB\}$. It is apparent that the semitone relation is used in introducing new members of [06] type.

Table 5.13 Dyad and Trichord Types in Phrase 7

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Flutes	{CC [#] } {C [#] D} {DE ^b } {E ^b E} {FF [#] } {F [#] G} {A ^b A} {B ^b B} {BC}	{EB ^b } {FB} {F [#] C}	{FF [#] G} {B ^b BC}	{C [#] DE} {DC [#] B} {E ^b EF [#] } {EE ^b C [#] }	{A ^b AC}	{CBF [#] } {EE ^b B ^b } {FF [#] B}
Clarinets	{CC [#] } {C [#] D} {DE ^b } {EF} {FF [#] } {F [#] G} {GG [#] } {B ^b B} {BC}	{C [#] G} {DG [#] } {E ^b A}	{CC [#] D} {F [#] GG [#] } {BCC [#] }	{CBA} {FED} {FF [#] A ^b } {F [#] FE ^b } {BCD}	{FEC [#] } {BB ^b G}	{C [#] CG} {DC [#] G [#] } {E ^b EA} {G [#] GD} {AB ^b E ^b }
Harp and Celesta	{AB ^b } {F [#] G}	{DA ^b }			{B ^b AF [#] }	{DE ^b A ^b }
Strings	{C [#] D} {DE ^b } {E ^b E} {EF} {FF [#] } {F [#] G} {G [#] A} {AB ^b } {B ^b B}	{C [#] G} {DA ^b } {EB ^b } {FB}	{FF [#] G} {A ^b AB ^b }	{C [#] DE} {DC [#] B} {B ^b BC [#] } {BB ^b A ^b } {DE ^b F}	{C [#] DF} {DE ^b F [#] } {EE ^b C} {GF [#] E ^b } {AA ^b F}	{C [#] DG} {C [#] CG} {GF [#] C [#] } {A ^b AD} {AA ^b E ^b } {BCF}

Phrase 7 contains new members in all four trichord-types. Among six members of [012], three members ($\{FF^{\#}G\}$, $\{F^{\#}GA^b\}$, $\{A^bAB^b\}$) are new. In the [013] type, there are four members ($\{DD^{\#}F\}$, $\{DC^{\#}B\}$, $\{FED\}$, $\{F^{\#}FE^b\}$) are new members among twelve members. In the [014] type, nine members occur in phrase 7 including one new member $\{C^{\#}DF\}$. In the [016] type, there is one new member $\{A^bAD\}$ among the fourteen members.

Phrase 8 (mm. 190–200)

Rhythm

Example 5.33 Composite Rhythm in Phrase 8

The image displays four staves of musical notation for Example 5.33, covering measures 190 to 200. The notation is in a single melodic line with a treble clef and a 3/4 time signature. Measure 190 shows a half note followed by a quarter note. Measure 191 features a half-note triplet. Measure 192 contains a dotted quarter note followed by an eighth note. Measure 193 begins with a half-note triplet. Measure 194 shows a dotted quarter note followed by an eighth note. Measure 195 features a half-note triplet. Measure 196 contains a dotted quarter note followed by an eighth note. Measure 197 shows three dotted quarter notes. Measure 198 features a half-note triplet. Measure 199 contains a dotted quarter note followed by an eighth note. Measure 200 shows a half-note triplet. The notation includes various rhythmic patterns such as triplets and dotted rhythms, with measure numbers 190, 193, 196, and 199 marked at the beginning of their respective staves.

The alternation between the triplet and the dotted rhythm or duplet is the main rhythmic feature of phrase 8 as shown in Example 5.33. After three appearances of the half-note triplet in mm. 193-196, the rhythmic pattern changes to the dotted quarter note. The three dotted quarter notes in m. 197 could be considered as a set of triplets since the three dotted notes are located between two triplet rhythms. This transfers the half-note triplet to the quarter-note triplet. The rhythmic pattern becomes shorter from the triplet having a whole-note duration to the triplet occupying a half-note duration.

After this rhythmic contraction happens in mm. 193–198, a rhythmic expansion takes place in mm. 198–200 through connecting several notes with a tie. Phrase 8 is entirely rhythms with long durations. This prepares the conclusion of this fourth movement as well as the entire piece.

Chord-Types

Example 5.34 Phrase 8 (mm. 190–200)

The image displays a musical score for Example 5.34, Phrase 8, spanning measures 190 to 200. The score is organized into two systems of staves. The first system (measures 190-200) includes staves for Oboe (Ob.), Violin I (Vl. I), Violin II (Vl. II), Viola (Va.), Clarinet in B-flat (Cl. Bb.), Clarinet in A (Cl. A), Bassoon (Fag.), Trumpet (Tr.), Trombone (Tbn.), and Tuba/Euphonium (Tuba/Euph.). The second system (measures 201-200) includes staves for Flute (Fl.), Piccolo (Picc.), Clarinet in B-flat (Cl. Bb.), Clarinet in A (Cl. A), Bassoon (Fag.), Trumpet (Tr.), Trombone (Tbn.), and Tuba/Euphonium (Tuba/Euph.). The score features various musical notations, including notes, rests, and dynamic markings such as *pp* and *ppp*. A rehearsal mark [190] is present at the beginning of the first system, and another [198] is located above the Flute staff in the second system. The score concludes with a double bar line and the measure number 200.

In phrase 8, no row is employed. In spite of without row, two dyad-types of [01] and [06] appear that is the significant thing in phrase 8. The pairing of instruments and use of the same rhythmic durations creates two dyad-types perceptibly. While the clarinet in A sustains $f_4-f_4^\#$ using a trill in mm. 190–196, other groups of instruments create two dyads, [01] and [06] vertically; the flute and alto flute along with the harp form the dyad [06] ($d_5^b-g_3$) in mm. 191–192 and the violin and viola along with the celesta make the dyad [01] ($a_5^\#-b_4$) in m. 191. The different timing of the entrances of [01] and [06] and the same rhythmic duration of each dyad clearly separate the two different sonorities. After establishing these two sonorities through long duration, there are several occurrences of [01] and [06] in different members. Nine members of [01] type ($\{C^\#D\}$, $\{DE^b\}$, $\{E^bE\}$, $\{FF^\#\}$, $\{GG^\#\}$, $\{G^\#A\}$, $\{AB^b\}$, $\{B^bB\}$, $\{BC\}$) and all six members of [06] type happen in phrase 8. Table 5.14 shows the members of dyad and trichord types appearing in phrase 8.

Through phrase 8, there is one continuously present member, $\{FF^\#\}$. After the clarinet in A plays its member in mm. 190–196, the violin takes over its continuation. This is deeply related to the pitch range of phrase 8 (discussed later in this chapter).

Among the four types of trichord in phrase 8, [012] and [016] have new members. In the case of the [012] type, the four members contain one new member, $\{E^bEF\}$. In the case of [016], fifteen members have two new members, $\{FEB\}$ and $\{BB^bF\}$. The [013] type has three members that are appeared in previous phrases. The three members of [014] in phrase 8 have also appeared in previous phrases.

Table 5.14 Dyad and Trichord Types in Phrase 8

	Dyads		Trichords			
	[01]	[06]	[012]	[013]	[014]	[016]
Flutes	{G [#] A}	{D ^b G}				
Clarinets	{FF [#] }	{C [#] G} {DA ^b } {E ^b A} {EB ^b }	{FF [#] G}	{FF [#] G [#] }	{FF [#] A} {F [#] FD}	{C [#] DG} {DC [#] A ^b } {E ^b EA} {EE ^b B ^b } {FF [#] B} {GA ^b C [#] } {A ^b GD} {AB ^b E ^b } {B ^b AE}
Celesta	{C [#] D} {DD [#] } {D [#] E} {A ^b A}	{D ^b G} {D [#] A} {EB ^b }	{D [#] EF}	{FF [#] A ^b }		
Strings	{DD [#] } {FF [#] } {GA ^b } {A ^b A} {AB ^b } {A [#] B} {BC}	{C [#] G} {DA ^b } {D [#] A} {EB ^b } {FB} {F [#] C}	{EFF [#] } {B ^b BC}	{F [#] FE ^b } {CBA}	{FF [#] A} {BCE ^b }	{CBF [#] } {FF [#] B} {FEB} {F [#] FC} {BCF} {BB ^b F}

All of Two Phrases (Coda)

Rhythm

Example 5.35 Composite Rhythm in the Coda

The musical score for Example 5.35 is presented across five staves, each beginning with a measure number: 185, 188, 191, 194, and 197. The notation includes rhythmic values such as eighth and sixteenth notes, rests, and dynamic markings like 's' (sforzando). The time signature changes from 3/8 to 2/8 and back to 3/8. The music is written for a single melodic line, likely for a flute or clarinet.

As shown in Example 5.35, the coda (phrases 7 and 8) contains all the rhythmic patterns (the triplet, quintuplet, sextuplet, duplet, and the dotted rhythm) used in this fourth movement: starting the sextuplet rhythm changes to the quintuplet rhythm and then to the triplet and duplet rhythms; the rhythmic pattern becomes slower. In addition, the rhythm of the last measure, m. 200, is lengthened with a tie. The expanding rhythmic pattern with the prolonged note at the end of the coda is to provide a sense of the conclusion.

Texture

The coda has obviously contrasting textures; the polyphonic writing in phrase 7 and the chordal (homophonic) texture in phrase 8. The type of constituent pitches strongly supports this contrast in texture through the employment of the row in phrase 7 and absence of the row in phrase 8. However, these two different textures express and articulate the same sonorities, the dyad and trichord types, especially [01] and [06].

Invariance and Chord-Types

The invariance occurs only in phrase 7 since no row is used in phrase 8. In phrase 7, four kinds of invariance occur in sub-phrase 1 and three kinds of invariance occur in sub-phrase 2. Among the seven kinds of invariance, three are [01] dyad types and one is [06] type. Those two sonorities play a crucial role in creating contextual invariance; the [01] type develops to tetrachord and pentachord invariance in sub-

phrase 1 and the [01] and [06] types develop to the vertical texture containing the same invariance in sub-phrase 2. In spite of the absence of invariance in phrase 8, the same sonorities, [01] and [06], are continuous in the same rhythmic durations. The different techniques of creating [01] and [06] types create all twelve members of [01] and all six members of [06] through the coda. Table 5.15a provides the dyad types in the coda.

Table 5.15a [01] and [06] Dyad Types in the Coda

	[01]				[06]		
	Phrase 7	Phrase 8	All		Phrase 7	Phrase 8	All
{C-C [#] }	✓		✓	{C-F [#] }	✓	✓	✓
{C [#] -D}	✓	✓	✓		{C [#] -G}	✓	✓
{D-E ^b }	✓	✓	✓	{D-A ^b }		✓	✓
{E ^b -E}	✓	✓	✓		{E ^b -A}	✓	✓
{E-F}	✓		✓	{E-B ^b }		✓	✓
{F-F [#] }	✓	✓	✓		{F-B}	✓	✓
{F [#] -G}	✓		✓				
{G-G [#] }	✓	✓	✓				
{G [#] -A}	✓	✓	✓				
{A-B ^b }		✓	✓				
{B ^b -B}	✓	✓	✓				
{B-C}	✓	✓	✓				

Table 5.15b [012] and [013] Trichord Types in the Coda

	[012]				[013]		
	7	8	All		7	8	All
{CC [#] D}	V		V	{CC [#] E ^b }			
				{C [#] DE}	V		V
{C [#] DE ^b }				{DD [#] F}	V		V
				{E ^b EF [#] }	V		V
{DE ^b E}				{EFG}			
				{FF [#] A ^b }	V	V	V
{E ^b EF}		V	V	{F [#] GA}			
				{GA ^b B ^b }			
{EFF [#] }		V	V	{G [#] AB}			
				{AB ^b C}			
{FF [#] G}	V	V	V	{B ^b BC [#] }	V		V
				{BCD}	V		V
{F [#] GG [#] }	V		V	{C [#] CB ^b }			
				{DC [#] B}	V		V
{GG [#] A}				{E ^b DC}			
				{EE ^b C [#] }	V		V
{G [#] AB ^b }	V		V	{FED}	V		V
				{F [#] FE ^b }	V	V	V
{AB ^b B}				{GF [#] E}			
				{A ^b GE}			
{B ^b BC}	V	V	V	{AA ^b F [#] }			
				{B ^b AG}			
{BCC [#] }	V		V	{BB ^b A ^b }		V	V
				{CBA}	V	V	V

Table 5.15c [014] and [016] Trichord Types in the Coda

	[014]				[016]		
	7	8	All		7	8	All
{CC [#] E}				{CC [#] F [#] }			
{C [#] DF}	✓		✓	{C [#] DG}	✓	✓	✓
{DE ^b F [#] }	✓		✓	{DE ^b G [#] }	✓		✓
{E ^b EG}				{E ^b EA}	✓	✓	✓
{EFA ^b }				{EFB ^b }			
{FF [#] A}		✓	✓	{FF [#] B}	✓	✓	✓
{F [#] GB ^b }				{F [#] GC}			
{GG [#] B}				{GA ^b C [#] }		✓	✓
{A ^b AC}	✓		✓	{A ^b AD}	✓		✓
{AB ^b C [#] }				{AB ^b E ^b }	✓	✓	✓
{B ^b BD}				{B ^b BE}			
{BCE ^b }		✓	✓	{BCF}	✓	✓	✓
{C [#] CA}				{C [#] CG}	✓	✓	✓
{DC [#] B ^b }				{DC [#] G [#] }	✓	✓	✓
{E ^b DB}				{E ^b DA}			
{EE ^b C}	✓		✓	{EE ^b B ^b }	✓	✓	✓
{FEC [#] }	✓		✓	{FEB}		✓	✓
{F [#] FD}		✓	✓	{F [#] FC}		✓	✓
{GF [#] E ^b }	✓		✓	{GF [#] C [#] }	✓		✓
{A ^b GE}				{G [#] GD}	✓	✓	✓
{AA ^b F}	✓		✓	{AG [#] E ^b }	✓		✓
{B ^b AF [#] }	✓		✓	{B ^b AE}		✓	✓
{BB ^b G}	✓		✓	{BB ^b F}		✓	✓
{CBA ^b }				{CBF [#] }	✓	✓	✓

Four new members of the [012] trichord ({E^bEF}, {FF[#]G}, {F[#]GA^b}, {A^bAB^b}) occur among eight members in the coda. The {FF[#]G} occur in both phrases 7 and 8 and the {E^bEF} develops semitone from the {FF[#]G} and {EFF[#]}. The [013] type has four new members ({DD[#]F}, {DC[#]B}, {FED}, {F[#]FE^b}) among twelve members in the coda. The [014] trichord type has one new members ({C[#]DF}) among twelve member and the [016] type forms three new members ({FEB}, {A^bAD}, {BB^bF}) among nineteen members in the coda; the {FEB} is a semitone

above the $\{EE^bB^b\}$ in phrase 7 and the $\{BB^bF\}$ is a semitone below the $\{CBF^\#\}$ in phrase 7. These new members complete all the remaining possible members (a detailed discussion is presented in the section pertaining to entire chord-type).

All of Four Sections

Even though section A' returns to the music of section A, it is not quite the same. Section A' contains not only elements of section A but also elements of section B. In addition, section A' prepares the ending part of this piece, the coda. The coda really reconsiders what the piece expresses and summarizes. Based on the musical elements of each section, I will compare the similarities and differences and observe how they develop through the piece.

The Relation between Sections A and A'

Form

The employment of Volans in the same rhythmic pattern (the half-note triplet) at the beginning of sections A and A' clearly shows the sectional division. Sections A and A' each consist of two phrases. The division of the two phrases in section A is based on the constellation of Volans, which is formed in the beginning of each, phrases 1 and 2. On the other hand, the division of section A' is based on the fermata.

Both sections employ the vocal line in the same way; phrase 2 (section A) and 6 (section A'). Thus, the phrase 1 (section A) and the phrase 5 (section A') play

an introductory role for the vocal line with the instrumental line. In addition, the first phrase of each section contains tempo changes from $\text{♩} = 48\sim 52$ to $\text{♩} = 66$; after that the tempo returns to the original tempo one measure later.

Constellations

Each section employs five constellations (Volans, Cassiopeia, Ursa Major, Triangulum Australe, and Columba) with a different order: after two constellations (Volans and Cassiopeia) in phrase 1, all five (Columba, Ursa Major, Triangulum Australe, Volans, and Cassiopeia) constellations appear in phrase 2. On the other hand, after four constellations (Volans, Cassiopeia, Ursa Major, Triangulum Australe) in phrase 5, two constellations (Cassiopeia, Columba including the reappearance of Cassiopeia) appear in phrase 6. In terms of the number of constellations, the two sections have different formations, 2:5 (section A) and 4:2 (section A').

Only one constellation, Cassiopeia, occurs in all of the phrases (1, 2, 5, and 6). The number of consisting pitches in Cassiopeia is five and relates to the number of constellations in each section. The number five becomes something important, which is related to pentachord-type. Pentachord-type will be discussed later on in this chapter.

Rhythm

The two sections have the same rhythmic pattern in the beginning due to the appearance of Volans. All in all, the employment of the triplet, quintuplet, and

sixtuplet is the same in both sections, but the detailed rhythmic development is quite different. In section A, phrase 1 has contraction in the triplet and phrase 2 has it in the quintuplet, which introduces the sextuplet rhythm. Overall, rhythmic and durational decreases occur in section A (for a detailed discussion, see section A's rhythm).

On the other hand, in section A', phrase 5 contains all rhythmic patterns that occurred in section A. In addition, the overlapping rhythm (triplet and quintuplet) occurs thereby creating 5:3. Thus, the rhythms of section A (phrases 1 and 2) show up in phrase 5. This is also a kind of rhythmic contraction; the contraction that occurred in section A between phrases 1 and 2 again happens in section A' entirely within phrase 5. Containing all of the rhythmic patterns in section A', especially within phrase 5, is one means of expressing the text (which will be discussed with later in this chapter).

Volans and Cassiopeia have a regular rhythmic pattern: the rhythm of the two Volans in sections A and A' is exactly the same. Cassiopeia's rhythms appear four times and are only slightly different based on the quintuplet. A detailed rhythmic comparison has been provided in Example 5.1. The rhythmic change represents the idea of Cassiopeia's rotation.

On the other hand, two other constellations, Ursa Major and Columba, have irregular rhythmic patterns and do not comprise the same rhythm in sections A and A'. These two constellations do have the same feature of rhythmic development between sections A and A'; the rhythm of section A' expands to twice that of section A (Examples 5.2 and 5.3). In rhythmic expansion, a different technique is used in

each constellation. The meter 2/2 changes to 4/2 in Columba's rhythmic alteration and the meter 5/4 alters to 5/2 in Ursa Major's rhythmic change. The expansion of the constellations' rhythm in Columba and Ursa Major is one of the techniques to describe the text, which will be addressed later under the topic of the relation of text and music.

The Relation between Sections A and B

Form

Both sections A and B consist of two phrases. The division of the two phrases in each section is based on the vocal line. The first phrases of each section (phrases 1 and 3) do not contain the vocal line consisting of only the instrumental line. The second phrase of each section (phrases 2 and 4) consists of the vocal and instrumental lines. This vocal line plays an important role in the aspect of the rhythm.

Rhythm

Section A contains the rhythm of the triplet, quintuplet, and sextuplet with contracting duration in the instrumental line. Section B also has the triplet rhythm containing the alternation between expanding and contracting durations in the instrumental line. The durational development is different, but the rhythmic formation in section A is a basis for rhythmic development in section B.

The continuous use of the triplet in the beginning of section B smoothly introduces the groups of three dotted notes having the same duration such as three

dotted quarter notes or three dotted eighth notes. The gradually introduced groups of three dotted notes located between the triplets become the main rhythmic pattern in section B; not only do groups of three dotted notes occur but also single notes or sets of two dotted notes. Furthermore, the rhythmic transfer occurs between the instrumental and vocal lines in the middle of section B. Finally, the dotted rhythmic pattern occurs prominently in the vocal line. Overall, the continuous rhythmic patterns (triplet, quintuplet, sextuplet), especially the triplet in section A, introduce groups of three dotted rhythms and then the dotted rhythm becomes the main rhythmic pattern at the end of section B, after using these groups, which resemble triplets as an intermediary step.

Constellations

Although keeping the same number of constellations in both sections, the constellations featured in sections A and B are quite different: Ursa Minor, Cassiopeia, Pegasus, Andromeda, and Libra in section B and Volans, Cassiopeia, Columba, Ursa Major, and Triangulum Australe in section A (A'). Only one constellation, Cassiopeia, is common between sections A and B. The reason for overlapping Cassiopeia is related to the pentachord. This will be discussed later in the chapter.

The different employment of the constellations in each section highlights different features in sections A and B. Section A presents the constellations' shape and physical characteristics by the pitches. The shapes of Volans, Cassiopeia, and

Triangulum Australe are apparent through the shape of the notes that describe them. By creating the twelve-tone aggregate through two constellations, Cassiopeia and Ursa Major, Dallapiccola also suggests their complementary physical locations. On the other hand, section B represents the psychological features rather than physical aspect. Pegasus's meaning (extension) is represented by sustained pitches and Ursa Minor's feature of containing Polaris is expressed by the highest pitch. Still, section B employs Cassiopeia forming its shape. All constellations employed in section B cover the North hemisphere, while those in section A cover the whole sky, the northern and southern hemispheres.

The employment of different techniques to present the constellations in both sections apparently helps contrast the different features presented in sections A and B. The different handling of instrumentation clearly contrasts the constellations in sections A and B. Section A has eight appearances of constellations. Among them, seven use a single instrument or single instrumental family. Only Columba consists of several instruments. Section B has six occurrences of constellations. Among them, five appearances consist of several instruments. While the harp or celesta plays one constellation's pitches completely, other instruments also play one or two of their pitches. This produces a thick texture. Only Libra consists of a single instrumental family, the three strings for preparing section A'.

Chord of Dyad-Types ([01] and [06]), Trichord-Types ([012], [013], [014], [016]), and Pentachord-Types

Dyad-Types

All possible members of the two dyad types happen in each section. In particular, all six members of the [06] type are provided through semitone relations. The semitone, occurring frequently in the row, plays a role in developing the [06] sonority. Tables 5.16a and 5.16b show the appearance of [01] and [06] in each phrase.

Table 5.16a [01] Dyad Type in the Fourth Movement

	Section A		Section B		Section A'		Coda	
	1	2	3	4	5	6	7	8
{CC [#] }		✓	✓		✓	✓	✓	
{C [#] D}	✓	✓	✓	✓	✓		✓	✓
{DE ^b }	✓		✓	✓	✓	✓	✓	✓
{E ^b E}	✓	✓		✓	✓	✓	✓	✓
{EF}	✓		✓		✓		✓	
{FF [#] }		✓		✓	✓	✓	✓	✓
{F [#] G}	✓	✓	✓	✓	✓		✓	
{GG [#] }		✓	✓	✓	✓	✓	✓	✓
{G [#] A}	✓	✓		✓	✓	✓	✓	✓
{AB ^b }	✓	✓	✓	✓	✓	✓	✓	✓
{B ^b B}	✓	✓	✓	✓	✓	✓	✓	✓
{BC}	✓	✓		✓	✓	✓	✓	✓

Table 5.16b [06] Dyad Type in the Fourth Movement

	Section A		Section B		Section A'		Coda	
	1	2	3	4	5	6	7	8
{CF [#] }	✓	✓		✓	✓	✓	✓	✓
{C [#] G}	✓	✓		✓		✓	✓	✓
{DG [#] }		✓		✓	✓		✓	✓
{E ^b A}	✓	✓	✓	✓	✓		✓	✓
{EB ^b }		✓		✓	✓		✓	✓
{FB}		✓		✓	✓		✓	✓

The technique of presenting [01] varies as the piece progresses. In section A, the adjacent and non-adjacent pitches of the row are the main method; the pitches outside the row also participate in creating [01] dyad-type in a smaller portion. In section B, the lack of employment of the row in the instrumental line contributes to the increasing number of [01]s formed by the pitches outside the row. But section B still contains [01] types through the pitches based on the row. The obvious change occurs in section A', the return to employment of rows in both lines produces [01]s through invariance. Consideration of the choice of rows and the manipulation of rhythm, slightly different starting point in each row and changes of instrumentation emphasize the invariance of [01] and form the invariants simultaneously both vertically and horizontally. Actually, section A' briefly introduces this technique so most [01]s consist of the adjacent and non-adjacent pitches based on the row or outside the row. Finally in the coda, [01] dyads are formed through invariance as well as the use of pitches with the same rhythmic duration. The twelve [01]s formed through different techniques in each section is one technique to create polarity.

Trichord-Types

The consistent occurrence of trichord partitioning in the pitches, not only based on the row but also outside the row like the constellations, is a carefully planned compositional device. As I mentioned in the analysis, all possible members of the four types of trichords occur through the movement. As indicated in Tables 5.17a–5.17d, most new members have a semitone relation from the previous section's

trichords except in section A. The exposed members in section A are the basis for introducing new members by a semitone.

The technique in forming trichords changes slightly as the movement proceeds from the pitches based on the row to the pitches outside the row. This evolution is based on the constituent pitches in each section. In the [012] type, section B's (phrase 3) two members ($\{CC^\#D\}$ and $\{C^\#DE^b\}$) have a semitone relation from the $\{BCC^\#\}$ in section A. The coda's (phrase 7) members ($\{FF^\#G\}$, $\{F^\#GG^\#\}$, $\{G^\#AB^b\}$) also have a semitone relation from section A's trichord members. The $\{E^bEF\}$ also have a semitone relation from section A's members, $\{DE^bE\}$ and $\{EFF^\#\}$. The semitone relation within each section was discussed in an analysis of each section (Table 5.17a).

In the [013] type, one member ($\{B^bBC^\#\}$) in section B has a semitone relation with section A's trichord, $\{BCD\}$. The $\{F^\#FA^b\}$, $\{GA^bB^b\}$, $\{A^bGF\}$, and $\{AA^bF^\#\}$ occurring in section A' keep a semitone development from section B's members: the $\{FF^\#A^b\}$ and $\{GA^bB^b\}$ are a semitone above and below the $\{F^\#GA\}$ in section B, and the $\{A^bGF\}$ and $\{AA^bF^\#\}$ also keep a semitone relation with the $\{GF^\#E\}$ and $\{B^bAG\}$, respectively. The coda's five new members also have a semitone relation; the $\{DD^\#F\}$ is a semitone above and below between the $\{C^\#DF\}$ and $\{E^bEF^\#\}$, which occur in section B. The $\{DC^\#B\}$ is a semitone below the $\{E^bDC\}$ in section B. Both members have a semitone relation with section B, exceptionally (not previous

section). The $\{FED\}$ and $\{F^{\#}FE^b\}$ are a semitone above and below between the $\{EE^bC^{\#}\}$ and $\{GF^{\#}E\}$ occurring in section A' (Table 5.17b).

In the [014] type, six new members ($\{DE^bF^{\#}\}$, $\{C^{\#}CA\}$, $\{EE^bC\}$, $\{GF^{\#}E^b\}$, $\{BB^bG\}$, $\{B^bBD\}$) in section B have a semitone relation with section A's members; two new members ($\{AB^bC^{\#}\}$, $\{E^bDB\}$) have a semitone relation within section B (phrases 3 and 4) and two new members ($\{F^{\#}GB^b\}$, $\{A^bAC\}$) do not have any semitone relation. The new member ($\{FF^{\#}A\}$) in section A' (phrase 6) has a semitone relation within section A' (phrase 5). The last new member $\{C^{\#}DF\}$ occurring in the coda has a semitone relation with the $\{DE^bF^{\#}\}$ occurring in section B (Table 5.17c).

In the [016] type, five new members in section B have a semitone relationship: the $\{G^{\#}GD\}$ is a semitone above and below between the $\{GF^{\#}C^{\#}\}$ and $\{AG^{\#}E^b\}$ occurring in section A and the other four members in phrase 4 have a semitone relationship with phrase 3. Three new members in section A' have a semitone relationship with section B's members: the $\{FF^{\#}B\}$ in phrase 5 is a semitone above and below between $\{EFB^b\}$ and $\{F^{\#}GC\}$ in phrase 4 (section B), the $\{CC^{\#}F^{\#}\}$ in phrase 6 is a semitone below the $\{C^{\#}DG\}$ occurring in section B, and the $\{C^{\#}CG\}$ is a semitone below the $\{DC^{\#}G^{\#}\}$ formed in section B as well as section A' (phrase 5). The one new member, $\{A^bAD\}$, occurring in the coda has a semitone relationship with the $\{GA^bC^{\#}\}$ and $\{AB^bE^b\}$ formed in section A' (Table 5.17d).

Table 5.17a [012] Trichord Type in the Fourth Movement

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5	Phrase 6	Phrase 7	Phrase 8	All phrase
{CC [#] D}			✓		✓		✓		✓
{C [#] DE ^b }			✓	✓					✓
{DE ^b E}				✓	✓	✓			✓
{E ^b EF}								✓	✓
{EFF [#] }				✓	✓			✓	✓
{FF [#] G}							✓	✓	✓
{F [#] GG [#] }							✓		✓
{GG [#] A}		✓	✓			✓			✓
{G [#] AB ^b }							✓		✓
{AB ^b B}	✓			✓		✓			✓
{B ^b BC}	✓			✓		✓	✓	✓	✓
{BCC [#] }		✓					✓		✓

Table 5.17b [013] Trichord Type in the Fourth Movement

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5	Phrase 6	Phrase 7	Phrase 8	All Phrase
{CC [#] E ^b }		✓	✓						✓
{C [#] DE}	✓			✓			✓		✓
{DD [#] F}							✓		✓
{E ^b EF [#] }	✓			✓			✓		✓
{EFG}		✓							✓
{FF [#] A ^b }					✓		✓	✓	✓
{F [#] GA}				✓	✓				✓
{GA ^b B ^b }					✓				✓
{G [#] AB}				✓		✓			✓
{AB ^b C}				✓	✓	✓			✓
{B ^b BC [#] }			✓				✓		✓
{BCD}		✓		✓			✓		✓
{C [#] CB ^b }		✓							✓
{DC [#] B}							✓		✓
{E ^b DC}	✓		✓	✓					✓
{EE ^b C [#] }	✓					✓	✓		✓
{FED}							✓		✓
{F [#] FE ^b }							✓	✓	✓
{GF [#] E}		✓	✓	✓	✓				✓
{A ^b GF}					✓				✓
{AA ^b F [#] }					✓				✓
{B ^b AG}				✓					✓
{BB ^b A ^b }			✓			✓		✓	✓
{CBA}				✓		✓	✓	✓	✓

Table 5.17c [014] Trichord Type in the Fourth Movement

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5	Phrase 6	Phrase 7	Phrase 8	All Phrase
{CC [#] E}		✓							✓
{C [#] DF}							✓		✓
{DE ^b F [#] }				✓			✓		✓
{E ^b EG}		✓		✓					✓
{EFA ^b }	✓								✓
{FF [#] A}						✓		✓	✓
{F [#] GB ^b }				✓	✓				✓
{GG [#] B}									✓
{A ^b AC}			✓				✓		✓
{AB ^b C [#] }				✓					✓
{B ^b BD}				✓		✓			✓
{BCE ^b }	✓			✓	✓	✓		✓	✓
{C [#] CA}			✓						✓
{DC [#] B ^b }			✓						✓
{E ^b DB}				✓					✓
{EE ^b C}				✓	✓	✓	✓		✓
{FEC [#] }		✓					✓		✓
{F [#] FD}		✓		✓	✓	✓		✓	✓
{GF [#] E ^b }				✓			✓		✓
{A ^b GE}		✓		✓					✓
{AA ^b F}	✓		✓				✓		✓
{B ^b AF [#] }		✓		✓			✓		✓
{BB ^b G}			✓	✓			✓		✓
{CBA ^b }	✓			✓					✓

Table 5.17d [016] Trichord Type in the Fourth Movement

	Phrase 1	Phrase 2	Phrase 3	Phrase 4	Phrase 5	Phrase 6	Phrase 7	Phrase 8	All Phrase
{CC [#] F [#] }						✓			✓
{C [#] DG}	✓		✓	✓			✓	✓	✓
{DE ^b G [#] }		✓					✓		✓
{E ^b EA}				✓	✓	✓	✓	✓	✓
{EFB ^b }			✓	✓	✓				✓
{FF [#] B}					✓		✓	✓	✓
{F [#] GC}				✓					✓
{GA ^b C [#] }		✓	✓			✓		✓	✓
{A ^b AD}							✓		✓
{AB ^b E ^b }	✓			✓	✓	✓	✓	✓	✓
{B ^b BE}		✓		✓		✓			✓
{BCF}		✓					✓	✓	✓
{C [#] CG}						✓	✓	✓	✓
{DC [#] G [#] }		✓		✓	✓		✓	✓	✓
{E ^b DA}	✓			✓					✓
{EE ^b B ^b }				✓	✓	✓	✓	✓	✓
{FEB}								✓	✓
{F [#] FC}		✓				✓		✓	✓
{GF [#] C [#] }	✓	✓					✓		✓
{G [#] GD}			✓	✓			✓	✓	✓
{AG [#] E ^b }		✓	✓				✓		✓
{A [#] AE}				✓	✓	✓		✓	✓
{BB ^b F}								✓	✓
{CBF [#] }	✓	✓		✓			✓	✓	✓

Pentachord-Type

Twenty-three times of pentachord-types occur in the fourth movement. The consistently formatted pentachord partition through outside row's pitch means the composer carefully and artistically manipulates the pitches for coherence. Unlike the dyad and trichord-types, all possible members of each chord type do not arise, since the pentachord's appearance starts only in the fourth movement. Other chord types have consistently taken place from the first movement. Table 5.18 shows the occurrence of pentachord partitions in this movement.

Table 5.18 The Pentachord Types⁶⁵ in Whole Movement

	Section A		Section B		Section A'		Coda	
	1	2	3	4	5	6	7	8
[01236]	✓	✓		✓	✓			✓
[01246]			✓			✓		
[01247]	✓				✓		✓	
[01268]		✓		✓			✓	✓
[01346]							✓	
[01367]		✓			✓	✓		✓
[01457]			✓	✓	✓	✓		

Since the employment of constellations exploits the pentachord-type, most types come from the pitches outside the row. Especially, the appearance of [01346] is unique — it does not appear until the coda. The combination of three techniques, the creation of overlapping rhythmic patterns, the arrangement of pitches from different rows to occur simultaneously, and the use of instrumental changes form the [01346] in m. 189.

⁶⁵ This table illustrates the appearance of pentachord partitions. Among twenty-three kinds of pentachord-types, I summarize the seven pentachord-types based on the pentachord partition, since I did the same summary with dyad and trichord types.

The composer tries to project the same sonorities in the partitions of the row and the constellations and expands his use of chord type to the pentachord. Thus, all members of the dyad-types ([01] and [06]), trichord-types ([012], [013], [014], [016]) and all the types of pentachord partition are created in this piece (the reason to employ all the members of dyads and trichords will be discussed in the relation between the music and text).

Pitch Range

Table 5.19 The Pitch Range of the Fourth Movement

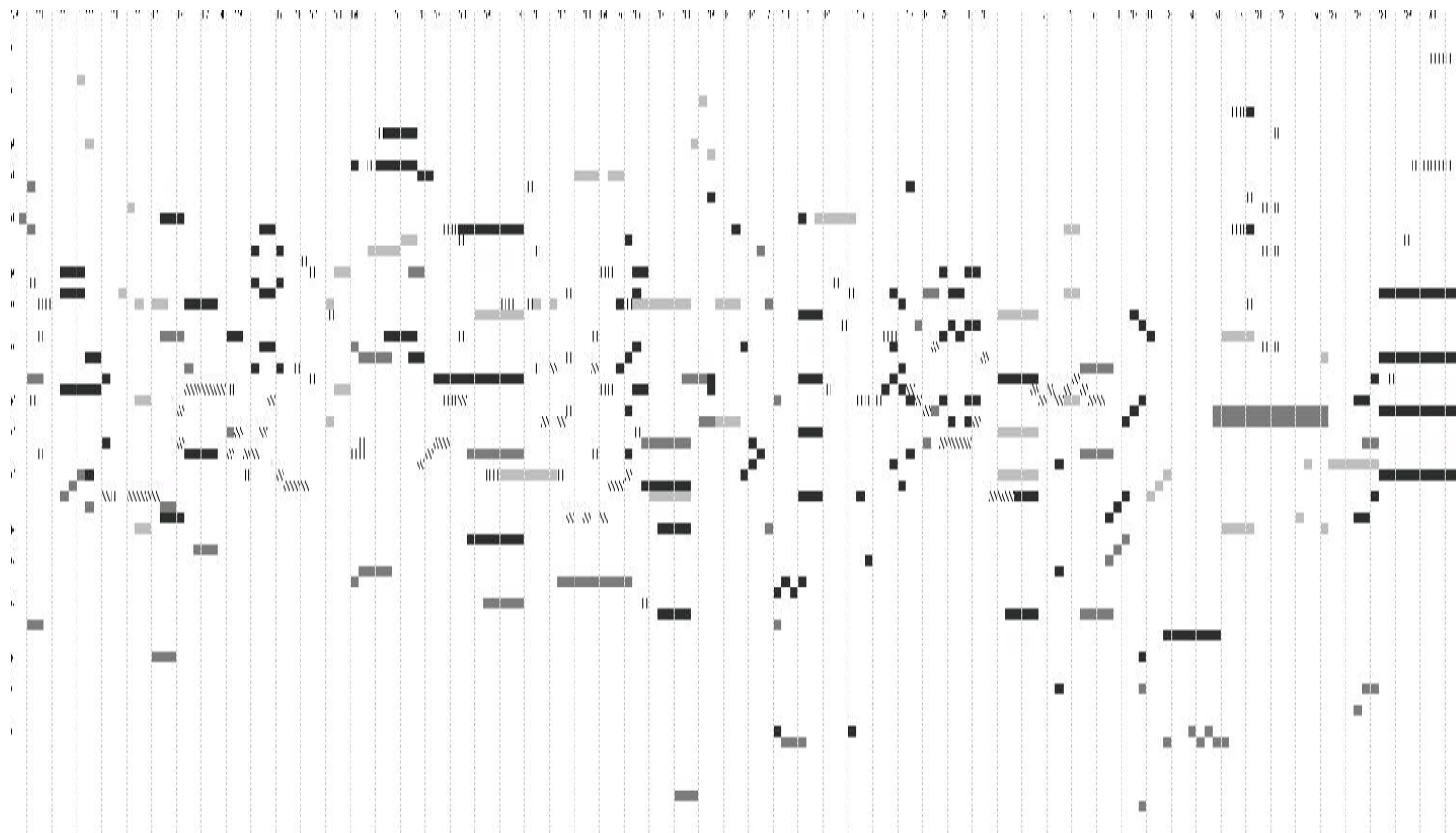
Section		Pitch Range	Center Pitch
Section A	Phrase 1	$b_2-c_7^\#$	$g_4^\#$
	Phrase 2	$d_2-f_6^\#$	
Section B	Phrase 3	$d_3-g_6^\#$	$e_4^b-e_4$
	Phrase 4	$f_1-f_7^\#$	
Section A'	Phrase 5	$b_1-b_6^b$	f_4
	Phrase 6	e_2-g_6	
Coda	Phrase 7	$f_1-a_6^b$	e_4-f_4
	Phrase 8	$d_2-e_7^b$	

Section A's pitch range spreads wide as high as $c_7^\#$ in phrase 1 and as low as $d_2^\#$ in phrase 2. Its wide pitch range converges around the pitch a_4 in the end of section A. Actually, in the beginning of section A, the pitch a_4 is made apparent by the sustained rhythm in Volans. Holding the same pitch range around a_4 in the beginning and end of section A, the pitch range expands first high and then low. Example 5.36 shows the pitch range in this fourth movement. The pitch a_4 is close to the center pitch $g_4^\#$ which plays the role of an axis in section A. The two Cassiopeias

played within phrase 1 are related by retrograde-inversion around the axis $g^{\#}_4$. In addition, the $g^{\#}_4$ is another axis in the strings' trichords occurring in mm. 140–142 (see Section A). The axis prepares the pitches' converging to a_4 , just a semitone above, in the middle of section A.

There are two ways of considering section B's pitch range — regarding Polaris and disregarding Polaris. Regarding Polaris, I may consider the highest pitch as Polaris, a^b_6 (in fact, the highest pitch of section B is f_7 ; the second highest pitch is a^b_6 , Polaris). The center pitch between a^b_6 (Polaris) and $f^{\#}_1$ (the lowest pitch) is $c^{\#}_4$, which is the first pitch heard in the vocal line. On the other hand, disregarding Polaris, the center pitch between the highest pitch (f_7) and lowest pitch ($f^{\#}_1$) is f_4 and $f^{\#}_4$, which is heard by the repetition of the second hexachord of row P_1 in the vocal line (mm. 161–64) and by the piccolo clarinet's line in the end of section B. In addition, the pitch $f^{\#}_4$ is also the center pitch of the vocal line's pitch range ($f^{\#}_3$ – e_5). Consequently, the use of the row P_1 in the vocal line is significant. The row begins with the pitch of $c^{\#}_4$ and ends with the pitch of c_4 . By those two pitches of $c^{\#}_4$ and c_4 , the vocal line emphasizes the center pitch range between Polaris and the lowest pitch. Within the voice, the center pitch, $f^{\#}_4$, is also the instrumental line's center pitch, between the highest and lowest pitches

Example 5.36 Pitch Graph of the Fourth Movement



(disregarding Polaris) in section B. The ending pitches in section B merge to the central range around f_4 .

In section B, the wide range pitch covering $f_1^\#$ to f_7 (which is wider than the pitch range of section A) is deeply related to the latitudes of constellations used in this section. The pitch range ($d_3-g_6^\#$) of phrase 3 expands to the pitch range $f_1^\#-f_7$ in phrase 4 expanding both the upper and lower pitch range. The latitudes of the constellations Cassiopeia and Ursa Minor used in phrase 3 cover $90^\circ \sim -20^\circ$, while that of constellations, Pegasus and Andromeda used in phrase 4 are $90^\circ \sim -60^\circ$. For the wide latitudes in phrase 4, the pitch range in phrase 4 becomes wide. Since the southern latitudes are increased in phrase 4, the lower pitch range is further expanded in phrase 4 (Polaris still represents the higher pitch).

The expansion of rhythmic pattern in phrase 3 (discussed in section B) is for emphasizing the pitch of Polaris, a_6^b , in m. 154. In the sky, Polaris shows the direction north and plays a role of guidance since it contains this bright star. This importance is expressed in music by the highest pitch, a_6^b , which accompanies the expanded rhythmic pattern. After the emphasis of a_6^b by this expansion, the rhythmic pattern is drastically reduced. Like phrase 3, the rhythmic shape of phrase 4 is similar to phrase 3 with both expansion and contraction, which reflects the meaning of the text (this will be addressed later in the chapter).

In section A', phrase 5 has wider pitch range than phrase 6. The range of phrase 5 is $b_1-b_6^b$ and that of phrase 6 is e_2-g_6 , although most of the pitches are gathered together around $b_3^b-e_6$. The gathered range in phrase 6 is similar to the

range of the vocal line, $b^b_3-d_5$. The wide pitch range in phrase 5 before entering the narrow pitch range of the vocal and the instrumental lines in phrase 6 supports hearing phrase 5 as an introduction to phrase 6.

Phrase 5's center pitch (between b_1 and b^b_6) is e_4-f_4 and phrase 6's center pitch (between e_2 and g_6) is $f_4-f^{\#}_4$. The similar center pitch range of the two phrases is presented in the beginning and end of section A'. The alto flute and piccolo clarinet play the pitch f_4 in the beginning of phrase 5 (mm. 168–170) and the vocal line sings pitches around g_4-a_4 in the end of phrase 6. Thus, section A' begins with the center pitch of phrases 5 and 6 and then the range extends widely downward to b_1 and upward to b^b_6 through section A'. Finally, the pitches gather around g_4-a_4 at the end of phrase 6 (section A'). The range of g_4-a_4 starts a semitone higher than the center pitches played in the beginning of section A'. This shows the shaping of pitch ranges in sections A and A' is similar — both are arch forms.

The vocal line in section A' begins with the a^b_4 and ends with the g_4 having pitch range $b^b_3-d_5$. The center pitch of the vocal line is $f^{\#}_4$. Those starting and ending pitches are close to the center pitch of section A'. This clearly shows that the choice of the row P_9 in the vocal line is the result of consideration not only of the pitch range but also of the center pitch.

The coda has the widest range in this piece as $f_1-e^b_7$ ($f_1-a^b_6$ in phrase 7 and $d_2-e^b_7$ in phrase 8). After expanding the low range in phrase 7, the expansion of the high pitch range occurs in phrase 8. The lowest pitch in the coda, f_1 , is also the lowest

pitch of the fourth movement and the highest pitch in the coda, e^b_7 , is the second highest pitch in this entire piece. As a result, the range of the coda covers the entire pitch range of this piece starting with the lowest pitch in phrase 7 and ending with the second highest pitch.

Phrase 7's center pitch (between f_1 and a^b_6) is $c_4-c^\#_4$ and phrase 8's center pitch range (between d_2 and e^b_7) is $a^b_4-a_4$. The center pitch of the two center pitch ranges is e_4-f_4 . This range f_4 is sustained for seven measures (mm. 190–196) by the clarinet in A (replacing the B^b clarinet in the coda) in a trill. The reason for changing the clarinet from B^b to A in the coda becomes obvious; it is for emphasizing the center pitch, f_4 . For a clear sound of the pitch f_4 , the clarinet in A is better than the clarinet in B^b because of the instrument's structure. After a trill, the violin takes over the sustained $\{FF^\#\}$ in mm. 197–200 with a different pitch range, $f^\#_4-f_5$. All in all, the pitch range of the beginning of the coda is low played by the bass clarinet, the middle part of the coda takes the middle range, f_4 , played by the clarinet in A, and the last part of the coda takes the high pitch range played by the vibraphone and celesta.

All the sections' center pitches occur between $e^b_4-g^\#_4$; section A is $g^\#_4$, section B is $e^b_4-e_4$ ($c^\#_4$ in phrase 3 and $f_4-f^\#_4$ in phrase 4), section A' is f_4 , and the coda is e_4-f_4 . Those center pitches' center pitches are $f_4-f^\#_4$, which are sustained through the coda by the clarinet in A and the violin.

The Relation between Music and Text

The text (Epitafio ideal de un marinero) of this movement is clearly divided into three sections based on the content. The first and third sections (section A and A' in the music) describe the entire firmament; on the other hand, the second section (section B) focuses on a narrower space. This content corresponds to the use of the constellations; the constellations used in sections A and A' cover the North and South while those used in section B cover only the North, where Italy is located.

The poet expresses the relation of death to the sky and stars in the poem. To best express the text, Dallapiccola employs the constellations whose shapes are represented in the first and third stanzas and characters in the second stanza (which uses the added instruments of harp, celesta, and vibraphone), which support these constellations with their sounds. Based on the consideration of the text, each section, even each phrase, constructs and processes the musical elements to describe the text's meaning. The place each constellation used is deeply related to the meaning of the poem. The composer carefully included each constellation after considering the mythology; Columba symbolizing the dove that relates to Noah's story is put together with the text expressing the search for the grave in the sky (the first section).

The second section uses combined materials (texture and rhythm) for expressing the text. While the poem expresses "death", the rhythmic pattern and the texture are thick. The text, "Llueve tu muerte de una estella" (your death rains from a star), portrays grave and heavy sentiments, which the densest texture articulates in mm. 157-160. While the poem describes the lightness, the rhythmic pattern and texture become thin: the text, "La losa no te pesa" (the tombstone is not heavy on

you) articulates weightlessness, which the spare texture demonstrates in mm. 161–165. In addition, the short rhythmic pattern (sixteenth or dotted thirty-second notes) expresses the lightness.

In the third section, the text, “estas en todo” (you dwell in all), includes sky, sea, and earth, all the basic elements in the poem. Here, the use of the repeated e^b_4 in the vocal line represents the meaning of everywhere, rather than using a wider pitch range. The instrumental line’s wide pitch range covering b_1 to b^b_6 before the vocal line is enough to describe the text. In addition, including all the rhythmic patterns formed in sections A and B corresponds to the significant word, “everywhere,” which included all types of poem materials.

Through the text, the sky expands its province to a universe including sky, sea, and earth — topics in the previous movements. In this textual interrelation, the third poem encompasses the images of the previous texts and gradually but strongly, the music articulates this, especially in the use of dyad and trichord types. Two types of dyads ([01] and [06]) and four types of trichords ([012], [013], [014], [016]) are consistent and completed in all their possible members in this fourth movement. As the piece proceeds, the number of members as well their frequency increases and finally this movement completes all members in the coda. Due to the appearance of the word “everywhere” in the third section, the completion of all members occurs in the end of the movement. In addition, the augmented rhythmic pattern in the constellations used in section A’ also represents the idea of completion.

Conclusion

The ultimate concern in analysis is to illuminate musical elements' function, to explain the composer's musical language, and to clarify the ways of creating unity and diversity. The fourth movement is a good example of how Dallapiccola creates unity as well as diversity.

Dallapiccola provides the diversity in the rhythmic development, in his techniques of creating sonorities, especially [01], and in the various members of chord types. We can then recognize how these diversities develop into unity, especially his technique of eventually completing rhythmic patterns, rows, and chord, and instrumentation is a beautiful demonstration of this unity. The role of A' and the coda as synthesizing the diverse elements of A and B is another beautiful way of achieving unity with diversity. Furthermore, the text is infused with diversity and unity involved in covering all the materials (sea, earth, sky), which coincides with the completion of all the members of trichord types.

Chapter 6. Conclusion

In Chapters 2 through 5, I analyzed each movement of *Sicut Umbra*. In these chapters each movement was treated as an independent structure. However, each movement forms a small structure which functions together with the others to determine the direction of the piece, ultimately creating the large-scale formal design. Perhaps the continuous measure numbers from the beginning to the fourth movement strongly support this view that each movement connects to the others and together form a greater unity. While the texts are all different poems, they are all by one poet, Juan Ramon Jimenez, and have closely connected material that also powerfully supports a sense of larger unity.

To understand Dallapiccola's compositional intent in this piece, this final chapter reviews the fundamental musical elements (rhythm, instrumentation, sonorities, rows, texture, and pitch range) analyzed through the four movements. These observations clearly show each element's function within the whole piece. Next, the interrelation of these functions will reveal how the text is described in the music, creating the larger picture and achieving unity. Finally, this unity illustrates how Dallapiccola consistently achieves polarity in this piece.

Rhythm

The rhythmic pattern progressing through all four movements clearly shows an area of interconnection. The whole piece forms the shape of an arch. After introducing rhythmic patterns briefly in the first movement, the process of rhythmic

development happens in the second and third movements and then the fourth movement concludes its rhythmic process. The rhythms used — the triplet, quintuplet, and septuplet — are odd numbers. The duplet rhythm is added to produce these rhythmic developments. Dallapiccola exploits consistent techniques to build up these rhythmic patterns through the piece. As will be revealed later in this chapter, the creation of a rhythmic climax in the third movement has implications in considering the relation of the text and music.

The establishment of the duplet and triplet rhythms in the first movement is transformed into a quintuplet rhythm in the second movement. Further, the quintuplet rhythm with the alternation between duplet and triplet creates the septuplet rhythm in the third movement. After reaching the greatest rhythmic density (the septuplet) in the third movement, the rhythm simplifies to triplet in the last movement.

The fourth movement employs all of the rhythmic patterns occurring in the previous three movements (except the septuplet rhythm), which not only summarizes the rhythmic features of the whole piece, but also shows a strong return to the rhythm of the first movement, since the first movement also has all rhythmic patterns except the septuplet.

Instrumentation

There is a different instrumentation in each movement; each adds instruments, which shows that Dallapiccola is not only trying to present polarity created in sonority, but also accomplishing this in the instrumentation. Each movement adds three instruments. The culmination of twelve instruments in the final movement,

having started from three instruments in the first movement, comes through the overlapping instrumental groups between movements. The technique of introducing new instruments by overlapping is similar to the creation of polarity in this piece. The summary of chords shows the connection between text and sonority and its role in creating polarity.

The twelve instruments consisting of four instrumental families (three flutes, three clarinets, three strings, and an ensemble of vibraphone, celesta, and harp) reveal an aspect of Dallapiccola's compositional intention. As mentioned in the introduction, Dallapiccola comments that a compressed single chord of twelve notes can be divided into two hexachords, three tetrachords, four trichords, or six dyads.⁶⁶ This can be extended to apply to the instrumentation. He uses similar methods in employing four, three-instrument groups in the instrumental group.

Sonority

One of Dallapiccola's compositional techniques, the use of pitches outside the row, occurs in combination with the twelve-note row throughout the entire piece. As the composition progresses, sequences of notes which are not part of any series take up a larger portion of the piece. All pitches in the first movement is based on the row and, in the fourth movement, there are actually more pitches outside the row than pitches based on the row. However, the two kinds of sonorities that consistently stand out are the two dyad-types ([01], [06]) and four trichord-types ([012], [013], [014], [016]).

⁶⁶ See Introduction, p. 13.

Dyad-Types

[01]-Type

Table 6.1a [01] Dyad Type in the Whole Piece

	1 st Movement	2 nd Movement	3 rd Movement	4 th Movement
{CC [#] }	✓	✓	✓	✓
{C [#] D}	✓	✓	✓	✓
{DE ^b }	✓	✓	✓	✓
{E ^b E}	✓	✓	✓	✓
{EF}	✓	✓	✓	✓
{FF [#] }	✓	✓	✓	✓
{F [#] G}	✓	✓	✓	✓
{GG [#] }	✓	✓	✓	✓
{G [#] A}	✓	✓	✓	✓
{AB ^b }	✓	✓	✓	✓
{B ^b B}	✓	✓	✓	✓
{BC}	✓	✓	✓	✓

After the establishment of dyad [01], {CC[#]}, in the first movement by the inversional axes and invariance, the introduction of twelve possible members of [01]-type occurs and repeats not only in each movement but also in each section within the movement.

The second movement has two sets of all twelve members of [01], one from the prelude through the transition and the other in section B. The third movement has five sets of all twelve possible [01] members, two in section A (one in sub-section 1 and the other in sub-section 3), one in section B, and two in section A' (one in sub-sections 6–7 and the other in sub-section 8). The fourth movement contains four of the twelve members of [01], one in each section. The occurrence of twelve members increases to two in each section in the third movement and then decreases to one in each section in the fourth movement. Thus, the creation of a climax in the rate of occurrence of [01]s in the third movement supports the text's implication.

The technique of creating [01]s in each movement is not the same. While the inversional axis occupies the characteristic form of [01] dyad-type in the first movement, the use of two adjacent pitches within the row and the pitches outside the row become the focal elements creating the [01] members in the second movement. The third movement has four methods to provide [01]s: (1) the adjacent two pitches within the row, (2) the adjacent two pitches outside the row, (3) the repeated notes within the row, and (4) the use of inversional rows. Among four techniques to form [01]-type, the first technique provides vertical [01]s and the second and third techniques form horizontal [01]s. The fourth method shapes both horizontal and vertical [01]s simultaneously. The fourth movement changes the process of making [01]s: the first section of the movement briefly reviews the first three. Section A' and the coda demonstrate the new process, [01] created by invariance. In spite of the fact that not all twelve possible members appear by invariance, the changed technique in the end of the piece suggests the emphasis on creating [01].

[06]-Type

Table 6.1b [06] Dyad Type in the Whole Piece

	1 st Movement	2 nd Movement	3 rd Movement	4 th Movement
{CF [#] }	✓	✓	✓	✓
{C [#] G}	✓	✓	✓	✓
{DA ^b }	✓	✓	✓	✓
{E ^b A}	✓	✓	✓	✓
{EB ^b }	✓	✓	✓	✓
{FB}	✓	✓	✓	✓

The first movement has no particular technique of forming [06] except the use of two adjacent pitches within the row. The second movement gradually shows the

creation of [06]-type in two ways: (1) repeated pitches in the row by adjacent notes and non-adjacent notes in the vocal line, and (2) the two adjacent vertical [01] dyads. In the third movement, many more techniques appear to create the members of [06]-type. As well as using the same techniques of the second movement, there are new methods: (1) using two groups of pitches outside the row, which show the tritone relation, and (2) using two inversional rows, which provide [06]-type horizontally through invariance and vertically through the axes. This produces powerful effect due to the simultaneous employment of [06]-type vertically and horizontally.

The second movement has two sets of all six members of [06]-type, one from the prelude through the transition and the other in section B; the third movement also has two all six members, one in section A and the other in section A'. The fourth movement contains four sets of all members, one in section A, another in section B, another in section A', and the other in the coda. As the number of techniques of creation increases through the fourth movement, the occurrence of all possible members is also increased. The creation of [06] is partly interrelated to the occurrence of [01]s, since the tritones often occur a semitone apart.]

Trichord-Types

Through the piece, Dallapiccola employs consistent sonorities based on the trichord partition. The formation of four types of trichord occurs in three ways: (1) the row's adjacent pitches (trichord partition), (2) the row's non-adjacent pitches, and (3) three pitches outside the row. The trichords formed by non-adjacent pitches

accompany rhythmic and pitch manipulations, repeated pitches, and pitches' omission in the row.

[012]-Type

Each movement has a different number of members and a different technique to provide this type: six members in the first movement, ten members in the second movement, two sets of twelve members (one in section A and the other in section A') in the third movement, and one set of all members in the fourth movement. Table 6.2a shows the occurrence of [012]-type in the piece reaching a climax in the third movement. This implies a deep relation with the text discussed later in this conclusion.

Table 6.2a [012] Trichord Type in the Whole Piece

	1 st Movement	2 nd Movement	3 rd Movement	4 th Movement
{CC [#] D}	✓	✓	✓	✓
{C [#] DE ^b }	✓	✓	✓	✓
{DD [#] E}	✓	✓	✓	✓
{D [#] EF}		✓	✓	✓
{EFF [#] }			✓	✓
{FF [#] G}		✓	✓	✓
{F [#] GG [#] }		✓	✓	✓
{GG [#] A}		✓	✓	✓
{G [#] AB ^b }			✓	✓
{AB ^b B}	✓	✓	✓	✓
{B ^b BC}	✓	✓	✓	✓
{BCC [#] }	✓	✓	✓	✓

Among the six members in the first movement, five members occur in the first trichord partition of five rows, P₁, P₂, P₀, I₀, and RI_e. The [012]s are formed not only by the first trichord partition of the row, but also by the connection of two rows – between the last two pitches and first pitch or first two pitches and last pitch of

consecutive rows. After establishing vertical trichords in the first movement, the second movement adds four more members with new techniques for creating chord-type. Four formational techniques add new members: (1) the horizontal trichord by the row's non-adjacent pitches, (2) the vertical trichord by the row's non-adjacent pitches, (3) the vertical trichord based on outside the row, and (4) the horizontal trichord based on outside the row. The third movement keeps the same technique of creating [012] trichords with more frequent occurrence of vertical trichords partitioned in the row than that in the second movement. The process of forming trichords in the fourth movement remains the same as the techniques in the second and third movements, but the frequency of occurrence by pitches outside the row increases, both vertically and horizontally.

[013]-Type

Table 6.2b displays the [013] trichord's formation through the piece. In the first movement, the adjacent three pitches in the row (trichord partition) form seven members. There is no technique to create the [013]-type deliberately. The second movement introduces fifteen members with ten new members and the third movement forms twenty-two members with six new members. Finally, the fourth movement reaches all twenty-four members with one new member. The formation of new members in each movement is based on the previous trichord's occurrence and the same technique of introducing new transpositions by semitone is used between sections and phrases within each movement.

Table 6.2b [013] Trichord Type in the Whole Piece

	1 st Movement	2 nd Movement	3 rd Movement	4 th Movement
{CC [#] E ^b }	✓	✓	✓	✓
{C [#] DE}				✓
{DD [#] F}		✓	✓	✓
{E ^b EF}			✓	✓
{EFG}			✓	✓
{FF [#] G [#] }	✓	✓	✓	✓
{F [#] GA}		✓	✓	✓
{GG [#] A [#] }	✓	✓	✓	✓
{G [#] AB}		✓	✓	✓
{AB ^b C}		✓	✓	✓
{B ^b BC [#] }	✓		✓	✓
{BCD}			✓	✓
{CBA}		✓	✓	✓
{C [#] CB ^b }	✓	✓	✓	✓
{DC [#] B}		✓		✓
{E ^b DC}			✓	✓
{EE ^b C [#] }		✓	✓	✓
{FED}			✓	✓
{F [#] FE ^b }	✓	✓	✓	✓
{GF [#] E}		✓	✓	✓
{A ^b GF}	✓		✓	✓
{AG [#] F [#] }			✓	✓
{B ^b AG}		✓	✓	✓
{BB ^b G [#] }		✓	✓	✓

[014]-Type

As with the [013] trichord, the first movement does not use any particular technique to form [014] other than trichord partition. The first movement contains six members. As shown in Table 6.2c, the second movement contains fourteen members including ten new members and the third movement has twenty members including eight new members. The fourth movement provides all twenty-four possible members. Between the first and second movements, only three members show the semitone relation among the ten new members. Between the second and third movements, all eight new members form a semitone relation. The fourth movement

summarizes the occurrence of [014] formed in the first, second, and third movements.

This has a close relation to the text, which will be presented later in this conclusion.

Table 6.2c [014] Trichord Type in the Whole Piece

	1 st Movement	2 nd Movement	3 rd Movement	4 th Movement
{CC [#] E}	✓		✓	✓
{C [#] DF}		✓	✓	✓
{DE ^b F [#] }		✓	✓	✓
{E ^b EG}		✓	✓	✓
{EFG [#] }			✓	✓
{FF [#] A}		✓	✓	✓
{F [#] GB ^b }			✓	✓
{GG [#] B}			✓	✓
{G [#] AC}		✓		✓
{AB ^b C [#] }			✓	✓
{B ^b BD}			✓	✓
{BCE ^b }	✓	✓	✓	✓
{CBA ^b }		✓	✓	✓
{C [#] CA}	✓	✓	✓	✓
{DC [#] B ^b }	✓	✓	✓	✓
{E ^b DB}		✓		✓
{EE ^b C}			✓	✓
{FEC [#] }	✓		✓	✓
{F [#] FD}			✓	✓
{GF [#] E ^b }		✓		✓
{G [#] GE}		✓	✓	✓
{AG [#] F [#] }			✓	✓
{B ^b AF}		✓	✓	✓
{BB ^b G}	✓	✓		✓

[016]-Type

The nine occurrences in the first movement suddenly increase in frequency to twenty-three members in the second movement including fourteen new members. In the third movement, one new member is added among nineteen members. The fourth movement contains all twenty-four possible members. The sudden increase of members in the second movement is a result of the combination of two dyads, [01] and [06]. After creating inversional rows in the first movement, the two axes combine and change their sonority to the [016]-type in the second movement, especially in the

transition. This combination explains the development of sonority from two dyad-types, [01] and [06], into a trichord-type.

Table 6.2d [016] Trichord Type in the Whole Piece

	1 st Movement	2 nd Movement	3 rd Movement	4 th Movement
{CC [#] F [#] }	✓	✓	✓	✓
{C [#] DG}		✓	✓	✓
{DE ^b G [#] }		✓	✓	✓
{E ^b EA}	✓	✓		✓
{EFB ^b }		✓	✓	✓
{FF [#] B}	✓	✓		✓
{F [#] GC}		✓	✓	✓
{GG [#] C [#] }	✓	✓		✓
{A ^b AD}		✓	✓	✓
{AB ^b E ^b }			✓	✓
{B ^b BE}		✓	✓	✓
{BCF}		✓	✓	✓
{CBF [#] }		✓	✓	✓
{C [#] CG}	✓	✓	✓	✓
{DC [#] G [#] }	✓	✓	✓	✓
{E ^b DA}		✓	✓	✓
{EE ^b B ^b }	✓	✓		✓
{FEB}		✓	✓	✓
{F [#] FC}	✓	✓	✓	✓
{GF [#] C [#] }		✓	✓	✓
{A ^b GD}	✓	✓	✓	✓
{AA ^b E ^b }		✓	✓	✓
{B ^b AE}		✓	✓	✓
{BB ^b F}		✓		✓

In summary, all four trichord-types have the same frequency and fashion of formation. After providing a few members in the first movement, the added members are mostly based on the semitone relation and happen repeatedly in the second, third, and fourth movements. As the piece progresses, the number of members increases and finally reaches all twenty-four possible members in the fourth movement. Some trichord-types peak in their occurrence during the third movement and some trichord-types constantly add to its occurrences through the fourth movement. The first

situation is one of the techniques to show the implication of the text, and the second one is related to the polarity. Both situations are detailed later in this chapter.

Texture and Form

The form of the music is based on the consideration of musical surfaces such as rhythm, texture, instrumentation, dynamics, and the certain sonorities. These surfaces could unify the sections as well as separate them. Table 6.3 shows the form and texture of *Sicut Umbra*.

Table 6.3 Evolution of Form and Texture in Whole Piece

	Form	Texture	Pitches ⁶⁷
1 st movement	Two-part (AA')	Canon	
2 nd movement	Two-part (AB)	A-vertical B-horizontal	A-row B-no row
3 rd movement	Three-part (ABA')	A-horizontal B-vertical A'-horizontal	A-no row B-row A'-no row
4 th movement	Four-part (ABA'Coda)	A-vertical B-horizontal A'-vertical Coda-both (vertical and horizontal)	A-row B-no row A'-row Coda-both (row and no row)

According to the above observations, the all four movements participate in developing form and texture; the first movement uses the canon to suggest possible textures, vertical and horizontal, and then the second, third, and fourth movements employ two possible textures alternately related to the type of constituent pitches. The vertical texture has the pitches based on the row and the horizontal texture includes

⁶⁷ Denotes most constituent pitches of section. It does not mean section consists of row's pitches or pitches outside row.

the pitches outside the row. Having the same relation between texture and constituent pitches, each movement alternates the texture occurring at the beginning as follows: the second movement begins with the vertical texture, the third movement begins with the horizontal texture, and the fourth movement returns to the vertical texture. Furthermore, each movement continuously develops in form from two-part to four-part. The same two-part form in the first and second movements contains a development from an AA' form to an AB form. This constantly developing form implies a deep connection to the developing sonorities added through the piece and to the text (this will be discussed later in the chapter). Finally, the last section of this piece, the coda of the fourth movement, changes the relationship between texture and constituent pitches to link the horizontal texture with the row's pitches and the vertical texture with the use of pitches outside row. The sudden change of their relation in the coda is connected to the revolution of the creating [01] dyad; from manipulating pitches both based on the row and outside row before the coda to invariance in the coda.

Pitch Range

As mentioned for each movement, the pitch range has deep implications with respect to the choice of row as well as the expression of the text. Within each movement, the section's center pitch is significant in developing sonority and forming movement. As shown in Table 6.4, the pitch range constantly widens throughout four movements: the first movement covers a_3-c_7 , the second movement is $a_2-c_7^\#$, the third movement has $g_1-a_6^b$, and the fourth movement is $f_1-e_7^b$. With exception in the

high pitch of the third movement (a little descent to a^b_6), both the low and high pitches extend their ranges through the piece.

Table 6.4 Pitch Range of Whole Piece

	Pitch Range
1 st movement	a_3-c_7
2 nd movement	$a_2-c^{\#}_7$
3 rd movement	$g_1-a^b_6$
4 th movement	$f_1-e^b_7$

The extended pitch range has four reasons for formal design. First, the instrumentation is continuously expanded. The method of adding instruments is one factor in expanding the range. Between the first and second movements, the change from three to six instruments without any overlapping instrumentation causes a further degree of extended pitch range. Second, the development to four-part form through four movements also accompanies the wide pitch range. Third, the added trichord-types' members in each movement widen the pitch range. Finally, the implication of the text, especially the fourth movement, is an important element in developing the pitch range. The pitch range of the fourth movement is contained in the coda's pitches. In addition to the coda's importance in rhythm, texture, and chord, the coda also synthesizes the pitch range, forming the widest pitch range at the end.

Relation between Text and Music

The shift from a text-less first movement to sung texts in the second and third movements becomes obvious and clear in understanding the music. However, the metaphorical expression of the texts in the second and third movement is not yet clear

in our understanding of the music. Symbolic expressions of forgetfulness as liberator of mankind and memories as golden sand dunes arrive in imagery apparent in the fourth movement, which employs nine constellations, a complementary type of image. Until this visual imagery appears in the fourth movement, several techniques combine the fundamental musical elements with the text exposed in this piece. I will observe the relationship between text and fundamental elements, respectively, after discussing the topics individually.

Each movement reveals its own specific topic: the second movement deals with forgetfulness, the third movement deals with memories, and the fourth movement describes the constellations and mentions all topics, sky, sea, earth, in the end of the poem. This implies two things: (1) the fourth movement's coda concludes both its movement as well as the entire piece, and (2) the order of sky, sea, and earth is the exact reverse of the order of topics in the second, third, and fourth movements. In the metaphorical expression, the liberator of mankind in the second movement relates to the earth, and the golden sand dunes in the third movement connect to the sea since the golden sand dunes may suggest the sea's tide. Of course, the constellations of the fourth movement are located in the sky. Hence the fourth movement comprises a synthesis of images drawn from the entire work. Perhaps this synthesis arose as a result of the order in which Dallapiccola composed the piece – completing the fourth movement and then finishing the rest of the piece.

With respect to the relationship of text to rhythm in the work, one might recall at this time Dallapiccola's comment that the lack of a definite relation between rhythm and the twelve-note system changes the way we perceive twelve-note music.

He mentioned that in classical music, the theme is nearly always subjected to melodic transformation, while its rhythm remains unaltered; in music based on a note-series, the task of transformation is concerned with the arrangement of the notes, independent of rhythmic considerations. However, Dallapiccola adopted a classical technique for dealing with rhythm flexibly and to aid the precision of his own language. In this piece, rhythm is another area of dialogue relating specifically to time flow.⁶⁸ The rhythmic duration is one of the expressions representing tense in the second movement and the variable rhythmic pattern is one of the representations for the variable shape of memory in the third movement. In the second movement, the employment of two simple types of rhythmic pattern (triplet and quintuplet) achieves the maximum effect of representing forgetfulness. The simple rhythm represents the forgetfulness, empty without a memorable shape. Then, the rhythmic development leading to the septuplet in the third movement addresses memory, with its tendency to have variable shapes. The rhythmic development depicts memory's intensity, vividness, and weakness. Thus, the rhythmic pattern in the third movement is the most complex in this entire piece.

In the fourth movement, the complex rhythmic pattern simplifies to the triplet and quintuplet. However, the coda includes the rhythmic tendencies of the second and third movements, short and long sustained rhythm as well as all types of rhythmic patterns: triplet, quintuplet, and sextuplet instead of the septuplet. This directly relates to the end of text including all topics: sky, sea, and earth.

⁶⁸ Robert Cogan and Pozzi Escot, *Sonic Design*, (New Jersey: Prentice-Hall, 1976), p.221. He defines that music takes place in time has been called *rhythm*. He also mentioned that a musical work could be conceived as a time flow – unique, imagined, and notated by its creator. In his comment, time flow is general meaning while time flow in my analysis means a specific passing time related to man's life.

With respect to the relationships found among text, texture, and pitch we note that the pairing of vertical texture with the use of the row's pitches and horizontal texture with the use of pitches outside row remains constant until section A' of the fourth movement. However, the coda reverses this relationship. This change breaks the previous regularity since the sequence of interconnected topics ends just before the coda. Along with the text's evolution until the fourth movement (which is the climax containing all materials — sky, sea, earth), the texture and pitch keep and develop their relationship and then the texture and its characteristic type of constituent pitch changes along with the disappearing text. The sudden change in texture and component pitches is another technique for maximum expression of the text.

With respect to the relationships between the text and the types of chords employ the piece we note that the process of creating all possible members in two dyad-types and four trichord-types is the most powerful technique for expressing the text's implication. The gradually introduced chord-types in each movement are continuously compiled and then produce all possible chord-types' members in the end of piece, a process that describes the text's evolution, displaying each material in each movement and then mentioning all materials together (sky, sea, earth) in the fourth movement.

Two common things in developing sonorities clearly show the coda's implication: (1) all possible members occur only in the final fourth movement except for the [012] trichord (having half the possible members compared to the others, it makes it to an early completion in the third movement), and (2) the gradual piling up

of transpositions except the [016] type (sudden increased frequency in the second movement shows the development of dyad-type to trichord-type).

Finally, the text seems reflected in the evolution of the work's instrumentation. The addition of instruments symbolizes the text's meaning, as does the chord-type. The gradually added instrumentation in each movement then results in the employment of all instruments in the fourth movement and thus has the same feature as the evolution of the chord-types. This strongly reflects the process involved in the text's evolution.

Polarity

Polarity, a certain attractive feeling or extremely subtle relation in sonority according to Dallapiccola, could not be achieved only in pitch level. Even though Dallapiccola mentioned polarity with the example of pitch, I assume that the comment is one of other possible examples and does not mean that polarity can be accomplished only in pitch level. Furthermore, his comment, "polarity can change (or be changed) from one work to another," leaves space for the possibility of change even within one work. An understating of Dallapiccola's musical style and his concept of polarity in the twelve-tone system supports my conclusion, as we see referential chord-type established in the first movement and maintained throughout the piece.

In *Sicut Umbra*, Dallapiccola creates polarity in two dyad-types ([01] and [06]) and four trichord-types ([012], [013], [014], [016]). To ensure the consistent appearance of those chord-types and create polarity through the piece, Dallapiccola

manipulates the musical elements analyzed above; the rhythmic climax in the third movement, the widest pitch range in the fourth movement, the employment of all twelve instruments in the fourth movement, and the extension of musical form in the fourth movement are all brought about by manipulation of these referential sonorities.

The use of canon is the crucial method in creating sonority. It contains two important properties. First, the canon is a method of combining pitches and creates referential chords consisting of non-adjacent pitches. The canonic treatment in the first movement unfolds several possibilities for creating sonority, which is reason enough to call the first movement “Introduction.” Based on the possibilities in the first movement’s canon, the remaining movements show several techniques in combining pitches by adjacent and non-adjacent pitches, and in constituent pitches, based on the row and outside the row. All of these techniques arise from the canon. The sonorities it presents, and the possibilities it shows for developing those sonorities. Second, the canonic treatment uses the inversional relation. Two inversional rows have two axes related by a tritone, and consisting of a semitone, $\{CC^\#\}$ and $\{F^\#G\}$. The semitone interval is especially important, playing the decisive role in developing sonority through the entire piece. The semitone relation introduces most new members from the previous phrase’s, section’s, even movement’s trichord-types. Finally, all possible members are introduced through the semitone relation. It thus produces the complete collection of sonorities gradually and delicately.

The following steps summarize the process in creating polarity:

- (1) His choice of polarity in sonority is based on the row’s partitions.
- (2) He creates the polarity by forming all possible members using

- a. semitone relation emphasized in the first movement by the canonic treatment of inversions; rows;
 - b. gradual appearance of new members through four movements;
 - c. gradual increase in frequency as each movement progresses; and
 - d. formation of all members in the fourth movement.
- (3) He appreciates and considers the text, and manipulates other musical elements based on this interpretation and on the polarity:
- a. creating rhythmic climax in the third movement;
 - b. gradual evolution in instrumentation;
 - c. constantly widened pitch range; and
 - d. continuing the unfolding of musical form.
- (4) He controls each function containing the same fashion, gradual formation of a climax in the fourth movement.
- (5) Finally, he accomplishes polarity by forming all possible members in sonority as well as creating a culmination of all musical functions in the fourth and final movement.

The analyses that I have undertaken here demonstrate the structure that Dallapiccola defines in *Sicut Umbra*; furthermore show how the creation of polarity enables such an extended form to remain a coherent whole. Understanding this structure gives several insights into Dallapiccola's compositional style: (1) deeper understanding of his use of pitches (both row and outside row), rhythm, texture, and sonority, (2) an interpretation of how these elements shape the form and create the

unique relationship to the text, and (3) appreciation for the combination of classical and twelve-tone techniques involved in polarity. Dallapiccola's polarity is not a technique for composition but is a concept inseparable from the set musical elements, their development, and functions and is essential to Dallapiccola's construction of musical form for expression, coherence, and unity.

Bibliography

- Alegant, Brian. "The 77 partitions of the Aggregate: Analytical and Theoretical Implications." Ph.D. dissertation, University of Rochester, 1992.
- . "Cross-Partition as Harmony and Voice Leading in Twelve-Tone Music." *Music Theory Spectrum* 23/1 (2001): 1–40.
- Babbitt, Milton. "Some Aspects of Twelve-Tone Compositions." *The Score and IMA Magazine*, 12 (June 1955): 53–61.
- . "Twelve-Tone Invariants as Compositional Determinants." *Musical Quarterly* 46 (1960): 245–259.
- . "Set Structure as a Compositional Determinant." *Journal of Music Theory* 5/2 (1961): 72–94.
- . "Twelve-Tone Rhythmic Structure and the Electronic Medium." *Perspectives of New Music* 1/1 (1962): 49–79.
- . "Since Schoenberg." *Perspectives of New Music* 12/1-2 (1973): 3–28.
- . "Responses: A First Approximation." *Perspectives of New Music* 14/2-15/1 (1976): 3–23.
- . *Milton Babbitt: Words About Music*. Edited by Joseph Straus and Stephen J. Demski. Madison: University of Wisconsin Press, 1987.
- Brown, Rosemary. "Continuity and Recurrence in the Creative Development of Luigi Dallapiccola." Ph.D. dissertation, University College of North Wales, 1977.
- Dallapiccola, Luigi. "On the Twelve-Note Road." *Music Survey* 4 (October 1951): 318–32.
- . "Meeting with Anton Webern (Pages from a Diary)." *Tempo* 99 (1972): 2–7.
- Dapogny, James. "Style and Method in Three Compositions of Luigi Dallapiccola." Master thesis, University of Illinois, 1971.
- DeLio, Thomas. "A Prolifertation of Canons: Luigi Dallapiccola's *Goether Lieder* No. 2." *Perspectives of New Music* 23/2 (1985): 185–195.
- Eckert, Michael. "Octatonic Elements in the Music of Luigi Dallapiccola." *Music Review* 46/1 (1985): 35–48
- . "Text and Form in Dallapiccola's *Goethe-Lieder*." *Perspectives of New Music* (1979): 98–111.
- Fearn, Raymond. *The Music of Luigi Dallapiccola*. New York: University of Rochester Press, 2003.

- Forte, Allen. *The Structure of Atonal Music*. New Haven: Yale University Press, 1973.
- Gould, Glenn Hibbard. "A Stylistic Analysis of Selected A Twelve-Tone Works by Luigi Dallapiccola." Master thesis, Indiana University, 1964.
- Lerdahl, Fred, and Jackendoff, Ray. *A Generative Theory of Tonal Music*. Cambridge, Mass: The MIT Press, 1983.
- Lewin, David. "A Theory of Segmental Association in Twelve-Tone Music." *Perspectives of New Music* 1/1 (1962):180–207.
- . "On Partial Ordering." *Perspectives of New Music* 14/2-15/1 (1976): 252–59.
- . "Transformational Techniques in Atonal and Other Music Theories." *Perspectives of New Music* 21/1-2 (1982-83): 312–71.
- . "Music Theory, Phenomenology, and Modes of Perception." *Music Perception* 3/4(1986): 327–392.
- . *Generalized Musical Intervals and Transformations*. New Haven: Yale University Press, 1993.
- . *Musical Form and Transformation: Four Analytical Essays*. New Haven: Yale University Press, 1993.
- Mancini, David. "Form and Polarity in Late Works of Luigi Dallapiccola." Ph.D. dissertation, Yale University, 1987.
- . "Twelve-Tone Polarity in Late Works of Luigi Dallapiccola." *Journal of Music Theory* 30/2 (1986): 203–24.
- Martino, Donald. "The Source Set and Its Aggregate Formations." *Journal of Music Theory* 5/2 (1961): 224–73.
- Mead, Andrew. "Detail and the Array in Milton Babbitt's *My Complements to Roger*." *Music Theory Spectrum* 5 (1983): 89–109.
- . "Some Implications of the Pitch-Class/Order-Number Isomorphism Inherent in the Twelve-Tone System." *Perspectives of New Music* 26/2 (1988): 96—163; 27/1 (1989): 180–233.
- . *The Music of Milton Babbitt*. Princeton: Princeton University Press, 1994.
- Morris, Robert D. "Combinatoriality without the Aggregate." *Perspectives of New Music* 21/1-2 (1982-83): 432–486.
- . "Set-Type Saturation Among Twelve-Tone Rows." *Perspectives of New Music* 22/1-2 (1983-84): 187–217.
- . *Class Notes for Atonal Music Theory*. Hanover, NH: Frog Peak Music, 1991.
- . "New Directions in the Theory and Analysis of Musical Contour." *Music Theory Spectrum* 15/2 (1993): 205–228.
- . "Compositional Spaces and Other Territories." *Perspectives of New Music* 33/1-2 (1995): 328—359.

- Morris, Robert D., and Alegant, Brian. "The Even Partitions in Twelve-Tone Music." *Music Theory Spectrum* 10 (1988): 74–103.
- Nathan, Hans. "Luigi Dallapiccola: Fragments from Conversation." *Musical Review* 27/4 (1966): 294–372.
- . "On Dallapiccola's Working Methods." *Perspectives of New Music* 15/2 (1977): 34–57.
- . "The Twelve-Tone Compositions of Luigi Dallapiccola." *Musical Quarterly* 44/3 (July 1958): 289–310.
- Perkin, John McIvor. "Dallapiccola's Art of Canon." *Perspectives of New Music* 1/2 (1963): 95–106.
- Rahn, John. "On Pitch and Rhythm: Interpretations of Orderings of and in Pitch and Time." *Perspectives of New Music* 13/2 (1975): 182–203.
- . "How Do You *Du*?" *Perspectives of New Music* 14/2–15/1 (1976): 62–80.
- . "Logic, Set Theory, Music Theory." *College Music Symposium* 19/1 (1979): 114–27.
- . *Basic Atonal Theory*. New York: Longman, 1980.
- Shackelford, Rudy, trans. "A Dallapiccola Chronology." *Musical Quarterly* 67/3 (July 1981): 405–36.
- Starr, Daniel V. "Sets, Invariance, and Partitions." *Journal of Music Theory* 22/1 (1978): 1–42.
- Starr, Daniel, and Morris, Robert. "A General Theory of Combinatorality and the Aggregate." *Perspectives of New Music* 16/1 (1977–8): 3–35; 2:50–84.
- Straus, Joseph N. "Listening to Babbitt." *Perspectives of New Music* 24/2 (1986): 10–24.
- . *Introduction to Post-Tonal Theory*. 2nd ed. Upper Saddle River, New Jersey: Prince Hall, 2000.
- Swift, Richard. "Some Aspects of Aggregate Composition." *Perspectives of New Music* 14/2—15/1 (1976): 236–247.
- Waterhouse, John C. G. *Dallapiccola*. *New Grove of Dictionary of Music*, ed. Stanley Sadie. 2nd edition. Vol. 10. London: Macmillan, 2002.
- Westergaard, Peter. "Toward a Twelve-Tone Polyphony." *Perspectives of New Music* 4/2(1966): 90–112.