ASPECTS OF MUSICAL LANGUAGE IN GYÖRGY LIGETI'S

TEN PIECES FOR WIND QUINTET (1968)

by

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ABSTRACT

György Ligeti's Ten Pieces for Wind Quintet (1968) is a work representative of his style in the middle sixties; it illustrates many compositional procedures in a medium considerably more "compact" than that of many of his other works. Moreover, refinements of techniques from earlier pieces are apparent throughout the quintet. The first chapter traces the development of Ligeti's compositional style from his early period in Hungary to his more mature period, the style of which began to evolve in 1956 with his move to Vienna. Major works are cited, excerpts given, and stylistic features defined and substantiated, often by Ligeti's own characterizations of his changing musical language.

Chapter II isolates certain musical parameters—form, texture, rhythm, and pitch—and discusses them independently of each other, defining details of their structures and illustrating them in excerpts from pieces 2 to 9 of the quintet. Concerning aspects of form, subgroupings of pieces within the quintet as a whole are suggested, while delineating factors within individual pieces are discussed in the light of the parameters effecting such segmentation. The section dealing with texture identifies two prevalent arrangements in the work, i.e., "ensemble" and "soloistic," and outlines general and specific textural aspects of each type (e.g., modes of instrument interaction). Rhythmic principles are discussed next, and the roles of meter and other rhythmic groupings are defined and illustrated. And finally, the section on pitch organization treats linear and harmonic details separately. Regarding the former, various means of linear connection and pitch-class unfolding are exposed, while in the latter, harmonic structures are
classified and related according to a derived system of consonance-dissonance factors. Chapter II, through the examination procedures outlined above, provides a basic understanding of techniques and devices in preparation for the detailed analyses which follow in Chapters III and IV.

Chapters III and IV deal exclusively and extensively with the first and last pieces respectively. Again, musical parameters are studied individually, and many concepts introduced in Chapter II are further discussed. These and other concepts (the latter being introduced with specific reference to the first and/or last pieces) are also approached on a larger scale, providing a comprehensive view of the pieces' overall musical structures. Instances of interaction between parameters are referred to in this regard. In addition, these two detailed analyses include aspects of connection between the first and third pieces of the quintet, and between the ninth and tenth.

In Chapter V, conclusions are given which pertain to the quintet as representative of Ligeti's music of this period, as evidenced in findings resulting from the analysis.
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EDITORIAL NOTES

Subheadings of the sections within chapters of this paper are rank-ordered in the following manner:

First-Level Subheading

Second-Level Subheading

Third-level subheading

Fourth-level subheading

Registrally specific pitches are designated according to the following octave classifications:

\[
\begin{align*}
    &c^1 &c^2 &c^3 &c^4 &c^5 &c^6 &c^7 \\
\end{align*}
\]

Upper-case letters with superscript numbers thus denote registrally specific pitches, e.g., $E^4$, $D^3$, etc. Pitch-classes (i.e., registrally non-specific pitches) are indicated by upper-case letters, e.g., D, F# , etc.

PC stands for pitch-class, IC for interval-class, and C-D factor for consonance-dissonance factor (explained at the appropriate point in the text).
CHAPTER I

INTRODUCTION

The year 1956 may be considered a major turning point in György Ligeti's life, for it was the move from Hungary (his place of birth in 1923) to Vienna in that year which put him in contact with several leading European avant-garde composers such as Eimert, Koenig, and Stockhausen. The result of this exposure was a marked change in Ligeti's compositional style.

Ligeti's works prior to 1956 may be divided into three smaller groups. His earliest works, composed between 1938 and 1942, consist mainly of unpublished piano pieces, chamber works, and songs. From the middle to late forties, however, the political situation largely restricted the composition of new music to mere folksong arrangements. And finally, in the early fifties, when the restrictions were somewhat relaxed, Ligeti began to develop a new style:

About 1950 I realized that further development in the post-Bartók style in which I had been composing was not the way forward for me. . . . In 1951 I started to experiment with simple structures of rhythm and sound in order, in a manner of speaking, to build up a new music from nothing. . . . I asked myself: what can I do with a single note? what can I do with its octave? what with one interval? what with two intervals? what with definite rhythmic relationships which could form the foundations of a whole based on rhythm and interval? In this way several small
pieces were composed, chiefly for the piano.  

His Musica ricercata (11 Pieces for Piano, 1951-53) was composed in the wake of these questions. While this work contains some of the seeds of Ligeti's new style, a freely tonal language remains prominent in the Bartók-influenced String Quartet No. 1 - Metamorphoses nocturnes (1953-54), and Ejszaka, Reggel (1955) for chorus.

In 1956, with the move to Vienna, Ligeti developed the style which brought him international acclaim—a style which he maintained for about a decade. Apparitions (1958-59) and Atmospheres (1961), both for orchestra, are the works which were largely responsible for this immediate widespread recognition. Atmospheres is characterized by the use of static, chromatic sound masses, gradually transforming sonorities, and micropolyphony. The first of these three textures, as illustrated in Example 1, is defined as a sustained chromatic cluster. In this particular excerpt, the sound block includes every pitch from $\text{C}^\flat$ to $\text{E}^{\#}$, except $\text{C}^\flat$, sustained "ametrically" as though suspended in space.

4 György Ligeti, quoted in Ove Nordwall, liner notes for Musica ricercata (1951-53), on Duo Pohjola (Grammofonfirma BIS 18, recorded in W. Germany, 1974). Given the unavailability of published sources by Ligeti, or sources which quote Ligeti, information gleaned from liner notes such as this has proved invaluable in ascertaining Ligeti's own characterizations of the techniques of his musical language.

5 Ibid.

6 This sustained sound mass may be considered "ametric" because of the absence of perceivable, accent-delineated metric units; the $\frac{4}{2}$ time signature and notated barlines are essentially notational conveniences.

7 My characterization of these measures is corroborated by Thomas Clifton in his recent book, Music as Heard (New Haven: Yale University Press, 1983), pp. 155-56. Clifton states:

"The most elemental kinds of surface occur under three conditions: the first requires the absence of movement; the second, the absence of any contrast in dynamics; and the third, an absence of timbral complexity. The opening measures of Ligeti's Atmospheres reveal the
Example 1. *Atmospheres*, measures 1-6, showing static, chromatic sound mass.
unmerklich einsetzen / imperceptible onset

die Tremoli so dicht wie möglich / the tremolos as thick as possible

1) without the hair of the bow

2) scarcely audible

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Example 2, also from *Atmospheres*, illustrates a texture which consists of gradually changing sonorities. In this process, each member of an established vertical sonority moves independently of others until a new verticality has evolved. This particular excerpt features the interaction of several sound blocks, each of which goes through the metamorphic process described above. For instance, in measure 30, the second violins are sustaining the pitches of which move one by one until is formed in bar 32 and subsequently sustained. Occurring rhythmically independent of, but nevertheless concurrent with, the second violins' transformation is a progression from to in the violas, effected through the same process. The piccolos, oboes, clarinets, trumpets, first violins, and cellos are also engaged in independent sonority transformations throughout these measures.

"Micropolyphony," as illustrated in Example 3, is defined by Ligeti as:

... a technique by which instrumental parts are interwoven and crowded together into a dense contrapuntal texture. There are so many parts, and their polyphonic interweaving is so complex, that the individual parts are completely submerged into a micropolyphonic web, and the overall musical pattern which emerges from this technique imposes a formal shape on the work.  

first two of these conditions. Within these measures—I think particularly of the first six—one experiences very little sensation of change. Without change, which is constitutive of rhythm, time itself is suspended. ... Accordingly, the texture of the opening measures of *Atmospheres* can be described as synthetic, in the sense that individual elements are absorbed into this amorphous mass of sound."

8 An "established vertical sonority" is one which has sounded long enough, without internal pitch change, to be recognized as a static verticality.

9 The black vertical bar indicates a chromatic cluster, i.e., all pitches between and including the two indicated.

10 György Ligeti, liner notes for *Ligeti: Melodien for Orchestra* (Decca Headline, Head 12, 1976).
Example 2. *Atmospheres*, measures 30-34, showing gradually transforming sonorities.
The denseness of the polyphonic interweaving in Example 3 is the result of the complex composite rhythm of, and relatively narrow ambitus, over which the forty-eight independent linear events operate. The overall effect undoubtedly outweighs that of any one of its components.

Static sound blocks, gradual sonority transformations, and micropolyphony are the main textural characteristics of other works in the early to middle sixties, as evidenced in Volumina (1961-62) for organ, movements one and two of the Requiem (1963-65) for two choruses and orchestra, the first movement of the Cello Concerto (1966), Lux aeterna (1966) for chorus, and Lontano (1967) for large orchestra, three of which (Volumina, Cello Concerto, and Requiem) are discussed in more detail below.

Example 4 consists of the opening of Volumina, which graphically illustrates the concept of static sound mass. Notice in this excerpt that, although the dynamics fluctuate as a result of registration changes, pitch content remains static throughout. The opening movement of the Cello Concerto typifies a slightly different application of slowly changing sonorities from that of the block-like clusters of Atmospheres. Here, a mode of linear expansion may be discerned. Specifically, the unison E⁴ of measure 11 gradually expands to more complex verticalities, pitches being added in the following order:

\[
\begin{align*}
\text{m. } 11 & \quad \text{m. } 17 & \quad \text{m. } 26 & \quad \text{m. } 28 \\
\end{align*}
\]

The second movement of the Requiem contains portions exhibiting complex micropolyphonic textures such as the excerpt given as Example 5. Here, as in the excerpt from Atmospheres, the complex interweaving of linear components occurs within a narrow range, specifically from \( \text{ } \) to \( \text{ } \). Linear independence is consequently rendered subordinate to
Example 3. *Atmospheres*, measures 52-53, showing micropolyphony.
Example 4. *Volumina*, rehearsal nos. 1 to 2, showing static, chromatic sound mass.
the effect of the whole. 11

Apparitions, the other work underlying Ligeti's immediate recognition in the late fifties, is somewhat different from the pieces illustrated above. Rather than a continuous sound structure of slowly transforming textures, it features a succession of abruptly changing textures (one of which is micropolyphony). This "fragmented" quality is also discernible in several of Ligeti's other pieces from the middle sixties such as Aventures (1964) and Nouvelles Aventures (1964) for three solo voices and seven instruments, the third movement of the Requiem, and second movement of the Cello Concerto. Example 6 is an excerpt from Apparitions, and Example 7, from Aventures, both of which illustrate this more disjunct style.

In the first of these (from Apparitions) a change of musical element occurs on almost every beat, each element being defined by different orchestration, register, rhythmic design, length, melodic shape, dynamics, and articulation. Notice that by measure 16 the independent elements begin to overlap, transforming the former "patch-work" texture (i.e., one of juxtaposition) to one of complex superimposition of disparate musical ideas. The excerpt from Aventures also reveals successive and superimposed, contrasting elements often involving non-traditional vocal techniques.

Around 1965 Ligeti began to alter his musical style once more:

Since about the middle sixties I have gradually been transforming the technique of micropolyphony, aiming to make the separate lines clearer and more individually distinguishable. The polyphonic pattern is still complex, but the polyphony itself is less "micro" in that the possibility now exists of designing autonomous, divergent, mutually contrasted

---

11 Two observations regarding this example are noteworthy, the first of which is the fact that the voice parts are doubled in the strings; three choral sections--soprano, mezzo, and alto--are in operation. The second detail concerns the texture itself. Within each section, micropolyphony is effected through a four-voice canon. Although these canons are not rhythmically strict, the succession (i.e., unfolding) of pitches is the same in each case.
Example 5. *Requiem*, second movement, measures 67-72, showing micropolyphony.
Example 6. Apparitions, second movement, measures 10-17, showing a rapid succession of disparate textures.
Example 7. *Aventures*, measures 1-11, showing a rapid succession of disparate textures.
melodic processes, which lead an independent existence within the overriding contrapuntal network.\textsuperscript{12}

This newly established, more transparent texture is a distinguishing feature of such works as the *Ten Pieces for Wind Quintet* (1968), *Chamber Concerto* (1968-70), *Melodien* (1971) for orchestra, *Double Concerto* (1972) for flute, oboe, and orchestra, and *San Fransisco Polyphony* (1973-74) for orchestra.

An example of the more perspicuous texture, still rhythmically complex but with lines exhibiting increased independence and direction, is found in the first movement of the *Double Concerto*, an excerpt from which is given in Example 8.

It should be clear from this example that, although the rhythmic structure is still complex (e.g., \( \begin{array}{c} 3 \\ 5 \end{array} \) against \( \begin{array}{c} 4 \\ 6 \end{array} \) against \( \begin{array}{c} 7 \\ 9 \end{array} \)), each of the linear components reveals independence in terms of melodic direction and goal of motion. For instance, the first viola moves from A\textsuperscript{5} to D\#6 by measure 70, while the third viola travels from its initial B\textsubscript{b}5 in bar 68 to E\textsubscript{b}5 by measure 72, and so on. Although the "totality" of the resulting complex polyphonic web is an important aspect, so too are the individual components which comprise the overall texture.

Other aspects of musical language of this second phase of Ligeti's mature period are disclosed in the following quotation:

The musical language of this work [*Chamber Concerto*], as in the case in all my compositions since the middle sixties, is neither tonal nor atonal. There are no tonal centres, nor are there any harmonic combinations or progressions which can be functionally analyzed; on the other hand the twelve notes of the chromatic scale are not treated as notes of equal importance, as in atonal and serial music. There are specific predominant arrangements of intervals, which determine the course of the music and the development of the form. The complex polyphony of the individual parts is embodied in a harmonic-musical flow, in which the harmonies (i.e., the vertical combinations of intervals) do not change suddenly, but merge into one another; one clearly discernible interval combination is gradually blurred, and

\textsuperscript{12}Ligeti, liner notes for *Melodien*. 
Example 8. *Double Concerto*, first movement, measures 68-74, showing a more transparent polyphony with independent components.
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from this cloudiness it is possible to discern a new interval combination gradually taking shape.\textsuperscript{13}

Ligeti's Ten Pieces for Wind Quintet,\textsuperscript{14} the subject of this paper, adheres to the compositional procedures stated above to a considerable degree (as will become apparent), although the quotation was made with specific reference to the Chamber Concerto. In fact, the wind quintet offers an extremely diverse selection of techniques representative of Ligeti's works from the middle to late sixties, some of the techniques being refinements of those found in earlier works. Also, the quintet, being a chamber work, is more accessible than the larger orchestral works for the type of analysis presented here.

In Chapter II, aspects of musical language in the quintet—form, texture, rhythm, and pitch—will be examined individually, with interrelationships noted where applicable. Detailed studies of all ten pieces would have been a task too great for this paper; consequently, the first and last pieces were chosen to be analyzed in detail because each represents one of the two prevalent textural configurations found in the work. These detailed analyses are found in Chapters III (piece No. 1) and IV (No. 10) and, like Chapter II, approach the various musical parameters individually. Specific details pertaining to these particular pieces will be disclosed, as will extended applications of concepts introduced in Chapter II. A summary of conclusions will follow in Chapter V.

\textsuperscript{13}Ibid.

\textsuperscript{14}The Ten Pieces for Wind Quintet is, henceforth, referred to as "the quintet."
CHAPTER II

ASPECTS OF MUSICAL LANGUAGE IN GYÖRGY LIGETI'S

TEN PIECES FOR WIND QUINTET

Introduction

The intent of this chapter is to define and exemplify certain aspects of musical language in the ten pieces, thus providing a basis for the detailed analyses in Chapters III and IV. The main sections of this chapter are as follows:

- Formal Organization of the Work as a Whole
- Aspects of Textural Structure
- Principles of Rhythmic and Metric Design
- Modes of Pitch Organization
  - Linear Details
  - Harmonic Details

Summary.

Many of the concepts discussed in this chapter are of general significance in the work, pertaining to several pieces or sections within pieces, while others expose techniques of more limited application. Because the first and last pieces of the quintet are the subjects of Chapters III and IV, respectively, present references to them are minimal.
Formal Organization of the Work as a Whole

Perhaps the most significant formal aspect of the work as a whole is the regular alternation between "ensemble" and "soloistic" pieces. Specifically, the odd-numbered pieces are of the ensemble type, while the even-numbered ones are soloistic. The order of the featured instruments in the soloistic pieces is as follows: No. 2 - clarinet, No. 4 - flute, No. 6 - oboe, No. 8 - horn, and No. 10 - bassoon. Fluctuations in instrumentation-density (i.e., the number of instruments sounding) from piece to piece, as well as variances in actual instrumentation, suggest subgroupings within the quintet. In Example 9, the instrumentation-density of each piece (and each section within a piece—to be explained below) is given with the suggested subgroupings indicated by brackets.

Example 9. Instrumentation-density and subgrouping of the ten pieces.

<table>
<thead>
<tr>
<th>Piece No.: 1 2 3 4 5 6 7 8 9 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumentation-density: 5 5 5 3 4 5 5-4 3-4-5 3 4-5</td>
</tr>
<tr>
<td>Subgroupings:</td>
</tr>
</tbody>
</table>

Concerning fluctuations in instrumentation-density and instrumentation, several details are noteworthy. The alto flute is used in the first three pieces, reserving the flute for its soloistic treatment in the fourth piece.

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1 Although these two classifications are defined in detail in the next section, they refer essentially to pieces in which all of the scored instruments participate equally (ensemble) and those in which one particular instrument is featured (soloistic).

2 Other subgroupings of pieces may be interpreted according to factors other than instrumentation-density and instrumentation. These, however, are disclosed in the light of the specific parameters effecting such connections.
The english horn appears in the first two pieces, the oboe d'amore in the third, and neither in the fourth and fifth; the oboe is saved for No. 6 where it is the featured instrument. Internal fluctuations in instrumentation—density indicated in pieces 7 to 10 are based on conditions similar to those listed above. In the second formal section of the seventh piece, for example, the horn is silent in preparation for No. 8 where it is featured. A good portion of the eighth piece, however, occurs without the horn; its entry, along with that of the oboe later in the piece, is responsible for the "stepped" density indicated in Example 9. The bassoon does not participate in the ninth piece, again in preparation for its soloistic treatment (in the final piece). Finally, although the last piece is scored for five instruments, only on one sixteenth-note in the entire piece do they actually sound together (specifically, at the culmination point of the main body of the piece in bar 15).

Other aspects of organization and factors of large-scale grouping are defined in subsequent sections of this chapter, as well as in Chapters III and IV. Details of formal structuring within individual pieces are examined in the light of the various parameters (e.g., texture, rhythm, etc.) which effect the formal delineations.

Aspects of Textural Structure

As stated in the previous section, the quintet is organized in alternating ensemble and soloistic pieces. Texture plays a most decisive role in defining these types. Although each piece explores a unique mode of textural characterization (i.e., unique in detail), there exist several aspects of texture which have widespread significance in the ensemble pieces, and others, of equal importance, which are specific to the soloistic pieces. These two types of pieces and corresponding textural details will
now be discussed in detail.

Textural Details in Ensemble Pieces

Essentially two textural configurations are found in the ensemble pieces: one which consists of only one textural element throughout, and one which features several consecutive elements. Only on one occasion are two disparate textural elements sounded simultaneously (this departure to be discussed shortly). Texture, the parameter which best differentiates ensemble and soloistic pieces, is also an important factor in the delineation of form within individual ensemble pieces. Successive textural elements, in fact, most often correspond to main formal sections, in which case they usually involve all of the instruments for which the piece is scored, as well as to transitional passages, which may feature a reduction in the number of components.

The fifth and ninth pieces are each comprised of one, continuous textural element which involves all of the scored instruments throughout.

---

3 A textural element is a homogeneous mode of interaction between instruments, as in a polyphonic or homophonic texture. The individual parts in such a textural element are referred to as "sounding components" or simply, "components." A textural element may also be comprised of only one component as in a single-line melody. The texture of a piece at any given time may consist of one or more textural elements, each having one or more components [e.g., vertical three-note chords (one element, three components), with a single-line melody (one element, one component)]. This mode of textural characterization is influenced in part by Wallace Berry's views. See in this regard his Structural Functions in Music (Englewood Cliffs: Prentice-Hall, Inc., 1976), Ch. 2.

4 The contrary, however, is not always true. In other words, a piece which features one continuous textural element may have several formal sections delineated by variances in other parameters.

5 Where such a reduction occurs, however, the components left sounding contribute to only one textural element.
The texture of the fifth piece is one of polyphony, while that of the ninth is a three-part canon. In the latter, the textural continuity corresponds to the unisectional form, while in the former, despite its continuous texture, formal segmentation occurs through variances in other parameters such as textural space and rhythmic intensity (each of which is discussed later). Examples 10 and 11 consist of excerpts from No. 5 and No. 9, respectively, each revealing a single textural element.

Of the remaining ensemble pieces, each of which contains several successive textural elements, the first piece is detailed in the next chapter. Measures 1-7 of piece No. 3, however, provide another example of a textural element which features equal and total involvement of the instruments for which it is scored. The third piece also provides the one instance of simultaneous textural elements in an ensemble piece. In measures 10-12, the octave-doubled theme represents one textural element, while the trill (clarinet) and sustained note (horn) represent the other.

---

6. The components of this particular polyphonic texture are extremely "articulate" in their use of repeated staccatissimo notes. The implications of this surface detail with respect to rhythmic design are dealt with in the next section. Also, the specific mode of pitch organization operative in this particular polyphonic element is explained in the final section of this chapter.

7. The canonic treatment employed here is a prime example of linear independence within a polyphonic texture. That is, apart from contributing to the effect of the whole, the individual components exhibit a considerable degree of independence and direction. As noted in the previous chapter, this increased independence is characteristic of many of the polyphonic textures in Ligeti's music of the late sixties.

8. The details of the linear structure in this particular textural element will be examined in the section on pitch organization. Also, it might be noted that this textural element comprises almost half the piece. It is, in fact, characteristic of the ensemble pieces that a textural element, once established, continues to operate over a substantial portion of the piece.

9. The doubling of the "theme" in octaves in this section negates any soloistic implication.
Example 10. Piece No. 5, measures 1-5, showing a single textural element.

Presto staccatissimo e leggero - Oboe tacet -

Staccatissimo-Tonfolgen, im ganzen Stück. Tone repetitions throughout the piece.


Balance of dynamics: mp approximately equal in all instruments.

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The two texturally defined formal sections outlined above (i.e., measures 1-7 and 10-12) are bridged by a rhythmically intensified polyphonic element which diminishes in density from four to three components, and descends in register, culminating on the trill in bar 9 (one of the two simultaneous textural elements of the second section). This transitional element, featuring a reduction or subgrouping of components is given as Example 12.
Example 12. Piece No. 3, measures 7-10, showing a subgrouping of components in the transitional passage.

The seventh piece is perhaps the most explicit example of consecutive, disparate textural elements characterizing adjacent formal sections. The specific textural elements are extremely consistent throughout each section, again revealing the attribute of textural continuity.
vertical homorhythmic sonorities of the 'a'-section (measures 1-37) feature equal involvement of all the instruments. Although the clarinet sustains a note out of the vertical complex in bar 6, all the instruments will have followed suit by the close of the section (cf. bars 12, 15, and 34). The 'b'-section (measures 38 to the end), initiated without a transition, features four of the five instruments in a contrasting polyphonic texture (the horn being silent in preparation for the eighth piece). These diverse textural configurations are illustrated in the two excerpts in Example 13.

Example 13. Piece No. 7, measures 3-8 and 40-41, showing disparate textures characterizing adjacent formal sections.
Textural Details in Soloistic Pieces

Although it is somewhat more difficult to generalize about the soloistic pieces, because each instrument is featured in a much different way, two modes of textural structure may nevertheless be discerned. One involves the establishment of an accompanimental textural element comprising all of the instruments (or all but the featured one), out of which (or over which) the featured instrument asserts itself in a distinct, second textural character. In some cases the accompanimental element resembles a particular ensemble texture found elsewhere in the quintet. In the second piece (featuring the clarinet), for example, all five instruments contribute to the accompanimental five-note vertical sonorities (e.g., measures 1-11, 15, and 20-21). These verticalities are separated by rests, some of which are partially filled by the linearizations of the clarinet (these being the second textural element). Note, however, that the accompanimental vertical complexes are similar in effect (and harmonic quality) to those of the seventh piece ('a'-section only). The opening four measures of the second piece, illustrating the two-element texture are given as Example 14.

The accompanimental element of the sixth piece (featuring the oboe) is a second example of a texture borrowed from another piece. In this case the accompaniment (bars 1-8) is comparable to the whole of the preceding ensemble piece in several ways: it involves the same four instruments, the tempo is the average of the two in the previous piece, and the performance instructions regarding articulation are the same. The oboe is isolated

11 Regarding performance instructions see György Ligeti, Ten Pieces for Wind Quintet (Mainz: B. Schott's Soehne, 1969), pp. 18 and 20. Also, it was noted in the section on formal aspects that subgroupings of pieces occur through a variety of parametric variances (in addition to those involving instrumentation-density and actual instrumentation). The fifth and sixth pieces may be considered one such subgroup, with the three
Example 14. Piece No. 2, measures 1-4, showing a two-element texture.

from the accompanimental texture through dynamic exposure, articulative differentiation, and timbral quality, as shown in Example 15.
Example 15. Piece No. 6, measures 1–4, showing a two-element texture.

Presto staccatissimo e leggero

<table>
<thead>
<tr>
<th>Flauto</th>
<th>Oboe</th>
<th>Clarinetto in Sib</th>
<th>Coro in Fa</th>
<th>Fagotto</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) $\text{staccatissimo, wie in Satz 5}$

**) Tonrepetition bei der Oboe: staccatissimo, sehr distinkt, sehr rasch, wie möglich. Die Spielart ist identisch mit der $\text{staccatissimo}$ notierten Spielart der übrigen Instrumente ($\frac{1}{4}, \frac{3}{8}$, etc.). Die andersgeartete Notation bezieht sich lediglich auf die rhythmik: bei der Notation $\text{staccatissimo}$ ist die Dauer der Tonfolge gegeben, die Anzahl der Schlüsse jedoch frei, bei der Notation $\text{repeated tones as in Movement 5}$ ist die Anzahl der Schlüsse festgelegt, die Dauer der Tonfolge jedoch frei (so kurz wie möglich, da Tonrepetition so rasch wie möglich). Bei der Notation $\text{repeated tones in the Oboe staccatissimo.}$

***) Repeated tones in the Oboe staccatissimo, very distinct, as fast as possible. The manner of playing is identical to the manner of playing notated $\text{staccatissimo}$ in the other instruments ($\frac{1}{4}, \frac{3}{8}$, etc.). The different notation refers only to the rhythm: in the notation $\text{staccatissimo}$ the sequence is fixed, but the number of the attacks is free; in the notation $\text{repeated tones as in Movement 5}$ the number of the attacks is fixed but the duration of the sequence is free (as short as possible, since the tones are repeated as fast as possible). In the notation $\text{repeated tones in the Oboe staccatissimo.}$

****) The entrance of the first tone is metrically fixed by the rests preceding it, whereupon the tones are repeated independently of the metre. The rests in brackets are imaginary completion of the metre, and will be absorbed in part by the repeated tones. For example, $\text{attack the third quaver of the triplet; the rest[1] is the virtual completion of the triplet.}$

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The accompaniment of the first sixteen measures of the eighth piece, although not suggestive of any other texture in the quintet, nevertheless features the flute, clarinet, and bassoon in what could very well be an ensemble texture, according to the criteria outlined in the ensemble pieces. That is to say, the three instruments interact within a continuous polyphonic texture in which no particular instrument predominates, the main effect being that of the whole. It is, in fact, only when the horn enters in bar 12 with a contrasting sustained quality that the implication of a soloistic texture is realized. The "ensemble-like" texture and eventual horn entry are illustrated in the excerpt given as Example 16.

It was noted earlier that two modes of textural structure may be discerned in the soloistic pieces. The second mode is one in which only one textural element is in operation, the featured instrument generally being the most continuous and dynamically exposed of all the components involved. The accompanying components, taken separately, fail to define a textural element with enough independence and continuity to be considered separate from the featured component. Rather, the components interact with the featured instrument in ways which suggest one overall textural element with one primary and several secondary components. Two examples will serve to illustrate this mode of textural structure.

Measures 12-15 of the second piece reveal a continuous clarinet line with numerous polyphonic fragments contributed by the remaining four instruments. Again, these fragmented "overlays" do not comprise a textural element of their own, but are, rather, integral to the single

- This type of component interaction within a single textural element is one of two to be discussed in Chapters III and IV as factors of "textural quality."
Example 16. Piece No. 8, measures 1, 2, 5, 10, and 12, showing an "ensemble-like" texture as an accompanimental element.

Allegro con delicatezza (sehr gleichmäßig, ohne jede Betonung der Takte bzw. Taktunterteilungen.)

(very evenly, without any accentuation of the bars or their subdivisions.)

*) fließend, alle neuen Einsätze sehr weich / fluently, every new entry very soft

Flauto

Clarinetto in Sib

Fagotto


**) Fagott, con sordino: Ein Tuch, in die Schallöffnung gestopft.

*) Balance of dynamics: pp equal in Flute, Clarinet Bassoon. Play the clarinet somewhat louder.

**) Bassoon, con sordino: a cloth stuffed into the upper joint.

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overall texture in which the clarinet is primary. This is illustrated in Example 17.

Example 17. Piece No. 2, measures 12-15, showing one textural element with one primary and four secondary components.

This is a particularly clear example of formal delineation through textural diversity. The opening of the second piece was shown earlier to consist of two simultaneous, disparate textural elements while in the passage just discussed and illustrated above—a second formal section—only one element operates. These formal segments are further defined through variances in tempo and dynamics.
The fourth piece features a single polyphonic texture in which the flute is dynamically, registrally, and rhythmically exposed relative to the other two components. The clarinet and bassoon (the latter being considerably more fragmented than the other two instrumental parts) contribute more to the overall polyphony than to a disparate textural element. An excerpt from No. 4 is given as Example 18.

Example 18. Piece No. 4, measures 1-4, showing one textural element with one primary and two secondary components.
In both instances outlined above (i.e., the second and fourth pieces), the primacy of the featured instrument and suggestion of a single-element (but multi-component) texture are reinforced by strong harmonic affiliation between the primary and secondary components—a detail which will be dealt with in the final section of this chapter.

Concerning textural structure, a parallelism between Ligeti's earlier works (mentioned in Chapter I) and the pieces of the quintet may be drawn. The ensemble pieces were said earlier to possess a certain degree of textural continuity, the individual textures often consisting of slowly changing sonorities. In this regard they are suggestive of earlier pieces of which Atmospheres is representative. The soloistic pieces, texturally differentiated from the ensemble pieces, also contrast with the latter in that they feature frequent and, often, abrupt texture changes. The second, sixth, eighth, and tenth pieces, for example, each contain from four to six texture changes, often accompanied by changes in tempo, notated meter, dynamics, register, density, and general "mood." In this sense they are suggestive of the style of Apparitions and Aventures. Although the scale of the quintet pieces is much smaller than that of the aforementioned related pieces, the parallel mode of differentiation is of significance in the characterization of textures in the quintet.

Summary

Texture has been cited here as a major factor in the characterization of "ensemble" and "soloistic" pieces. While ensemble pieces were shown to involve essentially one textural element at a time (either throughout a complete piece or at least a formal section), one instance of simultaneous, disparate textural elements was noted in the third piece. Two configurations
were said to characterize the soloistic pieces: one in which two simultaneous, contrasting textural elements occur, the featured instrument providing one of them; and one in which only a single element is apparent, with the featured instrument emerging as primary through dynamic and/or registral exposure, as well as continuity of structure. Finally, the ensemble pieces were likened to a group of Ligeti's earlier works of which Atmospheres is representative, and the soloistic pieces to a group typified by Apparitions and Aventures.

**Principles of Rhythmic and Metric Design**

While it is not the intention here to attempt to explicate completely the rhythmic structures of all ten pieces, several aspects of rhythmic and metric design are accessible, noteworthy, and necessary for even a moderate understanding of the musical language of the work. The most universal and, perhaps, most significant aspect of rhythm in all of the pieces is the rarity of operative meter at the level of the notated measure.

Meter in the present context refers to one particular mode of rhythm\(^{14}\)--specifically, one in which impulse groupings are defined by patterns of accented\(^{15}\) and unaccented beats. These patterned groupings, called measures, represent the lowest-level metric unit. Meter, then, depends on accent; metric units are delineated by accented impulses. In saying, therefore, that meter is hardly ever operative at the level of

\(^{14}\) Other "element-rhythms" will be defined in Chapter III with specific reference to the first piece.

\(^{15}\) A particular articulation or impulse may be accented through registral and/or dynamic exposure, articulative accents (e.g., −, ′, >, ^, etc.), and/or extended duration relative to surrounding impulses. In short, accent here refers to emphasis inherent in the music, not imposed by the performer.
the notated measure in the pieces, the suggestion is that patterned units of strong and weak beats are rarely established in a way that makes notated, apparent metric units perceivable as such. The implications of this phenomenon are considerably different in pieces or sections in which the notated meter is constant, as compared to those in which it is fluctuant. In the former, barlines appear primarily for ease of reading; these pieces (or sections) may be considered "ametric" at the level of the notated measure (because of the lack of accent-delineated metric units of that size). Higher-level impulse groupings (not necessarily large-scale metric units in the sense of accent-articulated groupings) may, however, be discerned. For instance, larger phrases without internal metric subdivisions (at the level of the measure) may be felt as continuous gestures which display particular rhythmic structures (to be specified below). The lowest-level impulse unit, then, becomes the phrase itself, not the notated bar.

Most often these continuous gestures or phrases are not single-line melodies, but rather textural elements consisting of several sounding components. We may, for example, speak of a "homophonic phrase," in which all of the components move in strict vertical alignment, or a "polyphonic phrase," in which the components are engaged in a complex interweaving considered together as a single gesture of fluctuating rhythmic interaction. In the case of the more common polyphonic phrase, one fundamental aspect of rhythmic design concerns the properties of "progression" and "recession," in the level of rhythmic activity of the textural element as a whole.

Although such continuous polyphonic phrases are found most frequently

16 "Progression" and "recession" are terms and concepts used extensively by Wallace Berry. See his Structural Functions, Chapters 2 and 3.
in ensemble pieces (because, as noted earlier, they characteristically feature only one textural element at a time), several soloistic pieces offer examples. The accompanimental element (i.e., flute, clarinet, and bassoon) of the first sixteen measures of piece No. 8, for instance, offers an excellent example of rhythmic progression and recession within a single, continuous polyphonic phrase. Example 19 consists of a graphic representation of the activity level in this section (accompanimental element only) as to the number of impulses per quarter-note in the composite rhythm (henceforth termed "impulse-density").

Ignoring the horn part for now, the graph reveals a large-scale progression and recession of rhythmic activity which peaks in bar 11 (22 impulses/\( \frac{1}{4} \)) followed by an abrupt decline in activity commencing in bar 14. These, then, represent two large-scale impulse units which consider "quantitative" aspects of rhythmic design (i.e., activity levels exhibiting growth and decline), rather than specific patterns of accent and unaccent (i.e., "qualitative" aspects in connection with specific metric units). While the "downbeat" delineates metric units, we might speak of a "turn-around point" as being a delineator of impulse-density units. Such a juncture may be characterized as the point at which the rhythmic progression ceases and the recession begins (as in this particular case) or vice versa. In this piece the turn-around point occurs on the third beat of measure 14 as indicated in Example 19.

The accompanimental element, therefore, reveals its own mode of large-scale rhythmic structure—one which may also be seen to interact with the horn part (the second distinct textural element). This interaction

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17 If more than one instrument sounds in strict vertical alignment, it counts as one impulse only for the purposes of the impulse-density graph.
Example 19. Piece No. 8, measures 1-16, impulse-density graph.

results from several conditions. First, the latter enters when the former is at its maximum level of activity (i.e., 22 impulses/\( \text{ measure}\), measure 12). In a sense the opening rhythmic progression in the accompaniment may be heard to function anacrustically to the horn entry (although the latter does not occur in a registrally or dynamically exposed manner), while retaining the continuity within its own textural element. Second, the maintenance of peak activity in the accompaniment lasts for twelve quarter-notes, roughly coincident with the opening sustained and dynamically intensifying pitch.
in the horn. The first pitch change in the horn (measure 14), marked \textit{poco in relievo} is, curiously, the point at which the decline in activity in the accompaniment begins (i.e., the turn-around point). And third, as the graph reveals, the activity curve of the horn part is itself a small-scale version of that of the accompaniment, both coinciding just prior to the zero-activity level in bar 16.

Apart from these interactive features, the horn part exhibits its own lower-level metric units, defined not by the notated measures of the score, but a fluctuating meter based on the lowest common denominator of the rhythmic divisions in operation (i.e., $\frac{3}{4} \times \frac{5}{4} = 60/\downarrow$).\textsuperscript{18}

Example 20 consists of the horn part (measures 12-16) in the metric configuration found in the score (bottom staff of example), and a re-metered version, perhaps more indicative of the perceived accent pattern. Three suggested levels of metric structure are represented by the arrows depicting upbeats and downbeats.

The criteria for the downbeat characterizations at level (a) include aspects of duration and register primarily. The first $A^b$ may be considered a local downbeat simply because it is the first pitch of the line (although its entry, as noted earlier, is somewhat overpowered by the accompaniment), and there are no other patterned impulses to suggest otherwise. The dynamic culmination on the change of pitch to $B^b$ contributes to its downbeat characterization, while register (i.e., the highest pitch in the line) and linear approach (i.e., after the delay of progression to $D^b$) gives the $E^b$ a local downbeat quality. The leap from $B^3$, stepwise approach

\textsuperscript{18}By considering the pulse unit to be $60/\downarrow$, any impulse within the metric configurations involving $\frac{3}{4}$, $\frac{5}{4}$, and $\frac{7}{4}$, the three operative in the piece, may qualify as a downbeat, on condition that it is accent-defined through register, dynamics, duration, etc.
Example 20. Piece No. 8, measures 12-16 (horn part only), showing low-level metric units.
from A\(^4\) (over the B\(^3\) delay of progression), and longer duration are factors which emphasize the G\(^4\)--also a downbeat at this particular level. Finally, the C\(^b_4\), having been approached linearly from the sustained G\(^4\), has the feel of an arrival point aided, in part, by the termination of activity in the other three components.\(^{19}\)

At the level of the units delineated by the local downbeats specified above \([i.e., \text{level (b) on Example } 20]\), two impulses continue to emerge as downbeats or arrival points. The B\(^b_4\) is felt as such because of the approaching dynamic intensification which culminates with its articulation. The final C\(^b_4\) is the only other downbeat of any structural value and, in fact, is the arrival point of the whole line as suggested in level (c). Again the cessation of rhythmic activity in the accompanying components is a prime factor in the accentual significance attributed to the final C\(^b_4\).

While the first section of the eighth piece provides a clear example of rhythmic progression and recession in a continuous phrase (e.g., in the accompaniment), as well as one of the few instances of low-level metric subdivision (e.g., the horn part), one additional aspect of rhythmic design in this section is noteworthy. Specifically, the accompanimental element comes closer than any section in the quintet to defining a regular (if undifferentiated by accent) pulse.\(^{20}\) As indicated in Example 21, measures 1 (beats 1-2) and 10 (beats 3-4) of the piece, the three instrumental parts coincide on each quarter-note, while interacting in a complex way during

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\(^{19}\) The harmonic structure which occurs across bars 15-16 is a B major chord with an added second; the relative consonance of this sonority plays an important role in the arrival-point quality of the sustained pitches (in both textural elements).

\(^{20}\) Ligeti does, however, specify in the score: "very evenly, without any accentuation of the bars or their subdivisions." See Ligeti, *Ten Pieces*, p. 27.
the balance of each beat. Even without any performer-imposed stress, the quarters are marked through the concurrence of articulation.

Example 21. Piece No. 8, measures 1 (beats 1-2) and 10 (beats 3-4), showing potential pulse definition.

As the interaction between rhythmic patterns becomes more complex and, especially in the light of the linear pitch patterns which occur out-of-phase with the rhythmic patterns, the quarter-note pulse is effectively obscured in favor of three rhythmically independent linear events. Example 22(a) consists of measure 5 of the score with the aforementioned linear patterns marked with slurs. This clearly reveals the lack of synchronization between rhythmic and linear patterns.

In (b) of Example 22, the first notes of the linear patterns in each instrument are indicated by noteheads with thick stems, all of which are connected by a thick beam. The stems between the beamed notes

21 These three events, however, are still components of the one textural element in operation at this point.
represent the rhythmic configurations of each part, thereby showing the distances between pattern recurrences. Not only is the lack of synchronization between rhythmic and linear patterns, apparent in system (a), further illustrated, but an element-rhythm other than meter is, here, revealed—the rhythm of linear pattern recurrence. Three distinct rhythms are in operation (one in each instrument), the interaction of which obscures the quarter-note pulse, as indicated earlier, and reinforces the rhythmically progressive and recessive qualities of the texture as a whole.

Example 22. Piece No. 8, measure 5, showing rhythmic and linear patterns.
Piece No. 4, featuring the flute, is notated completely in $\frac{4}{4}$ (the meter being essentially non-functional as to perceived effect\textsuperscript{22}), and is texturally structured so that the flute is engaged in two continuous phrases with the accompanying instruments providing the (often fragmented) counterpoint. The resulting single textural element is one of pseudo-polyphony effected by the rhythmic "phasing" of the flute with the clarinet and bassoon. That is, the accompanying instruments move in and out of rhythmic synchronization with the flute, appearing more independent than they actually are.\textsuperscript{23} The phasing is, however, in part responsible for the local progressive and recessive tendencies in the piece, both phrases of which reveal an overall move from an active to an inactive state. Example 23 consists of a graphic representation of the rhythmic activity (i.e., impulse-density of the composite rhythm) of the fourth piece.

The general rhythmic recession in the first phrase (measures 1-9) is obvious from the graph. The second phrase, however, is considerably more complex as it contains several interruptions, one of which alters the overall flow of rhythmic activity (e.g., the fermata over the rest in bar 18). The flute is silent during the other interruptions, which feature abrupt changes in register and dynamics in the clarinet and bassoon (e.g., measures 11-12, 16, and 17); it is, therefore, only the rhythmic flow of the flute part which is affected. The flute resumes its level of activity immediately upon re-entering.

\textsuperscript{22}Ligeti underscores this by the performance notes in the score; "Apart from the indicated accents, always play very evenly and without accentuation, so that the subdivisions into bars does not become perceptible." See Ligeti, \textit{Ten Pieces}, p. 15.

\textsuperscript{23}Their relationship to the flute line will become more apparent in the next section.
Example 23. Piece No. 4, impulse-density graph.
Rhythmic structure of the flute part in the second phrase is "frustrated" as a result of recurring interruptions noted above. Even the final recession of rhythmic activity in measures 19 to the end (both in the flute alone, as well as in the trio), seems somewhat divorced from the previous measures because of the abrupt "breaking off" of the flute line, concurrent with the extreme register and dynamic shift in the other parts. Although the overall rhythmic drive is brought convincingly to a close, one gets the impression that the flute is left in a state of unfulfillment back in bar 19.

Although in the fourth piece the notated measure is not operative as a metric unit, large-scale units of impulse-density, not unlike those noted in connection with the eighth piece, may be discerned here as well. In the first phrase, for example, the first six bars may be defined as a progressive unit with the turn-around point occurring on the first beat of bar 7. The criteria for this interpretation are threefold: first, the maximum impulse-density of the phrase occurs on the last beat of bar 6 (e.g., a density of 6); second, the flute itself offers a local rhythmic intensification towards that point, culminating with the first quintuplet in the piece (i.e., \[ \begin{array}{c} \text{3} \\ \text{5} \end{array} \]); and third, the activity level drops considerably with the absence of the flute commencing on the first beat of bar 7. The recessive unit spans measures 7-9, whereupon the rhythmic tension is completely relaxed with the sustained vertical dyad C\(^4\)-D\(^4\). The first phrase, as two large-scale units of impulse-density (one progressive and one recessive) might be depicted as in Example 24.

If one compares the "recession" in the two phrases, one notices that, in the first, the flute changes register smoothly and without interruption (e.g., bar 2). In the second phrase, the flute stops suddenly and rests before re-entering at the lower register and dynamic level (e.g., bar 19).
Example 24. Piece No. 4, large-scale impulse-density units.

The second phrase is more difficult to characterize as to units of rhythmic progression and recession. However, because the overall rhythmic flow is essentially unaffected by the interruptions (apart from the rest in bar 18), the large-scale progressive unit might also be considered unaffected. Even the rest in bar 18 might be felt to heighten the tension because it is not approached by an appreciable decline in rhythmic activity. The problem lies in finding the turn-around point. In consideration of the impulse-density curve (Example 23), one interpretation for such a point is measure 21—the beginning of the final rhythmic recession. If, on the other hand, one takes into account tension through registral and dynamic exposure, the second beat of bar 19 might be more persuasive. After all, the first beat of bar 19 is unquestionably the registral and dynamic climax point of the piece, while the second beat initiates a relaxing trend within those same parameters (but not within the parameter of rhythm). In any case, the fourth piece does exhibit the potential for characterization as to large-scale units of impulse-density within a rhythmic structure of progressive and recessive qualities.

The third piece (an ensemble type) provides an example of large-scale
rhythmic progression and recession within an extended polyphonic phrase which spans the entire piece. Example 25 consists of the impulse-density curve of the piece and, although its shape is generally similar to that of the excerpt from the eighth piece cited earlier (even the emergence of a simultaneous second textural element occurs in both), No. 3 is differentiated by one important structural factor. Specifically, the single, continuous textural element, indicated on the graph, is composed of four consecutive textural elements. Three of these contribute to the large-scale progression (measures 1-8, 8-9, and 9-13), and one comprises the recession (measures 14 to the end). (The rhythmic implications of the octave-doubled theme in bars 10-12—i.e., the simultaneous second textural element—will be dealt with shortly.)

The difference in the levels of overall activity in the three stages of progression are largely the result of rhythmic and textural particulars (i.e., surface details) of the individual components of each consecutive polyphonic element. For example, in measures 1-8, the components move relatively slowly and in a fragmented fashion;\(^{25}\) the increasing complexity of interaction between components provides the overall rhythmic progression. In the second stage, bars 8-9, each part moves more continuously and in smaller note values. The interaction of components, each of which undergoes a rhythmic intensification, yields the sharp increase in total rhythmic activity represented on the graph by the almost vertical line.\(^{26}\) The third stage of progression is effected by the clarinet trill (e.g., an indefinite number of impulses per quarter-note).

The beginning of each of the three stages of rhythmic progression (defined above) as well as that of the recessive gesture is marked by a concurrence of articulation. In consideration of this detail, one may wish to attribute metric accentual significance to these particular impulses, thereby qualifying the four consecutive elements as metric units—units which are larger than the notated measure but smaller than the units of impulse-density to be exposed later. These are indicated in Example 26 and, once again, in order that impulses—notated "off-the-beat" in the score—be considered local downbeats, the metric indications must be based on a pulse

\(^{25}\) The continuity inherent in the linear components of this particular textural element, despite the apparent fragmentation of the instrumental parts, is discussed in the next section on linear details of pitch organization.

\(^{26}\) This sharp increase in rhythmic activity, concurrent with the instrumentation-density reduction, was referred to earlier as a transitional section between the two main formal sections of the piece.
rate which will accommodate such characterizations.

Example 26. Piece No. 3, metric units.

Taken as one continuous statement, the piece (not yet considering the octave-doubled theme) may be viewed as a large-scale unit of rhythmic progression followed by one of rhythmic recession, the turn-around point occurring at the beginning of measure 14 (as indicated in Example 25). With respect to this particular mode of rhythmic structure, the overall design (i.e., at the highest level) is not completely unlike that of the excerpt from No. 8 cited earlier. Also similar to the No. 8 excerpt is the emergence of a simultaneous, second textural element at the peak of rhythmic activity. The rhythmically progressive portion of the continuous texture may be felt as anacrustic to the octave-doubled theme, while
retaining the continuity within its own large-scale structure.  

Apart from the interaction between the two simultaneous elements, the octave-doubled theme may be heard to reveal its own low-level metric structure (again, not unlike that of the horn line in No. 8). By definition, metric units require accent-differentiated impulses which are defined here, as in piece No. 8, by registral and/or dynamic exposure, linear approach, duration, and/or notated articulative markings. Ignoring the notated meter signature, one might conceive the E at the end of bar 10 as an accented, local downbeat because of its duration and linear approach (refer to Example 27). The next pitch of comparable durational exposure, the F of bar 11, may also be heard as a local arrival point, especially in view of the leap which approaches it. Although the C of bars 11-12 is comparable in duration and has added emphasis through registral exposure, it comes too soon after the F to be heard as a metric downbeat—that is, one which articulates the beginning of a metric unit at a level comparable to that of the previous unit. It is therefore considered subordinate to the previous E and F in terms of metric strength. Finally, the A in bar 12

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27 It is interesting to note that the continuous statement would seem to drift in and out of textural "primacy." In other words, the three stages of rhythmic progression are the primary textures in the opening section (they are the only ones). As the rhythmic activity reaches its peak (i.e., the trill), however, the instrumentation-density decreases and the register and dynamics become less intense, reducing the status of that particular textural element (i.e., the trill). The octave-doubled theme which emerges over the latter is considered primary until it dissolves in bar 12, whereupon the recessive gesture (within the large continuous statement) emerges as primary.

28 An additional general similarity between piece No. 3 and the excerpt from No. 8 may be discerned: the rhythmic activity curve of the emerging theme, in each case, mirrors on a smaller scale that of the larger continuous element.

29 Note also the higher-level stepwise approach from the E of bar 11.
may be heard as the ultimate arrival point of the theme (it is the last pitch to be doubled in octaves) and is, therefore, considered to be of accentual and metric significance.

Because of the lack of explicitly articulated pulse—especially one which concurs with the three downbeats defined above—a pulse factor derived from the rhythmic divisions of the theme itself may be assumed for the purpose of determining the metric indications. If a pulse of \( \frac{6}{6} \) is used, for example, two equal metric units of \( \frac{17}{6} \) are delineated by the E, F, and A, with the accented C falling within the second unit (e.g., a "syncopation" of sorts). This rhythmic/metric configuration is illustrated in Example 27.

Example 27. Piece No. 3, measures 10-12, rhythmic and metric design.

Again, lower-level metric organization is revealed within a larger, more continuous rhythmic statement, the latter exhibiting impulse groupings considerably larger than the asserted metric units of the theme itself.
While the fifth, seventh, and ninth pieces (all being of the ensemble type) also reveal continuous rhythmic statements, some involving progression and recession, the statements lack the presence of explicit turn-around points comparable to those exposed in the pieces discussed thus far. In the fifth piece, for instance, four sections are delineated by alternating tempi and dynamics (e.g., \( J = 120 \), \( J = 132 \), \( J = 120 \), \( J = 132 \)).

\[
\begin{align*}
\text{sfz} & \text{ ff} \\
\text{4} & \text{4} \\
\text{sfz} & \text{ ff} \\
\text{3} & \text{4}
\end{align*}
\]

The impulse-density curve of this piece is given in Example 28. In this particular piece, because the mode of articulation throughout is one of repeated \textit{staccatissimo} notes, the impulse-density is actually representative of the rhythm of pitch change. The implications of this detail will soon become clear.

Example 28. Piece No. 5, impulse-density graph.
Within the first section (\(\text{\textit{J}} = 120, \text{measures 1-8}\)), the activity level of the highly articulate polyphonic texture is relatively constant, suggesting neither progression nor recession. The second section is intensified through the abrupt tempo change (i.e., to \(\text{\textit{J}} = 132\)) and marginal increase in impulse-density, while the third section (back to \(\text{\textit{J}} = 120\)) involves a rhythmic recession to the original level of activity and beyond to 0 impulses/\(\text{\textit{J}}\) for several consecutive beats in bar 11. While the junctures at which rhythmic activity changes direction [i.e., from one of progression to one of recession (e.g., measure 9), or vice versa (e.g., measure 12)] might be viewed as turn-around points, the difference in magnitude of impulse-density is hardly enough to warrant such a characterization. The effect of an increase in impulse-density from 2 to 4/\(\text{\textit{J}}\), for example, is significantly overpowered by the mode of articulation (i.e., the continuous, arhythmic note repetitions). The \textit{staccatissimo} reiterations, in fact, prevent a feeling of rhythmic repose even when the pitches are kept constant (e.g., in measure 11).

The rhythmic intensification in the second section of the seventh piece (bars 38-44)—essentially a single section which is "torn off" at the peak of its rhythmic activity—results from gradual independence of the four sounding components. Each time a component enters, it does so in rhythmic unison with a part already in progress. Soon after entry, however, the new component branches off on its own rhythmic course (e.g., oboe and clarinet in measure 39, and bassoon in bar 40), thus intensifying the interaction between parts and ultimately the level of the composite.

\[30\] In this piece the difference between the most active and inactive states is only 4 impulses/\(\text{\textit{J}}\); compare this with 22 in No. 8, 8 in No. 4, and at least 15 in No. 3 ("at least" because of the indefinite number provided by the trill).
rhythmic activity. Example 29 offers a graphic representation of rhythmic activity as to impulse-density.


Although the ninth piece consists of one, continuous textural element throughout (i.e., the three-part canon mentioned earlier), a graphic representation of the impulse-density of its composite rhythm would reveal a rather uninteresting oscillation between 0 and 2 impulses per quarter-note---clearly not the most significant aspect of rhythmic structure in the piece. In fact, pitch unfolding and registral ascent are more important factors of progression in the piece than rhythmic intensification. Rhythm does, however, play a vital role in the independence of the canonic components. Each of the three parts moves in multiples of a different durational unit:
piccolo - $\frac{5}{3}$, oboe - $\frac{5}{3}$, and clarinet - $\frac{3}{3}$. This detail in rhythmic design prevents the imitation from becoming too regular (or strict).

At the beginning of the present section on rhythmic aspects, it was noted that the consequences of non-operative meter at the level of the notated measure are different in pieces with constant notated meter from those with fluctuating meter. In consideration of the latter type (specifically, four of the five soloistic pieces) a number of examples exist where the barlines would appear to be strategically placed to heighten the downbeat quality of certain points (be they arrival and/or departure points), already exposed through other means of accentuation (e.g., increased dynamics, articulative markings, etc.). The second piece offers two instances of explicitly defined downbeats as arrival points. The first occurs in bar 11, approached from bar 9, while the second takes place on the downbeat of bar 24, approached from the last beat of the previous measure. These excerpts are given in Example 30 (a) and (b) respectively. Given the rhythmically complex environment in which these two downbeats occur, their placement would seem to be of structural significance. The first one may be heard to close off the opening section, the continuation in the clarinet (bar 11) serving as a connection to the next formal section ($\uparrow = 144$, poco meno mosso). The downbeat of bar 24 would appear to end the main body of the piece, while eliding with the connecting link to the coda (i.e., measures 28 to the end).
Example 30. Piece No. 2, local arrival points.

(a) measures 9-11

(b) measures 23-24

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Two instances of local downbeats in the sixth piece are of significance. Each is approached by a cadenza-like passage in the oboe (the featured instrument), marked *senza tempo*, and each functions as an elided downbeat—that is, a simultaneous arrival and departure point. Example 31 illustrates the two points in question.

Example 31. Piece No. 6, local arrival/departure points.

(a) measures 8–9

(b) measures 10–11
A second function of the barlines and metric indications may be one of rhythmic grouping without accent-delineation. In other words, a musical idea may require the time-span of five quarter-notes at a given tempo so it would be labelled as \( \frac{5}{4} \) without any metric (i.e., accent) implication such as \( \text{\ding{172}}\text{\ding{173}}\text{\ding{174}}\text{\ding{175}}\text{\ding{176}} \) or \( \text{\ding{172}}\text{\ding{173}}\text{\ding{174}}\text{\ding{176}}\text{\ding{177}} \). This would appear to be the situation in parts of the eighth piece. In measures 26-32, for instance, five disparate musical ideas are presented in succession, each requiring a different time-span (not necessarily a different pattern of accented and unaccented pulses). Example 32 consists of these seven measures from the score. Notation in straight \( \frac{4}{4} \) would be next to impossible and would, almost certainly, undermine the dramatic impact of the disparate musical ideas presented in the excerpt.\(^{31}\)

Summary

Concerning rhythmic and metric design, three main principles were found to be of significance in the quintet. The first involves the fluctuation in composite rhythmic activity, termed "impulse-density," and its vital influence on progressive and recessive tendencies in sections and pieces consisting primarily of polyphonic textures. The second principle concerns the fact that notated meter is largely inoperative in the pieces and, in fact, accent-articulated units at the level of the notated measure were judged to be essentially irrelevant. However, low-level metric units (delineated by factors other than notated barlines) were said to operate in the horn part of piece No. 8 and the octave-doubled theme of No. 3. The third principle stated that, in pieces with a constant notated meter, barlines were found to be notational conveniences. In pieces exhibiting

\(^{31}\) The earlier parallel drawn between the soloistic pieces of the quintet and the larger pieces characterized by the style of *Apparitions* and *Aventures* is exemplified in this particular excerpt.
Example 32. Piece No. 8, measures 26-32, showing consecutive disparate musical ideas.
fluctuating, notated meter, however, factors of downbeat characterization and time-span considerations of disparate musical ideas were found to be relevant in addition to that of notational convenience.

While other details, and principles of greater consequence, may be found to operate within the rhythmic and metric design of these pieces, it is hoped that the issues discussed in this section will serve as a point from which a greater understanding of this musical language may be developed.

**Modes of Pitch Organization**

**Linear Details**

The linear details of pitch organization, for the purposes of this study, refer to (predominantly) stepwise patterns of registrally specific pitches and/or pitch-classes (PC's). As one might expect to find many such linear patterns in music of this language, our concern will focus on linear connections which tend to move toward and/or away from specific structural points in the pieces, thereby suggesting elements of progression and recession.

Two aspects of linear connection to be studied are modes of pitch/PC structuring within the various pieces, and large-scale connections between pieces. In the former, the connections may be found to occur in one particular instrument (i.e., one component within a larger textural

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32 According to Edward Cone, stepwise connections are vital to the perception of linear structure as "the ear will naturally connect each tone with those nearest it in pitch. The adjacent pitches may be diatonic or they may be chromatic; they may be actually adjacent or displaced by one or more octaves; they may be present by implication only." See "Analysis Today," The Musical Quarterly (April 1960): 177-78.

33 Regarding the latter, such instances may be considered additional modes of large-scale connection or piece subgrouping, several of which were outlined earlier in this chapter.
element), or they may be the result of the interaction of components (the linearizations, themselves, being additional components of sorts).

Although significant linear connections may be found in all of the pieces, the structural details or particulars of linearization are often different from piece to piece. The second piece, for example, reveals two linearizations effected by the arpeggiation design of the clarinet part. In the 'b'-section, measures 12-15, the upper and lower pitches of the successive arpeggios create simultaneous, different linear continuities. In both ascending events, the final pitches are marked by the leap of a third which is further displaced by an octave. These connective patterns, which provide linear direction to the four measures at hand, are illustrated in Example 33.

A second linear event resulting from a similar arpeggio design may be discerned in measures 21-22 and continued in bar 29. The upper notes of the consecutive two and three-note patterns (i.e., oscillations and arpeggios) create an ascending line from $D^\flat$ to $G^\natural$ (bars 21-22) which is continued from $A^\sharp$ to $A^\natural$ in bar 29. The lower notes contribute to a simultaneously ascending line from $C^\natural$ to $B^\natural$ and an overlapping descending line from $F^\natural$ to $D^\flat$. Example 34 portrays these interacting linear events. While continued linearization of the lower notes does not occur in the final measure, the resumption of the ascending line in the upper part is responsible for the directed tendency towards the highest pitch of the piece ($A^\natural$).

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34 While the "inner" parts of the arpeggios may also reveal linear relationships, the "outer" voices are most readily perceived at the operative tempo, $J = 144$. 
Example 33. Piece No. 2, measures 12-15, two simultaneous linearizations.

Example 34. Piece No. 2, measures 21-22 and 29, two simultaneous linearizations.
Much of the flute part in the fourth piece is constructed of successive, two-note oscillations, the upper and lower notes of which may be heard to define independent linearizations, not unlike those of the second piece. Although the clarinet part (in No. 4) opens in a relatively stepwise fashion, it also exhibits a bi-linear structure from the middle of bar 2 to bar 8. Example 35 shows the flute and clarinet parts from the score with the suggested linearizations in the flute (above the score) and in the clarinet (below).

Although the connections are self-explanatory, two details are noteworthy. First, regarding registral space, it is significant that the point of origin of the flute's top linear event, C⁵ (bar 1), is the arrival point of its lower ascending line (in measure 2). The dotted line connects the two, suggesting a conjoined linearization of E⁵ to F♯⁶ through prolongation of the C⁵. Second, the bi-linear structure of the flute part, which terminates abruptly at the end of bar 6, may be heard to continue in the clarinet part, as suggested by the arrow from bars 6-7. The linear-progressive tendencies, initiated in the flute and clarinet at the onset of the piece, are brought to a convincing close in measures 7-8 by the clarinet and bassoon, the arrival points on B⁴ and C⁴ coinciding with the aforementioned rhythmic repose. ³⁵

In the 'b'-section of the seventh piece (measures 38 to the end), a linear event may be discerned which results from dynamic, durational, and registral exposure, as well as motivic recurrence. The peaks of the recurring dynamic "swells" are often concurrent with a sustained pitch which has been approached by an ascending arpeggio and, more immediately, ³⁵The sense of cadence at this point in the piece also results from a particular harmonic detail to be explained later.
Example 35. Piece No. 4, measures 1-8, simultaneous linear connections.
by a tritone (ascending or descending). The linear pattern in question involves the progression of the recurring tritones (although, in this particular example, movement by step is exceeded).\(^{36}\) The top staff of Example 36 reveals the tritones exposed through the means described above. System (b) illustrates the various "inversion"\(^{37}\) and interlocking relationships inherent in the succession of tritones, while system (c) shows the derived linear progression. Interval-classes (IC's) between contiguous tritones of the progression are indicated below system (c), the "-" representing a descent, and "+" an ascent. The transposition and near-inversion relationship between the opening and closing tritones of the linearization are summarized on systems (d) and (e). Once again a complete formal section is traversed by a linear event, the stepwise ascending structure of which contributes to a "directed" tendency towards its conclusion.

The opening of the 'b'-section (of the seventh piece) is noteworthy for reasons of pitch/PC organization other than those involving linear connections. It is an example of a carefully controlled unfolding of PC content; the twelve PC's are sounded once before any are repeated. Although the twelve-note ordering is not further treated transpositionally or inversionally, as an actual twelve-tone "row," it does represent one mode of PC organization which is operative in other pieces of the quintet.

The PC content of piece No. 5, for example, unfolds according to four different twelve-note orderings, concurrent, for the most part, with the

\(^{36}\) Both the recurring linear tritones and general arpeggio approaches to sustained pitches may be considered motivic.

\(^{37}\) Inversion relationship refers to the vertical order of the tritone members (even though a tritone, as such, is not invertible with respect to actual IC).
Example 36. Piece No. 7, measures 38–44, linear progression of tritones.

mm. 38  40  41  42  43
(oobo) (obo) (flute) (obo) (flute) (flute) (flute)

(a) [Musical notation]

(b) [Musical notation]

(c) [Musical notation]

(d) [Musical notation] T₅

(e) [Musical notation]
four sections of the piece (as delineated through other parameters already mentioned). In the first and third sections some PC's are repeated before all twelve have sounded, the twelfth PC signifying the end of the first section and, in the latter case, the beginning of the fourth.\footnote{The completion of the third PC ordering (i.e., the $E^\flat$) coincides with the first note of the final section (as defined by tempo and dynamics). The final section, therefore, contains thirteen notes: The $E^\flat$ from the end of the third ordering and the twelve notes of its own ordering, which also ends on $E^\flat$.} The second and fourth sections contain no such repetitions; once the twelve PC's have sounded in each case, the section is over. Although the four PC orderings are not transpositionally or inversionally related, many internal PC pairs are retained (bracketed in Example 37), as is one particular IC ordering ("boxed" in Example 37).

Example 37. Piece No. 5, PC orderings, showing PC pair and IC ordering relationships.
The beginning of the sixth piece continues the organizational concept of the twelve-note ordering but, unlike in the fifth piece, only one ordered unfolding occurs, after which the PC's do not appear to be arranged in specific patterns. The initial ordering is, however, of interest as it retains some of the PC pairs and the recurrent IC ordering from the PC patterns used in the previous piece. Example 38 reveals the PC pair relationships between the first ordering of the sixth piece and the first and last of the fifth piece (bracketed in the example), as well as the recurring IC ordering (boxed in the example).

Example 38. Pieces 5 and 6, PC pair and IC ordering relationships.

Finally, with regard to ordered PC unfolding, the ninth piece deserves mention. The whole piece consists of one, nine-note ordering which unfolds canonically in the piccolo, oboe, and clarinet. Although the unison E♭ is repeated in the opening, the remaining PC's of the ordering are articulated only once (i.e., once per instrument).
An important aspect of progressive (i.e., directed) linear connection may be associated with the orderings of the three pieces just examined. Apart from controlling the introduction of PC's, the actual patterns of unfolding reveal linear and wedge-like continuities, the latter consisting of simultaneously ascending and descending linearizations. In Example 39 the orderings of the ninth, fifth, and sixth pieces are notated as PC's, registrally arranged to illustrate the linear and/or wedge patterns inherent in their orderings.

The pattern in the ninth piece (top staff of Example 39) is, in fact, the registral configuration of the canonic theme, apart from the C\(^6\) which actually sounds an octave higher (as indicated by the black note in parentheses). The ascending fourth E\(^b\) to A\(^b\), the asserted linear progression in the piece, has added significance in the light of the linear details of the final piece—a connective feature which will be dealt with in Chapter IV.

In the case of the first and third sections of piece No. 5, the PC patterns in Example 39 are also the registrally specific pitches of the piece, apart from those with a black note above or below. (In the latter cases, the black notes are the actual sounding registers of the notes.) The pitches of the second and fourth sections, however, are registrally dispersed over four and one-half octaves; the linear patterns illustrated in Example 39 are, therefore, more problematic as "stepwise" events.

Apart from revealing internal linear patterns, the orderings of the fifth piece exhibit interrelated directive tendencies. The wedge-like "spatial" expansion of the opening section is preparatory for the extremely wide coverage of the registrally dispersed second section, and in this sense tends to "point" towards it. The energy generated in the latter is
Example 39. Pieces 9, 5, and 6, patterns of PC unfolding.
somewhat dissipated by the registrally compact linearity of the third section—a linear descent which also tends to recede towards a point of repose, assisted by the decline in rhythmic activity noted earlier. The explosive fourth section would appear to interrupt the linear descent, which may be seen to continue with the final four pitches of the piece. The condition most responsible for the suggestion of such a continuation is the PC and registral equality of the final four members of the third and fourth orderings.

Concerning registral equality, a detail alluded to earlier is noteworthy. While the C♭⁴, F⁴, and E⁴ of the third ordering occur early in the third section, the final E♭ occurs an octave lower and as the first pitch of the final section (as defined by tempo and dynamics). This may be indicative of an averted linear descent, the intended connection coming at the end of the fourth section where the register of the final E♭ is consistent with the preceding three pitches.

Despite the continuation of the linearization, as suggested above, the piece would appear to conclude in an "open" fashion with respect to PC unfolding. Several conditions reinforce the notion that D⁴ would qualify as a final arrival point: first, the piece opens with an emphatic D⁴ (reiterated in unison); second, the fourth section begins on D⁵ and progresses through a descending seventh; and third, the final four pitches of the fourth section point linearly to, but fall short of, D⁴.

This apparently "incomplete" close may, however, have functional significance. Although the unfolding of pitches in the opening of the sixth piece does not conform to the registral configuration of the wedge

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39 This is further reinforced by the note in the score: "stop as though torn off." See Ligeti, Ten Pieces, p. 19.
pattern noted on the bottom staff of Example 39, it is responsible, in PC terms, for an aspect of connection between the two pieces. For example, while the end of the fifth piece approaches D from above (i.e., G, F, E, Eb), the opening of the sixth piece approaches it from below (i.e., A#, B, C, C#, the actual order being B, C#, C, A#). The D (fifth PC of the ordering) is the featured oboe's first note. The difference in timbre as well as articulation (as specified in the score), render the long-awaited D more emphatic. The PC connection between the fifth and sixth pieces is summarized in Example 40.

Example 40. PC connection between the fifth and sixth pieces.

Before leaving the concept of linear wedge-patterns, the opening twelve measures of the eighth piece should be examined. Although twelve-note orderings are not in operation here, the expansion and contraction of the "outer voices" contribute to the directive quality which points to the horn entry in bar 12. "Outer voices," here, refer to the highest and lowest pitches of the overall registral space created by the interaction of the

\(^{40}\) Other aspects cited earlier include tempo, articulation, instrumentation, and the *attacca* indication at the end of the fifth piece.
three instruments. Example 41 summarizes these pitch extremities and reveals the aforementioned wedge-like pattern of linearization.

Example 41. Piece No. 8, measures 1-12, wedge-patterned linearizations.

The horn entry is marked by the contraction to the minor second, F♯⁴-G⁴, in the accompanimental element. The interaction between pitch and rhythmic patterns in these opening twelve measures is noteworthy. In the section on rhythm, the horn entry was said to be marked by the maximum in composite rhythmic activity. During this steady increase in impulse-density, the pitch structure has revealed a twofold wedge pattern. The interaction of both patterns (i.e., rhythm and pitch) may be represented as in Example 42.

Example 42. Piece No. 8, measures 1-12, patterned pitch unfolding as compared to rhythmic activity.

pitch unfolding:

rhythmic activity:
(impulse-density)
A unique mode of linear connection may be discerned in the opening eight measures of the third piece. Although all five instruments contribute to the polyphonic textural element, only three components are actually present in the first four measures. In bars 5-7 the number of components increases to four and, finally, five. The continuous linear components, as distinct from the often fragmented instrumental parts of the score, are illustrated in Example 43.

The components indicated in the example are created through the use of a device I have termed "unison transfer." Essentially it refers to the connection of two fragments of a single linear component through an overlapping unison in the two instruments involved in the transfer. In the second measure (refer to the score), for example, the alto flute sounds a C#5, concurrent with the horn entry, also on C#5. Once the horn has assumed the pitch, the flute drops out. The linear component has, here, been transferred from the flute to the horn via the unison overlap (refer to Example 43).

As in the incident cited above, instruments are most often silent immediately before and after presenting a portion of a particular linear component. On occasion, however, both instruments continue to sound after a transfer has occurred. This is the case in bar 5, for example, where the clarinet continues to sound its E5 (and the rest of its component) after the latter has been assumed by the flute. Here, the unison transfer may be said to have spawned a fourth component, thereby affecting the textural-

41 One particular departure from this standard procedure occurs in bar 5. The oboe d' amore continues its D5 after that pitch is assumed by the bassoon, and only when it reaches D♭5, several beats later, does it rest, after the D♭5 is, in turn, picked up by the horn. This exception may be seen as an "extended" overlap.
Example 43. Piece No. 3, measures 1-8, linear components through unison transfer and pitch interchange.
These brackets indicate the span over which a particular instrument sounds; the dotted portion at the end of each indicates the point of "unison transfer" and the other instrument involved.

These diagonal lines indicate instances of "pitch interchange."
density.

Unison transfer is also responsible for thinning the texture. In bar 7, the horn's G♯⁴ is assumed by the bassoon (already sounding a linear component), after which the horn drops out, thereby ending one component. An example of an incomplete unison transfer accounts for the brief fragment B⁴−A⁴ in the flute, measures 4–5. The initial B in the flute does not come from an existing B in another instrument, as in the normal transfers. In this respect the transfer is incomplete. The closing A, however, is assumed by the bassoon with the characteristic unison overlap.

"Pitch interchange" is a second voice-leading device employed in this particular section of the piece. While components usually move independently of one another, the rhythmic divisions of two components engaged in a pitch interchange are identical. This particular device usually involves the exchange of pitches between two disparate components (and not an exchange of the actual components themselves), and is occasionally responsible for the generation and termination of linear components (not unlike unison transfer), thereby assisting in the control of textural-density. Referring again to Example 43, pitch interchange is used in measure 7 to spawn a new component. The F⁴ and A♯⁴ of the bassoon are interchanged with the A♭⁴ and F⁴ of the flute. Just as the initial three components of the piece were engaged in pitch interchanges at their onset, so the technique is employed here to introduce a fifth component. Occurring simultaneously to the emergence of the line just mentioned, is the termination of an already existing one, effected through pitch interchange. In measure 7, the components in the clarinet and oboe d' amore are involved in a pitch interchange after which the oboe continues but the clarinet drops out.

While the techniques of unison transfer and pitch interchange may be
important factors in linear pitch organization in the components of these opening measures, the sense of progression towards bar 6 and the feeling of climax in that measure are largely the result of the expanding registral boundaries dictated by the linear components themselves. The ascending and descending linearizations which outline the progressive wedge-pattern are indicated on system (b) of Example 43.

Summary

Several modes of linear pitch and PC connection have been found to operate in the pieces of the quintet. In the second and fourth pieces, for example, the featured instruments were noted as consisting of linearizations involving the upper and lower pitches of successive arpeggios. In the fifth, sixth, seventh, and ninth pieces, specific orderings (most often twelve-note successions) were found to control the introduction of PC content. Many of the orderings were shown to contain common PC pairs and one particular IC ordering, although the successions are not transpositionally or inversionally related. Apart from the control of PC content, the patterns of PC unfolding were seen to reveal directed linearizations, some in the form of wedge-like expansions and contractions. Finally, a wedge-pattern was also found in the third piece; it was suggested that the components of this pattern result from the techniques of unison transfer and pitch interchange. One attribute, common to all of the linear events noted above, regardless of varying details of structure, is the sense of directed activity and continuity which they effect.

42 The climax is formed by the highest pitch in the section, G⁵, as well as the widest registral space which accompanies it, F⁴-G⁵.

43 Others certainly exist, several of which will be exemplified in the next two chapters.
Two central issues of harmonic organization in the quintet are consonance and dissonance in verticalities, and functional relationships between sonorities. Such characterizations and relationships, however, depend largely on the textural environment in which they occur. For example, a most prevalent textural condition was noted earlier as the single, polyphonic element consisting of from three to five components. In this particular situation, the vertical sonorities are slowly, but continuously, changing (often one note at a time), resulting in a continuum of consonance-dissonance fluctuation.

The opening seven measures of the third piece, just examined in the light of linear organization, exemplify such harmonic fluctuation. System (a) of Example 44 consists of the linear components, as stated earlier, while system (b) indicates the harmonic changes, delineated by the vertical lines through both systems. Verticalities may be classified as consonant or dissonant according to their semitone and whole-tone content as indicated on the left of Example 45 (see page 89). These are then plotted on the graph (Example 45) revealing the fluctuation in harmonic quality. (The numbers from 1-25 on the graph correspond to the complexes of Ex. 44.)

The criterion of semitone content is a suggested "first step" towards the characterization of consonance and dissonance in verticalities. In the analysis of the first piece (Chapter III) this initial step serves as a point of departure for a more detailed set of criteria used to differentiate consonant and dissonant sonorities in the opening polyphonic section. It is clear, however, that in this particular musical language the reference points for vertical consonance and dissonance are radically different from those of triadic music. A whole-tone may take on the role of a consonance in relation to semitone structures. Perhaps the most blatant example of this comes at the end of the third piece. The simultaneous, but out-of-phase, oscillation between A^3 and B^3 results in a reiterated minor second. The final major second, A^3-B^3, sounds extremely convincing as a point of resolution; its status as a consonance can hardly be disputed.
Example 44. Piece No. 3, measures 1-8, harmonic complexes.
Example 45. Piece No. 3, measures 1-8, consonance-dissonance criteria and harmonic quality fluctuation.
It must be remembered, however, that these vertical complexes are essentially points along a continuum and, while their individual consonance-dissonance qualities may be perceived in isolation, it is, perhaps, their contributions to the large-scale progression of harmonic quality which is more significant here. The higher-level progression from consonance \(\rightarrow\) dissonance \(\rightarrow\) consonance, suggested by the curve above the graph on Example 45, for instance, is analogous in dimension to the level of rhythmic and metric characterization noted earlier. 45

The harmonic structure of the fifth and ninth pieces, like that of the third, reveal continuously changing verticalities and, hence, fluctuating consonance-dissonance quality. Rather than staff notation, the first section of the fifth piece and measures 7-15 of the ninth are, here, represented by line-graphs, given as Examples 46 and 47. The increase in spatial density (see below) of the harmonic complexes (representative of consonance-dissonance fluctuation) is effectively portrayed through this means.

The expansion in registral space, which results from the previously established wedge-pattern of pitch unfolding, is a primary factor in the perceived dissonance of the sonority. 46 The continuously expanding registral boundaries in these two pieces represent in this sense a gradual reduction in perceived dissonance—a pattern which may, again, be considered the highest, most general, structural level of harmonic quality fluctuation.

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45 In the foregoing sections of this chapter, these seven measures were characterized as one continuous gesture with respect to rhythmic intensification, metric structure, and linear organization. The large-scale progression of harmonic quality is congruent with the span of functional unity suggested by these parametric characterizations.

46 For example, verticalities may consist of several occurrences of IC 1, but in compound forms (e.g., minor ninth, etc.). In these instances, the perceived dissonance of the IC 1 is presumably somewhat reduced.
Example 46. Piece No. 5, measures 1-8, line-graph representation of linear and harmonic expansion.
Example 47. Piece No. 9, measures 8-15, line-graph representation of linear and harmonic expansion.
(unison to this point)

FLUTE

OBOE

CLARINET

(unison to end)
It was asserted at the beginning of this section on harmonic details that textural environment influences the approach to harmonic classifications and functional relationships. In the second, fourth, and tenth pieces, a second textural situation is prevalent—one in which a primary line interacts with secondary components, the latter occurring in a fragmented capacity at times. Revealing aspects of harmonic organization in this textural environment centre around relationships between the primary and secondary components. In the three pieces cited, the tempo and rhythmic activity render the individual harmonic relationships too fleeting to be of significance, the linearity of the texture, once again, being the focal point. The harmonic quality which is perceived on a more global level, however, is the result of the detailed relationships along the way.

Example 48 consists of two excerpts, measures 12 and 13 of the second piece, and measure 1 of the fourth, both of which are notated without stems and beams for ease of reading. The groups of pitches which sound together are boxed, numbered, and detailed on the second system of each excerpt. As the details in the example reveal, affiliations between notes of the primary and secondary components usually involves dissonance followed by relative consonance.

Concerning the aforementioned affiliation, a concept of consonance-dissonance relations may be posited. In measure 13 of the second piece,

47 The tenth piece is dealt with in Chapter IV.

48 The score should be consulted for understanding of the rhythmic configurations of the verticalities. Often, for example, a subtle rhythmic variation between components will produce consecutive verticalities. In the rhythmic configuration \[ \frac{7}{4} \frac{5}{4} \], for instance, two verticalities sound, although very briefly.
Example 48. Piece No. 2, measures 12-13, and piece No. 4, measure 1, harmonic interval fluctuation through voice leading.
for example, a relativity principle allows that the whole-tone is considered as a consonance or a dissonance, depending on the interval which proceeds or follows it, an idea already alluded to in connection with the end of the third piece. This concept is also relevant to the ends of the two phrases which comprise the fourth piece. Here, the rhythmic activity has relaxed sufficiently to allow perception of the fluctuating harmonic quality. The two instances in question are shown in Example 49. The ultimate arrival point on the whole-tone (from the "dissonant" semitone) reinforces the concept of relativity and also raises the possibility of this particular relationship being considered as a resolutive cadential device.

Example 49. Piece No. 4, measures 7–9 and 23–26, harmonic interval fluctuation through voice leading.
Parts of the second and seventh pieces feature verticalities, the component parts of which are simultaneously articulated (i.e., they occur in strict vertical alignment). In this textural environment the harmonic aspect is primary, with the possibility of derived linear relationships, rather than the other way around. In the second piece, the vertical sonorities comprise the secondary textural element in the opening section, over which the clarinet is featured. Five vertical complexes are sounded in this particular section (measures 1-11), the first three consisting entirely of adjacent semitones. The last two feature semitone and whole-tone content—a subtle, yet implicative departure from the opening sonority.

The five-note verticalities appear later in the piece (e.g., bars 15, 20, and 21) and serve to recall the opening section. In these three recurrences, the content is exactly that of the third complex of the piece (i.e., consecutive semitones from E to G—a transposition of the first complex in the piece). In this sense they resolve the harmonic departure of the sonorities which end the opening section. Finally, in bar 29, a verticality occurs which recalls PC's D#, E, and F from the opening sonority (where they appear as the lowest three pitches), thereby providing a degree of PC closure. These harmonic complexes are indicated on the second staff of Example 50 (all the pitches within each box sounding together). The outer interval of each simultaneity (varied through internal combinations of semitones and whole-tones) is given on the third system.

Three additional details in Example 50 are worth noting. First, the three harmonies which conclude the piece exhibit another instance of functional consonance-dissonance relation, as posited in connection with
the third and fourth pieces. The three sonorities in question, along with the IC's of the consonance dissonance progressions are also included on the second staff of Example 50. Second, a linear pattern may be imposed on the complexes indicated on the second staff (i.e., the complexes which characterize the 'a'-section and subsequent allusions to it). The pattern involves the connection of PC's which represent pitch extremities of each complex, the upper ascending line contributing to the overall PC progression, and the lower line providing a departure from, and return to, the PC representing the lowest pitch of the opening sonority. These linear events are indicated on the top staff of Example 50. And finally, the upper ascending linear connection just mentioned is, in a sense, "summarized" by the sonorities which close the piece. This relationship is noted on the third staff of the example.

The interval make-up of the recurring verticalities found at the beginning of the seventh piece is the same as that of the opening sonority of the second piece. Specifically, they are comprised of five adjacent semitones, first, from G⁴ to B⁴ (measures 1-23), and then from D to F♯ (registrally dispersed) in bars 30 and 34. Variety in the reiterated sonorities based on G⁴ is provided by the various instrumental voicings in which it occurs. (Refer to Example 51.)

While the reiterated harmonies remain based on G⁴, the sustained sonorities which grow out of them are varied and, in themselves, exhibit

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49 Here is another instance to reinforce the notion of the semitone to whole-tone "resolution" functioning as a cadential device.

50 As "stepwise" events these particular linearizations are admittedly more problematic (than previous examples) because of the registral dispersion of their members. Linear events involving such octave-displaced "steps," however, may be viewed as an important aspect of linear organization in this musical language.
Example 50. Piece No. 2, harmonic organization.

Example 51. Piece No. 7, measures 1-38, harmonic organization.
a directed fluctuation. For instance, the first sustained element is the $B^b_4$ (measures 6 ff.), followed by the trichord $G^4-A^4-B^b_4$ (bars 12 ff.), and finally the four-note sonority $G^#4-A^4-A^#4-B^4$ (bars 15 ff.)--the top four pitches of the original five-note complex. The textural thickening of the sustained sonorities provides direction towards the emphatic display of the five-note verticalities in bar 23.\(^{51}\) The change of sonority to the five-note complex built on D is also marked by the registrally dispersed spacing of the chord. Between the two verticalities--one based on G, the other on D--all PC's from D to B are represented. Although the harmonic aspects in this particular section are considerably more straightforward, compared to those of the second piece, it is interesting that they both use, as a "harmonic reference," a five-note verticality which consists of adjacent semitones. Also, both exhibit departures from, and reversions to, the all-semitone complex.

The final harmonic detail to be examined in this chapter concerns the use of unison and octave doubling. The widespread use of highly-chromatic sonorities and complex rhythmic interactions creates an environment in which the least expected musical event is a motive or theme which is doubled in unison or octaves. The use of this mode of doubling in the pieces of the quintet (and it occurs in all but the fourth) thus has an extremely potent effect. While the function and occurrence of such doubling in the first and last pieces will be dealt with in the next two chapters, instances in other pieces are noteworthy here.

Most of the motives and themes involving unison and/or octaves have, in fact, been mentioned in connection with other aspects of the

\(^{51}\) Notice in the successive verticalities of bar 23 that pitch content remains the same; only the instrumental distribution varies.
musical language. The three-note, octave-doubled motive in the second piece (bar 23), for example, was introduced earlier as leading into one of the few aurally perceived downbeats in the piece. The octave-doubled theme in the middle of the third piece (measures 10-12) was characterized as one of the two simultaneously sounding textural elements in the piece—the only occurrence of such a texture in a particular ensemble piece. The fifth and ninth pieces open with a reiterated and sustained unison, respectively, each functioning as a departure point for a wedge-patterned unfolding of pitch content. The ninth piece also concludes on a unison. In the sixth piece, a brief theme which opens in unison and concludes in octaves introduces the coda; see measures 11-14 in this regard. The unison treatment in the seventh piece has also been alluded to earlier. In the 'b'-section (bars 38 to the end) each linear component, upon entering, doubles an existing part at the unison, after which it gains independence both linearly and rhythmically. Finally, in the eighth piece the sustained octave B♯ (measures 23-26), the brief octave motive (measure 29), and the unison motive (measure 30) represent the disparate musical ideas noted earlier as being indicative of the style of Apparitions and Aventures. The intense unison motive in bar 30 provides a dramatic introduction to the sustained sonorities of the calm final section.

Summary

In the foregoing discussion of harmonic details, consonance and dissonance in verticalities, and functional harmonic relationships were stated as being the two main issues. Textural environment was asserted as influencing such characterizations. Three textures were examined: polyphony, pseudo-polyphony (in which one component is primary), and homophony. Regarding the first of these, the third, fifth, and ninth
pieces were seen to consist of a continuum of fluctuating vertical consonance and dissonance. Specifically, the sonorities were noted as involving subtle changes in semitone and whole-tone content. In connection with the second texture, the harmonic affiliations between primary and secondary components were examined, and a concept of consonance-dissonance relations posited. The second and fourth pieces were cited in this regard. The homorhythmic verticalities of the third texture, as found in the second and seventh pieces, also revealed a consonance-dissonance fluctuation involving semitone and whole-tone content. Finally, the use of unison and octave doubling was found to be of dramatic import in all but the fourth piece.

Summary

This chapter aims to establish a basis for understanding the musical language of Ligeti's Ten Pieces for Wind Quintet via the definition and illustration of general and specific aspects of form, texture, rhythm, meter, and linear and harmonic pitch organization. Concepts introduced in connection with the examples studied will serve as a basis for detailed analyses of the first and last pieces of the quintet, subjects of the next two chapters.
CHAPTER III

ANALYSIS OF PIECE NO. 1

Introduction

The following analysis of piece No. 1 resembles, in format, the previous chapter on aspects of Ligeti's musical language. That is, each parameter is dealt with separately with interrelationships noted where applicable. The main sections of this chapter are as follows:

- Delineating Factors of Formal Segmentation
- Aspects of Textural Structure
- Principles of Rhythmic and Metric Design
- Modes of Pitch Organization
  - Linear Details
  - Harmonic Details
- Connective Factors Between the First and Third Pieces and Interruptive Aspects of the Second

Summary.

Some concepts introduced in Chapter II will be shown to have application in the first piece. Often, however, details of parametric organization are specific to piece No. 1; these will also receive close attention.

Delineating Factors of Formal Segmentation

The first piece exhibits a clearly defined two-part formal structure, measures 1-16 comprising the 'a'-section, and 16-22, the 'b'-section. A brief transition in bars 15-16 bridges the two main divisions and an "echo" of the 'a'-section (to be explained later) occurs at the end of the piece (i.e., measures 22-24). A brief summary of delineating factors of formal
segmentation is given below, all of which are dealt with in greater detail later in the chapter.

Concerning aspects of texture, the 'a'-section features complex polyphony operating over the range $\frac{p}{p}$, dynamically from pianissimo to mezzoforte. The latter portion of the piece (i.e., measures 16-22) consists of paired entries at fff, less interaction between parts, and a contrasting register and textural space, e.g., $\frac{f}{f}$. A legato character and molto sostenuto e calmo, dolcissimo marking accompany the opening section, while a reiterative quality (marked tutta la forza) distinguishes the 'b'-section. In terms of rhythmic definition, the activity level in the 'a'-section is much higher than that of the 'b'-section, and instruments in the former utilize the rhythmic divisions $\frac{3}{3}$, $\frac{5}{5}$, and $\frac{1}{1}$, while in the latter, only $\frac{3}{3}$ and $\frac{1}{1}$ are found. With respect to tempo, the two sections are marked $\mathbf{J} = 40$ and $\mathbf{J} = 48$, respectively. The final tempo change back to $\mathbf{J} = 40$ in bar 22, along with the quasi eco indication and return to pianissimo are factors which suggest an allusion to the 'a'-section.¹

Summary

The aforementioned factors of delineation contribute to a clearly defined formal structure in the first piece. Some details are straightforward, such as tempo and dynamics, while others are more complex, e.g., levels of rhythmic activity and textural characteristics. All factors, however, will be dealt with in detail in subsequent sections.

¹The PC content of the final dyad, C and D, is another aspect suggesting relationship to the 'a'-section; this, however, will receive closer attention in the section dealing with linear details of pitch organization.
Aspects of Textural Structure

Textural characteristics of piece No. 1 are generally consistent with those defined in the previous chapter as specific to ensemble pieces. The first piece, for example, features only one textural element at a time, and is comprised of essentially two consecutive textures corresponding to the main formal sections. Also consistent is the transition which features a reduction in textural-density to three components (yielding one textural element). In approaching the textural structure of the piece, two aspects will be considered: textural quality and textural space.

Textural Quality

Texture, as a delineator of form, must first be understood to account for the ways in which instruments interact in music. Sections of a given piece may then be differentiated from each other by their specific characteristics of instrument interaction. A fundamental aspect of interaction concerns the rhythmic structure of the individual instrumental parts. Instruments (or components) moving in strict vertical alignment, for instance, may be considered interdependent, while those moving in non-alignment are independent. Such classifications are "qualitative"; we may therefore speak of independence among components as one textural quality and interdependence among components as another. Where subgroupings of parts occur, various degrees of independence/interdependence may result, depending on the textural quality of each subgroup.

In Example 52 a qualitative analysis is applied to the textural

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2 Instrument interaction is the primary factor in the determination of textural elements which in turn define overall texture.

3 The terms "independent" and "interdependent," in reference to the interaction of components, are associated with the work of Wallace Berry. See his Structural Functions, Ch. 2.
Example 52. Line-representation of textural components, showing textural quality.

TE = textural element
ITC = interdependent component
IDC = independent component
components of the first piece. The 'a'-section and transition are characterized by a textural quality of independence (i.e., polyphony), the transition also featuring the density reduction noted earlier. The 'b'-section is texturally contrasted in that it is comprised of subgroups, the components of which move independently at times, and interdependently at other times. The subgroups themselves (specifically at points of interdependence of components) enter independently of one another. Finally, components of the closing dyad enter interdependently. This particular instance of vertical alignment is prepared by the interdependence of components within the previous subgroups. The shift from total independence to interdependence is noted in Example 52 below the line-representation of textural components.

Textural Space

For the purposes of this paper, textural space refers to the intervallic distance between outermost registrally specific pitches of a particular formal section or other structural segment. In comparing textural spaces of two sections (be they consecutive or not), register is of secondary concern; after all, any perfect fifth is larger than any major third, etc., regardless of register. The registral placement of a section's textural space is, however, of significance on a more global level, e.g., that of the whole piece.

In the piece under discussion, four textural spaces may be discerned, as indicated in Example 53. Below the spatial representations are intervallic relationships revealing an overall pattern of spatial expansion followed by contraction. For example, the expansion from the 'a' to 'b'-section [i.e., the minor seventh (D3-C4) to the octave (B4-B5)] is reinforced by the more local expansion of the transition's minor third
Example 53. Textural spaces of formal segments.

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4 A more immediate expansion is discernible within the 'b'-section itself, specifically in the progression from the opening unison C#5 to B4 and Eb5.
Summary

Two aspects of textural structure have been dealt with in this section: textural quality and textural space. The former, defined by independent and/or interdependent modes of interaction between textural components, was found to function as a formal delineator in addition to its role as a basis for its own particular mode of progression. Textural space was referred to as the space defined by pitch extremities in various formal segments of the piece. This aspect of textural structure was also shown to provide small and large-scale patterns resulting in an additional mode of direction within the piece, specifically, one of spatial expansion followed by contraction. Registrally, the first piece reveals a large-scale ascent—a detail which will gain significance later in this chapter.

Principles of Rhythmic and Metric Design

The first piece is consistent with the other ensemble pieces with regard to meter. That is, the notated $\frac{4}{4}$ is essentially undefined by patterned strong and weak beats; rather, it is solely a notational convenience. Meter was defined earlier as one particular mode of rhythmic grouping—specifically, one which groups rhythmic impulses according to accent and unaccent—and, while this type of rhythmic unit is not operative in the first piece, other element-rhythms contribute significantly to the progressive and recessive tendencies inherent in the music. To quote Wallace Berry:

All element-processes are rhythmic. In an important sense, the study of rhythm is the study of all musical elements, the actions of those elements producing the effects of pace, pattern, and grouping which constitute rhythm.  

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5Berry, Structural Functions, p. 301.
For our purposes, an element-rhythm may be thought of as a pattern of recurrence with respect to an event within a particular element, or a pattern of recurring changes within a certain element. In the previous chapter, for example, a particular element-rhythm was said to operate in the first sixteen bars of the eighth piece. Specifically, the recurrence of brief linear patterns in the flute, clarinet, and bassoon were said to result in three disparate rhythms. Any given piece may be heard to consist of many such element-rhythms interacting with one another in varying degrees of complexity. Occasionally, structural significance may be attributed to specific points which are marked by the concurrence of several different rhythms. The following examination of the first piece will expose rhythmic units based on six different elements or parameters: impulse-density, dynamics, textural-density, textural quality, harmonic-density, and tempo.

Element-Rhythms

Rhythm of impulse-density fluctuation

In the previous chapter, impulse-density was said to define widespread units of rhythmic progression and recession delineated by a "turn-around point." Units of comparable design and dimension are also discernible in the first piece, as indicated above the graph on system (a) of Example 54 (see "large-scale units"). These units (particularly the progressive one) may be seen to consist of underlying "stepped" increases and decreases in rhythmic activity, each plateau being delineated by a change in magnitude in the

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In the former, the recurring event is the same. For example, meter is one specific element-rhythm—one which relies on recurring accent-delineated patterns. A pattern of recurring change would be, for instance, a fluctuation in instrumentation-density. The recurrent event (i.e., a fluctuation) is different each time; sometimes it is an increase in density, at other times it is a decrease. In either case, as will be explained, a rhythm relies on a recurrence of some kind.
Example 54. Two levels of impulse-density fluctuation.
progressive direction and, after the turn-around point, in the recessive direction [see system (b) of Example 54]. Such recurrent changes may be perceived as establishing a "rhythm" (according to the criteria stated earlier), the individual plateaus representing small-scale units of impulse-density fluctuation. This particular element-rhythm, then, may be viewed as having two levels and two standards of measurement, the low-level units marked by magnitude changes, and the higher-level units by the turn-around point (or change in direction).

Rhythm of dynamically exposed pitch-pair groups

In the first twelve measures of piece No. 1 each instrumental part consists of a succession of linear pitch-pairs separated by rests. The initial pitch of each pair begins at pianissimo and gradually intensifies dynamically. At or just before articulation of the second pitch, the dynamic increase peaks at mezzoforte, at which point a diminuendo begins. This pattern repeats itself with each subsequent pitch-pair. Although the peaks of dynamic intensification and corresponding pitch changes in the five instruments occur independently of each other, they nevertheless do so in relatively close proximity. The result is a "group" of dynamically exposed pitch-pairs. The next occurrence of mezzoforte pitch changes in close proximity constitutes another group, and so on. These recurring groups of dynamically intensified pitch-pairs create an overall, slow pulsation—a rhythm of sorts. The first mezzoforte pitch change of each group may be heard to articulate units of this particular rhythm.

Example 55 consists of a graphic representation of the dynamically exposed pitch-pair groups in the first twelve measures. The outer systems of the graph indicate groups of pitch-pairs occurring in close proximity and, at the same time, units of overall dynamic fluctuation. Two systems
Example 55. Units of dynamically exposed pitch-pair groups.
have been employed because of the overlapping of groups; the graph is to be read by alternating between the top and bottom systems. The diagonal arrows above and below the centre line indicate the dynamic increase towards the initial *mezzoforte* pitch change of each group, the duration of pitch changes at *mezzoforte* (i.e., the horizontal portion), and the overall *diminuendo* (after the last *mezzoforte* pitch change). The centre line itself shows only the initial *mezzoforte* point of each group. These particular junctures may be heard to delineate recurring units of dynamically exposed pitch-pairs—a second element-rhythm discernible in the piece. Incidentally, a progressive tendency is revealed in the diminishing lengths of dynamic units commencing in bar 9—a tendency which complements the increase in impulse-density noted earlier.\(^7\)

**Rhythm of textural-density fluctuation**

While textural independence and interdependence, discussed earlier, are qualitative features, a mode of grouping is defined by the aspect of textural-density fluctuation—a quantitative feature. Specifically, abrupt changes in density articulate a particular rhythm, albeit an irregular one. System (c) on Example 56 (p. 122) consists of the line-representation of textural components used in Example 52. The rhythm of density fluctuation is indicated by the vertical lines marking changes in the number of sounding components.

**Rhythm of textural quality fluctuation**

The concept of textural quality was discussed in the previous section. As a particular mode of rhythmic grouping, however, overall

\(^7\)Because each *mezzoforte* marks a pitch change, the close proximity of the individual dynamic peaks represents a rhythmic intensification reflected on the impulse-density graph.
qualitative changes function as recurring events which delineate specific units. These units are indicated on system (d) of Example 56.

Rhythm of harmonic-density fluctuation

In the 'a'-section and transition, harmonic-density (i.e., the number of vertical pitches sounding) is essentially tied to textural-density; the number of sounding components equals the number of pitches.\(^8\) The 'b'-section is interesting in that the textural and harmonic densities do not correspond. Despite a five-component texture, the harmonic-density begins with a unison C#\(^5\) and gradually expands to a tetrachord by measure 21. Each new pitch entry marks a growth in harmonic-density (within the static textural-density), thereby generating its own mode of rhythmic grouping. (The interaction of these two densities is illustrated graphically in Example 56, to be introduced shortly.)

Rhythm of tempo change

Tempo change is another event which recurs in the piece and, as noted earlier, tends to coincide with changes in the formal structure. It nevertheless articulates a widespread rhythmic pattern, to be revealed in conjunction with those already defined.

Interaction of element-rhythms

Example 56 is a representation of the six element-rhythms defined above. In the case of impulse-density, only the large-scale progressive and recessive units are noted and are indicated here as straight lines

\(^8\)Two verticalities in measure 12 represent brief departures from this norm. In these instances, to be disclosed in a later section, the five instruments sound a four-note sonority.
Example 56. Interaction of six element-rhythms.
omitting the detailed fluctuations and lower-level units included in Example 54. The rhythm of dynamically exposed pitch-pair groups is also simplified here as only the initial mezzoforte pitch change of each group is indicated (these being the unit delineators taken from the centre line of Example 55).

Two points of significant concurrence among element-rhythms are in measures 16 and 22. These junctures, of course, mark the main formal sections. Of lesser formal import is the transition (measures 15-16), also marked by coincidence of rhythms: the rhythms of textural and harmonic densities.

Summary

It was found that the first piece is consistent with the other ensemble pieces in the quintet with regard to metric structure; specifically, the notated $\frac{4}{4}$ does not signify metric groupings as such, but is, rather, a notational convenience. The concept of element-rhythms (other than meter), however, was found to be of great significance in the pacing, progression, recession, and formal delineation of the piece. The rhythms examined involve the parameters (elements) of impulse-density, dynamics, textural-density, textural quality, harmonic-density, and tempo. Substantial concurrence among these was noted at structural points in the piece, namely, the beginnings of formal sections. The transition, a formal segment of lesser importance, was also noted as being defined by the

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9 This is merely for clarity; as will be shown, significant interaction occurs only at the turn-around point, adequately represented by this less-detailed version.
simultaneous reduction in textural and harmonic densities. The rhythmic structure of piece No. 1, despite a lack of metric definition, is one of considerable complexity, as manifest in the interaction of element-rhythms exemplified above.

**Modes of Pitch Organization**

**Linear Details**

As in the examples cited in the previous chapter, the linear details of pitch organization in the first piece involve stepwise patterns of pitch and/or PC connections. Three specific modes of linear connection will be examined. The first involves outer-voice prolongation in the 'a'-section, as well as the PC connection to, and two-voice structure of, the 'b'-section. The second mode considers linear progressions which, through lateral voice crossing, connect pitch extremities in the 'a'-section (the latter being the pitches prolonged in the outer voices referred to above). Linearizations comprised of dynamically accented pitch-pairs define the third mode of linear connection.

**Outer-voice prolongation**

The (five-component) texture of the 'a'-section's first twelve bars yields a continuum of changing five-note vertical sonorities spanning a range of \( \text{C}^\# \) to \( \text{A}^\# \). On system (a) of Example 57 each vertical stem (above the top staff) in the first twelve measures marks a new harmonic complex. The pitches are organized such that the highest pitch of each verticality (regardless of instrumentation) appears on the top staff, the second highest on the second staff, etc. The "highest" pitches are

\( \text{C}^\# \) to \( \text{A}^\# \)
Example 57. Outer-voice prolongation in measures 1-16.

\[\begin{align*}
\text{e.p.} &= \textit{embellishing pattern} \\
\text{l.n.} &= \textit{lower neighbour} \\
\text{u.n.} &= \textit{upper neighbour} \\
\text{m.m.u.n.} &= \textit{major-minor upper neighbour} \\
\text{m.m.l.n.} &= \textit{major-minor lower neighbour} \\
\text{i.m.m.u.n.} &= \textit{incomplete major-minor upper neighbour} \\
\text{ant.} &= \textit{anticipation}
\end{align*}\]
considered linearly to form a "voice" as distinct from the actual instrumental parts. The same holds true for the second highest pitches, and so on. The five "voices," then, are the result of constant pitch and frequent position changes within successive vertical complexes. Each instrumental part moves from one voice to another depending on the position of its pitch in the verticality. Pitches of a given instrumental part are connected by horizontal and diagonal lines and arrows, revealing the motion across voices as described above. For example, if a line connects two pitches on the same staff, it means they are sounded by the same instrument and the second pitch retains its voice position in the vertical complex. A rest separates the two pitches if the line is notated with a parallel slash, e.g., \( \text{\#} \). Where a diagonal line connects two, like pitches on separate staves, its voice position has changed (but not its instrumentation) as a result of a pitch change elsewhere in the verticality. Finally, where a diagonal arrow connects two different pitches on separate staves, it indicates a pitch and position change (within the same instrument), again, separated by a rest if the arrow has a parallel slash through it, e.g.,

Our focus on the outer voices in particular as one mode of linear connection is for three reasons. First, they are characteristically the most readily perceived. Second, they reveal prolongations of D\(^3\) and C\(^4\) (the pitch extremities) and, hence, contribute to the delineation of form. And third, the PC's C and D have functional import in the large-scale linear structure of the piece. Concerning the second condition, refer to

\(^{11}\)Measures 13-16 as represented on system (a) of Example 57 will be dealt with later.
system (b) of Example 57, where all pitches in the outer voices are indicated. The extremities, $D^3$ and $C^4$, are notated as open notes which are stemmed, beamed, and slurred together. Neighbour notes to these pitches are also stemmed but are indicated by black notes. Embellishing patterns,\textsuperscript{12} also notated as black notes, are stemmed to the slur which connects the two main tones they prolong. Finally, neighbours consisting of a "major" and "minor" second are notated thus:

\[\begin{array}{c}
\text{\textsuperscript{n}}\text{\textsuperscript{f}}
\end{array}\]

and labelled MMUN or MMLN (major-minor upper neighbour or major-minor lower neighbour).

Once the $D^3$ and $C^4$ extremities are reached in bars 5 and 7, respectively, they are prolonged in a straightforward manner as indicated on system (b). One particular detail is noteworthy however. It concerns the differentiation between "primary" and "secondary" instances of the pitch extremities. Notice, for example, that occurrences of $C^4$ in bars 7, 9, 11, and 13 are adjacent to those of the lower extremity, $D^3$, while in bars 5, 8, 11 (first beat), and 13 they are without such concurrence. Given the function of $D^3$ and $C^4$ as the outermost pitches and, hence, form delineators of the 'a'-section, reiterated instances of adjacent extremities would seem to be of "primary" importance, with the intervening occurrences of $C^4$, "secondary." System (c) represents this mode of distinction by including only adjacent, corroborating (i.e., primary) instances of $D^3$ and $C^4$ (as open notes). The initial $C^4$, notated as a black note, may be heard as an anticipation of the first primary $C^4$ appearing in measure 7. The initial "incomplete" major-minor upper

\[\text{\textsuperscript{12}}\text{An embellishing pattern, in this context, refers to stepwise motion (beyond a major second) away from, and back to, a particular structural note. It may also consist of a leap away from the main note and stepwise motion back, or vice versa.}\]
neighbour (IMMUN) approach to $D^3$ is also indicated in black notes on system (c).

On system (a) of Example 57, the end of the 'a'-section (measures 13-15), and transition (measures 15-16), are notated differently from the preceding bars in that the instrumental parts of the score are given. Rhythmic intensification, here, renders individual verticalities difficult to isolate; rather, the linear continuity of each instrumental part is more apparent as a focus of attention. The interaction of the instruments, nevertheless, carries the previously established outer-voice prolongations by close reiteration of $D^3$ and $C^4$, and linear embellishment not unlike that of measures 1-12. On system (a), pitches with brackets above (e.g., measures 13-14) contribute to the upper-voice prolongation, while those with brackets below effect the lower-voice maintenance, both of which are indicated on system (b) and the higher-level system (c). Incidentally, the linearization from $C^4$ to $F^3$ on system (b) (bar 14) suggests that, during these transitional measures, the underlying upper voice prolongs $F^3$ (the lower remaining on $D^3$) as an interim basis.\textsuperscript{13} This lower-level detail, however, is not included on system (c); $D^3$ and $C^4$ remain the primary registral reference points for the 'a'-section.

In Example 58, system (a) consists of the 'b'-section (measures 16-22) in score form. Systems (b) and (c) begin with identical summaries of system (c) from Example 57 (i.e., measures 1-16), but offer two different interpretations for the structure of the 'b'-section and its relationship to the previously prolonged $D^3$ and $C^4$. The first views the

\textsuperscript{13} This is the reduction in textural space noted earlier.
prolonged $C^4$ as a "pitch-class (PC) neighbour," functioning with $C#^5$ of bar 16 as an incomplete major-minor lower neighbour to the final $D^5$, the $E^b^5$ of bar 21 being its incomplete upper neighbour. $D^3$ of the 'a'-section is then viewed conversely as a PC neighbour with $C#^5$ as an incomplete major-minor upper neighbour to the final $C^5$, the $B^4$ of bar 20 being its incomplete lower neighbour. In the second interpretation [system (c)], $C^4$ is considered a "PC representative" of the final $C^5$, with $D^5$ of bar 16 and $B^4$ of bar 20 functioning, respectively, as complete upper and lower neighbours. $D^3$ from the 'a'-section is treated here as a PC representative of the final $D^5$, with $C#^5$ (bar 16) and $E^b^5$ (bar 21) functioning, respectively, as complete lower and upper neighbours.

In short, the first interpretation involves two, simultaneous incomplete major-minor neighbours, $C/C#$ to $D$ and $D/D^b$ to $C$, while the second recognizes two large-scale PC prolongations, one of $C$ (involving $C^4$ and $C^5$), and one of $D$ (involving $D^3$ and $D^5$). The end result of either interpretation is the inversion and register shift of the prolonged pitch extremities of the 'a'-section. System (d) of Example 58 summarizes this relationship—one which, along with the return to the original tempo and dynamics, and quasi eco indication in the score, strengthens the allusion to the 'a'-section suggested earlier.

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14 "Pitch-class (PC) neighbour" refers to registraly non-specific neighbour notes.

15 The PC's C and D, in fact, figure very prominently in the auditory experience as a result of the aforementioned outer-voice prolongation and linear directedness to measure 22.
Example 58. Linear structure of the 'b'-section and its relationship to the 'a'-section.
Linear progressions involving lateral voice crossing

As noted in Chapter II, the most perceivable linear connections in this idiom are those involving movement by semitones and whole-tones. In measures 1-12 each instrument articulates two pitches between rests and, although in the first nine of these measures movement between rests is by step, movement across rests is often by leap. In order to discern more extended linear connections, stepwise movement across the five-voice structure must be considered (i.e., lateral voice crossing). Two classifications of linear events involving lateral voice crossing will be defined for the purposes of this paper: principal and subordinate. The former is characterized by traversal of the entire range of the 'a'-section, thereby connecting pitch extremities (i.e., E3 and B3 in measures 2-5, and D3 and C4 by measure 7). Voice crossings which connect D3 and C4 represent a type of lateral prolongation—one which complements the linear prolongations effected by the outer-voice movement just examined.

Three conditions characterize a lateral voice-crossing event as subordinate: first, it may not span the entire range of the 'a'-section (or it would be a "principal" progression); second, it must arrive on one of the two pitch extremities; and third, it must originate—be spawned—from a principal progression already underway. Concerning the third condition: at some point a principal progression may have two available stepwise connections, one in the direction it started (i.e., the continuation of the principal progression), and the other in the opposite direction. If the progression which branches off in the opposite direction arrives back at the starting pitch of the original principal progression
it is considered to be a subordinate linearization. 16

Stepwise pitch connections effecting these lateral voice-crossing events involve pitches which emerge as (audibly) prominent through timbral, dynamic, or articulative exposure. These three types of "exposed" connection will now be discussed in greater detail.

Timbral connection

Semitone or whole-tone movement in one particular instrument, either in the same voice or across voices, 17 as indicated by a diagonal arrow, qualifies as a timbral connection. In Example 59, two such connections are boxed on system (a)—the same "voicing" arrangement as Example 57—and summarized on system (b). The first instance of connection in Example 59 occurs in the same voice, while the second involves voice crossing.

Connection through dynamic exposure

Movement at mezzo forte to a pitch which is a semitone or whole-tone above or below the preceding pitch of the progression (heard in another instrument and which continues to sound) defines connection through dynamic exposure. This particular connection always involves two instruments, the first one sustaining its pitch after the second one continues the linear progression with its dynamically exposed pitch; refer to Example 60. 18

16 If at some point a principal progression has two available stepwise connections, each in the same direction as it started (e.g., from G to C and G to F), both of which continue in that direction and arrive on the lower pitch extremity (the upper extremity if the lines are ascending) these are considered to be, and notated as, two separate principal progressions occurring over different time spans.

17 Voices, remember, are linear continuities comprised of tones of equal position in successive verticalities (regardless of instrumentation).

18 In this particular type of connection, dynamic exposure is of primary importance. Compare this with the first type where mezzo forte accent is secondary to the aspect of timbral consistency.
Example 59. Two instances of timbral connection in lateral voice-crossing events.

Example 60. One instance of connection through dynamic exposure.
Connection through articulation after a rest

When a pitch is articulated after a rest, and is a semitone or whole-tone above or below the preceding pitch of the progression (again, heard in another instrument and which continues to sound), it may be heard to continue the linearization across voices. Example 61 illustrates this third condition of linear progression through lateral voice crossing.

Example 61. One instance of connection through articulation after a rest.

Notice in the second and third criteria (i.e., Examples 60 and 61) that the instrument which sounds the new pitch of the progression (be it through dynamic or articulative exposure) does not have to move by step from its own preceding note. Rather, the stepwise connection occurs from an already sounding instrument to the one which provides the exposed pitch.

While many brief connections may be discerned, based on any one of
the three criteria stated above, it is the joint consideration of these principles with the conditions of principal and subordinate linear events, defined earlier, which reveals linear continuity in the opening twelve measures of the piece.\(^{19}\) System (a) of Example 62 consists of the same "voice" representation as Example 57 (used to illustrate outer-voice prolongation), here, up to measure 12 only. System (b) is comprised of the various principal and subordinate voice-crossing events defined through application of the criteria stated above.

All occurrences of D\(^3\) are approached by a principal voice-crossing progression; D\(^3\) of bars 7 and 10 are also departure points for lateral progressions to C\(^4\). Of the occurrences of C\(^4\), all are approached by a lateral progression (principal or subordinate), but not all are points of departure for descending lateral connections to D\(^3\). As it turns out, instances of C\(^4\) which fail to initiate voice-crossing progressions do not appear adjacent to occurrences of D\(^3\). Remember that, in the preceding discussion on outer-voice prolongation, a C\(^4\) was labelled primary if it occurred next to a D\(^3\), and secondary if it appeared "alone." It is consistent, then, that of the C\(^4\)'s which are not initiators of descending lateral progressions, all are secondary by definition.

System (c) of Example 62 offers a summary of the interacting lateral progressions. Those on the top staff progress toward and away from

\(^{19}\) Although bars 13-15 are part of the 'a'-section, increased rhythmic activity, slow dynamic fluctuation relative to pitch changes, and absence of rests preclude linear connections as defined by the asserted criteria of lateral voice crossing. It is interesting that, while bars 15-16 have been defined as transitional, a dissolution of parametric continuity is already emerging in bars 13-15 as suggested by the changes noted above (i.e., rhythmic, dynamic, and articulative), and by the conditional changes regarding outer-voice prolongation described earlier.
Example 62. Linear progressions involving lateral voice-crossing in measures 1-12.
prolongational points noted earlier, while those on the bottom are more extended and overlap the former progressions.

Connections between dynamically exposed pitch-pairs

The concept of dynamically exposed pitch-pairs was defined earlier as manifesting a particular mode of rhythmic grouping. To recapitulate the derivation of pitch-pairs, it was noted that in measures 1-12 each instrument features a succession of linear dyads separated by rests. Pitch changes between rests occur at or very near the peak of dynamic intensification at *mezzoforte*—hence, dynamically exposed pitch-pairs. At this point we are concerned with the actual pitch content of such pairs, and their relationship to surrounding pairs. Although contiguous pairs do not give rise to stepwise continuities which traverse or prolong outer-pitch extremities, as in the two modes of linear connection previously described, three details of this aspect of linear organization are worth noting.

The first involves local prolongation of specific pitches through neighbour motion provided by intervening pitch-pairs. In Example 63 these instances of low-level prolongation are noted on system (c). System (a) is the previously employed linear representation of pitch content, while system (b) is a summary of the dynamically exposed pairs. In the latter, each pair is slurred and the first pitch of each is notated just prior to changing rather than at its actual point of inception [since it is first articulated at *pianissimo* and is therefore most perceptible just prior to changing (i.e., at *mezzoforte*). In most pitch-pair groups (i.e., groups as separated by dotted vertical lines and which correspond to those of Example 54) the first pitch is prolonged through either a double neighbour or major-minor neighbour as indicated on system (c) of the graph.
Example 63. Connections through dynamically exposed pitch-pairs in measures 1-14.
Occasionally the interval of a third will approach the final pitch of the prolongation as in measures 11 and 12. Because the first pitch of each group is not always a pitch extremity of the section (e.g., D⁴ or C⁴), the connection of pitches in this manner results, at times, in low-level "inner-voice" prolongations, e.g., measures 4-5, 6, 10, and 11-12.

Perhaps more significant is the progressive expansion of intervals occurring between (linking) pitches of individual pairs. Below system (c), the designation m/M2 suggests that, up to measure 10, movement between the rests in each instrument is by step. In measure 10 this is expanded to include minor thirds and by measure 12, major thirds. This might be viewed as another manifestation of the expansion concept discussed in the preceding chapter.

A third detail of interest concerns measures 13-15, two bars which have already been mentioned in connection with the dissolution of several patterns. For example, heightened rhythmic activity in these measures was said to render vertical sonorities and outer-voice prolongations more difficult to discern. Lateral voice-crossing connections were also found to stop short of bar 13. To be added to this list of departures is the absence of pitch-pairs separated by rests; rather, linear continuity in each instrument is now more apparent. However, one final dynamic "swell" takes place in each instrument, again, exposing a pair of pitches. But rather than occurring contiguously, the pairs overlap as a result of increased rhythmic activity. The dynamically exposed pairs in question are bracketed on system (a) of Example 63. A low-level prolongation of C⁴ (through a major-minor lower neighbour) is perhaps the most significant outcome of this dynamic fluctuation [see system (c)]; it reinforces the
Summary

Three modes of linear connection utilizing stepwise motion have been examined in the foregoing section: outer-voice prolongations, lateral voice-crossing events, and low-level prolongations through dynamic exposure. In the first of these, $D^3$ and $C^4$—the pitch extremities of the 'a'-section—were simultaneously prolonged, and adjacent articulations of each were labelled primary. The two-voice structure of the 'b'-section was shown to be a continuation of these prolonged pitch extremities. In the second mode of linearization, three criteria involving timbre, dynamics, and articulation were used to establish lateral voice-crossing events which connect $D^3$ and $C^4$. Outer-voice prolongations and lateral voice-crossings were said to complement each other in maintaining the pitch extremities of the 'a'-section. The connection of dynamically exposed pitch-pairs in close proximity revealed low-level prolongations of inner voices as well as a particular mode of expansion. Concerning the latter, movement between rests was seen to expand from minor and major seconds in the first ten measures to minor and major thirds in bars 11 and 12. Linear continuity would seem to be tightly controlled through the modes of linear connection suggested in this section.

Harmonic Details

In the previous chapter, consonance and dissonance in, and functional relationships between, verticalities were stated as being two central issues of harmonic pitch organization. Concerning the first of these, semitone and

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$^20$Given that only the prolongation of $D^3$ and not $C^4$ is continued in the subsequent transition (measures 15-16), this final maintenance of $C^4$ through dynamic exposure has added significance.
whole-tone content will be used here, as it was earlier, as a main criterion for classifying harmonic quality. Because of textural consistency in the first twelve measures (already noted), that portion of the 'a'-section will be dealt with first. Measures 13-15 (the transition), and the 'b'-section will then be examined.

Measures 1-12

Underlying the five-part independent texture of measures 1-12, harmonically, is a continuum of changing vertical sonorities. Although from one aggregate to the next only one pitch is changed, harmonic quality may be affected considerably. The reader is referred to Example 64 where, in system (a), the previously employed pitch representation is given. The harmonic quality of each verticality must be established in order that higher-level relationships be discerned. The criteria for classifying these sonorities are relatively simple for two reasons: all but two of them contain five members, and the sets are registrally spaced within one octave.21

In the left column of Example 65 (p. 149) all possible combinations of the first two interval-vector entries for five-member sets and two combinations for four-member sets are given. For the purpose of this study, semitone content is considered the primary determinant of consonance-dissonance quality; each interval-class 1 (per verticality) is therefore assigned a value of 4. Whole-tone content is used as a further criterion to differentiate between sets having the same semitone content; each interval-class 2 is given a value of 1. When these values are applied to the combinations in the first column, qualitative totals are determined;

21 Semitones and whole-tones would, presumably, have to be treated different in sonorities where they appear registrally displaced by one or more octaves (i.e., as compound intervals).
Example 64. Harmonic structure.
Example 65. Consonance-dissonance criteria and C-D factors.
<table>
<thead>
<tr>
<th>a, b of Interval Vector</th>
<th>C-D Quality IC 1=4, IC 2=1</th>
<th>C-D Factor</th>
<th>Representative Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,3</td>
<td>19</td>
<td>(Diss.) 15</td>
<td>0,1,2,3,4</td>
</tr>
<tr>
<td>3,3</td>
<td>15</td>
<td>14</td>
<td>0,1,2,3,5</td>
</tr>
<tr>
<td>3,2</td>
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<tr>
<td>0,0</td>
<td>0</td>
<td>1</td>
<td>0,3,6,9           (Cons.)</td>
</tr>
</tbody>
</table>
these appear in the second column. The factors 4 and 1 were selected in order that the qualitative totals reflect semitone primacy, particularly across groups where whole-tone content is radically different. For example, a set with three semitones and one whole-tone is presumed more dissonant than one with only two semitones and three whole-tones. Higher whole-tone content, then, only affects harmonic quality of sets with equal semitone content. Qualitative totals are adjusted to consecutive numbers for ease of reference and listed in column three; these are henceforth termed consonance-dissonance factors (or simply C-D factors). The right-hand column consists of representative sets from the opening twelve measures.

The C-D factors established by the process explained above are indicated above the verticalities on system (a) of Example 64. With respect to the frequency of the various factors, at least three statistical details are noteworthy. The most frequently used sonorities are those of factors 9 and 10; they occur 12 and 16 times respectively. Also, the number of sonorities of C-D factor 10 and above is approximately that of factor 9 and below—respectively, 39 and 36. Verticalities of factor 9 and 10 might be considered "average" reference points based on these data. Finally, only one verticality of C-D factor 1 is used and one of factor 15, and both occur in relatively close proximity (e.g., measure 12).

Regarding specific locations of the various sonorities of a given harmonic quality, two important relationships may be discerned, both of which concern instances of consecutive verticalities of the same C-D factor. The first also involves recurring sets of the same factor. Referring back to Example 64, system (b) consists of the instances of D^3 and C^4 prolonged through the techniques outlined in the previous section. Noteworthy is the fact that most occurrences of D^3 and C^4 are articulated--
in a sense "harmonized"—by verticalities of C-D factors 9 or 10—the two most widely used in the piece. This reinforces the previously asserted "referential" property of these two harmonic qualities. These particular connections are indicated by the line, \[ \], above each staff on system (b). Also of import is the use of consecutive verticalities of equal harmonic quality in two of the three instances of adjacent arrivals on D⁴ and C⁶ (defined earlier as "primary" points of prolongation). In measures 9-10, for instance, both pitch extremities are accompanied by aggregates of C-D factor 3, while those in bar 11 are of the factor 10. These associations are indicated on system (b) by the diagonal line \[ \].

A second important relationship involves interaction between harmonic quality and dynamic fluctuation. Adjacent C-D factors of the same magnitude which represent verticalities involved in this interaction are bracketed above system (a) on Example 64. These factors are also indicated on Example 66, a reprint of an earlier example used to illustrate the rhythm of dynamically exposed pitch-pair groups. As the graph reveals, at least some contiguous mezzoforte pairs within a given group occur in vertical sonorities of equal harmonic quality. The ebb and flow of the asserted rhythmic pattern would seem to be strengthened by this aspect of harmonic structure.

Measures 13-15 (the transition), and the 'b'-section

As noted throughout this chapter, measures 13-15, although part of the 'a'-section, exhibit departures from the textural and rhythmic design of the preceding measures. The surface "business" of these bars continues into the subsequent transition, the latter featuring further rhythmic intensification as well as a reduction in textural-density to three components, all of which operate between D⁴ and F⁴. The continuous
Example 66. Recurring sets of equal harmonic quality in units of dynamically exposed pitch-pairs.
articulation of $D^3$, $D\#^3$, $E^3$, and $F^3$ in the transition gives the effect of a reiterated four-note sonority, despite the presence of only three linear components. The lack of harmonic eventfulness in the 'b'-section renders individual sonorities extremely perceptible.\textsuperscript{22} Obvious is the wedge-like expansion from a unison $C\#^5$ to the four-note set $B^4, C\#^5-D^5-E^b5$; interesting is the fact that this set, despite its cardinality, has a C-D factor of 10—the most frequent of those in the 'a'-section (most of which contain five members). Finally, a detail of harmonic organization introduced in the previous chapter may have application in the final dyad of this piece. Specifically, the whole-tone sonority $C^5-D^5$ may be heard as a consonant "resolution" (in a relative sense) from the penultimate chromatic verticality $B-C\#-D-E^b$. In this sense it is suggestive of the "cadential" attribute of the whole-tone noted already in the third and fourth pieces.

Summary

Consonance and dissonance in, and consequent functional relationships between, vertical sonorities were stated as being two main concerns in establishing principles of harmonic organization. In measures 1-12, five-note verticalities were identified as to consonance-dissonance "factors," arrived at through assigning values of 4 and 1 to semitones and whole-tones in their make-up. A correlation between verticalities with the most frequently used C-D factors, 9 and 10, and the prolongation of $D^3$ and $C^4$ was revealed. Also found to be of significance is the association between consecutive sonorities with the same harmonic factor, and peaks of the units defined by successive dynamically exposed pitch-pairs. In the 'b'-section, harmonic rhythm is tied to rhythmic activity in general because each articulation sounds a new verticality. In the 'b'-section, the harmonic rhythm is most often slower than the level of impulse-density because of the reiteration of pitches.

\textsuperscript{22}In the 'a'-section, harmonic rhythm is tied to rhythmic activity in general because each articulation sounds a new verticality. In the 'b'-section, the harmonic rhythm is most often slower than the level of impulse-density because of the reiteration of pitches.
section, the largest sonority (with respect to cardinality) is the penultimate verticality in bars 21-22. It was found to be of a factor 10—the most frequently used in the piece. Finally, the closing dyad of the piece was suggested to be another instance of the semitone-to-whole-tone cadential resolution asserted in Chapter II.

**Connective Factors Between the First and Third Pieces and Interruptive Aspects of the Second**

At the beginning of the second chapter, instrumentation-density and instrumentation were said to be responsible for apparent subgroupings of pieces in the quintet. Other connective aspects have since been defined (e.g., articulative and tempo similarities in, and PC connections between, the fifth and sixth pieces). A number of factors point to a characterization of the first and third pieces as a large-scale continuity, interrupted by the second piece. For example, pieces 1 and 3 are ensemble pieces at $J=40$, and scored for five instruments (only one of which is different). Each features an opening polyphonic section in which all instruments are marked *dolcissimo*, move in predominantly stepwise motion, and do so between the dynamic range from *pianissimo* to *mezzoforte*. Also common to both pieces is the fact that each opens in one clearly defined register and ends in another. In this regard, the register of the first piece's opening is restored at the end of the third piece, and the closing register of the first piece is that of the third piece's opening. (This will be illustrated shortly.)

In addition to the similarities listed above, each piece features a "dramatic event" after the opening polyphonic section. In the first piece it is in the form of a five-part unison (e.g., $C\#^5$ of bar 16), while in the third, an octave-doubled theme provides the dramatic contrast. The
two pieces may also be seen as related in terms of proportion. In each piece the dramatic event begins at the golden section of their respective lengths. Piece No. 1, for example, is 100 beats long. The golden section is 62, and the unison C♯ enters in beat 63. In the second piece, 64 beats long, the octave-doubled theme enters in beat 39, the golden section of 64. On a larger scale, pieces 1 and 3, taken as an uninterrupted continuity, are themselves in a golden section relationship. The twenty-five measure first piece is the golden section of the total forty-one bars of both pieces.

Pitch relationships between the opening and closing of the first and third pieces may also be discerned. These are indicated on the second system of Example 67, the top system being a summary of structural points in the pieces. The bottom system illustrates the aforementioned registral connections. The first of two important details in Example 67 is the senza diminuendo marking which appears with the final dyad of the first piece, possibly suggesting a connection to something which occurs later (e.g., the opening of No. 3?). The attacca indication at the end of the piece would also seem to imply a continuation. The second detail concerns the opening interval of a fifth in the first piece, linearized at the end of the third piece. In this sense, the B³ which is the ultimate arrival point of the third piece, provides a degree of large-scale closure from the first piece.

While the conditions outlined above suggest connective aspects between pieces 1 and 3, a number of contrasting features support characterizing of the second piece as an interruption. First, it is a

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²³In piece No. 1 the fifth represents the pitch extremities of the initial sonority. In piece No. 3 the linearized fifth occurs in the ascending trill of the clarinet in bars 12-16.
Example 67. Pitch relationships between the first and third pieces.
soloistic piece with an often fragmented texture, fluctuating notated meter, and a quicker tempo. Second, it has a much wider range than the pieces which frame it, and it features frequent and abrupt changes in register and dynamics. The note at the end: "stop suddenly as though torn off," suggests a denial of direct continuity to the opening of the third piece.

Summary

While instrumentation-density and instrumentation were said earlier to suggest subgroupings, a number of different factors add support to the notion of a connection between the first and third pieces. Among the connective factors are aspects of texture, tempo, articulation, dynamics, register, proportion, and pitch connection. The use of a unison or octave dramatic event is also common to both. Finally, several contrasting features of the second piece (e.g., texture, tempo, and dynamics) were said to qualify it as an interruption of the continuity between pieces 1 and 3.

Summary

The foregoing chapter is a detailed analysis of the first piece of the quintet. Aspects of formal delineation, textural structure, rhythmic and metric design, and pitch organization were dealt with individually and interrelationships noted where applicable. The first piece was found to be consistent, in many ways, with other ensemble pieces in the quintet, and concepts such as impulse-density and consonance-dissonance criteria, introduced in Chapter II, were found to have application here. Other concepts (e.g., textural quality, textural space, and interaction of element-rhythms) are specific to the analysis of piece No. 1. Finally,

24 Ligeti, Ten Pieces, p. 11.
the notion of piece subgrouping, also introduced in the second chapter, was found to be reinforced in elements of connection between the first and third pieces.
CHAPTER IV

ANALYSIS OF PIECE NO. 10

Introduction

In the analysis of piece No. 10 each parameter is examined individually as in the previous two chapters. The main formal sections are as follows:

- Delineating Factors of Formal Segmentation
- Aspects of Textural Structure
- Principles of Rhythmic and Metric Design
- Modes of Pitch Organization
  - Linear Details
  - Harmonic Details
- Connective Factors Between the Ninth and Tenth Pieces

Summary.

As in the analysis of the first piece, some concepts here are extended applications of those introduced in Chapter II, while others are particular to the tenth piece.

Delineating Factors of Formal Segmentation

Unlike other soloistic pieces in the quintet (e.g., Nos. 2, 6, and 8), where formal sections and disparate musical ideas often coalesce into a continuous stream, the tenth piece features formal segmentation which is more distinct and pronounced. Two main sections may be discerned: measures 1-12 and 13-22 and, although their surfaces may appear similar, many details underlie the individuality of each section. Such details concern parameters...
of texture and rhythm, as well as aspects of linear and harmonic pitch organization; these will be disclosed in subsequent sections of this chapter.

More obvious form defining factors, however, include the *general pause* in measure 12, prior to, and after which thirty-one beats (i.e., quarter-notes) of actual sound occur. Tempo indications also reinforce this point of segmentation; witness the *pochiss. rall.* in bars 10-12 (accompanied by a written *ritardando*), and *a tempo* and *ex abrupto* indications in bar 13. The melodic structure of the bassoon part is another factor of delineation. Each formal section, for example, may be heard to consist of a disjunct portion followed by a conjunct "cadenza." Dynamic indications accompanying these internal segments also contribute to the individuality of each formal section. In the 'a'-section the disjunct portion is at *ff* and the cadenza at *p*, while in the 'b'-section these are replaced by *fff* and *pp*. In short, the loud part of the 'b'-section gets louder and the soft part gets softer, resulting in a particular mode of expansion: \( \text{ff} \rightarrow \text{fff} \) \( \text{p} \rightarrow \text{pp} \), the 'b'-section having a wider dynamic range. And finally, fluctuation in instrumentation participation is in agreement with formal segmentation as defined above. The piccolo, silent during the disjunct portion of each section, enters in the cadenza, thus marking the end of each main formal division.

Summary

Many factors of formal segmentation involve details of textural and rhythmic structure, as well as those of pitch organization, to be examined in forthcoming sections. Patent indicators of formal delineation, however, include the *general pause* in bar 12, tempo markings, melodic contour of the bassoon part, dynamics, and instrumentation.
Aspects of Textural Structure

In the second chapter, two textural configurations were said to operate in the soloistic pieces of the quintet. In one of these types, accompanying instruments establish a particular textural pattern over which the featured instrument asserts itself in a contrasting manner. The other is comprised of a continuous linear event, effected in the featured instrument, with either "contrapuntal fragments" or "sporadic doublings and colorations" contributed by the remaining instruments.¹ The essential difference, then, is that in the first type two simultaneous textural elements comprise the overall textural configuration, while in the second only one is operative. The final piece of the quintet is texturally structured according to the principles of the latter type. Specifically, the bassoon is featured in a nearly continuous, disjunct² linear event while the remaining instruments provide unison and octave doublings, and semitone and whole-tone colorations throughout.³

In addition to the textural arrangement defined above, two other conditions are noteworthy. One is a "cadenza" figure consisting mainly of stepwise motion (in contrast to the first type). Instances of this occur

¹The latter designation refers to the textural quality of interaction between the bassoon and other instruments. For example, contrapuntal fragments were noted as being brief, rhythmically independent passages which appear superimposed on the featured instrument's part. This results in periodic fragments of polyphony. Doublings and colorations, on the other hand, are characterized by rhythmic interdependence; their vertical alignment results in brief instances of homophony.

²The disjunct disposition of the bassoon line, featuring abrupt and extreme register changes, suggests an implied multi-voiced linear structure— one which will be illustrated later in the chapter.

³Semitone colorations refer to a pitch (in an accompanying instrument) vertically aligned with, and a semitone above or below, a particular bassoon note. That designated as a whole-tone coloration occurs a whole-tone away.
in measures 5-6, 8-9 continued in 10-11 (piccolo), and 16-18 (the first bar occurring in the clarinet). These figures contrast the disjunct fragments in two other respects: they occur at \( p \) or \( pp \) (rather than \( ff \) or \( fff \)), and doublings and colorations do not occur during their execution. The third textural condition is one of silence—a device which will be shown to have a marked effect on pacing and progression in the piece. Two aspects to be examined here are formal structure as defined by the three textural conditions stated above, and textural progression as manifest in density and spatial fluctuations. The latter concept deals with instances of doubling and coloration specifically.

Formal Structure as Defined by Textural Conditions

As suggested earlier in the chapter, the piece may be heard to consist of two main formal sections, each exhibiting the use of the three textural conditions defined above. For instance, in Example 68, a line-graph representation of the piece, the 'a'-section is shown to be comprised of two phrases, each of which consists of three disjunct fragments and a cadenza. Large units of silence separate disjunct fragments in the first phrase while these are replaced by brief rests in the second.\(^4\) Generally speaking, the disjunct portion of the second phrase is more "condensed" as a result. Each phrase concludes with a cadenza, approached from the final disjunct fragment without interruption. (As will be shown later in the chapter, the rhythmic structures of the cadenzas have a significant effect on pacing.)

While the 'b'-section also features two phrases, their internal

\(^4\) In that the use and effects of rests concern rhythmic progression and recession, they will be examined in the next section, on rhythmic design.
Example 68. Line-graph representation of piece No. 10.

\[\text{\textbf{[\text{\(\phi\)}}] = \text{octave doubling}}\]

\[\text{\textbf{(\(\phi\)) = semitone or whole-tone coloration}}\]

\[\text{p.d. = phrase divider}\]
structures are somewhat different from that of the phrases outlined above. For instance, the first phrase is comprised of only two fragments and does not appear to conclude with a cadenza (at least not one which adheres strictly to the characteristics of previous cadenzas). On close inspection, however, a brief, disjunct fragment may be heard to separate the two phrases (labelled "p.d." or "phrase divider" on the graph)—one which, in some respects, has a considerably close relationship to previous cadenzas, particularly the first one (i.e., measures 5-6). Its reduced dynamics and lack of doublings and colorations are factors specific to previous cadenzas and, although it occurs as a disjunct fragment, its order of PC unfolding is clearly stepwise: A♭-G-G♭, E♭-E-F. In fact, apart from A♭, these are the opening PC's of the first cadenza (cf. bars 5-6 where A begins the cadenza). Its disjunct structure, however, denies it the explicit linear directive quality of preceding cadenzas, and the rests which frame it isolate it from surrounding phrases. For these reasons it may be considered a separate entity—a "divider"—rather than an integral part of the phrase which precedes it (as with previous cadenzas).

The second phrase of the 'b'-section contains no such subdivisions but, rather, is one continuous gesture culminating at the end of bar 15. Factors of doubling, coloration, textural-density, register, rhythmic design, and pitch organization (all of which are discussed later)

5 The "rest" which follows the brief fragment is actually in the form of a breath mark (') of which Ligeti states that its duration is to be no more than a sixteenth-rest ('). See Ten Pieces, p. 34.

6 A sense of textural progression might be considered to arise from the increasing "urgency" of the phrases (i.e., the tendency from a texture of multi-fragmented phrases to one of continuity).
contribute to the characterization of the D^5 in bar 15 as a culmination point. The final cadenza is therefore not considered integral to the second phrase but, rather, as a "post-cadential extension."

The phrases of the 'a'-section, then, are consistent in their structure: three disjunct fragments plus an integrated cadenza. Those of the 'b'-section are consistent neither among themselves nor with those of the opening; rather, they are comprised of two and finally one fragment, each without an integrated cadenza. One common detail of textural design, however, concerns the employment of doublings and colorations. In the first phrase of each section semitone and whole-tone colorations figure most frequently, whereas the second phrase of each is marked by the use of octave doublings. These two modes of textural interaction are responsible for particular qualities of progression, to be disclosed next.

Textural Progression as Manifest in Density and Spatial Fluctuations

Because interdependent doublings and colorations are the only two modes of interaction between the bassoon and other instruments, they also represent the only means of textural thickening. Semitone and whole-tone colorations influence small-scale spatial fluctuation and, with octave and unison doublings, affect the fluctuation of instrumentation-density (or simply the number of instruments sounding at any given time). Octave doublings themselves may be heard to affect overall textural space, a more global consideration. Textural-density and textural space will now be discussed in greater detail.

Textural-density

Referring again to Example 68, instances of coloration are bracketed ( ) and the number of members in each verticality circled.
Notice in phrase I of the 'a'-section that colorations articulate registrally highest points of the fragments, the first and last having three members and the middle ones, only two. Phrase II is similar in that high points are accented by colorations, each of which has two members. Phrase I of the 'b'-section exhibits a mode of progression in its exclusive use of colorations. Specifically, each of the first four instances contains two members (i.e., distinct pitches) while the coloration marking the end of the phrase contains four, the largest number heard in the piece. In consideration of the aforementioned instances of coloration, a large-scale progression towards points of greater density may be discerned. System (a) of Example 69 is a graphic representation of fluctuating coloration-density (one mode of textural-density) as defined above, the general progressive direction being depicted by the arrow above the graph.

Other modes of textural-density include fluctuations in the number of instruments involved in occurrences of unison and octave doubling. These are indicated on systems (b) and (c), respectively, on Example 69, the former peaking on the four-part unison on D⁵ in bar 15. System (d) illustrates instrumentation-density fluctuation, referred to earlier. The culmination point here is also D⁵ in measure 15.

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7 The number of members in a given coloration includes the bassoon pitch itself.

8 Notice also that the end of phrase I in the 'a'-section is articulated by a coloration of three members, the largest number heard to that point. The harmonic quality of these two verticalities is of significance and will be disclosed later in the chapter.
Example 69. Four modes of textural-density fluctuation.
Textural space

With reference to Example 68 once again (p. 165), the pitch content of each formal section is "boxed" into three groups (the 'b'-section featuring a fourth box at the very end). These represent "spatial fields," the temporal spans of which are roughly coincident with formal subdivisions, e.g., phrases, cadenzas, etc. Two details in connection with fluctuations in textural space within the 'a'-section are noteworthy. First, the lower pitch boundary of the first two spatial fields is $B^\#_1$ and, were it not for octave doublings in the second phrase, the upper boundary would increase by only one semitone, e.g., from $G^4$ to $A^4$. The octave doublings, however, extend the upper extremity to $F^\#^5$ and in an important sense provide registral preparation for the cadenza which follows. Second, as clearly indicated on the graph, the overall direction of registral space (not just register) is one of ascent. For example, not only is the end of the 'a'-section in a higher register than its beginning, but the spatial field is itself higher, e.g., compare $B^\#_1-A^7_4$ in the opening to $A^4-E^5$ in the final cadenza. This extreme spatial traversal, without return to the opening register, is itself a factor of "incompletion"—a registrally articulated "half-cadence."

Although octave doublings do not provide registral preparation for the final cadenza in the 'b'-section, a similar pattern of spatial expansion and ascent is nevertheless apparent. Here, the spatial boundary is expanded in both directions in the second field and is followed by a considerably narrower field as defined by the cadenza—a field which lies in the

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9 "Spatial fields" are registral spaces defined by pitch extremities of particular formal sections or, in this case, subdivisions of such sections.
uppermost register like that of the final cadenza of the 'a'-section. The overall direction of registral space is again one of ascent.

Two additional details regarding textural space in the 'b'-section are worth noting. One is the minimal, yet important expansion in overall space from the 'a' to 'b'-section. The dotted line connecting the middle spatial fields of each section exhibits this ascent from F#5 to A#5 (the lower boundary remaining B#1). The other is a subtle recollection of the opening register effected by the bassoon's final C#2 (the fourth spatial box in the 'b'-section). Although the relatively static spatial field and abrupt termination of the final cadenza may be viewed as factors of "openness," this brief registral allusion would seem to denote closure within the realm of textural space and registral traversal.11

Summary

Disjunct fragments in the bassoon accompanied by sporadic octave and unison doublings, and semitone and whole-tone colorations in the remaining instruments were said to define one textural element in the tenth piece. Conjunct, cadenza-like passages (without doublings and colorations) and extended periods of silence were noted as being two additional textural arrangements. Coloration-density, as well as that of unison and octave doubling, were said to define specific modes of textural-density revealing progressive intensification towards specific points in the piece.

Concerning these two cadenzas, it is interesting that the pattern of spatial definition in measures 9-11 is one of tapered contraction, while that of bars 16-19 is extremely static. Although generally apparent on the graph, the rhythmic activity of these cadenzas will later be shown to complement these patterns of spatial fluctuation.

In terms of linear pitch organization, additional reinforcement for the assertion of openness is offered; details appear later in the chapter.
Instrumentation-density, a fourth mode, was said to take into account all
types of instrument interaction be it in the form of doubling or coloration.
A climax on D\textsuperscript{5} in measure 15 was noted with respect to this aspect of
textural-density. Finally, textural space, affected by octave doublings in
particular, was also shown to reveal patterns of direction and expansion
throughout the piece.

**Principles of Rhythmic and Metric Design**

In viewing the rhythmic and metric design of piece No. 10 three
principles will be discussed: the function of notated barlines and their
role in arrival point definition, impulse-number proportions of phrase
fragments, and directed patterns of impulse-density fluctuation. In
considering the first of these, it has been asserted throughout this paper
that notated barlines are largely for ease of reading—a convenience of
notational organization rather than an indicator of accent-defined metric
units. It was also noted in Chapter II that notated barlines in soloistic
pieces of the quintet occasionally appear to be placed in order to mark
specific arrival points.\textsuperscript{12} The tenth piece is consistent with the first
of these assertions; it also features a clearly felt arrival point, but
one which is independent of the demarcation of notated barlines. The D\textsuperscript{5}
on the final sixteenth-note of measure 15 is the juncture in question and
is, as noted earlier, the climax point for (unison) doubling-density (e.g.,
the four-part unison) and instrumentation-density (e.g., all five instruments
sound at once). As will be explained later, linear continuities also
culminate at this point and implications of PC centricity (on D) are realized
here. It is clearly (and audibly) the "structural" arrival point of the

\textsuperscript{12}In these instances, "downbeats" were defined as to parameters
other than accent-delineated metric patterns.
entire piece and, yet, the barline is indicated just after it. The clarinet portion of the cadenza commencing in bar 16 has the effect of an "afterbeat" relative to the preceding, highly exposed arrival on D. Given this apparently contradictory barline (although it is not perceptible as such) the performer may treat the arrival on D differently from a situation where the downbeat occurs in accordance with the conventional association, that is, immediately after the barline. While a precise characterization of such a "treatment" is difficult, a feeling of "incompleteness" or "inconclusiveness" is likely to accompany the arrival on D—a feeling which the performer may, in fact, convey to the listener. The resulting tension is dissipated, although not completely, in the ensuing cadenza.

Impulse-number proportions of phrase fragments is the second principle of rhythmic design to be discussed and, in that all instrument interaction is in the form of interdependent doubling and coloration, the rhythmic pacing of the piece is essentially dictated by that of the bassoon part itself. Example 70 consists of an impulse-density graph with impulse-number proportions of phrase segments indicated above the graph, and two levels of progression and recession depicted below. Regarding impulse-number proportions (i.e., the total number of impulses and "active" beats in each segment), disjunct portions of the 'a'-section

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13 The rhythmic "steadiness" of the cadenza (to be commented on later) and abrupt termination of activity (alluded to earlier) result in the retention of a certain degree of intensity. My own view is that only after the piece is actually finished is the intensity fully dissipated.

14 The large units of silence have not been included in the impulse calculation of active beats. Also, because of the rhythmic interdependence of the doublings and colorations, they have not been counted as separate impulses.
Example 70. Impulse-number proportions of phrase fragments and impulse-density graph.
and the first cadenza (measures 5-6) are relatively balanced. The six active beats of the first phrase, however, occur over seventeen beats of actual time, the three disjunct fragments being separated by large periods of silence. A "tentative" quality results—one which is replaced by a sense of drive and urgency in subsequent phrases where disjunct fragments are separated by a sixteenth-rest at most. These two tendencies are reinforced by the rhythmic structure of each section's final cadenza. In bars 8-11, for example, a steady decline in rhythmic activity creates a "hesitant" ambiance, reinforced by the seemingly "reluctant" pitch departure to $E^5$ in bar 11 (piccolo). The 'b'-section's cadenza, on the other hand, exhibits a steady rhythmic drive matching that of the preceding two phrases.

The extended lengths of the cadenzas in measures 7-11 and 16-22 (i.e., "extended" relative to the disjunct portions and cadenza in bars 5-6) may be viewed as functional necessities. The "pressing forward" of the 'a'-section's second phrase generates considerably more momentum than its first phrase and therefore requires a greater "wind-down" period for the dissipation of energy. In addition to this, it not only concludes the second phrase but punctuates the end of the 'a'-section as a whole.

Concerning the final cadenza of the piece, the continuation of rhythmic activity in bar 16 and sustained $D^5$ connecting bar 15 to 16 are factors which suggest that it operates within or at the level of the

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15 Regarding the cadenza in bars 8-11, the bassoon portion (curiously that which is rhythmically identical to the first cadenza, i.e., \[\text{[16]}\]) is also roughly balanced with the other phrase portions.

16 This particular pitch departure marks an important point in the structure of linear pitch organization, one which will be exposed later in the chapter.
'b'-section. On the other hand, its "post-cadential" quality noted earlier, and extended length (e.g., longer than the preceding portion of the 'b'-section) suggest that it also operates at a higher level, punctuating the end of the piece as a whole. The inactivity of bars 19-21 may be heard as a (partial) "wind-down" period for the rhythmic energy of the opening of the cadenza, the 'b'-section, and on a still larger scale, for the entire piece.

In consideration of the impulse-density graph, the apparently "balanced" phrase fragments discussed above (i.e., balanced in relative numbers of impulses, irrespective of rhythmic configurations) reveal progressive and recessive tendencies already alluded to. As suggested in level (a) below the graph in Example 70, phrase fragments of the 'a'-section exhibit brief rhythmic progressions, growing in intensity and culminating at the beginning of the cadenza in measures 7-8. The cadenza then effects a definite rhythmic recession to bar 11. The 'b'-section as depicted in level (a) reveals little in the way of rhythmic progression; a slight intensification towards the arrival on D at the end of bar 15 may, however, be discerned. Level (b) illustrates overall patterns of rhythmic direction, the 'a'-section revealing a progressive unit followed by a recessive one, and the 'b'-section exhibiting a relatively consistent level of activity, the recession of which occurs implicatively through the inactivity of bars 19-21.

Summary

Although barline-suggested downbeats (like those found in other soloistic pieces) are essentially non-existent in the tenth piece, the D⁵ in bar 15 emerges as a structural arrival point exposed through textural-density. An apparently contradictory barline was noted at this point. In
addition to this aspect of rhythm, impulse-number proportions of phrase fragments were found to be approximately balanced, and their rhythmic configurations, directed. Regarding the latter, the 'a'-section was depicted as a rhythmic progression followed by a recession, while the 'b'-section exhibited a relatively steady level of activity, the "wind-down" period of which occurs in the inactivity of the final measures.

Modes of Pitch Organization

Linear Details

In previous chapters we have observed linear events structured in a number of different ways. In No. 2, for example, pitch extremities of successive arpeggiations were found to reveal specific linearizations while in No. 4, two-note oscillations exhibited a comparable significance. Other factors such as dynamic exposure (No. 7), and unison transfer (No. 3) were also shown to generate stepwise linear connections of relative significance. And in No. 1, outer-voice prolongation and lateral voice crossing provided support for the maintenance of pitch extremities in a complete formal section thus revealing an aspect of large-scale pitch organization. Because of the textural primacy of the highly disjunct bassoon part and subordinate role of the other instruments, this study of linear organization in the tenth piece will focus on registral connections in the bassoon part itself. A second mode of linear organization, PC unfolding, will take into account semitone and whole-tone colorations provided by the oboe, clarinet, and horn.

Linear registral connections

In the light of the bassoon's highly disjunct structure, alluded to
above, it may readily be perceived as "multi-voiced." Specifically, pitches may be heard to form stepwise continuities unfolding in four registers simultaneously: i, $\frac{\text{f}}{\text{f}}$; ii, $\frac{\text{f}^\#}{\text{f}^\#}$; iii, $\frac{\text{d}^\#}{\text{d}^\#}$; and iv, $\frac{\text{g}^\#}{\text{g}^\#}$. The justification for these registral designations involves motivic considerations—an aspect to be explained more fully later in the chapter. Its role in registral definition, however, is illustrated in the first eight notes of the bassoon part as shown in Example 71. The top staff consists of the pitches as they occur in the score; each of the lower staves reveals a four-note motive, the lowest pitch of each initiates one of the four registers noted above.

Example 71. Motivic definition of registers i and ii.

The same four-note motive in the next octave (i.e., $B^\flat_3$ to $D^4$) occurs over a much longer span, but fails to continue to $D^4$ at any point

17 In this sense linear organization here is not completely unlike that found in the second and fourth pieces.
in the piece. Register iii therefore consists of only the four-note motive itself. The registrally "isolated" $E^4$ then initiates register iv which continues up to $E^5$ by measure 11.

The reader is now referred to Example 72 in which all of the bassoon pitches are indicated on the bottom four staves of system (a) (corresponding to the four registers defined above). The top two staves show the doublings and colorations provided by the other instruments. (The latter are stemmed down to the appropriate bassoon notes.) System (b) shows the relatively foreground level of pitch organization in which the functions of all pitches in the bassoon part are designated. (Notational symbols are indicated to the left of Example 72.)

While linear progressions and prolongations on systems (b) and (c) are straightforward, several factors of pitch exposure are noteworthy. For example, certain rhythmic details serve to highlight structural pitches of linear progressions, particularly the ascending fourth, $E^4$ to $A^4$ (bars 3-5); here, each pitch of the ascent is preceded by a rest. In the case of $A^4$ a delay of progression replaces the rest. Its approach, in fact, is rhythmically similar to that of $F^4$ in bar 3 (cf. $\text{\textbackslash|\|\|}$).

In addition to this rhythmic detail and the more obvious disjunct approach and registral exposure, three of the four pitches are punctuated by a coloration in one of the remaining instruments. (The harmonic implications

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18 In registers i and ii the four-note motive continues up to $D^2$ and $D^3$ and eventually up to $A^2$ and $A^3$, respectively. The denial of $D^4$ in register iii is the main factor of separation between registers iii and iv. The PC $D$, in fact, will be shown to have structural significance in this piece as it did in Nos. 1, 4, 5, and 6.

19 While the bassoon extends up to $E^5$ only, the piccolo notes in bars 10 and 11 are considered to function in the linear connection and registral extension up to $E^5$; they are thus a continuation of the bassoon's cadenza, not simply doublings or colorations.
Example 72. First and second levels of linear pitch structure.

- primary linear progression
  (see text for criteria of "primary" designation)

- less exposed linear progression

- prolongation of a particular pitch
  (neighbours stemmed to beam, embellishing patterns to slur)

- pitch in parentheses is "relocated" for interpretation of a linear progression

- "secondary" prolongation
  (see text for criteria of "secondary" designation)

- denotes "reinterpretation" of the second pitch
  (see text for details)
of these colorations will be considered later.) Each of three other structural pitches in this register is approached by a rest: the re-established \( A^4 \) in bar 7 (which proceeds almost immediately to \( A^4 \)), \( A^4 \) which begins the 'b'-section (preceded by the general pause of bar 12), and \( A^4 \) two beats later (this pitch initiating the ascending fourth to \( D^5 \) in measure 15).

With reference to system (c), three details are noteworthy. First, the initial ascending progression, \( E^b \) to \( A^4 \), is counterbalanced in the 'b'-section with the descent from \( A^4 \) to \( F^4 \) (measures 13-15). The eventual continuation of the initial ascent up to \( E^5 \) is also mirrored, this time in the final cadenza's reiteration of \( E^4 \). A second detail concerns the continuation up to \( E^5 \) just mentioned and involves the "wave-slip" (\( \sim \)). At the second level [i.e., system (c)], the re-established \( A^4 \) (bar 7) is reinterpreted and enharmonically notated (as G#) to depict its status as a passing-tone to \( A^4 \). The same situation arises in bars 10-11 where the reiterated \( E^b \) is ultimately reinterpreted and enharmonically notated (as D#) to suggest its passing-tone quality to \( E^5 \). Through this higher-level pattern of reinterpretation brief progressions are connected to form a more comprehensive linear event.

The third detail of significance in the linear pitch structure pertains to the apparent tendency towards the PC D. The initial four-note motive, \( B^b-B-C-D^b \), for example, exhibits inclination to D, realized in

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20 That is, it is reinterpreted from its initial occurrence where it functions as a goal of motion.

21 The initial \( E^b \) also stands as a local arrival point, i.e., the goal of motion of the ascent from \( A^4 \) in bar 7.
register ii where D$^3$ is reached in bar 3 and prolonged until bar 15.\textsuperscript{22} In registers i and iii, however, the motive continually falls short of its respective D, hence the passing-tone designation of C$^#^4$ and C$^#^2$ in measures 15 and 21 respectively [see system (c)].

Systems (a) and (b) of Example 73 represent third and fourth levels of linear structure. Each reveals the five essential linear progressions in the piece, the highest, most encompassing level omitting the initial octave ascent from E$^b^4$ to E$^b^5$ and fourth progression, E$^b^4$ to A$^b^4$ to E$^b^4$. In short, E$^b^5$ and E$^5$ are considered jointly as an incomplete major-minor upper neighbour to D$^5$ (to which it moves in bar 15).\textsuperscript{23} E$^b^4$ and E$^4$, also an incomplete major-minor upper neighbour, do not however move to D$^4$. Concerning registers i, ii, and iii—predominantly unfoldings of the four-note motive, B$^b$-B-C-D$^b$—only in register ii is the motive continued to D; the others, as noted above, are left "hanging."

One final aspect of linear pitch organization concerns motivic structure, already discussed to some extent. Example 74 illustrates occurrences of the four-note motive (the notes of which are beamed) in registers i, ii, and iii. Apart from overlapping occurrences of the pattern in register i, it is interesting to note the interaction between motivic structures as such, and "anticipated closure" on the PC D (a tendency inherent in the motive itself). In register iii the second of

\textsuperscript{22}System (b) reveals the structural details of the D$^3$ prolongation: upper neighbour (bars 3-5), embellishing pattern (bars 6-7), and finally a descending linear approach from A$^3$ (bars 13-15).

\textsuperscript{23}As was noted earlier, this culmination point is also the climax of instrumentation-density (i.e., it is the only point where all five instruments sound at once) and (unison) doubling-density (i.e., it is the only PC doubled in four parts). The C$^#^5$ which accompanies it will be dealt with in the section on harmonic details.
Example 73. Third and fourth levels of linear pitch structure.
Example 74. Motivic organization in registers i, ii, and iii.

```
Example 74 consists of three staves...
```

two occurrences of the motive is complete in a motivic sense (e.g., it contains no B♭) and also in terms of PC closure (e.g., it does not continue to D). Register ii is unique in that the motive occurs only once and does extend to D³ whereupon the latter is prolonged; it is therefore complete in both respects. Finally, register i, motivically the most active, is "closed" with respect to motivic structure (the final C♯ being the fourth PC of the pattern) but open in terms of PC closure (i.e., in the sense of a D-centricity).

**PC unfolding**

Apart from modes of linearization involving pitch and/or PC connections, patterns of PC unfolding—specifically, twelve-note orderings—were also noted in Chapter II. While such patterns are not as consistently applied in the tenth piece as, say, the fifth, No. 10 does exhibit a particular mode of PC unfolding. Example 75 consists of three staves
representing coloration PC's, bassoon PC's, and total PC content. Segments corresponding to disjunct fragments, cadenzas, etc., established earlier, are numbered for ease of reference.

One immediate observation of importance concerns the chromatic or near-chromatic total PC content in each segment. Often the PC content of a whole fragment unfolds (in the piece) in a chromatic or near-chromatic fashion, in which case the "normal form" ordering of total content (i.e., the third staff of Example 75) resembles that of the bassoon part and colorations (i.e., the top two staves of Example 75). Segments 1, 4, 5, 8, 9, and 13 reveal this relationship. Others exhibit several smaller chromatic "subsets" which, when considered jointly and organized into normal form, again give rise to chromatic patterns, e.g., segments 2, 6, 10, 11, and 12. The patterns of unfolding in segments 3 and 7 reveal little in the way of stepwise PC connections, yet the normal form ordering of their respective total contents still display a near-chromatic PC linearization.

Concerning the third staff, total PC content of each segment is arranged in "normal form" in the direction indicative of the actual pitch unfolding in the music. That is, in all segments but nos. 4, 9, 11, and 13 PC's are ordered in an ascending pattern with the smallest intervals to the left. The other four segments are "reversed" versions of the normal form ordering, i.e., descending from left to right with the smallest intervals to the right, again arranged to reflect the direction of unfolding in the actual music.

Segments with more than seven PC's will naturally reveal stepwise orderings. Smaller sets, however, still exhibit predominantly chromatic unfoldings rather than collections involving numerous whole-tones and small leaps.

A "subset" in this context refers to a group of pitches (within a segment) which unfold in a chromatic fashion in the piece. In segment No. 2, for example, two subsets may be discerned: D♭3 down chromatically to A♭2, and D♯3 up to F♯3 (the F being a note of coloration). (See staves i and ii.) When these two subsets are conjoined and arranged into normal form, all PC's except G are present.
Example 75. PC content of formal segments.
measure: 1
segment: 1

'a'-section

phrase I

disjunct fragments
cadenza
disjunct fragments
cadenza

phrase II


'b'-section

phrase I

disjunct fragments
phrase divider
disjunct fragments
cadenza

phrase II

*i = coloration p-c's
ii = bsn. p-c's
iii = total p-c content
In addition to the characteristic of chromatic ordering, PC content is itself an important aspect of linear organization. It is, in fact, responsible for specific relationships between contiguous and non-contiguous segments—relationships such as expansion, inclusion, overlapping, and twelve-note aggregate completion. Segment no. 1, for example, is embedded into the expanded no. 2, the latter containing all PC's except G. While the normal form ordering of the third segment overlaps that of the second (e.g., F and F♯), the first articulated PC in no. 3 (i.e., in the actual music) is G, thus completing the twelve-note aggregate initiated in no. 2. (The square bracket from no. 2 to no. 3 in Example 75 illustrates this completion.) Segment no. 3 omits A and A♯, A being the first and highest pitch of no. 4, and A♯, the lowest. Segment no. 4 also contains all PC's except one, this time G♯. Interestingly G♯ in no. 3 is the registral high point of the initial ascending fourth progression exposed earlier.27

The second phrase of the 'a'-section opens with a transposition of the first segment of phrase I: e.g.,

\[ m. 1 \begin{array}{c} \includegraphics[width=0.5\textwidth]{example.png} \end{array} \begin{array}{c} m. 3 \end{array} \]

Segments 5 and 6 overlap and jointly include all PC's except A♭ and C—the first two articulated in segment no. 7. This second overlapping completion of the total aggregate is also indicated in Example 75 by a square bracket. Each phrase of the 'a'-section exhibits a near-completion of the twelve-note aggregate in its opening two segments. The missing pitch(es) is (are) furnished by the "articulated" opening of the third segment in each case (i.e., nos. 3 and 7 respectively).

Phrase I of the 'b'-section opens in a similar fashion to that of

27 The structural value of A♭ in segment no. 3 warrants its omission in no. 4 and justifies negation of A in no. 3. (The registral connection to A, remember, occurs in bar 7, not with the A of segment no. 4.)
the 'a'-section. That is, its first segment is embedded into its second, the latter consisting of all PC's except one. The missing D#, although not the first articulated PC of segment no. 11, is the lowest in the normal form ordering. An overlapping twelve-note completion may once again be noted, as indicated in Example 75. The second phrase of the 'b'-section was stated earlier to be uniquely constructed of one continuous disjunct fragment. It is also unparalleled in terms of its PC content as it is the only single segment which contains all twelve. This sense of completion is complemented by the culmination of textural and linear progressions, specifically on the final D\(^5\) of the segment (as noted earlier). One final relationship is noteworthy. It concerns the bassoon part in segments 11 and 13 and, specifically its inclination towards the PC D in each case. Segment no. 11 (the phrase divider) stops short on the upper neighbour E\(^b\), while no. 13 sounds essentially the same PC's but substitutes the lower neighbour C\(^\#\) for E\(^b\). The two segments also differ in that no. 13 contains the ultimate "resolution-note," D, provided by the piccolo. In this sense—one purely of PC content, irrespective of the actual order of articulation—segment no. 13 might be viewed as "closed" relative to no. 11.

Summary

Because of the disjunct disposition of the bassoon part, registral linear connections were found to be of significance in the organization of pitch content in this piece. Four registers were established, essentially through motivic consistency (i.e., the four-note motive B\(^b\)-B-C-D\(^b\)), in

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28 The significance of this completion lies in the fact that the composed ordering closely resembles that of the "normal form," and the D\(#\) initiates the second "subset" of the segment.
which five primary progressions were exposed. A tendency towards the PC D, inherent in the four-note motive itself, was revealed in the primary progressions thus reiterating a D-centricity witnessed in previous pieces (e.g., Nos. 1, 4, 5, and 6). These primary progressions are $E_b^5/ E^5$, as an incomplete major-minor upper neighbour to $D^5$; $E^4/ E^4$, as an incomplete major-minor upper neighbour to $D^4$ (the latter never occurring but rather implied); $B^3$ to $C#^3$, suggesting motion towards $D^4$ which, again, never actually occurs; $B^2$ to $C#^3$ and up to $D^3$; and $B^1$ to $C#^2$ tending towards, but falling short of, $D^2$.

Segments of phrases defined earlier were studied here for their PC content (including that of colorations also), and patterns of unfolding were found to reveal chromatic and near-chromatic collections. Relationships between segments, with respect to twelve-note aggregate completion, were also found to be of significance in the piece.

**Harmonic Details**

In that coloration and doubling are the only forms of instrument interaction in the piece, they also represent the only instances of harmonic units—i.e., verticalities with specific interval content. Consonance-dissonance quality of colorations will be examined first, with a discussion of their specific placement and content to follow. A study of the various doublings and their placement will conclude the section.

**Consonance-dissonance quality of colorations**

The five simultaneities used in the piece in order of the most consonant to most dissonant (explained below) are $[0,2]$, $[0,1]$, $[0,1,3]$, $[0,1,2]$, and $[0,1,2,4]$. Semitone and whole-tone content, as well as the number of members in each verticality are factors in the classification of
harmonic quality. For example, \([0,2]\) is the most consonant (and therefore has a C-D factor of 1) because it is the only verticality without a semitone. The most dissonant harmony is \([0,1,2,4]\) (with a factor of 5) because it has the greatest number of members and two semitones. The verticality \([0,1]\) is the second most consonant because it is the only other set with two elements; it has a C-D factor of 2. Between \([0,1,3]\) and \([0,1,2]\), the former is more consonant (with a factor of 3) as it contains only one semitone compared to the latter's two (therefore having a factor of 4). Example 76 illustrates all instances of instrument interaction between doublings or colorations. The aforementioned "set-types" with their corresponding C-D factors are indicated below the various instances of coloration.

Referring to Example 76, one particular observation concerning consonance-dissonance fluctuation is noteworthy. Phrase I of the 'a'-section exhibits a shift from relative consonance (i.e., factors 3, 1, and 2) to dissonance (i.e., factor 4). The three-note sonority in measure 5, in fact, occurs only once and is the most dissonant found in the 'a'-section. Phrase II leans towards the consonant side with harmonies of factors 1 and 2. The 'b'-section reveals a similar pattern: phrase I picks up where the 'a'-section left off—i.e., with relative consonance—and moves to the most dissonant verticality in the piece in bar 14. Phrase II displays sets of factors 1 and 2 not unlike the second phrase of the 'a'-section. In both sections, then, a consonance \(\rightarrow\) dissonance \(\rightarrow\) consonance pattern emerges, with the peak of dissonance occurring at or near the end of the first phrase of each. The return to relatively consonant sonorities in the second phrase of each section may be heard as resolutive. In a sense this aspect of "consequence" contradicts other
Example 76. Consonance-dissonance factors of coloration verticalities.
'a'-section

<table>
<thead>
<tr>
<th>Measure Nos.</th>
<th>Phrase I</th>
<th>Phrase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>5</td>
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<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coloration Pitches:

Bassoon Pitches:

Set-types:

C-D Factors:

Doublings:

'tb'-section

<table>
<thead>
<tr>
<th>Measure Nos.</th>
<th>Phrase I</th>
<th>Phrase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coloration Pitches:

Bassoon Pitches:

Set-types:

C-D Factors:

Doublings:
factors of "openness" at the end of the 'a'-section (e.g., factors such as registral ascent and "hesitant" pitch departure from $E^b_5$ to $E^5$), while reinforcing the feeling of "closure" on the $b_5$ in bar 15 [effected by the culmination of instrumentation-density and (unison) doubling-density, as well as twelve-note aggregate completion and linear pitch connection].

**Specific placement and content of colorations**

Many colorations would appear to be strategically placed; some punctuate structural points in registral linear progressions defined and illustrated earlier, while others articulate the ends of formal segments (e.g., phrases or fragments). The first coloration in the piece, for instance, harmonizes the final pitch of the bassoon's opening disjunct fragment, i.e., the four-note motive, $B^b$-B-C-$D^b$, illustrated earlier. Curiously, one of the coloration pitches is $D^3$, the asserted "arrival-point-pitch" of the motive in register ii (measure 3, bassoon). In this sense the coloration $D^3$ is an "anticipation" of the structural $D^3$ appearing later in the bassoon. The remaining colorations in the first phrase harmonize structural pitches in the initial ascending fourth-progression, $E^b_4$ to $A^b_4$ (as noted earlier).  

The final pitch of the first fragment in phrase II, like that of phrase I, is marked by a coloration (although the harmonic quality is different). The last two colorations in the 'a'-section harmonize the

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29 It is the arrival point of this progression, $A^b_4$ in bar 5, which has the C-D factor 4 harmonization, the most dissonant of the 'a'-section. Its articulation is highly accented on the one hand, but somewhat "disguised" by the dissonant harmony on the other.

30 These two fragments, each terminated with a coloration, are transpositionally related as explained earlier. The parallelism of the two phrases in the 'a'-section, also noted earlier, is heightened by this relationship.
re-established $A^b_4$ (measure 7) of the ascending progression in register iv and the $A^4$ (measure 7) to which it ultimately moves. Notice that, while each of these two structural pitches is colored by a lower half-step, A is harmonized differently here from measure 5 (where its lower half and whole-step sound).

The colorations of $A^b_4$ and $F#_4$ in measure 13 are noteworthy as these particular pitches initiate the "counterbalancing" descending fourth-progression, $A^b_4$ to $E^b_4$, illustrated earlier. Although A is harmonized differently here from the opening ascent, its coloration tone concurs with that of the $A^b_4$ just mentioned, i.e., G. $F#_4$ is, however, harmonized as in bar 3, with $F^4$. The next two verticalities in phrase I of the 'b'-section articulate points of lesser importance in the linear structure. $B^3$ of bar 13, for example, initiates the second four-note motive in register iii, while the colored $E^4$ of bar 14 is another of the pitches in the descending fourth, $A^b_4$ to $E^b_4$.

Two of the remaining verticalities are worthy of mention: first, the coloration of the bassoon's $A^3$ in measure 14 punctuates the end of phrase I with the most dissonant sonority of the piece. The second involves the $D^5/C#^5$ vertical dyad in measure 15. The centricity of the PC D and, more specifically, the pitch $D^5$ have already been noted. While the dissonant $C#$ intensifies the arrival on D, it also tends to slightly "blur" the latter. The four-part unison doubling of $D^5$ and subsequent

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31 This point, as indicated earlier, is analogous to the close of phrase I in the 'a'-section where C-D factor 4 (the most dissonant to that point) is found.

32 It is interesting to compare the disposition of pitches in this final coloration to those of the first one in bar 1. In the earlier instance the $D^3$ (coloration) was noted as an anticipation of the bassoon's structural $D^3$ two bars later. In the final coloration, $D^5$ is the main note and $C#^5$ is the coloration pitch; the two PC's have essentially traded functions.
sustaining of D⁵ in the piccolo, however, confirm its role as a point of pitch closure.

Specific placement of octave and unison doublings

Octave and unison doublings were discussed earlier in the light of their contribution to the fluctuation of textural-density. As in many instances of coloration, however, these doublings may also be viewed in certain cases as factors of intensification. Three such points exist in the 'a'-section. The first is in measure 5 where the last three notes of the disjunct portion of phrase I (leading into the cadenza) are doubled in unison. The second instance accompanies the opening three notes of phrase II. These in turn lead into the fourth and final note of the fragment which, as stated earlier, is colored by a semitone. Perhaps the most emphatic instance, however, is that which occurs in measure 7. The four notes culminating on the structural A⁴ are doubled in unison by the oboe and clarinet. (This particular A⁴ is structural as it is the immediate goal of the initial ascending fourth-progression, Eᵇ⁴ to Aᵇ⁴, and on a larger scale, the tritone divider of the octave-progression, Eᵇ⁴ to Eᵇ⁵.) The unison doubling (four-part) of D⁵ in bar 15 is the most strategic doubling in the 'b'-section; as noted earlier, its real significance lies in its placement as a peak within the progression of (unison) doubling-density.

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33 The bassoon's final C♯², however, may be heard as a subtle "reminder" of C♯⁵ which accompanies D⁵ in bar 15.

34 The first note of the three is the Aᵇ⁴ goal of the initial ascending fourth-progression, also colored as noted earlier. And the final note is D³, the prolonged arrival point of the four-note motive in register ii, also discussed in the previous section.
Summary

In dealing with the harmonic structure of this piece consonance-dissonance factors (based on semitone and whole-tone content, and the cardinality of the various verticalities) were established for the instances of coloration used throughout. Each section exhibited progressively more dissonant structures towards the end of its first phrase, followed by more consonant sonorities in its second. The most dissonant sonority of the piece was found in the 'b'-section, thereby revealing one element of overall harmonic direction from the 'a' to 'b'-section.

Instances of coloration were frequently found to highlight structural pitches in registral linear progressions (particularly those in the uppermost register), and other important junctures such as phrase beginnings and endings. Octave and unison doublings were also found to intensify strategic points in the piece, the D\(^5\) of bar 15 being the most significant of such points.

Connective Factors Between the Ninth and Tenth Pieces

Four factors point to a possible relationship between the ninth and tenth pieces. The first of these concerns indications in the score at the end of the ninth piece.\(^{35}\) Such indications include "break off suddenly" (as though a continuation were forthcoming), silenzio assoluto (suggesting an "expectant" quality), senza diminuendo (thus deferring a feeling of closure), and attacca (directing an immediate continuation).

The second factor involves the first three PC's of piece No. 9.\(^{36}\)

\(^{35}\) Ligeti, Ten Pieces, p. 33.

\(^{36}\) The whole piece, remember, consists of only nine PC's in an ordered unfolding.
Specifically, the opening sustained and reiterated $E^b$ and subsequent $E$ and $D$ are PC's of primary importance in the linear structure of the tenth piece ($E^b$ and $E$ being considered jointly as an incomplete major-minor upper neighbour to the main arrival point $D$).

The linear structure of the entire ninth piece and one particular registral progression in the tenth would appear to be related, this being the third factor of connection between the two. As stated earlier, the ninth piece is comprised of a nine-note unfolding. As it turns out, this unfolding essentially outlines an ascending progression from $E^b_6$ to $A^b_6$ (this register being in the extreme upper range of the instruments involved). PC's $E^b$ and $A^b$ are interestingly also the extremities of the ascending fourth-progression in register iv of the tenth piece (measures 3-5). This relationship is summarized in Example 77.

Example 77. Linear progression relationship between the ninth and tenth pieces.

Finally, in the light of the pattern of PC unfolding in piece No. 9 (discussed in Chapter II) and the concept of twelve-note aggregate completion noted between certain contiguous segments of No. 10, a

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The intensity of No. 9, resulting from the upper range of the instruments, is matched in the tenth piece as the progression in question is at the top of the bassoon's range.
particularly strong connection may be discerned between the two pieces.
As noted in Example 78, if the descending PC line in No. 9 is extended
it generates the three PC's absent from the piece—curiously, those found
at the beginning of No. 10. This large-scale instance of twelve-note
aggregate completion provides an important bond between the two pieces;
in addition, it anticipates the use of inter-segment completion within
the tenth piece itself.

Example 78. Twelve-note aggregate completion from
the ninth to the tenth piece.

Summary

A number of factors have been cited above as pointing to a
connection or relationship between the ninth and tenth pieces. Notes in
the score at the end of No. 9 were said to imply a lack of completion and
a need to continue immediately, while underlying details of PC unfolding
(e.g., $E^b$-$E$-$D$ and the progression from $E^b$ to $A^y$) were found to provide
an association between the two pieces. And finally, an important
connection was also revealed in the twelve-note aggregate completion at
the beginning of the tenth piece, the first nine PC's having unfolded
in No. 9.
Summary

The foregoing analysis of the tenth piece has included independent examinations of form delineating factors, textural structure, rhythmic and metric design, and pitch organization. Associations between parameters have been indicated where applicable. While concepts such as registral linear connections and consonance-dissonance quality were introduced in previous chapters (albeit under considerably different circumstances), progressive tendencies in textural space and modes of textural-density, as well as impulse-number proportions of phrase segments are aspects specific to the analysis of the tenth piece. Relationships between the ninth and tenth pieces were also discussed, thereby adding another subgroup to the list of those previously defined.
CHAPTER V

CONCLUSION

In seeking an understanding of the musical language of György Ligeti's *Ten Pieces for Wind Quintet*, the foregoing study has presented individual examinations of musical parameters such as form, texture, rhythm and meter, and pitch. While the auditory experience of this (or any) music involves simultaneous consideration of all musical parameters, viewing them in isolation for the purposes of analysis allows specific details of their individual structures to be ascertained before attempting an understanding of the intricacies of their interaction. Chapter II focussed on certain principles (some general, others more specific) within the various musical parameters and exemplified them in excerpts from the second to ninth pieces in the quintet. This provided a basis for the detailed analyses of pieces 1 and 10 (in Chapters III and IV). In these particular studies, musical parameters (e.g., form, texture, etc.) were also treated separately, but in dealing with the two pieces as complete entities--i.e., looking at them on a more global level--instances of interaction between parameters were illustrated, thus providing a more comprehensive view of the overall musical structure in each case.

The quintet was suggested in Chapter I to be representative of Ligeti's works since the middle sixties, illustrating many compositional procedures in a medium considerably more "compact" than that of most of his other works. The fact is that Ligeti's own characterization of his musical language in this period is accurately represented in the quintet. He speaks
of his music (since the middle sixties) as having "no tonal centres" on the one hand, but not treating all twelve notes "equally" on the other. While tonal centres, as such, may not be in operation in the quintet, pieces 5, 6, and especially 10, revealed a strong inclination towards the PC D, referred to as a "D-centricity." Linear directedness, instrumental doubling, and durational exposure are some of the factors suggesting such an inclination to, and reinforcement of, that particular PC. In the first piece, PC centricity appeared to involve both D and C, these being the pitch extremities of the 'a'-section, maintained through outer-voice prolongation and lateral voice crossing. The 'b'-section also revealed linear directedness to D⁵ and C⁵, the final pitches of the piece.

Ligeti also comments (in connection with his works from the middle sixties) that certain "arrangements" of intervals "determine the course of the music and the development of the form." The quintet furnishes numerous instances of this as in the third piece, for example, where vertical complexes were shown to grow progressively more dissonant (according to the asserted criteria of harmonic quality) toward the climax, after which a trend towards increased consonance was discerned. (See Examples 44 and 45.) Also, vertical arrangements of intervals were shown to be a factor of formal segmentation in the fifth piece; of the four sections, the first and third were noted as being relatively restricted in overall textural space (and, hence, vertical intervallic disposition), while the second and fourth sections were shown to be registrally dispersed. And finally, piece No. 1 was defined as to the fluctuation in harmonic quality through a derived system of consonance-dissonance classification; verticalities with specific

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1Ligeti, liner notes for Melodien.
2Ibid.
C-D (consonance-dissonance) factors were shown to play a vital role in the maintenance of pitch extremities in the 'a'-section. (See Example 64.)

The harmonic structure of the first piece's 'a'-section also illustrates Ligeti's concept of "harmonic-musical flow," in which interval combinations merge slowly into one another rather than change abruptly.

Ligeti further defines his music from the middle sixties as utilizing micropolyphonic textures in which lines are more directed and retain a certain degree of independence within the "overriding contrapuntal network." Again, pieces 1 and 3 come to mind. In the latter, two suggested techniques—unison transfer and pitch interchange—were said to create linear continuities within an overall texture of complex polyphony. Regarding the first piece, outer-voice prolongations and lateral voice-crossing events, noted earlier, emerge as independent linear structures underlying the web-like interweaving of instrumental parts.

While many of the techniques outlined above are representative of earlier works typified by Atmospheres (in addition to representing Ligeti's music of the middle sixties), the style of Apparitions and Aventures—i.e., rapid successions of disparate musical ideas—was also seen to surface in the quintet, particularly in the sixth and eighth pieces.

The quintet, then, can be viewed as representative of Ligeti's compositional style in the middle sixties; in addition, it may be seen to expose refinements of earlier techniques and devices. The explication, illustration, and detailed analysis of these concepts—in relative isolation (as in Chapter II), and in more extended applications (as in Chapters III and IV)—aims to establish a fundamental working knowledge of Ligeti's

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3 Ibid.
4 Ibid.
musical language in the Ten Pieces for Wind Quintet.
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