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VOCAL PARTS IN THE MUSIC OF GEORGE CRUMB

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James Joseph Romeo

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VOCAL PARTS IN THE MUSIC OF GEORGE CRUMB

By

James Joseph Romeo

A THESIS

Submitted to
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in partial fulfillment of the requirements
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ABSTRACT

VOCAL PARTS IN THE MUSIC OF GEORGE CRUMB

By

James Joseph Romeo

This thesis provides an analysis of the vocal parts to five works by George Crumb: Madrigals Book I, Madrigals Book II, Madrigals Book III, Madrigals Book IV, and Ancient Voices of Children. The vocal parts have a mixture of regularly-sung pitches and non-pitched vocal techniques.

The pitched melodies are analyzed through the application of set theory. A chapter has been included which clarifies existing aspects of this theory, and also introduces concepts developed specifically for this thesis.

The palindromes in these works are also examined; their pitches and rhythms, and the structural role they play is discussed. The International Phonetic System, which Crumb uses as part of the text, is included in an appendix.

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CHAPTER I

BIOGRAPHY

George Crumb was born on October 24, 1929, in Charleston, West Virginia. He attended the Mason College of Music in West Virginia, where he received a Bachelor of Music degree in 1950. From there he entered the University of Illinois in Urbana, and in 1953 graduated with a Master of Music degree.

He enrolled in the doctoral program at the University of Michigan in 1954 and began studies in composition with Ross Lee Finney. During the summer of 1955, he studied with Boris Blacher at the Berkshire Music Center. Following this, he received a Fulbright Fellowship (1955-1956) to continue his studies with Blacher at the Hochschule für Musik in Berlin. In 1956 he returned to the University of Michigan to complete the Doctor of Musical Arts degree (1959).

Among the works composed by George Crumb at this point in his career, three had gained distinction: String Quartet, 1954 (Mills Music), Sonata for solo cello, 1955 (Peters Corporation), and his doctoral dissertation Variazioni for orchestra, 1959 (Mills Music).

He began teaching at the University of Colorado in 1959 and continued there until 1965. In 1965 began what was to be a series of major grants and awards.

He received grants from the Rockefeller Foundation in 1965, and the Coolidge Foundation in 1970. He was awarded the Guggenheim Fellowship and a National Institute of the Arts and Letters Award in 1967. The following year Crumb won the Pulitzer Prize in Music for his composition, Echoes of Time and the River: Four Processionals for Orchestra. In 1971 his Ancient Voices of Children was voted the most distinguished work heard at the International Rostrum of Composers in Paris, France.

From 1964 through 1965 he was a Creative Associate at the Center of the Creative and Performing Arts in Buffalo, New York. In 1965 he was appointed to the staff of the School of Music at the University of Pennsylvania, where he currently teaches composition.

In addition to the works mentioned above, other major compositions include: Eleven Echoes of Autumn (1965), Songs, Drones and Refrains of Death (1968), Madrigals, Books I-IV (1965-1969), Black Angels String Quartet (1970), and Makrokosmos, Books I-III (1968-1975).

CHAPTER II

ANALYTICAL PROCEDURES

Set Theory Analysis

Set theory, as it originally evolved, was primarily a mathematical concept. Its application to the analysis of musical compositions is a relatively new venture; as such, many of the applications have yet to be standardized.

In the analysis of the following works, set theory is employed to reveal pitch relationships that might otherwise go unnoticed. Following is a list of the symbols used:

Kh+--in the set¹ and in the complement, and the complement is in the music.

Kh--in the set, and in the complement, and the complement is not in the music.

K--in the set, or in the complement (in which case the complement must appear in the music).²

¹The phrase "in the set" refers to two sets being in a set/subset relationship. For example, set [0,2,4] is "in the set" [0,2,4,6,9].

²Another relationship exists--not in the set, but in the complement, and the complement is not in the music. This is such a weak relationship, however, that it is not considered in the analyses that follow.

Rp--pitch sets whose cardinal numbers are equal, and upon vertical analysis have at most one member that is different.

Set Determination

The vocal parts were separated into small segments for analysis. Following, in order from highest priority to lowest, are the criteria used for this process.

1. Long Rests. This refers to those places where there is a long period of time between one sung part and the next.
2. Shorter Rests. Here the vocal part may be fairly continuous, but a break occurs in the line due to a rest.
3. Long Notes. Frequently a fermata is employed, or a note is tied, creating a long note value. In these cases, the pitch in question is often used in elision.
4. Text Considerations. Where the above three determinants do not sufficiently define the set, the text and its syllabication is used to determine the best and most musically acceptable segmentation.

In many cases where the exact point of segmentation would be controversial, the actual pitch-class sets involved remain unaffected.

Determination of the Nexus Set

The nexus set is that set which has the greatest degree of interrelationship with the sets in any given analysis.³ To increase the musical significance of this concept, the stipulation is added that the set chosen for the nexus set must occur in the music. Furthermore, this set should be as close as possible to the cardinal number six.

A set of cardinal number one would map into every set of any piece, and therefore the significance of this set is minimal. Similarly, a set of cardinal number twelve would allow every set of any piece to map into it, and so this set too would be of minimal significance. A nexus set of cardinal two or eleven is better in this respect than a set of cardinal one or twelve, but they are still of little overall importance. In this way it can be seen that as sets approach the cardinal number six, they become better candidates for use as a nexus set.⁴

³Allen Forte, in his book The Structure of Atonal Music (Yale University Press, 1977), makes a distinction between the primary nexus set and the secondary nexus set. The primary nexus has a K or Kh relationship with every other set in the composition; the secondary nexus has relationships with only some of the sets. In this writing, however, Forte's distinction will not be made. If a set appears in a composition and does not relate to the nexus set, that should not necessarily weaken the position of the nexus set. Rather, it demonstrates only that the set in question truly is far-removed from the pitch classes that dominate the composition.

⁴However, should a set of cardinal four or five be particularly strong, and/or no set of six is dominant, the set of cardinal four or five can be chosen as the nexus set.

For use in determining the nexus set from a chart, the following values have been assigned to the four relationships.

$$Kh+ = 6$$

$$Kh = 5$$

$$Rp = 4$$

$$K = 3$$

The three K values ($Kh+$, Kh , K) fall into a natural order of significance.⁵ The Rp relationship is the relationship of one set to one other, whereas the Kh relationship is the relationship of one set to two others; therefore, Rp was determined to be of less significance than Kh . However, Rp is as close a relationship as two sets can have (without being equal sets); therefore, this relationship is of greater significance than the K relationship.

The values 3, 4, 5, 6 were used because this implies that a K relationship is half as important as a $Kh+$ relationship. Since K is a relationship to one set, and that set is in the music, and $Kh+$ is a relationship to two sets, both of which are in the music, this proportion is in fact the case.

To utilize these values in the determination of the nexus set, the following procedure should be followed.

⁵This natural order is derived directly from the definitions, which demonstrate the relative degrees of significance.

By adding the relationship values listed on a chart along the x axis, a number is reached that is representative of the degree of interrelationship for that set to the other sets. This number will be referred to as the IR number (interrelationship number). The greater the IR number, the greater the interrelationship of a given set to the others. These IR numbers are computed for all the sets in a chart.

Madrigals, Book I, Mvt. 1⁶

	3-5	4-1	4-5	4-8	4-9	5-4	6-12	6-13	6-41	7-1	8-10	IR#
3-5			Kh	Kh	Kh	Kh	Kh+	Kh	Kh+	K	K	43
4-1			Rp			Kh	K		K	Kh	K	23
4-5	Kh	Rp		Rp		Kh	Kh+		Kh+	K	K	36
4-8	Kh		Rp				K		K	K		18
4-9	Kh						K	K	K			14
5-4	Kh	Kh	Kh				K		K	K	K	27
6-12	Kh	K	Kh	K	K	K		Rp				26
6-13	Kh				K		Rp					12
6-41	Kh	K	Kh	K	K	K						22
7-1	K	Kh	K	K		K						17
8-10	K	K	K			K						12

If there is a set of cardinal number 4, 5, 6, 7, or 8, and this set has a significantly larger IR number

⁶The chart is set up using Pitch-Class sets, hereafter referred to as PC sets; these are representational numbers for actual sets (e.g. set [0,1,2,3] is PC 4-1). For a complete explanation, refer to Allen Forte, The Structure of Atonal Music, Yale University Press, 1977.

than the others, it can be designated as the nexus set. In the chart above, PC 4-5 has an IR number of 36, which is nine higher than the second highest IR number. Pitch-class set 4-5 can then be designated as the nexus set for this movement. Notice that, although PC 3-5 has an IR number of 43, it is not considered as a nexus set because it has a cardinal number of three and is therefore too small to be a candidate. Furthermore, PC 3-5 [0,1,6] is contained within the set 4-5 [0,1,2,6], making the selection of 4-5 as the nexus set even more firm.

If, in other cases, there are two or more sets with close IR numbers, the one whose cardinal number is closest to six can be designated as the nexus set. If, after examination of all the aspects given above, two sets are seemingly equal in all respects, then these can be referred to as nexus co-sets.⁷

Interlocking Sets

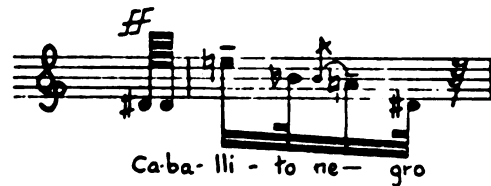
The phrase "interlocking sets" refers to a method of set connection that is found in the works of George Crumb. This method can be defined as the linking together of two sets of the same pitch-class by either:

⁷Although many aspects of this process are precise and mathematical, many other aspects are left necessarily subjective. The goal of any musical analysis should be an increased understanding of the work in question. In this case, all theoretical aspects cannot be reduced to mathematical formulae, but some must be left to the interpretive skills of the analyst.

1. The sharing of one note, where it is the last pitch of the first set, and the first one of the second set; or,
2. The sharing of two or more consecutive notes, where all tones shared form the final pitches of the first set, and the initial ones of the second set.

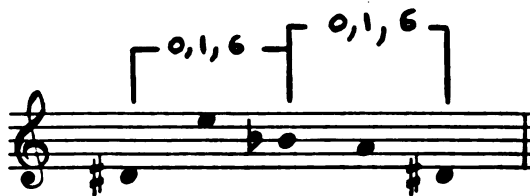
The set [0,1,6] occurs frequently in the vocal parts of the works of Crumb. The third movement of Madrigals, Book II begins with the set [0,1,6,7] in the Soprano part.

Example 1, Madrigals, Book II, Mvt. 3



This can be thought of as the interlocking of two sets under the first condition above (the sharing of one common pitch). (See Example 2.)

Example 2, Interlocking sets, condition one



In the third movement of Ancient Voices of Children, the Soprano begins by singing the set [0,1,6].

Example 3, Ancient Voices of Children, mvt. 3



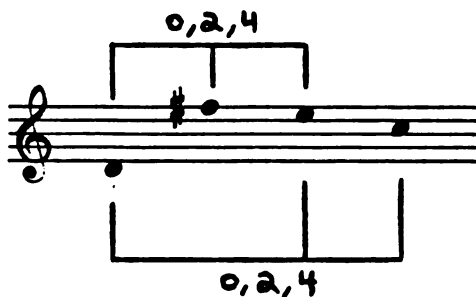
Following this, the Soprano sings the pitches F, E, A#, and B. This set can be thought of as the interlocking of two sets under the second condition stated above (the sharing of two or more consecutive pitches).

Example 4, Interlocking sets, condition two



To complete the illustration of the definition, the following example is included. In this case, it is incorrect to refer to two interlocking sets, as the formation of the second set must use two pitches (E and D) that are not consecutive.

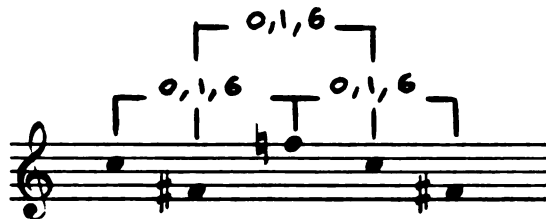
Example 5, Madrigals, Book IV, mvt. 3



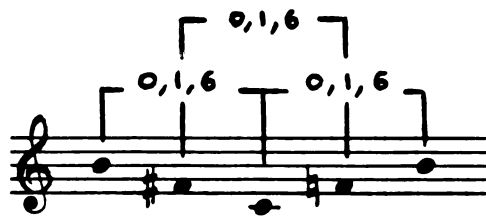
There is one other special category of interlocking sets--multiple interlocking sets. This occurs when three or more of the same pitch-class sets interlock.

Example 6, Multiple interlocking sets

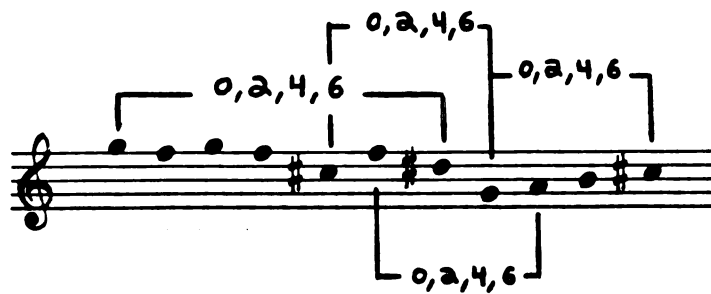
- a. Madrigals, Book I, mvt. 2



- b. Madrigals, Book II, mvt. 1



- c. Lux Aeterna



CHAPTER III

MADRIGALS, BOOK I

Instrumentation: Soprano, Vibraphone, Contrabass.

Text: fragments of poetry by Federico Garcia Lorca

Commission: Serge Koussevitzky Music Foundation in the
Library of Congress

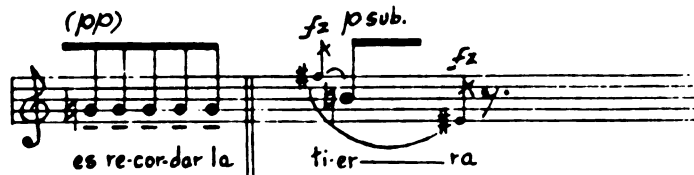
Dedication: to the memory of Serge and Natalie Koussevitzky

Date of Composition: 1965

Pitch Content

The nexus set for the first movement is PC 4-5
[0,1,2,6].¹ The subset [0,1,2] represents three consecutive
chromatic pitches (e.g., C, C#, D). In the actual music,
however, the interval of a half-step is not often found.
Instead, these chromatic pitches are presented by major
sevenths or minor ninths.

¹Appendix B contains complete charts for this and
all subsequent analyses.

Example 1, Madrigals, Book I, mvt. 1

As the nexus set would indicate, the tritone along with the half-step play a major role in the formation of the melodic line. The use of interlocking sets which contain $[0,1]$ or $[0,1,2]$ subsets can easily result in a highly chromatic line. This is the case in this movement; all twelve pitches are used in relatively short amounts of time. In Example 2 below, the phrase consists of thirteen notes,

Example 2, Madrigals, Book I, mvt. 1

all twelve pitches being present, with one repeated. This repetition does not come until the last part of the line, supporting the total-chromatic tendencies.

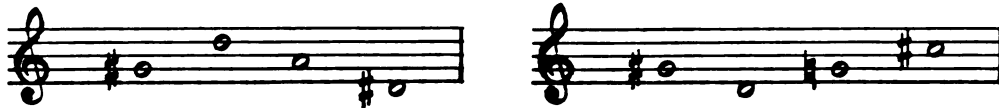
The second movement, with the nexus set PC 6-21 $[0,2,3,4,6,8]$, displays the same characteristics as the previous movement. In fact, the nexus set of the last movement is a subset (under transposition) of this movement's nexus set.²

²The nexus set for movement one is $[0,1,2,6]$. When this set is transposed up two degrees (by adding two to each number), the set $[2,3,4,8]$ results. The subset relationship between $[2,3,4,8]$ and $[0,2,3,4,6,8]$ can now more easily be observed.

If the set $[0,1,2,6]$ ($[2,3,4,8]$ under transposition) was removed from the set $[0,2,3,4,6,8]$, the pitches remaining would form the dyad $[0,6]$, or the interval of a tritone. As this would indicate, the tritone assumes a role of even greater importance in the second movement of this work.

The movement opens with the soprano singing two consecutive tritones of long note values, the four pitches taking approximately twenty seconds to perform. At the middle of this movement (the end of Rain-death music I) there is a return of this opening material, this time in exact inversion.

Example 3, Madrigals, Book I, mvt. 2



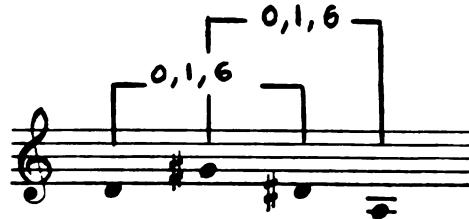
The significance of the tritone as a melodic interval is further illustrated in that it is the initial interval for three of the four phrases of this movement, and the closing interval for two of the four.

The third and last movement has a total of only four sets,³ and therefore the determination of a nexus

³There are several sets of cardinal number two, but they involve quarter-tones, and will be covered in the section that follows.

set is inappropriate.⁴ The first set, $[0,1,6,7]$, is presented as

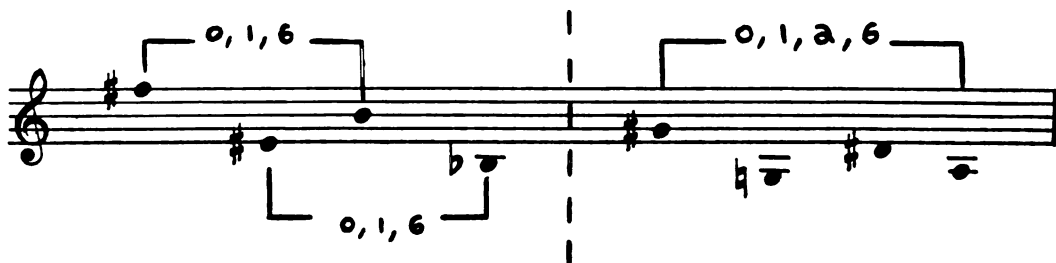
Example 4, Interlocking sets



two consecutive tritones, as in movement two. This is an example of interlocking sets; two $[0,1,6]$ sets join to form a new set.

The second set is the largest of the four, and can be broken into two parts. The first part is an interlocking set. The second part, $[0,1,2,6]$, is the nexus set of movement one.

Example 5, Madrigals, Book I, mvt. 3



The movement closes with two sets of cardinal number three ($[0,1,2]$ and $[0,2,6]$), which contain the

⁴Choosing a nexus set is inappropriate because, with such a few number of sets, each set assumes a role of great importance structurally. Singling any one out as most important would be misleading.

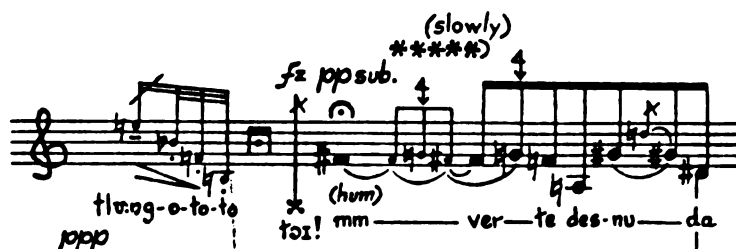
following pitches: A, G#, G, D#. The union of these two sets forms PC 4-5 [0,1,2,6], the nexus set of the opening movement. This presentation, which concludes the entire work, is a final demonstration of the close interrelationship of pitch-sets in this composition.

Use of Quarter-Tones

In Madrigals, Book I, Crumb uses the symbol $\downarrow$, which he explains "indicates a pitch $\frac{1}{4}$ tone lower than (the) given pitch." Quarter-tones are used for 7.5 percent of the total pitches in this work.⁵ Eighty-five percent of the quarter-tones used occur in the third movement, none being used in the second. The written pitches which are altered are G, B, Db, Eb, and A.

Although Crumb employs quarter-tones as a coloristic device, they are used with both the larger notes and the grace notes (see Example 6). The coloristic effect is achieved through a trill figure, using a written diatonic half-step.

Example 6, Madrigals, Book I, mvt. 1



⁵All such references apply to the vocal part only.

The text for each movement is short, and fragments are repeated many times throughout the course of each section. As a result of this repetition the quarter-tones, when they appear, are merely another musical element, with no special relationship to the text.

Special Techniques

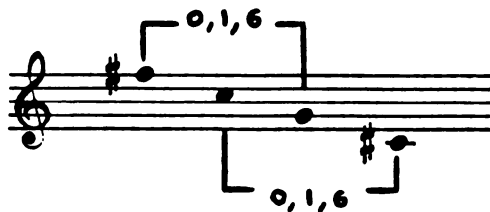
In this work, the text in part consists of the International Phonetic System (see Appendix B). Crumb uses this system not to formulate new vocal techniques per se, but rather to create a unique type of text. This text sounds like a series of words in some unknown language, but is actually only a collection of unrelated syllables constructed to meet the aesthetic demands of the composer.

Crumb interpolates these syllables with the Spanish text. The poetry, however, remains unobscured; the syllables seem only to heighten the dramatic effect.

Chanting, humming, whispering and speaking are all found in this work. Two special techniques are used: flutter-tongue singing, and "pitched speaking."

The pitches employed in the flutter-tongue passage

Example 7, Pitches in flutter-tongue passage



syllables do not obscure the text, but instead put it in relief, adding a new emotional depth to the words, "they do not think . . ."

CHAPTER IV

MADRIGALS, BOOK II

Instrumentation: Soprano, Alto Flute, Percussion

Text: fragments of poetry by Federico Garcia Lorca

Commission: Serge Koussevitzky Music Foundation in the
Library of Congress

Dedication: to the memory of Serge and Natalie Koussevitzky

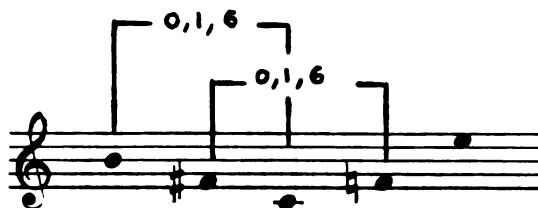
Date of Composition: 1965

The nexus set for the first movement is PC 5-7
[0,1,2,6,7]. This set occurs in the music near the end of
the movement, and is sung unaccompanied. This is an

Example 1, Madrigals, Book I, mvt. 1



interlocking set in part, as shown in Example 2. The

Example 2, Madrigals, Book II, mvt. 1

two subsets which interlock are each PC 3-5 [0,1,6], which has a high IR number [48].¹ This subset contains the intervals of a minor second [0,1] and a tritone [0,6], both of which occur frequently throughout this movement.

Another set with a high IR number is PC 4-5 [0,1,2,6]. This set extends the [0,1,6] subset by the addition of another half-step; it often appears in the form shown below.

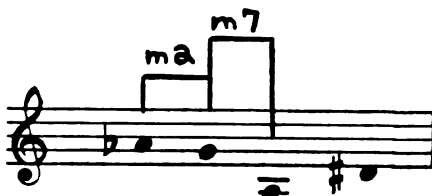
Example 3, Madrigals, Book II, mvt. 1

Here, the subset [0,1,2] is presented not as a series of chromatically rising half-steps, but as a whole-step/major seventh motive, with the inclusion of a tritone above the pivotal pitch C. The use of intervals in this manner gives the set a static quality. PC 4-5 is equally important in the second movement, where its presentation

¹See Appendix A for the complete chart of this movement.

in the music takes on a similar shape. Here, however, the second and seventh are minor instead of major.

Example 4, Madrigals, Book II, mvt. 2



The nexus set for the second movement is the same as the first (PC 5-7, $[0,1,2,6,7]$); its structure, however, is different. Where the interval construction in the first movement uses a perfect fourth for two out of four intervals (see Example 5, c), the interval configuration in the second movement is not so tonally oriented.

The difference in musical effect between these two movements can be related to the texts of each. The first movement has the text:

Bebe el agua tranquila de la cancion aneja.

(Drink the tranquil water of the antique song.)

This is presented at a low level of interval tension with regard to both the $[0,1,2]$ subset and the nexus set (see Example 5).

The second movement has the following text:

La muerta entra y sale de la taberna.

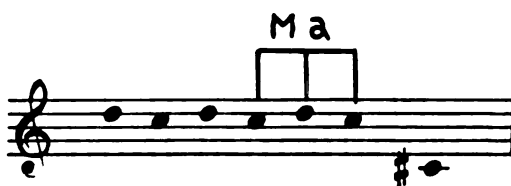
(Death goes in and out of the tavern.)

These words, more serious and brooding than the text to the first movement, are treated with an interval structure that

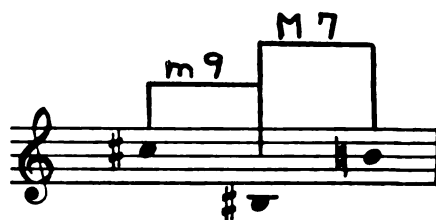
is more disjunct; the $[0,1,2]$ subset appears as two leaps-- a minor ninth and major seventh. Tension is further increased by the use of a minor second in place of the major second in the nexus set (see Example 5).²

Example 5, Madrigals, Book I

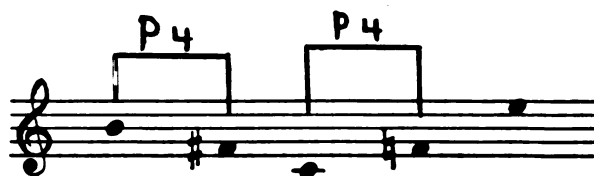
a. Movement 1, $[0,1,2]$ subset



b. Movement 2, $[0,1,2]$ subset

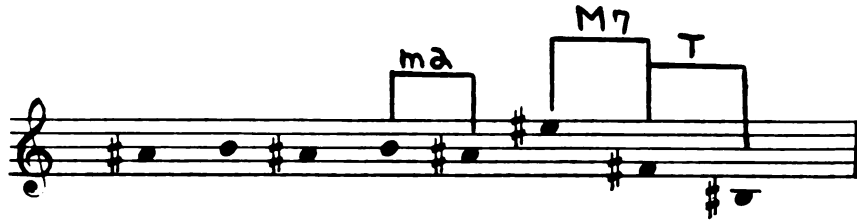


c. Movement 1, $[0,1,2,6,7]$ nexus set



²The manipulation of the five-pitch nexus set to achieve two so widely different musical effects is typical of Crumb's cohesive approach to the construction of melodic lines.

d. Movement 2, [0,1,2,6,7] nexus set



The nexus set for both movements one and two is PC 5-7 [0,1,2,6,7]. This set is prominent in the third movement also; not only does it have a high IR number [29], but it is in a subset relationship to the nexus set, PC 6-5 [0,1,2,3,6,7]. This is actually an extension of the previous nexus set, arrived at through the addition of a half-step.

half-step addition

[0,1,2,6,7]

[0,1,2,3,6,7]

The chromaticism in the nexus set manifests itself in increasingly more disjunct melodic lines throughout the progress of the work.

Example 6, Madrigals, Book II

measure 3: m2, d5



measure 21-22: m7, d5



measure 7: m2, m7



measure 28-29: m7, m9



measure 12: M2, M7



As the movement draws to a close, the vocalist sings an eleven-note phrase in which all pitches, with the exception of G#, are present.³ This final pitch statement

Example 7, Madrigals, Book II, mvt. 3



is consistent with the progress throughout the composition from a static, pivotal sound (Example 3) to a more disjunct, chromatic sound. This well reflects the progression of emotion of the text:

Drink the tranquil water of the antique song.
Death goes in and out of the tavern.
Little black horse, where are you taking your dead rider?

³The percussionist does play a G# on the glockenspiel immediately following this phrase.

CHAPTER V

MADRIGALS, BOOK III

Instrumentation: Soprano, Harp, Percussion

Text: fragments of poetry by Federico Garcia Lorca

Commission: none

Dedication: Elizabeth Suderburg

Date of Composition: 1969

The first movement of this work has PC 6-30 [0,1,3,6,7,9] as the nexus set. This set has special properties that not all sets have; it can be separated into two parts as shown below (Example 1).

Example 1, Madrigals, Book III, mvt. 1

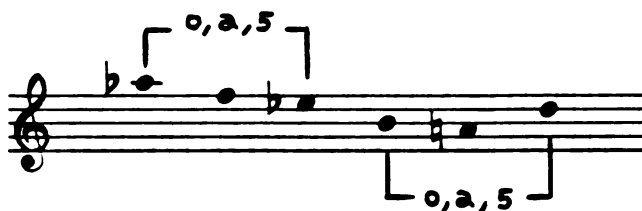


If the first subset (A) were to be transposed by a tritone (by adding six to each number), it would become the

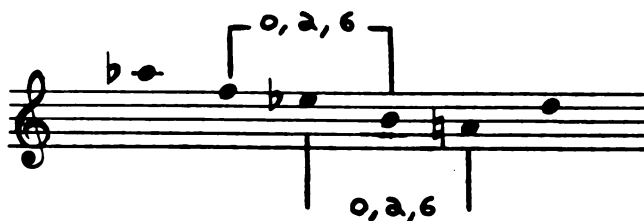
second subset (B).¹ To put this another way, the second subset (B) is a transposition up by tritone of the first subset (A). Due to this inherent symmetry of the nexus set, various configurations will display different symmetrical properties. The particular arrangement of intervals chosen by Crumb² contains a high degree of symmetry.

Example 2

- a. Each half has the same subset [0,2,5]. The roots of each subset (Eb, A) form the interval of a tritone.



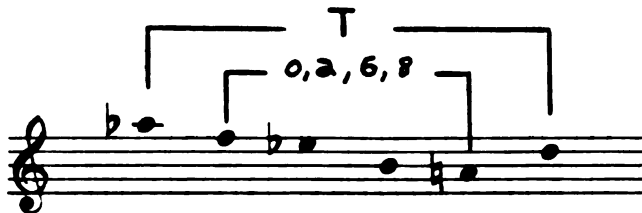
- b. The four central pitches are an interlocking set. The interlocking sets [0,2,6] each have a tritone as the outside interval.



¹[0,1,3] + [6,6,6] = [6,7,9]. Sets in this relation are referred to as equivalent sets.

²Of the thirty-six possible orderings of the six pitches, the configuration used by Crumb in the music contains the sixth highest possible degree of symmetry.

- c. The central four pitches form a symmetrical set themselves (if inverted, the set will not be different). Also, the remaining outside pitches form a tritone.

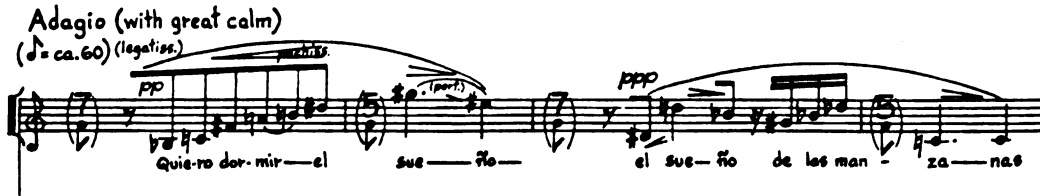


Along with the nexus set, PC 5-28 is the most prominently used. This is a subset of the nexus set, under transposition and inversion.³ The fact that the two most prominent sets are in set/subset relationship indicates a high degree of unity in the composition. This is the case in this movement, where the average IR number is 29, an IR number that is frequently high enough to qualify as a nexus set on many charts. Also, 74 percent of the relationships were of Kh value or higher. The high degree of set unity and the symmetrical nature of the nexus set combine to make this movement a concise network of pitches.

Movements two and three contain a total of only ten sets; their structure depends mainly upon literally repeated motives. The second begins with the soprano singing the following pitches:

³PC 5-28 [0,2,3,6,8]. When this set is inverted (by subtracting each member from twelve), the following set results--[12,10,9,6,4]. If three is subtracted from each member, the following transposition results--[9,7,6,3,1]. This (in its retrograde form [1,3,6,7,9]) is seen to be a subset of the nexus set, [0,1,3,6,7,9].

Example 3, Madrigals, Book III, mvt. 2



After an instrumental interlude, the soprano sings the following line, which is an exact inversion of the line shown in Example 3.

Example 4, Madrigals, Book III, mvt. 2



The third movement opens with a six-note series of pitches that constitutes five of the seven phrases sung in the first half. In two of these phrases, the set is transposed up a major third.

In the concluding section, Crumb uses a vocal technique that he describes as "half-singing." In this technique, the pitches are not specified, but the direction of the pitch and the relative range is indicated. Rhythms are specified, but not within a metrical structure. Part of this passage is a portamento, indicated by a straight line connecting two note-heads. The text at this point is:

Duermete, rosal, que an caballo se pone a llorar.

(Go to sleep, Rose-bush, the pony begins to cry.)

The reference to crying made in the text matches the effect of the "half-singing" combined with the portamento.

The work ends with the soprano humming, unaccompanied, the opening six-note motive of the movement.

Example 5, Madrigals, Book III, mvt. 3



MADRIGALS, BOOK IV

Instrumentation: Soprano, Flute (doubling Piccolo and Alto

Flute), Harp, Contrabass, Percussion

Text: fragments of poetry by Federico Garcia Lorca

Commission: none

Dedication: Elizabeth Suderburg

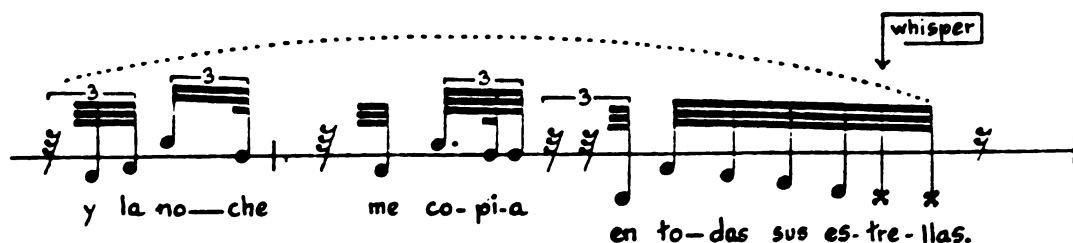
Date of Composition: 1969

This work places greater importance on non-pitched vocal techniques than any other of the three books. The following techniques are all required of the singer:

1. half-singing
2. whispering
3. portamento
4. continuous glissando

The half-singing technique is different from the pitched speaking technique used in Madrigals, Book I. In pitched speaking, the basic vocal sound is one of talking; the variation is achieved through changing the basic pitch of the voice. This is similar in effect to people of different sizes and ages talking--the vocal sound is the same, but the basic pitch is different. Half-singing, however, does not involve speaking of any sort. It is a type of singing that is not sung full voice; the result is a weak, breathy tone.

Example 6, Madrigals, Book IV, mvt. 1, half-singing



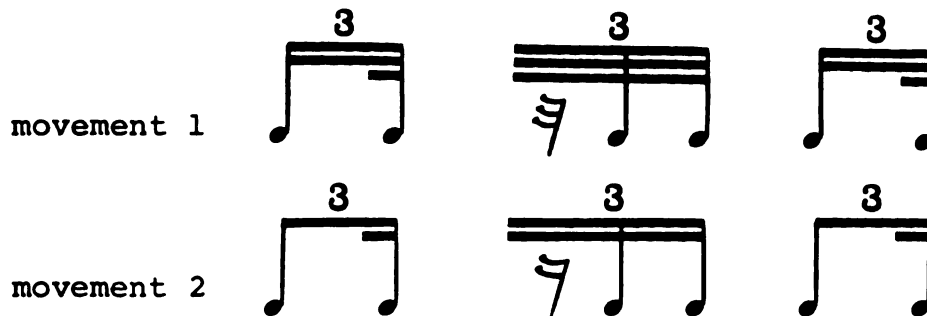
Crumb does not specify pitches, and the singer is free to sing "out of tune" pitches,⁴ further removing this technique from actual singing. The rhythms are precisely notated, and the actual amount of freedom afforded the singer is limited. Even the pitches, although not specified, are controlled in terms of relative range and direction of intervals.

The whispering is not an addition to more essential material, but is incorporated into the basic musical fabric of the second movement. It is presented unaccompanied; the rhythms are notated, and the relative pitches are also indicated. Crumb instructs the singer to perform a "dark, ominous whisper."

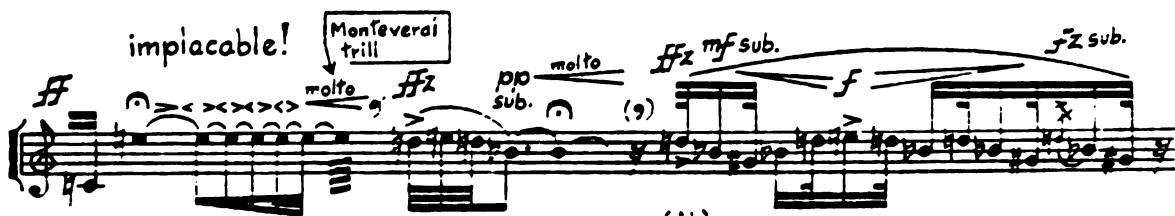
The pitch structure in all works analyzed thus far has been highly unified; the special effects are similarly unified, and are not isolated incidents. The rhythm of the half-singing in movement one is identical to the rhythm of the whispered passage in movement two.

⁴Pitches not within the equal-tempered system.

Example 7



In the third movement, one of the most prominent sets is PC 5-33 [0,2,4,6,8]. This set is the first five pitches of a whole-tone scale, and whole-tone sonorities pervade the entire movement. The opening phrase consists

Example 8, Madrigals, Book IV, mvt. 3, beginning

of the first four notes of a whole-tone scale [0,2,4,6]. This set is interrupted by a special technique called a "Monteverdi trill." This is not a true trill, as there is no alternation between two pitches; it is more closely related to a percussion roll. The effect is achieved by a rapid crescendo/decrescendo on a single pitch.⁵

⁵The name "Monteverdi trill" makes reference to a collection of liturgical madrigals published by Monteverdi in 1638. In the preface to this publication, he explains his new stylistic compositional procedures and effects, one of which was the tremolo, introduced as a symbol of passion.

The vocal part to this movement closes with fortissimo pitched-speaking, the rhythm of which is in a triplet figure similar to the passage quoted in Example 7.

CHAPTER VI

ANCIENT VOICES OF CHILDREN

Instrumentation: Soprano, Boy Soprano, Oboe, Mandolin,
Harp, Electric Piano, Percussion

Text: fragments of poetry by Federico Garcia Lorca

Commission: Elizabeth Sprague Coolidge Foundation

Dedication: Jan DeGaetani

Date of Composition: 1970

The nexus set for the first movement is PC 6-5; two other dominant sets are PC 7-7 and PC 7-19. These three sets form the nucleus around which the pitch structure of this movement is organized. They are in very close inter-relationship; with a combined IR number of 154, 80 percent of the possible chart relationships are fulfilled.

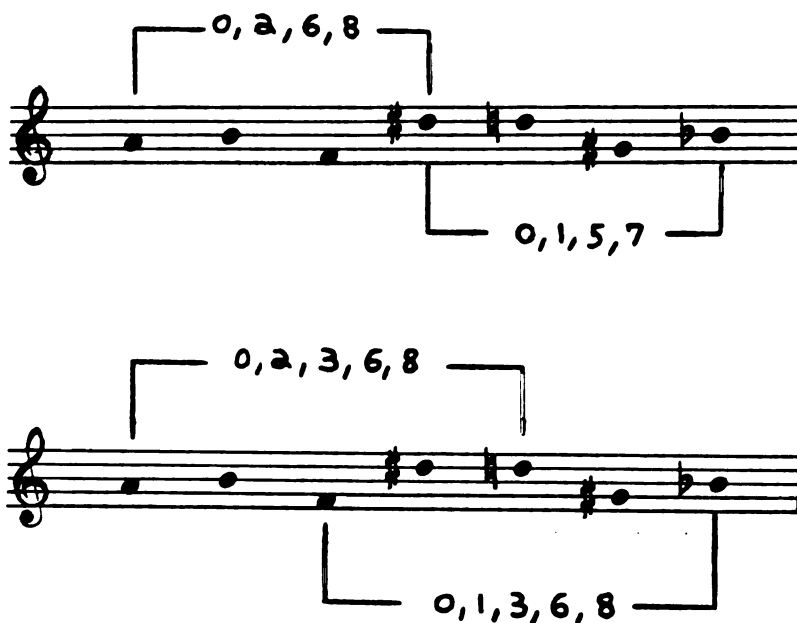
Each set of cardinal seven is in Kh+ relationship with the set 6-5; an Rp relationship exists between PC 7-7 and PC 7-19. These sets are listed below for easy comparison.

6-5 [0, 1, 2, 3, 6, 7]
7-7 [0, 1, 2, 3, 6, 7, 8]
7-19 [0, 1, 2, 3, 6, 7, 9]

The two sets of cardinal seven are extensions of the nexus set. Pitch-class 7-7 includes an extra half-step at the end, and PC 7-19 has an extra whole-step at the end.

Many sets throughout the piece are derived directly from the three sets above. In Examples 1 and 2 which follow, the note-order of the sets conforms to the presentation in the music.¹ In Example 1, PC 7-7 is broken into four- and five-note subsets.

Example 1, PC 7-7 [0,1,2,3,6,7,8]



¹The only change that has been made is one of octave displacement (all pitches have been brought into the range of one octave).

Example 2, Subsets in Movement One.

a. 0,2,6,8



b. 0,1,5,7



c. 0,2,3,6,8



d. 0,1,3,6,8



Many special techniques are used in this movement, but they are never used separately, as "sound effects." Always incorporated into the vocal line, these techniques combine with the pitches to produce a homogeneous result. In Example 3, fast, ornamental notes and longer structural tones are combined with flutter-tongue singing and tongue clicks.

Example 3, Movement One.

na - na - ku-i-u - a ke-i - o - ke-i - a - er - na na - i - u - na

The performance instructions to the Boy Soprano's part are: "The boy's aftersong should sound very remote. The style of singing should be simple and unaffected, even naive." The sets found in the melodic line of this part reflect the simplicity of sound which is the intention of the composer. All of these sets are subsets of the nexus set.

Example 4, Boy Soprano's "aftersong"; set analysis

0, 1, 4, 6 0, 2, 7

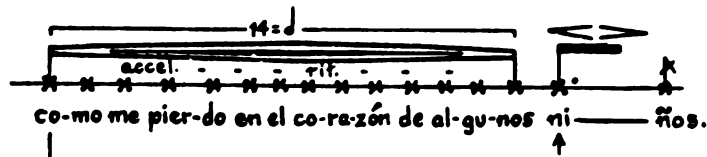
0, 2, 6 0, 2, 6

0, 2, 6

The second movement, while a separate entity within the composition, formally serves to bridge the first movement to the third. In this sense, it has a psychological function in the work as a whole--it is a state of repose before the exuberant third movement. As such, dynamics are subdued, and vocal techniques are kept to a minimum.

The soprano makes seven entrances throughout the movement, six of which consist entirely of chanted words. In this monotone, the rhythm is simple: a small accelerando followed by a ritard.

Example 5, Movement 2.



The seventh and final entrance begins with a glissando spanning a minor ninth. The pitches which follow form the set [0,1,2,3,4,5,6], a chromatic line with a tritone (G, C#) as the outer pitches.

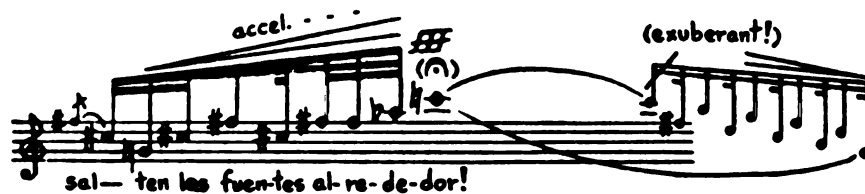
Example 6, End of Movement 2.



In the third movement, the vocal part is divided into two separate parts: regularly sung lines and improvisatory half-singing. These are separated into two distinct sections in the score through the use of "circular" notation.²

The nexus set of the sung parts is PC 5-7 [0,1,2,6,7].³ This set is presented in a phrase that begins with a palindrome; after a group of notes leading to a high C, a short indeterminant note-group follows. This is an example of text-painting, as the text for this passage is:

Example 7, Movement 3.



salten las fuentes alrededor!

(and the fountains leap all around!)

The tritone is the most important melodic interval in this movement; it is the initial and final interval of several phrases, and its use in an interlocking set gives the final measure its pitch-set.

²This notation is used by Crumb in many of his scores (Songs, Drones and Refrains of Death; Makrokosmos Book I). It gives graphic representation to the formal aspects of the movement; furthermore, it allows for temporal flexibility, in this case between the percussion ostinato and the rest of the ensemble.

³This set is a subset of the nexus set of Movement 1.

Example 8, Movement 3, final measure



The fourth movement, like the second, has little pitch material in the voice part. The work opens in the style of a recitative, with the soprano singing a line over a sustained C# major triad in the percussion. This line consists of a series of four sets: [0,2], [0,2,4], [0,2,4,6] and [0,2,4,6,8]. With each new entrance, another pitch of a whole-tone scale is added. Unlike every other instance in the entire work, the whole-step potential of the sets is not primarily realized in the music by sevenths and ninths, but by seconds and thirds (with the exception of one minor seventh). These small intervals are to be sung "as soft as possible." The result is a frail, spiritual sound, to suit the text:

each afternoon,
 each afternoon in Granada,
 each afternoon,
 a child dies.

The nexus set for the fifth movement is PC 6-41, [0,1,2,3,6,8]. This set is in Rp relationship with the nexus set of the first movement [0,1,2,3,6,7]. The interval that has been changed is the final one--a minor second has been altered to a major second. The nexus set of this movement, then, shows a development from the first

movement--the whole-tone characteristics of the fourth are incorporated into the nexus set of the last.

In the performance notes at the beginning of the score, Crumb comments: "In composing Ancient Voices of Children, I was conscious of an urge to fuse various unrelated stylistic elements. I was intrigued with the idea of juxtaposing the seemingly incongruous . . ." While this "juxtaposition" occurs in a larger sense (e.g., combining Flamenco style with a Bach quotation), a more subtle process is also at work.

In Example 9 below (from the fifth movement), main elements of the previous four movements can be seen; they are combined to form a new linear style. The various devices taken from earlier movements are listed below. It is with these "various stylistic elements" that Crumb makes a subtle juxtaposition (the letters given below correspond to the analysis in Example 9):

- A. Use of the [0,1,2,3] chromatic subset as linear sevenths and ninths (first movement),
- B. Non-pitched presentation of the text (second movement),
- C. The structural importance of the tritone as a melodic interval (third movement),
- D. Whole-tone scale material, presented as seconds and thirds (fourth movement).

The last movement closes with a duet between the Boy Soprano and the Soprano; the sets become less complex as the movement approaches its end. The pitches return to whole-tone material, and the dynamics become increasingly

Example 9, Ancient Voices of Children, mvt. 5

de los ma-res, cer-ca de las es-tre-las,

pa-ra pe-dir-le a Cri-sto-Se-ñor

de li-rios y de a-be-ja.

softer. A final [0,2,6] set is sung pianissimo. The words that end this movement are:

and I will go very far . . .
 close to the stars,
 to ask Christ the Lord
 to give me back
 my ancient soul of a child.⁴

⁴Garcia Lorca, Balada de la Placeta, trans. by J. L. Gili, in score to Ancient Voices of Children (New York: C. F. Peters Corporation, 1970).

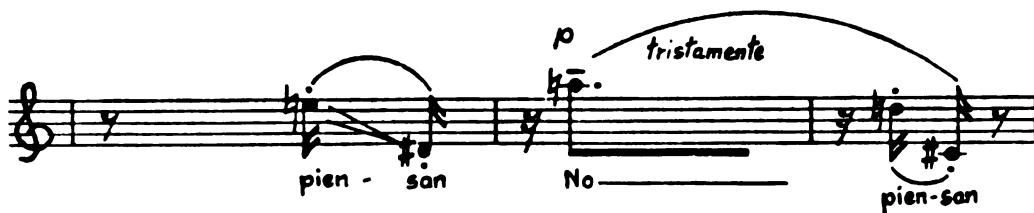
CHAPTER VII

PALINDROMES

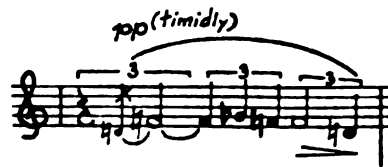
A palindrome is a specific arrangement of symbols in a series, an arrangement that implies symmetry from a central point outwards. Musically, it can be constructed with rhythms alone, pitches alone, or rhythms and pitches combined.

In the music of George Crumb, all three types of palindromes can be found; they are used as both melodic devices and as structural building blocks. In the examples below and the analysis that follows, different types of rhythmic and melodic palindromes are given.

Example 1, Palindrome of rhythm alone.
Madrigals, Book I, mvt. 2



Example 2, Five-note palindrome of pitches alone.
Lux Aeterna.



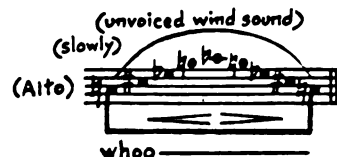
Example 3, Five-note palindrome of pitches and rhythm.
Madrigals, Book I, mvt. 3



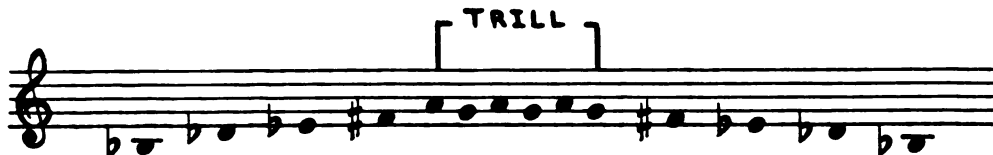
Example 4, Nine-note palindrome of pitches alone.
Songs, Drones and Refrains of Death, mvt. 2



Example 5, Nine-note palindrome of pitches and rhythm.
Night of the Four Moons, mvt. 2



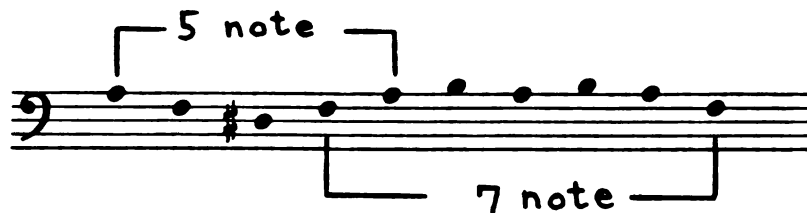
Example 6, Ten-note palindrome of pitches alone.¹
Night of the Four Moons, mvt. 4



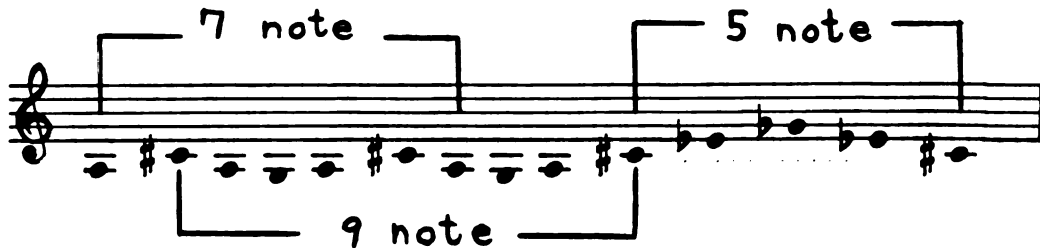
¹In this example, the "central point" is a written-out trill. Although not a strict palindrome (caused by the trill beginning on the upper auxiliary), aurally it will have the effect of one.

Crumb, in the construction of melodic lines, uses a device that can be referred to as a compound palindrome. It consists of two or more palindromes, which share two or more pitches. The following examples illustrate various types.

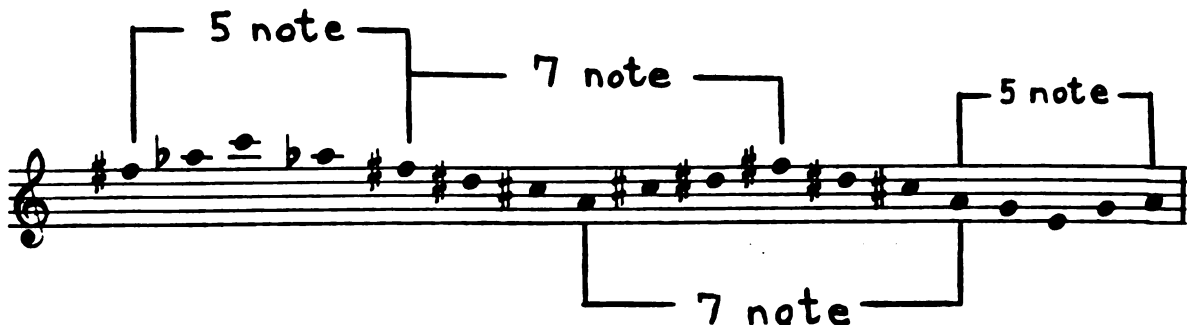
Example 7, Double palindrome, Songs, Drones and Refrains of Death, mvt. 4



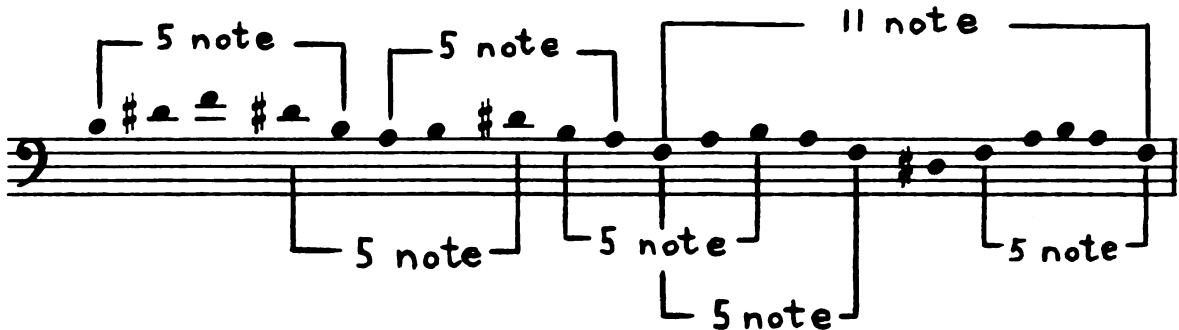
Example 8, Triple palindrome, Night of the Four Moons, mvt. 1



Example 9, Quadruple palindrome, Madrigals, Book IV, mvt. 3



Example 10, Septuple palindrome, Songs, Drones and Refrains of Death, mvt. 4

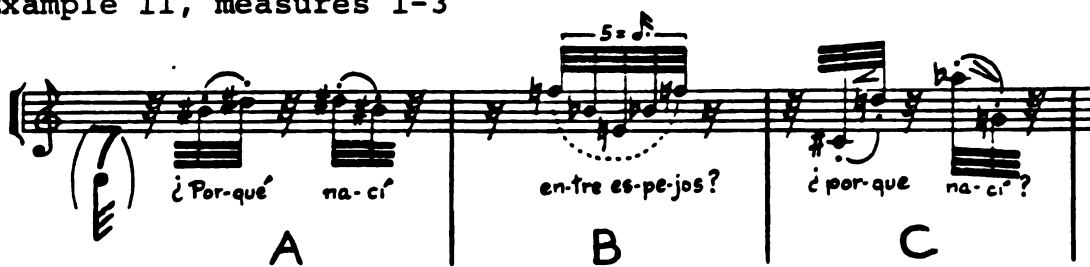


The importance Crumb places on the palindrome as a structural building block and as a melodic device can be seen through an analysis of Madrigals, Book IV, Movement 1.

This movement contains many palindromes, some of pitch alone, some of rhythm alone, and others of pitch and rhythm combined. Also, in some sections, the text itself forms a palindrome.

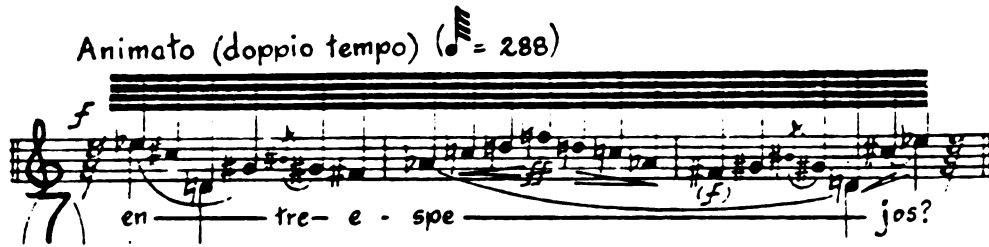
Below is the opening phrase of the soprano part.

Example 11, measures 1-3



Motive A and motive B are both palindromes of pitch and rhythm. The entire three measures together also form a rhythmic palindrome.

Example 14, measures 22-23



The great number of palindromes that are used in this movement can be accounted for by an examination of the text:

"Porque naci entre espejos?"

"Why was I born surrounded by mirrors?"

The implications of the text result in other melodic devices, also. Motives B and C are both inverted² when they occur in measures eight and nine. The inversion of motive C is dependent on the palindromic nature of the passage; taken note by note, these two measures would not be inversions. The larger palindrome has not been created in this manner, however.³ It is created motivically. Motive C is constructed in two parts: a minor ninth up, and a minor ninth down.

m9th ↑ / m9th ↓

The palindrome (or mirror image) of these two intervals would be minor ninth down, minor ninth up.

²The motives are also transposed.

³The larger palindrome referred to occurs in measures 1-10.

m9th ↑ / m9th ↓ | m9th ↓ / m9th ↑

The last two intervals are inverted in the music, however, the result being a motive that is the same as its original (transposed).⁴

Example 15, Motive C

measure 3



measure 8



⁴The palindrome of the motive and its inversion work to cancel each other out.

CHAPTER VIII

STYLISTIC TRAITS--A SUMMARY

A list of nexus sets for the movements analyzed in this thesis appears below.¹ Movements which did not yield suitable charts for analysis, due to short length or extended use of non-pitched vocal techniques (for example, movement two of Ancient Voices of Children, which contains only one set) have not been included.

4-5 [0,1,2,6], Madrigals, Book I, mvt. 1
5-7 [0,1,2,6,7], Madrigals, Book II, mvt. 1
5-7 [0,1,2,6,7], Madrigals, Book II, mvt. 2
5-7 [0,1,2,6,7], Ancient Voices of Children, mvt. 3
6-5 [0,1,2,3,6,7], Madrigals, Book II, mvt. 3
6-5 [0,1,2,3,6,7], Ancient Voices of Children, mvt. 1
6-21 [0,1,2,4,6,7], Madrigals, Book I, mvt. 2
6-30 [0,1,3,6,7,9], Madrigals, Book III, mvt. 1
6-41 [0,1,2,3,6,8], Ancient Voices of Children, mvt. 5

In Example 1, these sets have been built on the pitch F, and aligned, for easy comparison. The close relationship of each set to every other set shows a remarkable degree of stylistic unity. This consistency spans

¹Refers to works analyzed in full, not for works used as isolated examples. These are: Madrigals, Books I, II, III and IV; Ancient Voices of Children.

Example 1, Nexus sets

a compositional period of five years, from 1965 (Madrigals, Books I and II) to 1970 (Ancient Voices of Children).

The similarity of nexus sets is only one facet of the personal style of Crumb's music. The manner in which subset potentials are realized in the music also contributes to the overall effect.

The construction of sets and their utilization in the music can be broken down into the following generalizations:

1. The nexus set will begin with chromatic movement, either $[0,1]$, or $[0,1,2]$, or $[0,1,2,3]$ forming the first subset.

2. This will be followed by a leap up to a pitch that is the interval of a tritone away from a pitch in the first subset.²
3. This pitch, if followed by others, will begin a new series of step-wise movement, forming new tritones with pitches in the first subset.
4. In actual use, the chromaticism inherent in the nexus set will not appear in the music as a series of seconds, but as leaps of sevenths or ninths.³
5. In sets and configurations chosen by Crumb, an attraction for symmetry is apparent; in sets that are not symmetrical, palindromes are often constructed by repetition of set members.⁴

²This leap is sometimes filled in where a large set (cardinal six and greater) is used.

³Where this is not the case (for example, movement four of Ancient Voices of Children) the change is made as a special effect.

⁴Given the set [0,1,6], pitches could be repeated to form a palindrome as follows: B,C,B,F,B,C,B.

APPENDICES

APPENDIX A

ANALYSIS CHARTS

APPENDIX A

ANALYSIS CHARTS

Information on the interpretation of these charts is given in Chapter II of this thesis. The sets included in these charts all occur in the music--none are hypothetical or contrived. Therefore, all relationships that these sets yield exist in the music.

In cases where the determination of a nexus set was inadvisable (see Chapter III, Madrigals, Book I, movement 3), the chart may still provide valuable information regarding set interrelationships.

MADRIGALS, BOOK I

Movement 1

	3-5	4-1	4-5	4-8	4-9	5-4	6-12	6-13	6-41	7-1	8-10	IR#
3-5			Kh	Kh	Kh	Kh	Kh+	Kh	Kh+	K	K	43
4-1			Rp			Kh	K		K	Kh	K	23
4-5	Kh	Rp		Rp		Kh	Kh+		Kh+	K	K	36
4-8	Kh		Rp				K		K	K		18
4-9	Kh						K	K	K			14
5-4	Kh	Kh	Kh				K		K	K	K	27
6-12	Kh	K	Kh	K	K	K		Rp				26
6-13	Kh				K		Rp					12
6-41	Kh	K	Kh	K	K	K						22
7-1	K	Kh	K	K		K						17
8-10	K	K	K			K						12

Movement 2

	3-3	3-5	4-8	4-9	4-20	5-4	6-21	IR#
3-3		Rp				Kh	Kh+	15
3-5	Rp		Kh	Kh		Kh	Kh+	25
4-8		Kh			Rp			9
4-9		Kh						5
4-20			Rp					4
5-4	Kh	Kh						10
6-21	Kh	Kh						10

MADRIGALS, BOOK I

Movement 3

	3-1	3-8	4-9	8-2	IR#
3-1				Kh	5
3-8					0
4-9				K	3
8-2	Kh		K		8

MADRIGALS, BOOK II

Movement 1

	3-1	3-2	3-5	4-5	4-9	4-11	4-12	4-15	4-16	4-29	5-4	5-7	5-15	IR#
3-1		Rp	Rp	Kh							Kh	Kh	Kh	28
3-2	Rp		Rp			Kh	Kh			Kh	Kh			28
3-5	Rp	Rp		Kh	Kh			Kh	Kh	Kh	Kh	Kh	Kh	48
4-5	Kh		Kh				Rp				Kh	Kh	Kh	29
4-9			Kh						Rp	Rp		Kh		18
4-11		Kh								Rp				9
4-12		Kh									Kh			10
4-15			Kh	Rp										9
4-16			Kh		Rp					Rp		Kh	Kh	23
4-29		Kh	Kh		Rp	Rp			Rp					22
5-4	Kh	Kh	Kh	Kh			Kh							25
5-7	Kh		Kh	Kh	Kh				Kh				Rp	29
5-15	Kh		Kh	Kh					Kh			Rp		24

MADRIGALS, BOOK II

Movement 2

	3-1	3-8	4-1	4-5	4-9	4-16	5-7	5-10	5-15	7-28	8-4	8-9	IR#
3-1			Kh	Kh			Kh		Kh	K	Kh	K	31
3-8				Kh		Kh	Kh	Kh	Kh	Kh	K	K	36
4-1	Kh			Rp							K	K	15
4-5	Kh	Kh	Rp				Kh		Kh	K	K	K	33
4-9						Rp	K			K	K	K	16
4-16		Kh			Rp		Kh		Kh	K	K	K	28
5-7	Kh	Kh		Kh	K	Kh			Rp	K	K	Kh	38
5-10		Kh									K		9
5-15	Kh	Kh		Kh		Kh	Rp					K	27
7-28	K	Kh		K	K	K	K						20
8-4	Kh	K	K	K	K	K	K	K					26
8-9	K	K	K	K	K	K	Kh		K				25

MADRIGALS, BOOK II

Movement 3

[illegible]

MADRIGALS, BOOK III

Movement 1

	3-5	3-8	4-15	4-25	4-27	5-6	5-28	6-3	6-30	6-49	IR#
3-5		Rp	Kh			Kh	Kh	Kh	Kh+	Kh	35
3-8	Rp		Kh	Kh	Kh	Kh	Kh	Kh	Kh+	Kh	45
4-15	Kh	Kh				Kh	Kh	K	Kh+	K	32
4-25		Kh			Rp		Kh		Kh+	K	23
4-27		Kh		Rp			Kh		Kh+	Kh	25
5-6	Kh	Kh	Kh					K			18
5-28	Kh	Kh	Kh	Kh	Kh				Kh+	K	34
6-3	Kh	Kh	K			K					16
6-30	Kh	Kh	Kh	Kh	Kh		Kh			Rp	34
6-49	Kh	Kh	K	K	Kh		K		Rp		28

MADRIGALS, BOOK III

Movement 2

	3-4	4-3	4-11	8-13	IR#
3-4			Kh	K	8
4-3			Rp	K	7
4-11	Kh	Rp			12
8-13	K	K	K		9

Movement 3

	3-5	4-5	4-15	4-25	5-4	5-19	IR#
3-5		Kh	Kh		Kh	Kh	20
4-5	Kh		Rp		Kh		14
4-15	Kh	Rp				Kh	14
4-25							0
5-4	Kh	Kh					10
5-19	Kh		Kh				10

MADRIGALS, BOOK IV

Movement 1

	3-5	4-8	4-9	4-13	4-29	7-36	IR#
3-5		Kh	Kh	Kh	Kh	Kh	25
4-8	Kh			Rp		K	12
4-9	Kh				Rp		9
4-13	Kh	Rp			Rp	Kh	18
4-29	Kh		Rp	Rp		K	16
7-36	Kh	K		Kh	K		16

Movement 2

	3-7	4-5	4-12	5-15	7-13	IR#
3-7					K	3
4-5				Kh	Kh	10
4-12					K	3
5-15		Kh			K	8
7-13	K	Kh	K	K		14

MADRIGALS, BOOK IV

Movement 3

	4-13	4-21	4-25	4-29	5-33	6-23	6-29	IR#
4-13				Rp		Kh	Kh	14
4-21					Kh			5
4-25					Kh	K		8
4-29	Rp					K		7
5-33		Kh	Kh					10
6-23	Kh		K	K				11
6-29	Kh							5

ANCIENT VOICES OF CHILDREN

Movement 1

(Due to the large size of this chart, one half appears on this page, and the other half, on the following page.)

	3-1	3-3	3-4	3-7	3-8	4-13	4-15	4-16
3-1		Rp	Rp					
3-3	Rp		Rp				Kh	
3-4	Rp	Rp		Rp				Kh
3-7			Rp		Rp	Kh	Kh	
3-8				Rp			Kh	Kh
4-13				Kh			Rp	
4-15		Kh		Kh	Kh	Rp		
4-16			Kh		Kh			
4-25					Kh			
5-23			Kh	Kh				
5-28		Kh		Kh	Kh		Kh	
5-29			Kh	Kh	Kh	Kh		Kh
5-33					Kh			
6-5	Kh	Kh	Kh	Kh	Kh	Kh	Kh	
7-7	Kh	K	Kh	K	Kh	K	K	Kh
7-19	K	Kh	K	Kh	Kh	Kh	Kh	K

ANCIENT VOICES OF CHILDREN

Movement 1 (cont.)

	4-25	5-23	5-28	5-29	5-33	6-5	7-7	7-19	IR#
3-1						Kh+	Kh	K	22
3-3			Kh			Kh+	K	Kh	32
3-4		Kh		Kh		Kh+	Kh	K	41
3-7		Kh	Kh	Kh		Kh+	K	Kh	47
3-8	Kh		Kh	Kh	Kh	Kh+	Kh	Kh	50
4-13				Kh		Kh+	K	Kh	28
4-15			Kh			Kh+	K	Kh	38
4-16				Kh		Kh+	Kh	K	29
4-25			Kh		Kh		K	K	21
5-23									10
5-28	Kh			Rp	Rp		K	K	39
5-29			Rp				K	K	35
5-33	Kh		Rp						14
6-5							Kh	Kh	50
7-7	K		K	K	Kh+			Rp	51
7-19	K		K	K		Kh+	Rp		53

ANCIENT VOICES OF CHILDREN

Movement 2

Only two pitch-class sets are in this movement.

4-3 [0,1,3,4]

5-3 [0,1,2,4,5]

These two sets are in Kh relationship.

Movement 3

	3-1	3-5	3-8	4-9	5-7	5-14	7-36	IR#
3-1		Rp			Kh	Kh	Kh	19
3-5	Rp		Rp	Kh	Kh	Kh	Kh	28
3-8		Rp			Kh	Kh	K	17
4-9		Kh			Kh			10
5-7	Kh	Kh	Kh	Kh		Rp		24
5-14	Kh	Kh	Kh		Rp		K	22
7-36	Kh	Kh	K			K		16

Movement 4

Only two pitch-class sets are in this movement.

3-6 [0,2,4]

5-33 [0,2,4,6,8]

These two sets are in Kh relationship.

ANCIENT VOICES OF CHILDREN

Movement 5

(Due to the large size of this chart, one half appears on this page, and the other half, on the following page.)

	3-5	3-7	3-8	4-9	4-25	5-4	5-9	5-19
3-5			Rp	Kh		Kh	Kh	Kh+
3-7			Rp			Kh	Kh	Kh+
3-8	Rp	Rp			Kh	Kh	Kh	Kh+
4-9	Kh							Kh+
4-25			Kh					
5-4	Kh	Kh	Kh				Rp	
5-9	Kh	Kh	Kh			Rp		
5-19	Kh	Kh	Kh	Kh				
5-28	Kh	Kh	Kh		Kh			
5-29	Kh	Kh	Kh					
6-7	Kh		Kh	Kh	Kh		Rp	
6-15	Kh	Kh	Kh					
6-38	Kh		Kh	Kh				
6-41	Kh	Kh	Kh		K	K		
7-19	Kh	Kh	Kh	Kh	K	K		Kh+

ANCIENT VOICES OF CHILDREN

Movement 5 (cont.)

	5-28	5-29	6-7	6-15	6-38	6-41	7-19	IR#
3-5	Kh	Kh	Kh+	Kh+	Kh	Kh	Kh+	63
3-7	Kh	Kh		Kh+		Kh	Kh+	47
3-8	Kh	Kh	Kh+	Kh+	Kh	Kh	Kh+	67
4-9			Kh+		Kh		Kh+	28
4-25	Kh		Kh+			K	K	22
5-4						K	K	25
5-9		Rp						23
5-19							Kh+	26
5-28		Rp				K	K	30
5-29	Rp					K	K	25
6-7					Rp			28
6-15								15
6-38			Rp			Rp		23
6-41	K	K			Rp		K	34
7-19	K	K				K		41

APPENDIX B

PHONETIC SOUNDS

APPENDIX B

PHONETIC SOUNDS

International Phonetic System

(used in Madrigals, Books I-IV)

Crumb gives the following list in the Performance Instructions to the four books of Madrigals, with the comment that the list gives only the "approximate pronunciation of the phonetic syllables."

taI-o: -ti:k = ty-oh-teek

taI-o: -tok = ty-oh-tohk

tI: -ku: = tee-koo

tI: -ka: = tee-kah

taI-u: = ty-oo

tlu:ng-o-to-to = tloong-oh-toh-toh

tɔI = toy

tong = tohng

tI:ng = ting

tu:ng = toong

ʃ = sh (wind sound)

ʃɔI = shoy

Phonetic Sounds used in
Ancient Voices of Children

- a - like a in "father"
- e - like a in "day"
- i - like ee in "bee"
- o - like o in "snow"
- u - like oo in "mood"
- ai - like $\bar{i}$ in "rice"

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