An Analysis of Ruth Crawford Seeger's "Rat Riddles"
from Three Songs for Contralto, Oboe, Piano, Percussion, and Orchestral Ostinati

by Lynn Gumert

The performance instructions for this piece state that the Orchestral Ostinati should be rehearsed separately from the Concertanti at least once. The composer also requested that the Orchestra and Concertanti be separated spatially during performance if at all possible. Additionally, she requested that the oboe used have a strong, forceful tone, or that it be reinforced with clarinet.

The structure of this song is clearly related to the poetry. The two-line stanzas which introduce each bit of dialogue in the poem begin with closely related music in the vocal parts (mm. 18-24, mm. 40-45, mm. 58-60, and mm. 79-80). The dialogue sections of each stanza are more distinct (mm. 25-32, mm. 46-53, and mm. 63-77). The rat's response (mm. 63-77) is particularly striking. The ostinati drops out, the percussion becomes a sustained bass drum roll, the character of the oboe and piano parts changes to a homophonic texture, and the tessitura of the vocal line drops to its lowest and rises to its highest points.

The oboe and piano parts within each strophe are even more closely related than the vocal line, being essentially the same music with some transpositions, a few omissions, and some rhythmic variations from mm. 9-32, mm. 33-53, mm. 54-62, and mm. 78-end.

The music clearly seems to exist on several different planes, the ostinato, the vocal line, the percussion section, and the piano/oboe parts. The ostinato is distinguished by timbre, by being homophonic, and by being centered on pcset 5-1, with which it begins and ends each verse of the song and the piece as a whole. The vocal line is declamatory in nature, and as I will discuss below, is saturated with occurrences of pcset 3-5. The oboe and piano parts are rhythmically complex, with rapid changes of register, as if to represent the rat's scurrying about. They do not seem to be as organized in terms of pcsets as the vocal line, although they do reveal occurrences of pcset 3-5 and related sets, as well as the chromatic pcsets common to the ostinati. The percussion section adds atmosphere, with its light-sounding triangle, Chinese blocks, tambourine, and cymbal. The most extended use of the bass drum is the long roll which accompanies the voice in mm. 63-78.

Because of the layered nature of the piece, I will discuss each layer separately. I will focus on the orchestral ostinati and the vocal line. I will discuss the piano and oboe parts briefly, and the rhythm section not all. I will then turn to a discussion on how to analyze the pitch space and timbral aspects of a piece such as this.

Orchestral Ostinati

There are several interesting features about the ostinato. I will begin with a discussion of its pcset content and its rhythmic structure. I would also like to explore how each pcset is transformed into the next in terms of common pitch classes and registral exchanges.

As mentioned above, the ostinato consists entirely of homophonic chords, all but one of them pentachords. It seems possible that the sole exception, the seven-note chord in m. 31, is due to an error in the score rather than to the composer's intention. I base this conjecture on several observations: I have found other clear errors in the score; it would be unusual for this to be the single exception to a pattern established throughout the piece; the pattern of the piece shows that the ostinato is doubled between the string section and the wind sections except for this chord; also,

every other verse ends with a string of pentachords more distantly related to 5-1 than 7-1 would be before "resolving" back to the 5-1 pcset which is the basis of the piece. This being said, it is not easy to determine what the set at this point really should be. It seems likely that it would not be 5-1 [45678], which is the set in the strings, because every other instance of 5-1 involves the pitch classes [789TE]. This leaves the possibility of either 5-2 [35678] or 5-8 [35679]. Of these two, the first seems more likely because it involves one missing accidental in the string part, and reveals the register exchange of the shared pitch classes seen in the other sets, which will be discussed below.

The "tonic" of the ostinato, as implied above, is pcset 5-1 [789TE]. This set begins and ends each verse of the song, with the exception of the rat's narrative, during which the ostinato drops out. It is the most frequently stated chord in the ostinato, and the only one which appears in two different voicings (see mm. 5 and 11, for example). Pcset 5-15 seems to serve as the "dominant" of the song and is the second most repeated chord. It first appears in m. 16, between several statements of 5-1, where it seems to be preparing the entrance of the voice in m. 18. Its next appearance, in mm. 28-29 is preparatory to the return of 5-1 in m. 32 at the end of the first verse. Pcset 5-15 appears for the last time in mm. 82, 84, again inserted between several statements of 5-1, and serving as preparation for the final statement of 5-1 in m. 84.

Each strophe shows a movement away from the tonic pcset 5-1 towards more distantly related pcsets and back again. This is similar to the tension-release found in tonal music. Within each strophe, the harmonic motion is as follows:

verse 1:	5-1	5-1 extension	5-15	5-1	5-19	5-15	7-1	5-1	
verse 2:	5-1	5-1 extension	5-4	5-20	5-23	5-2	5-6	5-16	5-1
verse 3:	5-1	5-3	(ostinato drops out for remainder of verse)						
verse 4:	5-1	5-15	5-1						

Below is a chart showing the IcVSIM values of each of these pcsets in relation to the tonic pcset, 5-1. As can be seen from the chart and the above listing of pcsets, there is a general motion within each verse away from pcset 5-1 towards more distantly related pcsets, and then back again to pcset 5-1. Verse two shows the most complex "harmonic motion" in this respect. Pcset 5-2, which is the most closely related to 5-1 of the pentachords listed here, falls in the middle of the more distantly related chords accompanying that verse -- almost as if it were a deceptive cadence. As discussed below, the actual pitch class content of this statement of pcset 5-2 is very different from that in 5-1.

Set-Class Name	Interval Class Vector	Comparison with 5-1 using Isaacson's IcVSIM
5-1	432100	0
5-15	220222	1.73
5-19	212122	1.63
7-1 (possible m. 31)	654321	0.37

5-4	322111	0.82
5-20	211231	1.82
5-23	132130	1.73
5-2	332110	
0.585-6	311221	1.41
5-16	213211	1.41
5-3	322210	0.82
5-8 (possible m. 31)	232201	1.00

The most common number of shared pitch classes from one pcset to the next is two.. There is one instance in which there are no common pitch classes -- the motion from 5-19 [568E0] to 5-15 [12379] within mm. 28. Both pcsets are relatively distantly related to 5-1. This is the first spot in which the rhythm of the ostinato changes (see below), and is therefore a point of tension.

There is one point at which three common pitch classes are retained -- the motion from 5-4 [E0125] and 5-20 [E1267] between mm. 50-51. In this case, the pitches are retained in the same register. The first pcset, 5-4, is relatively closely related to 5-1, whereas the second, 5-20, is relatively distantly related. This is the second spot in which the rhythm of the ostinato changes. Perhaps the high number of common tones is to keep the tension level lower than it would otherwise be, since this is the beginning of the rhythmically agitated section of the ostinato, and it would be more appropriate to have the greatest tension nearer the cadence.

There is one point in which four pitch classes are retained -- the motion from 5-1 [789TE] to 5-3 [679TE] between mm. 60-61. All four pitches are retained in the same register. These two sets are relatively closely related. This marks the point at which the ostinato is broken for the rat's narrative. The same common tones are retained in the return of 5-1 in m. 79. This close relation between the two sets may be necessary to provide continuity over the long span during which the ostinato drops out.

All the pcsets used in verse one share two pitch classes with the "tonic" pcset 5-1 [789TE]. Verse two ranges further afield; pcsets 5-4 [E0125], 5-23 [T0135], and 5-2 [E1234] share only 1 pitch class with the tonic pcset class. In addition to being more distantly related in terms of pitch, verse 2 is also the most rhythmically complex and dense section of the ostinati.

The ostinati follows a regular rhythmic pattern which runs independently of the Concertanti. None of the pcset chords are sustained. Measured rhythmically, the ostinato repeats 11 times (mm. 5-10, 11-16, 17-22, 23-28, 29-34, 35-40, 41-46, 47-52, 53-58, 59-62, and 79-84). All except the last statement cover the length of 12 quarter notes. Counting from attack point to attack point and using the quarter note as the unit of measurement, the basic rhythmic pattern is [3,3,3.5,0.5,2]. (See below for a discussion of the relation of the ostinato to downbeats.) The basic rhythmic pattern is varied on the fourth statement [3,3,3.5,0.5,0.5,1.5], in which the last

"2-quarter" duration is subdivided into "0.5+1.5" quarter durations. Statements 5 through 7 return to the original rhythmic pattern. Statement 8 has the highest number of attack points. Although it keeps the basic 6+6 beats segmentation, the beats are now subdivided as [3,3,2.67,0.67,0.67,0.67,0.67,0.67]. This statement has the highest number of occurrences of sonorities on downbeats, which adds a sense of agitation and tension to the piece. Statement 9 returns to the original pattern, which now for the first time begins on a downbeat. Statement 10 shows the basic 6+6 beats, within a pattern of [3,3,3.33,0.33,2.33]. The final statement, after the long passage without ostinati (mm. 63-78), shows elongations of the third and last durations [3,3,4.5,.5,10].

The variations to the regular rhythmic pattern fall at important structural points. The first occurrence, statement 4 at mm. 23-28, is the last full statement before the end of the first stanza of the song. The second, statement 8 at mm. 47-52, occupies the same position in relation to the second stanza of the song. The third, statement 10 at mm. 59-62, immediately precedes the section in which the ostinati drops out. The final statement is at the end of the song. It seems clear that the fracturing into smaller rhythms seen in statements 4, 8, and 10 adds to the harmonic tension at those moments which is produced by the introduction of different pcset pentachords and the resulting increase in "harmonic rhythm." This is similar to the "drive to the cadence" observed in tonal music. The lengthening of the third duration in the final statement coincides with a statement of pcset 5-15, which seems to function as a "dominant" to 5-1, to which it resolves in m. 84.

Pcset sonorities fall on the downbeats at mm. 7, 13, 19, 25, 31, 37, 43, 50, 52, 53, 56, 58, 59, 60, 61,and 82. The ostinato begins on the second beat of m. 5, so the chords on the downbeats of the measures and the beginning chord of each statement of the ostinato do not coincide until m. 53; they coincide at that point because of the single 3/4 bar at m. 48. The final coincidence, at m. 82, falls in the middle of the ostinato. For the first seven statements of the ostinato, chords on downbeats occur at the regular interval of 6 measures. The frequency of chords falling on downbeats increases between mm. 50 through mm. 61, along with the increase in the speed of the harmonic rhythm. The downbeat at mm. 50 has been delayed from mm. 49, where it would have been expected, by the above-mentioned insertion of a 3/4 bar at m. 48.

The voicing of the pcsets is interesting. Each pcset is presented at the same T-level each time, and is positioned in the same place in relation to pitch space. The "tonic" set, pcset 5-1 is presented in two different voicings of [789TE] which are half-step related, with a common tone of G2. It is interesting that, even though each voice moves a half step, the result is a register exchange. For example, Bb3 becomes B3 while B2 becomes Bb2 and A3 becomes G#3 while Ab2 becomes A2. This kind of register exchange becomes important to the voice leading in the ostinato as a whole. Common tones between adjacent pcsets usually show this kind of register exchange. There are two occasions in which all common tones keep their original register: movement from 5-4 [E0125] to 5-20 [E1267] between mm. 50-51, and movement from 5-1 [789TE] to 5-3 [679TE] between mm. 60-61. Both are times of moving away from the tonic 5-1, so keeping the common tones in their original registers may serve as a bridge to keep the change in harmony from being too abrupt. See attached diagram for more examples of register exchange.

Vocal Line

The vocal line is saturated with pcsets 3-5. It also contains many chromatic segments, especially in the rat's narrative at mm. 63-76. See attached chart for a full listing of vocal line pcsets. I have segmented the vocal line in relation to punctuation in the text and rests or long notes in the music.

Each verse begins with a short chromatic pcset followed by or included in a statement of pcset 5-7. Pcset 5-7 can contain five subset occurrences of pcset 3-5, and in this piece it often contains up to three occurrences of the set. It is interesting that these two sets, 3-5 and 5-7, which are so prominent in the vocal part, are never seen in the ostinato. Additionally, there are no pcset 3-5 subsets of pcset 5-1. The contrast between the Orchestra and Concertanti gives a sense of atonal bitonality, if such a term could exist.

The pitch center of the vocal line, which runs from F#3 to E5, is F4. This is the only pitch class which is only performed in one octave, but it does not seem to be an important structural pitch. The opening chromatic set for the first three verses includes the pitch classes 6, 7, and 8. These pitches are also included in the last phrase of the vocal line, and seem to be important structural pitches for the vocal line. The lowest vocal note, F#3 (m. 63), is pitch class 6. The other two pitch classes, 7 and 8, are part of the ostinato's 5-1 tonic.

The tessitura of the vocal line is moderate, and remains primarily within Bb3-Eb5. The rat's narrative shows the most dramatic changes in tessitura -- the lowest vocal pitches of the piece, down as far as F#3, and the highest, E5. Although the E5 has occurred once before (m. 46), its prior appearance was as an isolated note. When it recurs in m. 67, it is accented by its duration and its position on the downbeat. It also follows the most extended upper registral section in the piece -- five notes above C5, which form a statement of pcset 5-1.

Verse 4 begins with 3-1 [89T]. By transposing the initial pcset 3-1 up and the following pcset 5-7 down, Crawford arrives at a pcset 8-1 at the beginning of the last verse. This is followed by its literal complement 4-1, so that the entire chromatic scale is stated between mm. 79-82. This transposition of 3-1 also links it more closely with the ostinati's 5-1 [789TE] set class. Now this 3-1 is a literal subset of that 5-1 pcset.

While pcsets 3-5 seem to control the pitch structure of the first two verses, verses 3 and 4 are much more saturated with chromatic pcsets. This chromatic saturation begins in m. 61 and continues until the end of the vocal line. It begins right before the orchestral ostinati drops out, and seems to take over its chromatic "tonality."

<u>Oboe and Piano</u>

Both the piano and oboe parts are organized structurally to conform with the same kind of strophic form found in the vocal part. The opening instrumental section serves as a ritornello before the entrance of the voice at each verse. In the oboe part, the following sections are almost exact repetitions, with some transpositions and rhythmic alterations: mm. 7-13 and 33-39, mm. 9-13 and 54-58, mm. 8-13 and 78-85. Occasionally a beat is omitted, but the music is essentially the same in all four sections. This is also the case for mm. 18-22 and 40-43 and mm. 19-22 and 59-60.

In the piano part, the sections are mm. 9-13, 35-39, 54-58, and 79-80. Mm. 79-80 are transposed an octave from mm. 9-10. Mm. 19-33 and 41-53 are also related. The closing bars, mm. 87-88 are related to mm. 16-17.

Neither part shows the same extent of pcset organization seen in the orchestral ostinati and vocal lines. I have marked pcsets in the Oboe and Piano lines in the score; because of the

essential repetition from section to section, and because the parts do not show much pcset structuring, I have marked the sets only for the first 33 bars.

Occurrences of pcset 3-5 are particularly apparent in the piano. The opening motive, Ab2-D3-G3, presented melodically in the left hand (mm. 4,6,9,10, for example), is a 3-5 [278] set class. This motive recurs repeatedly throughout the piece. A related motive, also a 3-5 [278] set class, is the G2-D3-Ab3 which appears in the left hand at m. 22. Other examples of 3-5 set classes are at m. 21, G#2-D#3 followed by A3, which is 3-5 [389] and in m. 17, G2-F#3 follows by C2, which is 3-5 [670]. The piano also has several examples of sets related to pcset 3-5. The opening of the piano part has many instances of pcsets 7-5 and 8-5, both of which have more 3-5 subsets than any other trichord subsets.

The oboe is much more chromatic than the piano, although both piano and oboe have chromatic pcsets. These chromatic pcsets provide an aural link between the vocal line and the ostinato in the first part of the piece. By the end of the piece, when the vocal line becomes more chromatically structured, the entire texture is primarily chromatic.

Timbre, Register, and Pitch Space

In this piece, space is very important. Physical space, since the composer wanted the Orchestra and Concertanti separated. Pitch space, since it is part of the character of the ostinato, both in terms of the low register it occupies and in terms of the unvarying transpositions of the pcsets used throughout the piece. Timbral space, since the Concertanti is set against the Orchestra -- with the oboe instructed to be very forceful in order to make it stand out more against the Ostinati.

Register is also important in the vocal line, both to the interpretation of the text and to the structure of the piece. In the first two verses, the low Bb3 (v.1) and B3 (v.2) on "I said" clearly separate reported speech from the narrator's current words. This change of register also causes a change in timbre to a darker color because of the nature of the human voice.

The use of register is especially striking in the presentation of the rat's speech in mm. 63-77. As mentioned earlier, this contains the highest and lowest points of the vocal line. It also marks a radical change in the character of the piano and oboe lines, both of which become homophonic and restricted in range during this section.

In terms of the piece as a whole, the orchestral ostinato is lower than the voice and oboe. The oboe is generally higher than the voice and is very rangy. The piano part covers the range of all the other instruments, encompassing the lows of the ostinato and the highs of the oboe. This means that it is necessary to include timbre as a factor in discussing the space of the piece; otherwise it would be difficult to separate a discussion of the piano from a discussion of the other instruments. In this piece, timbre is important in terms of the relationships among the various instruments and in relation to the instrument itself as its timbre is affected by register.

Because the actual pitches are important to the structure of the piece, it seems important to keep the concept of pitch space rather than trying to formulate a registral GIS, which would be a more indefinite measurement. Also, the registers involved in the orchestral ostinati vary from moderate to low placement within the range of the instruments involved, so a discussion in terms of register would seem to separate the sounds of the individual instruments from each other to too great a degree. I would therefore propose a direct product GIS of pitch space and timbre.

I would define the pitch space differently for the different instruments. Because the timbre of the orchestral ostinati is a composite timbre, I would treat the ostinati as a block of sound; its pitch space "S" would be the chromatic gamut from F#1 to Db4 rather than the ranges of

the individual instruments. IVLS=integers and int (s,t) = no. of semitones. The pitch space of the vocal line would be the chromatic gamut from F#3 to E5. The pitch space of the oboe line would be the chromatic gamut from B3 to F#6. The pitch space of the piano would be the chromatic gamut from C-0 to C8. Each space would begin with "0" as the lowest note.

Using a different measurement of pitch space for each instrument does create some problems in terms of comparing the instruments to each other; however, because "int (s,t)" in all cases is the number of semitones, I think it will be possible to work within this frame. Also, as I mentioned above, I think it works better to treat the orchestral ostinati in terms of the ranges of the composite rather than the individual instruments, and I would have a consistency problem if I did not follow a similar procedure in relation to the other instruments and voice. The advantage of using an instrument-specific range is that one can then compare, for example, the timbre and pitch-space of the lowest alto note with the timbre and pitch-space of the lowest oboe note and know that in each case one is dealing with the lowest note.

My inclination for a timbral GIS is toward a more intuitive approach than those suggested by Lewin in Chapter 4. I am interested in the sound of the music, not an actual measurement of the overtones. I realize that this makes it a subjective decision, which could create problems in interpretation. I would propose as "S" a gamut of sound quality from "clear" to "dark." I would define "clear" as pure tones; in the case of the oboe or the voice, the upper registers would be "clear." I would define "dark" as tones that are richer and more colorful; in the case of the oboe and voice this would more aptly describe the lower registers. IVLS would be integers from 0-9, ranging from 0=clearest to 9=darkest. int (s,t) = number of units along the scale.

The two GISes would be combined into a direct product GIS in which the first digit denoted the pitch space and the second digit denoted the timbre. This would enable one to trace timbral processes - increasing darkness, increasing clearness -- at the same time as one traced the registral processes accompanying them.

Rat Riddles

Carl Sandburg

There was a gray rat looked at me
with green eyes out of a rathole.

"Hello, rat," I said,
"Is there any chance for me
to get on to the language of the rats?"

And the green eyes blinked at me,
blinked from a gray rat's rathole.

"Come again," I said,
"Slip me a couple of riddles;
there must be riddles among the rats."

And the green eyes blinked at me
and a whisper came from the gray rathole:
"Who do you think you are and why is a rat?
Where did you sleep last night and why do
you sneeze on Tuesdays? And why is the
grave of a rat no deeper than the grave
of a man?"

And the tail of a green-eyed rat
Whipped and was gone at a gray rathole.