

## Motivic Transformations and Networks in Schoenberg's "Nacht" from *Pierrot Lunaire*

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Though *Pierrot Lunaire* (1912) certainly holds a place among the landmark compositions of the twentieth century, in some ways it has remained remarkably elusive. A survey of published studies of the work reveals an assortment of such common topics as poetic imagery, how to "properly" perform *Sprechstimme*, the few canonic features found in the work, plus a small number of motivic and set-class approaches.<sup>1</sup> After weeding out the most superficial of the lot, a number of interesting, detailed studies remain, but a scarcity of in-depth musical analyses is evident.<sup>2</sup>

Fortunately, this situation can no longer be attributed to a lack of viable analytic approaches. In his 1987 book *Generalized Musical Intervals and Transformations* David Lewin brought together, extended, and formalized concepts developed over some twenty-five years. The book includes many insightful applications to music from various style periods.<sup>3</sup> In earlier publications, Lewin has dealt specifically with *Pierrot Lunaire*, from detailing inversive aspects ("wedging") within "Die Kreuze," to briefly

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<sup>1</sup>For a good summary of gaps within the published *Pierrot* literature, with specific references and examples cited, see David Harold Smyth, "The Music of *Pierrot Lunaire*: An Analytic Approach," *Theory and Practice* 5/1 (1980):5–24.

<sup>2</sup>Refer to the reference list for the most in-depth published accounts of *Pierrot Lunaire*, as well as other important sources pertaining to the music of Schoenberg and atonal music in general.

<sup>3</sup>Varied perspectives on the book are presented in reviews by John Clough, *Music Theory Spectrum* 11/2 (Fall 1989):226–231; John Rahn, *Journal of Music Theory* 31/1 (Spring 1987):305–318; Wayne Slawson, *Music Perception* 6/2 (Winter 1988):203–212; Dan Tudor Vuza, "Some Mathematical Aspects of David Lewin's Book *Generalized Musical Intervals and Transformations*," *Perspectives of New Music* 26/1-2 (1988):258-87; and Bo Alphonse, *Intégral* 2 (1988):161–176.

mentioning the transformational structures in “Nacht.”<sup>4</sup>

In this paper, I will apply some of Lewin’s analytical techniques to “Nacht.” Permeated by variations of a primary motivic idea, the song is fertile ground for analysis based on transformational networks. This study will focus primarily on a few particularly important motives and the more systematic networks based on them. Consideration will also be given to several more loosely organized pitch structures, and to significant connections between music and text that the transformational structures may serve to enhance. Discussion of the song’s canonic details and passacaglia repetition will be kept at a minimum, since these “typical” topics are covered adequately in other sources. While most of my analysis will focus on pitch structure, brief consideration will be given to the possibility of duration as a distinctive characteristic for comparison among motivic networks.

*Motivic beginnings.* Much of the pitch material in “Nacht” is derived from one distinct, ordered motive, presented in Example 1. As the Example illustrates, there are two ways of considering its interval content. In one very brief comment on “Nacht,” Lewin labels this motive “3PLUS8EQUALS11” and notes its importance both as a motive and as a governing force in transformational networks throughout the piece.<sup>5</sup> While Lewin’s labelling (Example 1a) makes sense in pitch-class space, I have chosen to use pitch-specific interval labels (Example 1b), since in the context of the piece pitch-space interval content is maintained in almost all statements of set-class 3-3[014], and pitch-class intervals do not appear to have much independent significance. In addition, the many chromatic descending lines seem best viewed (and heard) as consecutive pitch intervals of -1 rather than as strings of pitch-class interval 11.<sup>6</sup> I will call the basic motive that consists of the

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<sup>4</sup>David Lewin has discussed “Die Kreuze” (Lewin 1968) and “Nacht” (Lewin 1982–83, 335, 368).

<sup>5</sup>Lewin 1982–83, 368.

<sup>6</sup>Labelling of larger-scale TTOs, however, will conform to standard pc-space interval designations (intervals from 0 to B), since this study is not significantly concerned with long-range register relations.

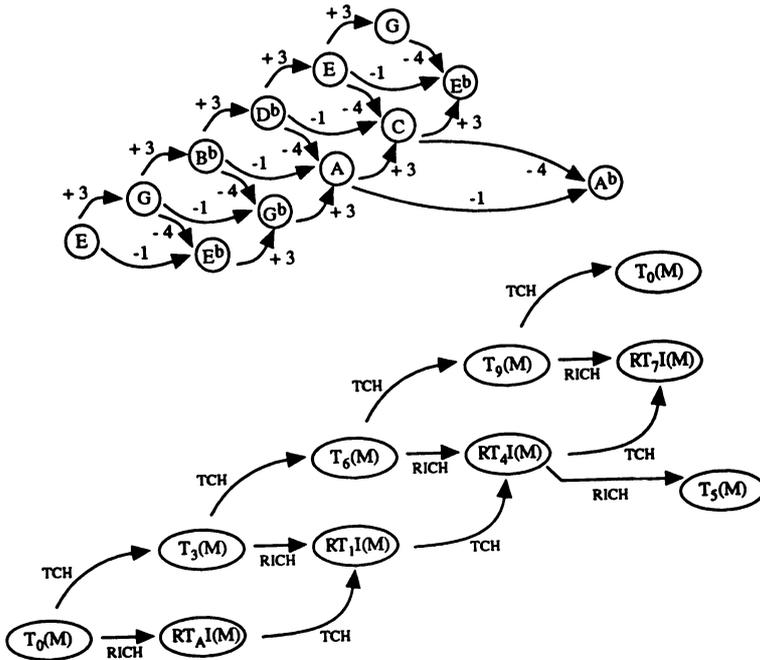
**Example 1. Primary Motive with Two Intervallic Labellings:  
(a) Lewin's; (b) mine.**

a) "3PLUS8EQUALS11"      b) "MOTH"



Schoenberg "Nacht" from *Pierrot Lunaire*. All excerpts are used by permission of Belmont Music Publishers, Pacific Palisades, CA.

**Example 2. Initial MOTH network, mm. 1-3.**



ordered succession of pitch intervals  $\langle +3, -4 \rangle$  "MOTH."

"Nacht" divides into a three-part form that follows the form of the text: Introduction = mm. 1–3; A = mm. 4–10; B = mm. 11–16; B' = mm. 17–26. Each section includes distinctive transformational structures involving the MOTH motive.

*Measures 1–10.* The three bars of the introduction present a network of layered MOTH motives. Successive transposition by interval 3 of two overlapped statements related by RI is sufficient to generate the entire network (Example 2). The incipient RI-chain (or "RICH") of two MOTH motives embedded within the network sets the stage for longer RI-chain structures that evolve later in the song.<sup>7</sup> From the initial  $T_0(\text{MOTH})$  to its final statement an octave higher, the structure completes a cycle of transpositions by  $T_3$ . There is a single appendage to the network: a statement of  $T_5(\text{MOTH})$  extends the RI-chain relationship from two statements of MOTH to three, and provides the  $A \flat$  that completes a three-note chromatic descent  $B \flat - A - A \flat$ . This chromatic descent foreshadows the development of a new motive that I shall call "CHROM," first heard in the voice in m. 4. Before moving on, we might note that the pc structure of the introduction is three notes shy of completing an aggregate. The missing pitches—B, D, and F—will be included when the network returns at the end of the piece.

Material from the opening three bars is expanded into a full-fledged theme which is stated four times in mm. 4–8 (Example 3). The descending chromatic tail of the canon theme clearly follows from  $T_0(\text{MOTH})$  in the bass clarinet, extending the three-note chromatic descent just mentioned within the network that opens the piece. The final ascent of interval 9 is also derived from the MOTH motive, as it represents the complement of the first interval of MOTH. With this final ascending interval, a long-range, secondary chromatic descent is created from  $G_3$  to  $G \flat_3$ . In contrast to the introduction where adjacent entries overlap a good deal in both time and register, here the full measure that separates consecutive entries along with their timbral and/or registral independence allows each thematic statement to be clearly heard. The change in texture seems contrary to events in the text, where

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<sup>7</sup>For a definition of RICH, see Lewin 1987, 180–81.

Example 3. Canon theme, first statement, mm. 4–6.

B. Cl.

m.4 +3 -4 -1 +8

-1 -1 -1 -1 -1 -1 -1 +9

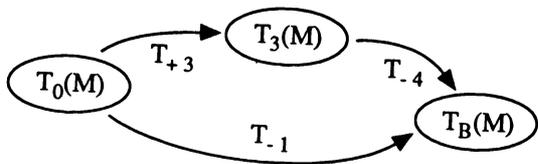
SC 3-3[014] SC 3-3

Example 4. Initial TRIMOTH, bass clarinet, m. 8.

B. Cl.

m.8  $T_0(M)$  +3  $T_3(M)$  -4  $T_B(M)$

-1 -1



mothwings are destroying the sun's brilliance: the murky darkness of the introduction has already lifted just enough to reveal the individual canonic entries.

Another significant melodic structure presented in the opening section is initiated by the bass clarinet in bar 8. As Example 3 illustrates,  $T_0(\text{MOTH})$  is combined and thus transformed, through its own intervallic content, to create a larger model of itself that I will call "TRIMOTH." This enlarged MOTH network is what Lewin calls "isographic" with the original MOTH, since the transformations involved in both networks are identical.<sup>8</sup>

Perhaps the word "Zauberbuch" (magic book) in bar 8 provides the impetus for this TRIMOTH, which is the very first instance of a clearly-presented, "magical" transformation of MOTH. While the first MOTH network appears as early as mm. 1–3, one might argue that the motive is still in its formative stages at that point. By m. 8, however, the listener should have a clear sense of the transformation of MOTH as it is activated in the bass clarinet. This statement also represents one of the few networks of the entire piece that is stated outside of the piano's domain. More importantly, this first TRIMOTH marks the MOTH motive's initial "escape" from the established canon theme. In the section that follows, this separation of the MOTH and the CHROM motives continues as each builds its own independent structures.

*Measures 11–16.* In this next section, a variety of MOTH networks are layered with fluttering chromatic passages as textural complexity builds up through the climactic cadence of bar 16. With the primary and secondary motivic material established in mm. 1–10, along with the transformational structure that yields the TRIMOTH network in mm. 8–9, Schoenberg begins to construct more complex motivic networks. He continues to work with transpositional relationships as in the TRIMOTH network of m. 8, but new  $T_n$  levels produce a network no longer isographic with the

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<sup>8</sup>For a discussion of "isography," see Lewin 1987, 198–200. "Isomorphic graphs" is the standard comparable term in mathematics. In our analytic context, the reader may note that the isography between intervals within the MOTH motive and transposition levels within the larger TRIMOTH structure also approximates Richard Cohn's concept of transpositional combination and Pierre Boulez's "multiplication."

original (Example 5). But if the pitches F and E $\flat$  found at the appropriate moments in the piano part (shown in parentheses) are added in, a true RI-chain results.

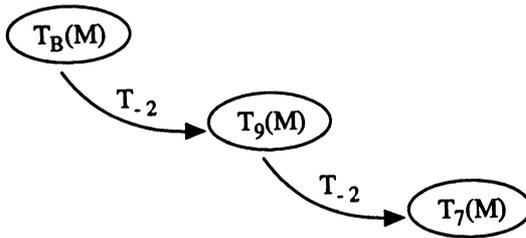
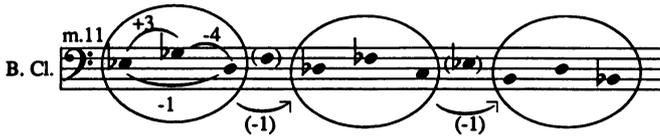
In mm. 12–13 Schoenberg returns to transposition networks isographic with the original TRIMOTH from m. 8. Pairs of TRIMOTHs then combine in mm. 14–15 to produce a new structure, “DOUBLETRIMOTH” in the upper two lines of the pianist’s left hand (Example 6). Adding in the quarter-note bass line, which presents reordered forms of the MOTH motive (Example 7), produces a three-voice structure that is comparable to the opening network of mm. 1–3 transformed by  $T_6$ . As shown in Example 8, each two-beat unit in mm. 14–15 corresponds to a subnetwork of the larger network of mm. 1–3. One might also note that the transposition interval of -3 from m. 14 to m. 15 resonates with that found within the MOTH motive.

This similarity between the network structures shown in mm. 14–15 and those from the opening gains added significance in light of the text, for it is here that there is a return to the opening line, “Finstre, schwarze Riesenfalter töteten der Sonne Glanz.” But there are some marked differences this second time around. While the music in mm. 4–6 serves more as an exposition of canonic material than a direct realization of the text, in mm. 14–16 the thicker texture, heightened rhythmic activity, and descending register led by the two DOUBLETRIMOTHs seem almost pictorial. Certainly the image of descending giant, black mothwings becomes more vivid and ominous in its new musical setting.

Though the opening network does not return in full in mm. 14–15, there is enough of it to mark an underlying recollection of the structure that parallels the return of text. The significance of this connection will become more apparent as the final structures of the movement are discussed later.

*Measures 17–26.* During the first sixteen bars of music the parent motive MOTH and its derivative CHROM are introduced and various networks and layerings are explored, but no single structure integrates MOTH with CHROM. In the B section, while both motives are common and contribute to more complex structures, MOTH and CHROM still generally remain distinct as different instrumental voices within the texture. In the final section (mm. 17–26), the two motives truly unite. There are two such

Example 5. Modified TRIMOTH network,  
bass clarinet, m. 11.



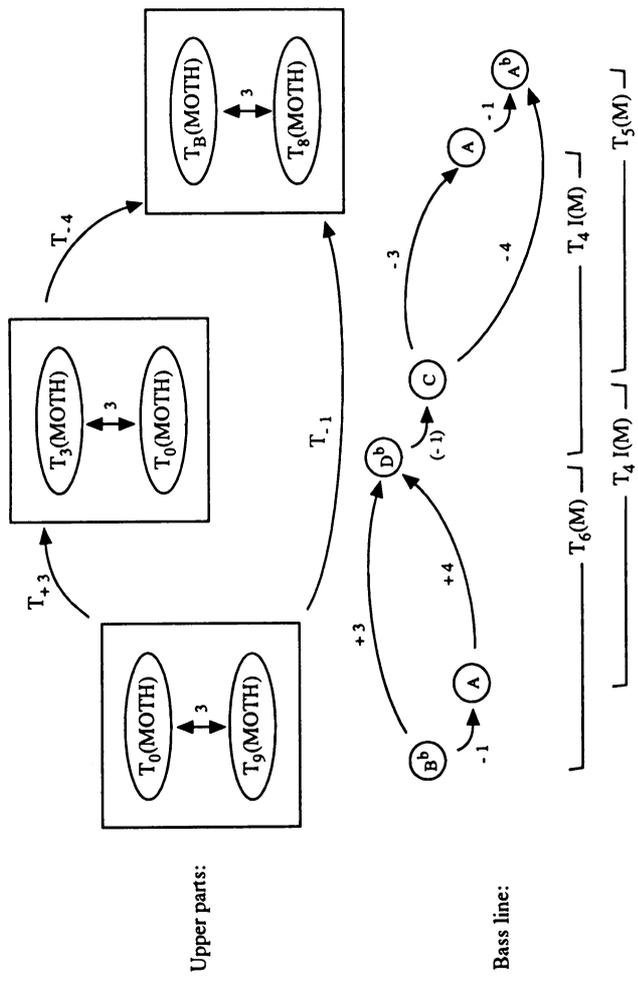
Example 6. DOUBLETRIMOTH networks, piano, mm. 14–15.

The image displays a musical score for piano, specifically measures 14 and 15. The notation is written on a grand staff with two staves. The left staff begins with a treble clef and a key signature of one flat (B-flat). The right staff begins with a bass clef and a key signature of one flat (B-flat). The music consists of a series of chords and melodic lines. In measure 14, there is a large slur over the first two notes of the left hand and the first two notes of the right hand. In measure 15, there is a large slur over the first two notes of the left hand and the first two notes of the right hand. The notes are mostly eighth and sixteenth notes. The overall texture is dense and complex, characteristic of a DoubleTrimoth network.

m.14

(ohne Ped.)

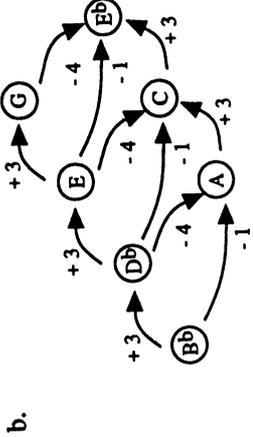
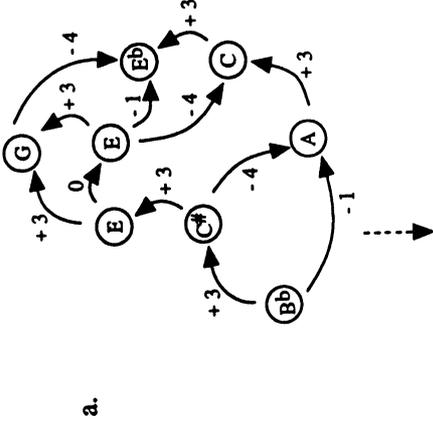
Example 7. Networks and isographies (DOUBLETRIMOTH and bass line), piano left hand, m. 14.



**Example 8. Networks and transformations:**

(a) Piano left hand, m. 14, beat 1-2.

(b) Introduction, mm. 1-3.



unifying structures to be found, representing the largest networks in the composition.

The first of these networks, a double RICH (or DOUBRICH) based on MOTH occurs in mm. 19–20 (Example 9). Linked with itself to form an RICH, the structure of the MOTH motive yields the TCH interval -1. Doubling the RICH structure produces four separate chromatic lines (i.e., CHROM) that descend in parallel. The treble RICH begins with  $RT_nI$  (MOTH) and the bass RICH starts with  $T_n$ (MOTH). Pitch-class repetitions are kept at a minimum, with only one pitch-class duplicated within each twelve-note group of m. 19. In addition, the vertical pairing of  $T_n$ (MOTH) with  $RT_nI$ (MOTH) highlights the dichotomy between the ics 3 and 4. As Example 9 illustrates, as the right hand descends by interval 4, the left hand ascends by interval 3, and vice versa.

In mm. 20–21, the DOUBRICH network becomes rather complicated as it unwinds. Example 10 outlines the details of that process. As shown in the diagram, there is a “MOTH exchange” between  $RT_8I$ (MOTH) and  $T_3$ (MOTH) inserted into the chain structure, temporarily interrupting its progress. The DOUBRICH in the piano part almost completes an octave descent by the beginning of bar 21, but remains two pitch-classes short. Interestingly enough, the violoncello presents the two “missing” pitch-classes B and G# at the precise temporal locations where they are needed (shown in brackets on Example 10). While the B and G# are part of a more complex chromatic violoncello line, it seems more than coincidental that they occur at exactly the right locations to complete the RI-chains in the piano.

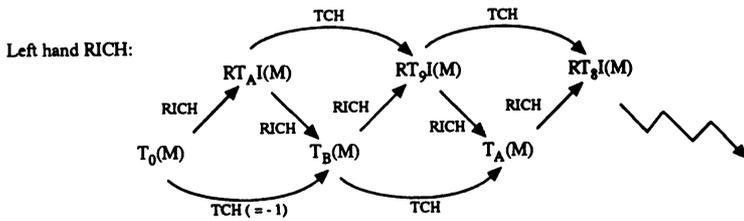
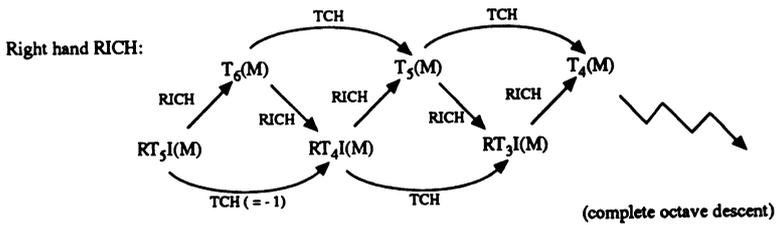
Before going further with the discussion of network structures, let us review some associations between text and music in the passages just discussed. Perhaps the seeming “dissolution” of DOUBRICH just outlined in Example 10 with its two “missing” pitch-classes, is prompted by the word “unsichtbar” (invisible) that begins that same measure. The unexpected inclusion of rests that stop the continuous motion of the DOUBRICH provides a more direct association with that same word. A more obvious text influence involves the phrase that begins in m. 18: “Und vom Himmel erdenwärts senken sich mit schweren Schwingen . . .” At the precise moment of “senken,” the DOUBRICH begins, initiating a gradual pitch descent in the piano that continues until m. 24—almost to the end of the piece. The in-and-out contour of the DOUBRICH based on  $RT_nI$ (MOTH) against  $T_n$ (MOTH) is an

Example 9. Double RICH (DOUBRICH), piano, mm. 19-20.

m.19

RT<sub>5</sub>I(M)

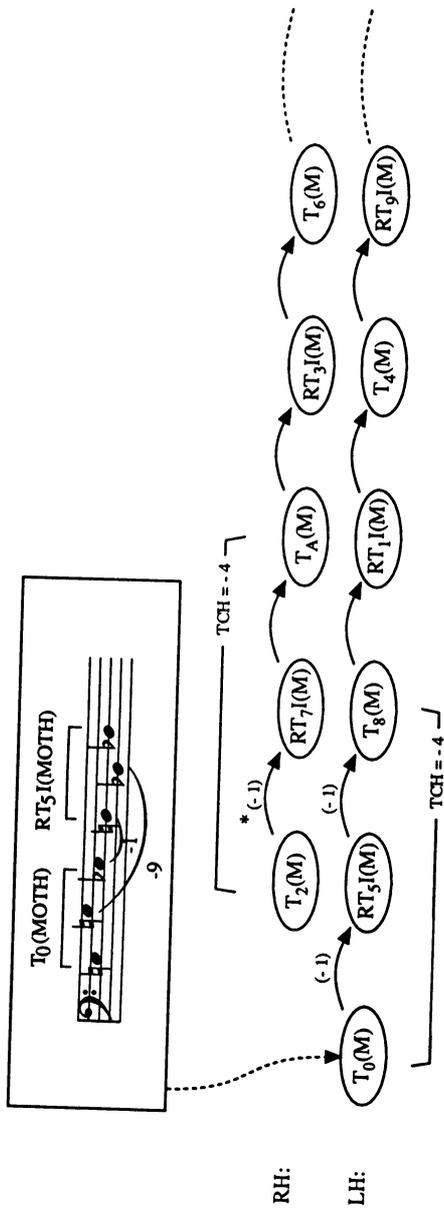
T<sub>0</sub>(M)



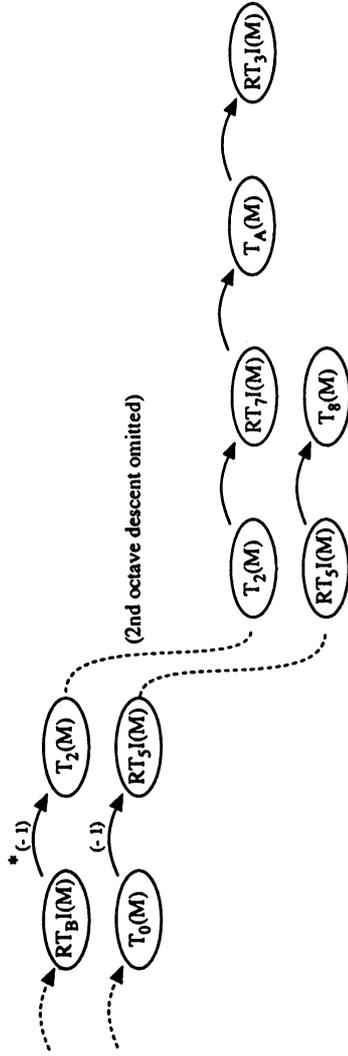
Example 10. Network details, piano, mm. 20–21.

The image displays a musical score for piano, spanning measures 20 and 21. The score is written on two staves: a treble clef staff (top) and a bass clef staff (bottom). The notation includes various notes, rests, and accidentals. Above the staves, several time points are marked with brackets and labels:  $T_A(M)$ ,  $T_9(M)$ ,  $T_8(M)$ ,  $T_7(M)$ ,  $T_3(M)$ ,  $T_2(M)$ ,  $T_1(M)$ , and  $T_0(M)$ . Additionally, specific notes are labeled with  $RT_iI(M)$  for  $i$  from 0 to 8. For example,  $RT_8I(M)$  is located in measure 20, and  $RT_0I(M)$  is in measure 21. A diagonal line is drawn across the score, connecting the  $RT_8I(M)$  label in measure 20 to the  $RT_0I(M)$  label in measure 21. The score is marked with a piano dynamic (*p*) and a common time signature (C).

Example 11. STRETCHDOUBRICH network, piano, mm. 21-23.



Example 11, continued.



\* NOTE. In this graph,  $(-1)$  represents the *connecting* interval between the last note of one MOTH and the first of the next. It does not signify a transformation of one node into the next.

effective representation of the word “Schwingen” (flappings).

Overlapping with the end of DOUBRICH in m. 21 is the start of an even larger double chain, “STRETCHDOUBRICH”<sup>9</sup> that may be perceived as the DOUBRICH’s “stretched-out” derivative (Example 11). As the diagram illustrates, STRETCHDOUBRICH maintains an alternation between  $T_n$  and  $RT_nI$  forms of MOTH, but instead of overlapping the motives by two tones to produce an RICH, the individual MOTHS remain disjunct, separated by the interval -1. Interval classes 3 and 4 are again prominent: the vertical “wingspan” distance of interval 9 recalls the end of the canon theme in the opening bars; the new TCH interval of -4 transforms each linear  $T_n/RT_nI$ (MOTH) pair. If the DOUBRICH of mm. 19–20 is viewed like the STRETCHDOUBRICH of mm. 21–23, (i.e., as a series of non-overlapping motivic statements of  $T_n$ (MOTH) and  $RT_nI$ (MOTH) in alternation), a comparison of their TCH intervals reveals an added background use of the conflict between intervals 3 and 4 as transposition levels (see Example 12).

While the DOUBRICH of mm. 19–20 generally avoids pitch-class repetitions, the STRETCHDOUBRICH alternates between pairings of  $T_n$  and  $T_nI$  forms of MOTH that minimize, then maximize, pc repetitions between simultaneous statements (Example 13). Dotted lines on Example 13 identify pc repetitions between simultaneous MOTH statements. Example 14 extracts such pairs of repeated pcs for the entire passage, revealing what might first be seen as a standard RICH of imbricated major and minor triads. But closer scrutiny reveals a number of MOTH motives in prime and RI-form (shown with brackets on Example 14). Another important kind of pc invariance occurs between alternate pairings of MOTH statements within STRETCHDOUBRICH. For example, the total pc content of  $T_2$ (MOTH)/ $RT_5I$ (MOTH) equals that of  $T_A$ (MOTH)/ $RT_1I$ (MOTH): {12569A} (refer back to Example 13).

After descending at the rate of one octave per measure during mm. 21–23 (compared to a descent of interval -9 for DOUBRICH in m. 19), the music reaches bottom with the return of the network

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<sup>9</sup>According to Lewin’s definition, the two parallel chains in mm. 21–23 are not RICHs, but their structure illustrates clear and close derivation from the RICHs immediately preceding. Thus, “RICH” remains in the new structure’s label.

Example 12. Comparisons of TCH intervals within the two large chain networks that begin in m. 19 and m. 20.

Example 12 consists of two musical staves. The top staff, labeled 'm.19', shows a sequence of notes with three intervals marked:  $T_0(M)$ ,  $RT_9I(M)$ , and  $T_9(M)$ . A bracket below the first two intervals is labeled 'TCH = -3'. The bottom staff, labeled 'm.21', shows a sequence of notes with three intervals marked:  $T_0(M)$ ,  $RT_{15}I(M)$ , and  $T_8(M)$ . A bracket below the first two intervals is labeled 'TCH = -4'.

Example 13. Pitch-class replication in STRETCHDOUBRICH, Piano, m. 21.

Example 13 shows a musical staff with two systems of notes. The top system has intervals labeled  $T_2(M)$ ,  $RT_7I(M)$ ,  $T_A(M)$ , and  $RT_3I(M)$ . The bottom system has intervals labeled  $T_1(M)$ ,  $T_8(M)$ , and  $T_4(M)$ . Below the bottom system, there are labels  $RT_{15}I$  and  $RT_{11}I$  with brackets indicating relationships between notes in the two systems.

Example 14. Underlying chain of repeated pcs, mm. 21–23.

Example 14 shows a musical staff with two systems of notes. The top system is labeled  $T_n(M)$  and has a bracket labeled 'etc.'. The bottom system is labeled  $RT_nI(M)$  and has a bracket labeled 'etc.'. The notes in both systems are connected by a series of arcs, indicating a chain of repeated pitch classes.

structure that began the piece, along with the opening line of text. As mentioned earlier, this is the third statement of this line of text and once again it is associated with its characteristic network in the piano. The solid arrows of Example 15 represent that part of the network that precisely matches the original (compare Example 15 and Example 2). Note that the pitch-classes that withheld aggregate completion in the first three measures—B, D, and F—are now present in the lower portion of the ending structure.

To create an effective cadence in the final bars of music, Schoenberg has loosely extended the closing MOTH network to form quartal sonorities that are unique within the piece. (See connections between these cadential chords and the preceding network in Example 15.) Though the quartal sound seems new and far-removed from what has preceded, some important features of pitch structure recur. The transpositional relation of  $T_{.21 \bmod 12}$  is  $T_{.9}$ , an interval quite familiar by this time. The highest pitch-classes of the last three verticalities are E–G–E♭: while the octave displacement renders this an atypical statement of the MOTH motive, the presence of these three pitch-classes in the expected temporal order helps achieve a sense of closure.

*Smaller structures.* A few details regarding deviation from the piece's established melodic and harmonic norms are worth noting. In mm. 11–12, a series of 3-5[016] sonorities represents three parallel MOTH motives, with the exception of the middle voice which would require an E♯ instead of E♭ within the third verticality (Example 16).<sup>10</sup> Interestingly enough, the vocal *Sprechstimme* line of mm. 11–12 includes an RICH which also “should” reach an E♯ (but arrives on F instead) at the same temporal location where the [016] trichord “mistake” occurs.<sup>11</sup> The avoided E, a pitch-class that has already achieved a certain status as a reference point, finally arrives in the piano on the

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<sup>10</sup>Kathryn Bailey erroneously suspects that the E♭ is a misprint in the score and should read E♯. See Bailey 1977, 103.

<sup>11</sup>Though pitch should not be taken too literally when *Sprechstimme* is the mode of performance, in this instance a clear descending sequence beginning with interval -4, B♭–G♭, appears in the notation through the second F♯ in m. 12.



Example 16. Sprechstimme, with 3-5[016] sonorities  
in the piano, mm. 11-13.

Voice  
m. 11

$T_3(M)$   $T_2(M)$  almost  $T_1(M)$   $RT_2(M)$

$RT_1I(M)$   $RT_0I(M)$   $T_0I(M)$

Piano  $T_6(M)$   $T_7(M)$

almost  $T_1(M)$

Example 17. Full score, mm. 11-12.

m. 1

Etwas rascher

B. Cl. (B)

Vc.

am Seg. . . . .

*p*

*pp*

Flug.

*p*

Etwas rascher

gesprochen

Aus dem Qualm verlorner Tiefen steigt ein Duft,

Etwas rascher

*ppp*

following downbeat (Example 17).<sup>12</sup>

Other deviations from established norms occur in mm. 11–13. Rhythmic expectations are thwarted by the arrival of that same 3-5[016] in m. 12 an eighth-note late relative to the rhythmic pattern established by the first two trichords. In the following measure, additional distortions take place in the voice and piano (Example 18). Except for the left hand of the piano part, the consistent MOTH motive has given way to set-classes 3-1[012] and 3-2[013], that emphasize interval-classes 1 and 2, and 1 and 3.

There are other instances of material derived from established motives by “expansion” (as STRETCHDOUBRICH was derived from DOUBRICH) in the bass clarinet and violoncello in mm. 17–20. In m. 17, octave displacements within a canon of two MOTH chains achieve a quick registral rise of three-and-one-half octaves in the ’cello (from E2 to A5) and two-and-one-half octaves in the bass clarinet (E3 to B5) (Example 19). In that same measure, the piano presents a brief and unique pairing of  $T_0(\text{MOTH})$  with a reordered  $T_5(\text{MOTH})$ . The sudden rise in all instruments in m. 17 hastily sets the stage for the upcoming text and its musical setting, which envisions a descent from heaven earthward (mm. 18–26).

While “Nacht” includes many other structures related to the MOTH motive, I have chosen to focus on the larger and more important networks that shape the piece through unity and contrast. Before concluding, I will briefly discuss some durational aspects of these important networks, since duration plays a role in shaping both the characters of the various MOTH networks and the structure of the entire piece.

*Durational considerations.* Within a defined MOTH structure such as TRIMOTH, all notes are equal in duration and the attack points of each successive MOTH maintain equal temporal distances. This consistency holds for all but a few structures. Thus simple comparisons may be made between these networks regarding not only durational content, but also overall textural “compactness.”

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<sup>12</sup>David Lewin agrees that there is no error in pitch here, and in informal comments to the author has referred to the E♭ in the piano as a “blues E” that resolves up by semitone on the following downbeat.

Example 18. "Distorted" motives, piano, and voice, m. 13.

Example 18 shows a musical score for measure 13. The top staff is the vocal line, starting with a treble clef and a key signature of one flat. The lyrics "Erinnrung mordend!" are written below the notes. The dynamic markings are *pp dim.* followed by a dotted line and *PPP* followed by another dotted line. The piano accompaniment consists of two staves: the right hand in treble clef and the left hand in bass clef. The piano part features a complex, rhythmic accompaniment with many accidentals and slurs.

Example 19. Registral rise, piano and instruments, m. 17.

Example 19 shows a musical score for measure 17. The top staff is for B. Cl. (B), with a treble clef and a key signature of one flat. The tempo marking "I. Tempo" is above the staff. The dynamic marking *pp* is below the staff, along with the instruction "am Griffbrett". The middle staff is for Vc. (Violoncello), with a bass clef and a key signature of one flat. The dynamic marking *pp* is below the staff, along with the instruction "I. Tempo". The piano accompaniment consists of two staves: the right hand in treble clef and the left hand in bass clef. The piano part features a complex, rhythmic accompaniment with many accidentals and slurs. The dynamic marking *pp dim.* is below the staff.

To facilitate such comparisons, we can define a “direct product GIS” based on durations alone.<sup>13</sup> For the direct product  $(x,y)$  of a structure such as TRIMOTH,  $x$  represents the distance between consecutive attack points within a single MOTH, and  $y$  represents the distance between consecutive attack points that mark the beginnings of a string of MOTHs. Both GIS<sub>1</sub> and GIS<sub>2</sub> are defined like the GIS of Lewin’s Example 2.2.1, where “the musical space is a succession of time points pulsing at regular temporal distances one time unit apart. Given time points  $s$  and  $t$ ,  $\text{int}(s,t)$  is the number of temporal units by which  $t$  is later than  $s$ .”<sup>14</sup> Thus, the only difference between GIS<sub>1</sub> and GIS<sub>2</sub> in this case is the particular series of intervals that are being measured. With the eighth-note chosen as the basic time unit 1, the resulting durational direct product of the standard TRIMOTH network can be easily computed (Example 20). As an added feature of the direct product label, a superscript integer provides the total number of MOTHs present in that particular structure.

Example 21 presents a chart outlining the major MOTH networks with durational direct-product labels. Several of these require explanation. First, the superscript 9 of the networks of mm. 1–3 and m. 24 does not include MOTH statements which lie outside the central structures of those two networks. Second, the complex label  $((1,0)^2,4)^3$  associated with the DOUBLETRIMOTH found in mm. 14–15 embeds two direct-product labels. The label  $(1,0)^2$  represents one complete “double” MOTH, with the zero signifying simultaneous attack points for the pair. In m. 14, three of these double MOTHs are consecutively presented at attack point intervals of 4. (Refer back to Example 6 for the musical passage.) While this particular formation was divided earlier into slightly different components (as a double TRIMOTH), the present division into three double MOTHs seems easier to translate into a complete direct-product label.

Finally, the basic durational character of individual structures is given by the two main numbers enclosed in parentheses. For example, two identical numbers, such as those found in the labels of m. 19, represent a standard RICH. For the remaining labels,

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<sup>13</sup>Lewin 1987, 37–46.

<sup>14</sup>Lewin 1987, 22–23.

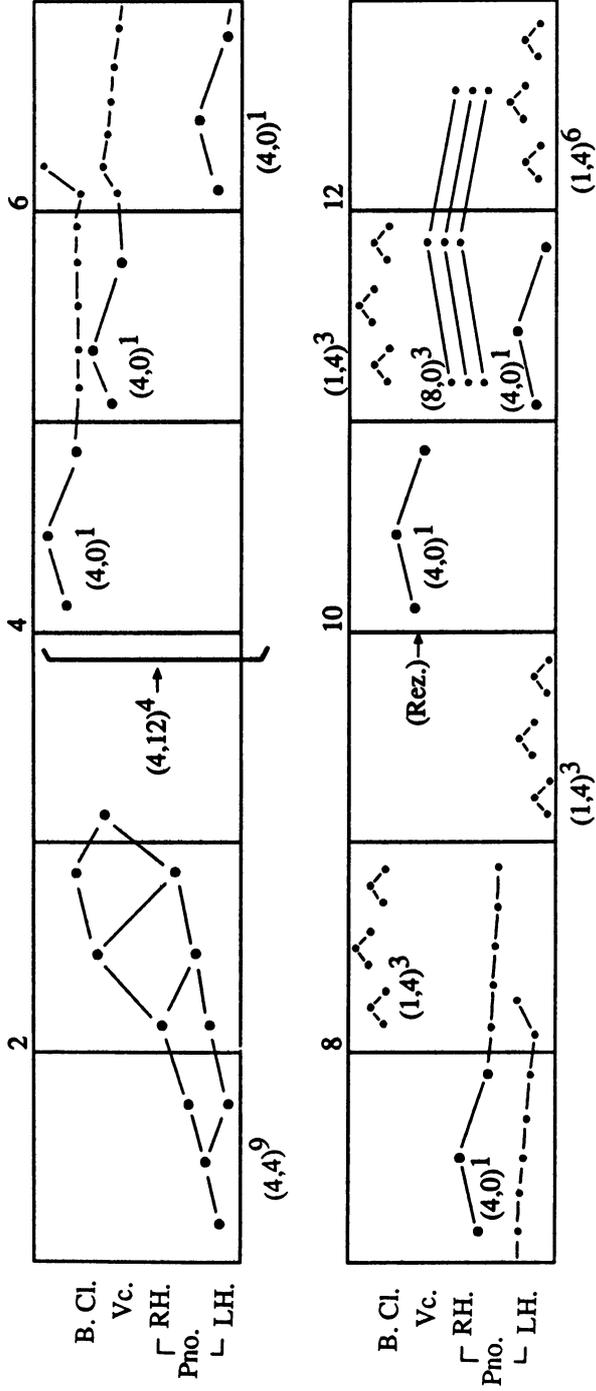
Example 20. Durations of TRIMOTH, m. 8.

B. Cl. m. 8

The image shows a musical staff for B. Cl. in measure 8. The staff contains a sequence of notes with fingerings and durations. The notes are: G4 (fingering 1, duration 4), A4 (fingering 1, duration 1), Bb4 (fingering 1, duration 1), C5 (fingering 1, duration 1), D5 (fingering 1, duration 1), E5 (fingering 1, duration 1), F5 (fingering 1, duration 1), G5 (fingering 1, duration 1), A5 (fingering 1, duration 1), B5 (fingering 1, duration 1), C6 (fingering 1, duration 1), D6 (fingering 1, duration 1), E6 (fingering 1, duration 1), F6 (fingering 1, duration 1), G6 (fingering 1, duration 1), A6 (fingering 1, duration 1), B6 (fingering 1, duration 1), C7 (fingering 1, duration 1). The durations are indicated by a bracket above the notes, with the number 4 above the first note and 1 above each subsequent note. The measure is labeled "m. 8" and "B. Cl.".

= (1, 4)<sup>3</sup>

Example 21. Durational Chart of Significant Networks.





those with the second number larger than the first represent non-overlapping MOTH statements. Of those non-overlapping MOTH sequences, those whose second direct product number is three times the value of the first number contain no separation by rest between MOTHs (mm. 21–23), and those whose second number is four times the value of the first (a frequent occurrence, as in mm. 8–9) have separation between MOTHs by the time unit given as the first number. Those labels whose second number is less than the first represent one of two possibilities: a higher degree of overlap than that of the standard RICH, with the greatest overlap being simultaneous statements of the same MOTH structure (mm. 14–15), or simply a single statement of MOTH, as found at the beginning of each canonic line in mm. 4–7 or in m. 10.

Before we leave the topic of motivic networks, transformations, and durational relationships, a few final comments on how they affect the overall shape of the piece may better unite these elements into an effective whole. First, from m. 11 to the final three bars, there is a gradual heightening of musical-rhetorical urgency. The vocal line hardly participates in this sweep of rhetoric. Instead, the various MOTH networks in the instrumental parts cooperate to produce the effect through Schoenberg's handling of register, texture, and duration. The most obvious influence involves the two distinctive pitch descents which occur in the middle and final sections of the movement. The first descent reaches the "depths" at m. 16 following the initial return of the opening text in mm. 14–16. After a hasty ascent back into the "heavens" (mm. 17–18), the second and more obvious, expansive descent begins and continues until m. 24, where a return to opening network material in its original register occurs. A spiralling, almost *accelerando* effect is created with this second descent by two long chain structures and their closely-linked MOTH motives. Indeed, the giant moths seem to be closing in quite rapidly on their victims!

Perhaps the most interesting aspect of the last few measures is that the final vocal line does not reinforce, as we might have expected, the material that returns in the piano in m. 24. It is as if the descending spiral is trying desperately to achieve that union but does not quite make it happen. The hurried effect is especially evident in the durational differences between the network of mm. 1–3 and its return in m. 24. Since the final network is presented at twice the rate of its opening counterpart, the sense of closure and

resolution remains slightly unsettled.

### Concluding Remarks

On the subject of repetition, Schoenberg once stated:

Here is the greatest difficulty for any listener, even if he is musically educated: the way I construct my melodies, themes, and whole movements offers the present-day perceptive faculty a challenge that cannot yet be met at a first hearing.

The causes of this difficulty lie in the following characteristic qualities of the way I write:

1. Substantially, I say something only once, i.e. repeat little or nothing.

2. With me, variation almost completely takes the place of repetition (there is hardly a single exception to this); by variation I mean a way of altering something given, so as to develop further its component parts *as well as the figures built from them*, the outcome always being something new, with an apparently low degree of resemblance to its prototype, so that one finds difficulty in identifying the prototypes within the variation.<sup>15</sup>  
(*emphasis mine*)

“Nacht” beautifully illustrates Schoenberg’s interest in the variation of a motive, but contrary to his remarks, variation hardly takes the place of repetition. (Perhaps this is one of the few exceptions to which he alludes.) The coexistence of clear repetitions of MOTH along with its many variations (or transformational networks) is one of the most striking and perceptible features of “Nacht.” Lewin himself has commented that “the piece is exceptional in the extent to which these [transformation] techniques are manifest in the very forefront of the listening experience.”<sup>16</sup> I must agree with Lewin,

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<sup>15</sup>Arnold Schoenberg, “New Music: My Music,” in Schoenberg 1975, 102–3.

<sup>16</sup>Lewin 1982–83, 335.

and certainly an analysis of “Nacht” using his techniques should enhance the auditory understanding of the piece, so that the listener may recognize not only the prototype motive itself (MOTH), but each of the unique networks of MOTH that give the piece its true character and musical shape.

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