

*Metamorphoses Nocturnes:*  
A Stepping Stone in the Compositional Development of György Ligeti  
An Analysis by David Mitchell

György Ligeti (1923-2006) finished *String Quartet No. 1: Metamorphoses Nocturnes* in 1954 when he was thirty-one years old. At the time, he was living under communist rule in Budapest, and he had not yet developed the compositional style that characterized his later more mature pieces. In many ways, he was still a developing composer. In 1954, due to regulations imposed by the communist regime, there were restrictions on what pieces could be published and performed in Hungary. Many of Béla Bartók's works from the 1920s were banned because of their dissonant harmonic language. The communist regime considered them bourgeois pieces, not written with the common people in mind and not easily accessible to the general public. Despite these restrictions, Ligeti managed to get copies of some of these banned pieces including Bartók's *String Quartet No. 4*. He borrowed many ideas from it when he wrote *Metamorphoses Nocturnes*. Ligeti borrowed Bartók's harmonic language, formal ideas, extended techniques, and specific motivic material from *String Quartet No. 4*. He borrowed these ideas and made them his own.

In 1968, when Ligeti wrote his *String Quartet No. 2*, he went in a different direction than his first string quartet. His compositional style had changed extensively in the intervening fourteen years, but there are still traces of Ligeti's first string quartet and the influence of Bartók's *String Quartet No. 4*. Viewed in retrospect, Ligeti's *Metamorphoses Nocturnes* was an important stepping stone in the career of Ligeti. By borrowing from Bartók, Ligeti developed many of the tools while composing *Metamorphoses Nocturnes* that he used to forge his own style of string writing in *String Quartet No. 2*.

We will first examine what Ligeti says about the relationship between Bartók's *String Quartet No. 4*, and his own *Metamorphoses Nocturnes* and *String Quartet No. 2*. We will examine what Ligeti says about how Bartók's *String Quartet No. 4* influenced the way he wrote *Metamorphoses Nocturnes*. Then we will look at what Ligeti says about the influence of *Metamorphoses Nocturnes* on his later *String Quartet No. 2*. What aspects of his Bartók-influenced *Metamorphoses Nocturnes* did Ligeti say he abandoned and what aspects did he continue to use in *String Quartet No. 2*? Then we will examine the pieces themselves to find evidence to back up or refute Ligeti's claims and determine what specific compositional techniques Ligeti borrowed from Bartók and how he used them in *Metamorphoses Nocturnes* and *String Quartet No. 2*. Tracing the lineage of compositional techniques from Bartók's *String Quartet No. 4* through *Metamorphoses Nocturnes* to *String Quartet No. 2* will show how *Metamorphoses Nocturnes* was influenced by Bartók's compositional style and how it was an important stepping stone in the career of György Ligeti.

In a conversation with Peter Varnai, Ligeti discussed the significance of his second string quartet and its relationship to his first string quartet. In this conversation, he also indicated that Bartók was an important influence on his compositional style during his Hungarian years which ending with his defection to Cologne in 1956. In a 1978 interview, Varnai asked, ". . . I wonder if you could tell me which of all your works you consider the most important in your output?"<sup>1</sup> Ligeti responded,

. . . It is perhaps my second Quartet which reflects my ideas most clearly – where you would find all the different techniques I have used. It was composed ten years ago, in 1968 . . . my Second Quartet sums up all my previous work. It also

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<sup>1</sup> Péter Várnai, Josef Hausler, and Claude Samuel, *György Ligeti: In Conversation* (London: Eulenberg Books, 1983), 13.

includes reminders of my Hungarian compositions, which show the influence of Bartók and Stravinsky. If you compare the First Quartet, composed in Hungary in 1953-54, with the Second, written fifteen years later in 1968, you can detect the sound of the First Quartet, a much dissolved manifestation of it in the Second.<sup>2</sup>

There is an excellent quote by Friedemann Sallis that indicates how much *Metamorphoses Nocturnes* was influenced by Bartók's compositional style. Sallis paraphrases a quote in Pierre Michel's book *György Ligeti: Compositeur d'aujourd'hui*.

*Metamorphoses Nocturnes* remains thoroughly grounded in Bartók's style and technique. With a touch of irony directed at himself and his work, Ligeti stated that having completed this quartet, he could have gone on to write the seventh, eighth or even twelfth Bartók quartet. If one steps back a moment, one can interpret the work as, on the one hand, the culminating point in Ligeti's pre-1956 development, and on the other, as a sort of necessary hurdle which the composer had to overcome in order to get beyond his previous development.<sup>3</sup>

From this quote it is clear that Ligeti was very familiar with Bartók's style and technique. He was also heavily influenced by it.

Eventually, Ligeti realized that copying Bartók's style and technique was a dead end, and he decided to move beyond what Bartók had done and find his own style. This is a natural step in the development of any artist, most gradually move away from imitation and find their own voice. Ligeti wrote, "Whoever copies Bartók's principles for handling material, also automatically takes over his style and Bartók's style without Bartók's content turns into an

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<sup>2</sup> Várnai, Hausler, and Samuel, *György Ligeti*, 13-14.

<sup>3</sup> Friedemann Sallis, *An Introduction to the Early Works of György Ligeti*, (Köln: Studio, 1996), 166.

empty, annoying epigonal skeleton. Each true statement discovers its expressive form and each new expressive form also brings the technique of music composition further.”<sup>4</sup>

If these statements are true, what specifically did Ligeti borrow from Bartók and what did he leave behind when he wrote *String Quartet No. 2*? In *Metamorphoses Nocturnes*, Ligeti borrowed his main theme from the third movement of Bartók’s *String Quartet No. 4*. The motivic material that Ligeti borrowed occurs in the cello at measure 64 (example 1). It is a four note ascending triplet-third-second-note figure on the upbeat of count two. The notes are C#, D#, D natural, and C natural. Intervallically, this is a major second up, a minor second down, and a major second up. The pitch class set for this motive is [0123], and its interval vector is <321000>. Obviously, this motive is rich with major and minor seconds, interval classes that are a major part of all three string quartets under discussion.

Additionally, [0123] is an important pitch class set in all three quartets. According to Bartók’s own analysis of *String Quartet No. 4* that accompanies the original 1930 pocket score by Universal Editions, this motive occurs at the beginning of the coda, measures 64 to the end, so it is not the main motive of this movement or of the piece itself. It is a new gesture that wraps up the movement. This motive is repeated in measure 65 on the upbeat of count two in the cello part starting on note F#. It is inverted and repeated in measure 66 on the upbeat of count two. In measure 67, there are three versions of it, an inverted descending gesture in thirty-second notes starting on C# on the down beat of count two, an ascending version starting on B natural on the upbeat of count two, and an inverted version starting on G natural on the upbeat of count three. These two versions of [0123] on count two of measure 67 combine together to create an

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<sup>4</sup> Sallis, *An Introduction to the Early Works of György Ligeti*, 167.

extended version of this motive in rhythmic diminution. This is an [01234] pitch class. Finally in measure 68, this motive occurs on the upbeat of count two starting on F#.

Where do we find this motive in Ligeti's *Metamorphoses Nocturnes*? It occurs in the first violin part at measure 7 on a G natural note (example 2). The notes in this motive are G natural, A natural, G #, and A#. Like the Bartók quartet, its pitch class set is [0123], and its interval vector is <321000>. Unlike the Bartók quartet, it is in eighth notes and it plays a very important role in *Metamorphoses Nocturnes*. Instead of occurring as a closing gesture in the coda, it is the main theme of Ligeti's entire quartet. Since it is in eighth notes instead of thirty-second notes, there is more time to savor the motive and its intervallic content. It establishes chromaticism as the dominant melodic flavor for the entire piece.

After measure 7, this motive occurs throughout the entire piece in a variety of different ways with a variety of different compositional techniques applied to. For example, it is inverted in the cello part at measure 21. It is extended in measure 41 in both the second violin and viola with rhythmic diminution and melodic sequencing at the major second (example three). This results in an [012345] pitch class. This is very similar to Bartók's style of melodic development in measure 67 (example one). On count two, there are two versions of the motive combined in rhythmic diminution and sequenced at the second. The only difference is Bartók's gesture has inversion, too. This results in an [01234] set class, a nearly identical subset of Ligeti's [012345] in measure 41 of *Metamorphoses Nocturnes*. This demonstrates that Ligeti has borrowed a melodic gesture directly from Bartók's *String Quartet No. 4* and developed it in a similar manner. It also shows that Bartók and Ligeti rely on the linear development of a melodic gesture to give their music a sense of progression and development.

Melodic and thematic development were left behind in Ligeti's *String Quartet No. 2*. By the time Ligeti composed this piece in 1968, he primarily wrote pieces that develop sound masses instead traditional melodies. Ligeti discussed this with Peter Várnai.

. . . . . First in Cologne in 1957 and later during my long stay in Vienna in the '60s, I gradually evolved a musical style in which I abandoned structures conceived in terms of bars, melodies, lines and conventional forms. In this respect my first two orchestral works, *Apparitions* and *Atmosphères*, are the most radical. *Atmosphères* is just a floating, fluctuating sound, although it is polyphonic.<sup>5</sup>

There is a good example of this in the third movement of Ligeti's *String Quartet No. 2* (example four). Measures 1-29 are almost devoid of melodic development. The voices stay stationary on individual notes for a long time, usually an entire measure. This means that there is very little melodic shape, and the texture is static. In measures 12-16, there is an example of a "polyphonic fluctuating sound." Violins one and two move upward in parallel minor seconds with intervening micro-tones, a half step a part. The viola and cello move downward in parallel minor seconds with intervening micro-tones, a half-step a part. There is no melody, just a polyphonic texture of ascending and descending chromatic lines. The upper voice moves chromatically from F# up to an A#. Its pitch class set is [01234], identical to Bartók's chromatic pitch class set in measure 67 of the third movement of *String Quartet No. 4* (example one). The second violin moves chromatically from an F natural to an Ab. Its pitch class set is [0123] the same as Ligeti's main theme in measure 7 of *Metamorphoses Nocturnes*, example two, and the motive from measure 64 of Bartók's quartet, example one. The viola moves down chromatically

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<sup>5</sup> Várnai, Hausler, and Samuel, *György Ligeti*, 13-14.

from Eb to C, an [0123]. The cello moves down chromatically from D natural to Bb, an [01234]. The pitch class sets are the same in all three quartets. But in measures 12-16 of Ligeti's *String Quartet No. 2*, pitch classes [0123] and [01234] function as a fluctuating chromatic mass instead of a melodic gesture. The interval vector is <321000> for set class [0123] and the interval vector is <432100> for set class [01234]. Both set classes are rich with minor seconds and major seconds. This means all three quartets have the same type of conjunct linear motion in half steps and whole steps. The difference is the way this conjunct linear motion is used and developed. In Bartók's *String Quartet No. 4* and Ligeti's *Metamorphoses Nocturnes* these set classes are developed melodically, while in Ligeti's *String Quartet No. 2* they are developed as part of a slowly evolving sound mass with very little melodic shape or gesture; therefore, all three quartets have a similar linear intervallic content. The difference is Ligeti abandoned traditional melodic and thematic development in his second quartet in favor of a slowly evolving sound mass.

In the third movement of Ligeti's second quartet, measures 21-29 are an example of the harmonic use of pitch class [0123] (example four). The cello plays F#, viola G natural, second violin Ab, and first violin plays A natural, a [0123] set class. They start on these notes then squeeze inward via micro-tone around the viola's G natural. The first violin and second violins move down a micro-tone and the cello moves up a micro-tone. Even though these pitches move inward by a micro-tone, most theorists consider them to still be part of set class [0123]. In Ligeti's "Instructions for Performance," he writes that "What is meant by this notation are not quartertones, but rather deviations of a not precisely determined size, which may reach a maximum of a quarter-tone." With this in mind, most theorists consider Ligeti's micro-tones to be an embellishment of the original note; therefore, measures 21-29 are an embellishment of [0123]. The real point of these measures is the gradually shifting rhythmic structure, which we

will examine in greater detail below. They are also a good example of the harmonic use of [0123], and they demonstrate how important and pervasive set class [0123] is in *Ligeti's String Quartet No. 2*.

Imitation is another form of linear/melodic development that Bartók and Ligeti use in their respective string quartets. Measures 54-61 in the second movement of Bartók's *String Quartet No. 4* are a good example of the use of imitation (example five). The first violin starts on E natural on the upbeat of count one and plays a chromatic gesture that ascends to B natural then descends and returns to E natural at the beginning of measure 60. All three parts play the same gesture starting a dotted quarter note apart. This creates some interesting harmonic interactions between the parts. The primary harmonies that occur between the notes, assuming octave equivalence, are major and minor seconds. When the cello enters on count three at the end of measure 55, the set class is [0246]. When the four part gesture ends in measure 60, the set class is [0123]. These two set classes play an important role in the harmonic structure of all three string quartets.

In *Introduction to Post-Tonal Music*, Joseph Strauss discusses the role of set classes [0123] and [0246] in *Bartók's String Quartet No. 4*. He says that [0123] expands to [0246] and contracts to [0123], marking points of arrival and departure. [0123] fills in the chromatic space within the [0246] set class. Strauss analyzes the first thirteen measures of Bartók's quartet.

Something striking happens on the second eighth-note of measure 6, where the chord [C, C#, D, D#] expands to [Bb, C, D, E]. The first chord is a member of set class 4-1 [0123] and the second is a member of set class 4-21 [0246]. These two

set classes, and the idea of expanding or contracting from one to the other, are basic to the way this music goes.<sup>6</sup>

This is what occurs in measures 55-60 in the second movement of Bartók's quartet. From measure 55 to 60, set class [0246] contracts to [0123]. This passage moves from a relatively stable [0246] to a relatively unstable [0123]. This type of imitation and harmony happens throughout Bartók's *String Quartet No. 4*. It is fundamental to the way he develops the basic melodic idea of the piece.

The same type of imitation occurs in Ligeti's *Metamorphoses Nocturnes*. At rehearsal BB, Ligeti uses exact imitation just like Bartók, see example six. The viola enters on the down beat of count one at rehearsal BB. It is followed by the first and second violins then the cello, all starting on note E. In measure 674, the viola and violin create an [02] dyad. The downbeat of count one in measure 675 is an [02] set class because the voices double on notes E and F#. The downbeat of count two in the same measure is an [024] set class that contains notes E, F#, and G#. The downbeat of measure 676 is an [0246] set class that contains notes F#, G#, A#, and C. The downbeat of measure 677 is also an [0246] set class. This particular passage lacks the same contraction to set class [0123] that occurs in Bartók's quartet, but it does have a lot of similarities. It starts on the same pitch and contains chromatic imitation with the same [0246] harmony between the parts. This is a good example of Ligeti's use of the same type of linear development technique that Bartók uses in his quartet. Another example is the beginning of Ligeti's quartet (example two). The cello, viola, and second violin play ascending chromatic scales a major second apart, a plaining [024] set class. Bartók and Ligeti's quartets are full of examples of this particular texture. This shows the influence that Bartók's compositional style

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<sup>6</sup> Joseph N. Strauss, *Introduction to Post-Tonal Theory*, (New Jersey: Pearson Prentice Hall), 75.

had on Ligeti's own technique and explains why the harmonic structure of both quartets sounds very similar.

This type of melodic imitation is not a significant part of Ligeti's *String Quartet No. 2*. Instead, Ligeti uses rhythmic imitation in which the voices start at the same time. The beginning of the third movement is an example of this type of imitation. All four parts start at the same time in measure 3 (example four). All four parts are in eighth notes doubling on notes A and B above the treble clef, an [02] dyad. In measure 5, the first violin stays on B and plays an eighth note quintuplet followed by a sextuplet then a septuplet. Two beats later, the first violin stays on A and imitates the same rhythmic pattern, eighth note quintuplet followed by a sextuplet then a septuplet. In measure 5, the viola and cello follow suit in rhythmic imitation. This creates a complex subtly shifting rhythmic pattern that increases in complexity as the movement progresses. This type of rhythmic development is an important part of Ligeti's *String Quartet No. 2*. It replaces the traditional melodic development that Ligeti used in his first string quartet. This is consistent with his claim that he “. . . had to get beyond formal structure as used by Bartók, and here I mean not only the overall structural forms but also the small formal elements of composition. . . The thematic-motival structure and its role in the progress of music is almost completely abandoned. . .” This is precisely what Ligeti does in *String Quartet No. 2*.

Despite the presence of harmonies that fit into set classes [0246] and [0123], there are still traces of tonal harmony and form in all three quartets. Measures 3-11 of the third movement of Ligeti's *String Quartet No. 2* demonstrate this. Once all of the notes unfold, measures 3-11 are part of a DIA+2 collection (example four). The beginning of the third movement in Bartók *String Quartet No. 4* is a good example. The upper three parts in measure 1-13 are all part of diatonic collection DIA+3 (example seven). The first three notes are part of set class [024], G#,

F#, and E. This creates continuity with the first movement and smoothes the transition to a more diatonic third movement. The cello part is more chromatic than the other parts, and it creates a sense of ambiguity in contrast to the other parts, which are clearly part of DIA+3. The other interesting aspect of the cello part is that it has a centricity toward note D in measures 6-9. It approaches D chromatically from above and below. Additionally, D is the longest note value in the cello part. Consequently, it carries more weight, and as a result it becomes a note of centricity. This is significant because note D is the only note that is missing from the DIA+3 collection in the upper parts; therefore, the cello is both destabilizing the diatonic collection and completing it with centricity toward note D.

The cello plays an important role throughout this movement. Most of the time, it is in opposition to homophonic referential collections that occur in the upper parts. At important structural moments, it becomes part of the upper voices in a kind of five-to-one motion. For instance, measure 13 is an important structural moment (example seven). In measures 10-12, the cello is not part of DIA+3. It sustains an F natural in measure 10 that is not part of DIA+3. In the same measure, there is a G natural dotted eighth note on count four that is also not part of DIA+3. There is also an Eb/D# in measures 8 and 9 that does not fit into DIA+3. In these measures, it destabilizes the harmonic texture. Then in measure 13, it lands on an A half note followed by an E. This is a five-to-one motion in DIA+3 and creates a cadential-like moment, a half cadence in A major. There is also a rest in the cello and a collection change to Oct. 1 in the upper voices that marks this measure as an important structural moment.

Measure 21 is another important structural moment. In the measures leading up to measure it, the cello notes do not agree with the homophonic texture above, which is DIA+3. There is a G natural in measures 17 and 18, not part of DIA+3. In measures 19 and 20, there is a

D# note, not part of DIA+3. In fact in measures 19-20, the cello part is AC-3 or E melodic minor. Then in measure 21, the notes in the upper voices form a new collection, AC-2 or F melodic minor. The cello comes into agreement with this when it lands on an F half note followed by a C natural in measure 21. This is another five-to-one motion in the cello that confirms a new collection. In measures 21-31, the upper voices continue to play notes that are part of AC-2 or F melodic minor, while the cello is in opposition to the upper voices. The cello moves back to AC+3 or E melodic minor. In other words, measures 22-31 juxtapose the cello in E melodic minor against F melodic minor in the accompaniment.

In measure 32, the upper voices form a new collection, DIA+4. This is an E major collection, the dominant key in relation to the A major DIA+3 at the beginning of the movement. In this case, the cello does not come into agreement with the upper voices. This time, the cello is in DIA-2 or Bb major. In measures 34-39, the cello, viola, and first violin are all in DIA-2. The notes are Bb, C, D, Eb, F, and G, everything except note A in DIA-2. The second violin sustains notes C# and E, which are not part of DIA-2. This means that the second violin is now in opposition to the other parts, a tri-tone away from E major and a half-step away from A major. This is the point of furthest remove in this movement.

In his analysis, Bartók considers measures 34-54 to be a second section in the movement that occurs just before the “free recapitulation” in measures 55-63. Measures 34-54 function as a development because they are the most tonally ambiguous measures of the third movement, and they are the furthest removed from the key of A major or DIA+3.

There is another five-to-one motion in the cello part in measure 55. In measures 50-54 the second violin and viola are in referential collection DIA0, while the first violin and cello are in referential collection DIA-5 or Gb. This is another tri-tone relationship between two diatonic

collections. Just before the “free recapitulation,” there is a C chord in measure 54 and a one-to-five, C to G, motion in the cello part in measure 55. This marks the end of the second section and the beginning of the “free recapitulation” according to Bartók. From measure 56 to the beginning of the coda in measure 64, the first violin and cello are in primarily DIA+4 or E major. This is where the dominant is reestablished. The thematic material from measures 10-12 is recapitulated in measure 56-62. If this is the recapitulation according to Bartók, the tonic is not established until the coda in measure 64. Harmonically, it is a recapitulation in the dominant instead of tonic.

True stability is only achieved when the cello reassumes its leading role in measure 64, the coda according to Bartók (example 1). The cello plays the ascending notes that we studied earlier, which are part of set class [0123]. In measure 64, this chromatic gesture lands on note E, the dominant of DIA+3, which the upper voices play. In measure 65, the cello ascends to note A, tonic in DIA+3. In measure 66, it descends to note A forming a “wedge” around the tonic. This is a favorite device of Bartók. On each A note in the cello, there is an E that doubles it, outlining notes five and one in DIA+3 or A major. In measure 67, the cello has an extended chromatic passage that we examined earlier, set class [01234]. It lands on note E, dominant in the key of A. Then it approaches note E from above, another “wedge” around note E this time. In measure 68, the cello ascends chromatically to note A and sustains it through measure 70 where the rest of the ensemble arrives on notes within the key of A major. This firmly reestablishes DIA+3 and note A as tonic by the end of the movement in measure 70.

The entire third movement is in sonata form and the key is A major. The first section of the exposition is delineated by one-to-five motion in A at measures 13. The development is measures 34-54 and begins in the key of Bb. It is preceded by an E major collection in the upper

voices in measure 32-33, a fifth away from DIA+3 or A major. The “free recapitulation” according to Bartók is in DIA+4 or E major and begins in measure 55. It is followed by a coda that reestablishes A major in measures 64 to the end. There are no traditional cadences in A major, only five-to-one motion in the cello that hints at cadential moments or key areas. This is consistent with Bartók’s assertion that for him, there is always a tonic. Ligeti uses the same kind of fifth related key areas, motion, and melodic entrances to establish tonal relationships between sections in *Metamorphoses Nocturnes*.

In his analysis, Bartók considered the third movement to be “the kernel of the entire piece.” The entire piece is in arch form with the third movement sitting in the middle of the piece. Because of the diatonic referential collections, it is the harmonically the most stable movement in the entire string quartet. It functions as an anchor for the entire piece because of its relative harmonic stability.

The slow movement is the nucleus of the piece, the other movements are, as it were, bedded around it: the fourth movement is a free variation of the second one, and the first and fifth movement are of the identical thematic material. Metaphorically speaking, the third movement is the kernel, the movements I and V the outer shell, and the movements II and IV, as it were, the inner shell.<sup>7</sup>

It is evident that Ligeti considered Bartók’s third movement to be important as well because he wrote a slow variation in *Metamorphoses Nocturnes* that is positioned in the middle of his string quartet. It is also in a kind of small-scale sonata form, and it contains diatonic collections. Additionally, there are three sections with a second section that is harmonically unstable and a short recapitulation, then a coda that returns to the opening key area, and there is a

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<sup>7</sup>Béla Bartók, *Streichquartett IV* (New York: Boosey and Hawkes Inc., 1956), 1.

great deal of homophonic motion that is very similar to Bartók's slow movement. Many of the notes, collections, and entrances are related to each other by fifth, just like Bartók's quartet.

The exposition of Ligeti's slow variation begins at rehearsal S in measure 539 with homophonic chords in the first violin, viola, and cello (example eight). In measures 539-541, these chords contain all of the notes in the key of Bb major. This is similar to Bartók. His slow movement begins with all of the notes in the key of A major. In Ligeti's slow movement, there is a B natural on the third count of measure 539 that does not fit into the collection. With the exception of this particular note, measure 539-541 are in Bb major or DIA-2.

The main theme from measure 7 returns at the beginning of this variation. The second violin plays a trill that becomes a tremolo in measures 540-543. The first trill in measure 539 is a whole step from G to A. The upper notes of this trill/tremolo are A, B, Bb, and C. These notes are part of pitch class set [0123]. This is the main theme that Ligeti introduced in measure 7 at the beginning of the piece. Now, it is in the key of Bb with the exception of note B natural on count two of measure 540. This B natural that is outside of the DIA-2 collection agrees with the B natural in the first violin part on count three of measure 539. In measures 542-543, the first violin repeats the main theme again starting on note G in the lower voice of the trill. This time the pitch collection is [01234] another familiar pitch class set. This is an extended version of the main theme that occurs in measures 10-11 at the beginning of the piece.

In measures 540-541, there is a five-to-one motion in the cello part that creates ambiguity in the collection. This is very similar to the one-to-five motion in measure 13 of Bartók's quartet. However, the five-to-one motion in this case is from C to F in double-stop fifths. This adds a degree of ambiguity to the key because the overall collection is Bb or DIA-2, while the five-to-one motion indicates the key of F. These notes create a sense that measures 539-541 are

in a dominant rotation of DIA-2 or Bb major. This adds an additional layer of dominant-related ambiguity among the notes in the opening measures of this slow variation. The Bb or DIA-2 collection is a kind of glue that holds this section together, while the chords and progressions are governed by linear rather than harmonic progression. The overall effect is a diatonic sound world that is harmonically ambiguous because it contains harmonies in Bb major and voice leading that indicates that F is tonic. There is an additional layer of dominant relationship among the voices. The first chord and second chord in measure 539 are made up of stacked fifths, F, C, G, D, and A. Fifth relationships are an important aspect of this movement, and as we will see, fifths are important to the large-scale structure of this piece. They are as important to the large-scale organization of this piece as pitch class sets [0123] and [024] are to the melodic structure of this piece.

The majority of the notes in this movement are related by fifths. In measures 544-548, the second violin and viola are a fifth apart, and the cello plays fifths. At rehearsal T, the first and second violin sustain fifths, while the viola and cello play fifths in a plaining motion from measure 551-555. Measures 555-560 are primarily plaining fifths in all parts, and measures 565-572 are fifths as well. In the exposition, measures 539-549, the fifths are primarily part of a diatonic collection. In the coda, measures 565-572, the fifths are also part of a single diatonic collection, Bb major or DIA-2. This gives these sections a sense of stability. The development, measures 551-558, the primary collection is Oct. 1. This gives the development a greater sense of harmonic instability and propels the variation forward. For example, in measures 551-553, the cello is Oct. 1 and the viola is in Oct. 2. This creates a nearly complete chromatic aggregate. At measure 555, both the viola and cello are in Oct. 1. Then on the last count of measure 555 through the first three beats of measure 556, there are plaining fifths in all parts that produce a

chromatic aggregate minus notes G and Ab. The rest of measure 556 and beginning of 557 is the most harmonically unstable portion of this variation. A complete chromatic aggregate occurs in eighth notes delineated by a fortissimo dynamic marking, then in sixteenth notes delineated by a triple forte dynamic marking. In other words, measures 555-557 are accelerating harmonically and rhythmically in the manner of a development or like the continuation of a sentence structure. The end of the development is marked by a tremolo on stacked fifths in the last half of measure 557. This collection of notes is DIA+3 or A major and is made up of stacked fifths, A, E, B, F#, C#, and G#. This collection is marked pianissimo and represents a return to diatonic. It is harmonically more stable than the preceding measures and reminds the listener of the diatonic harmonies at the beginning of the variation.

The recapitulation begins at rehearsal U with an interesting chord. The pitch class set is [01234789]. Subset [01234] is a familiar pitch class set in this piece. The notes that follow it in the first violin are a retrograde of the motive that begins the variation in measure 539. Here, it is transposed an octave higher and is harmonized with fifths as before. This time the cello doubles the second violin. This changes the diatonic collection to DIA0. Like measure 539-541, it is also in dominant rotation because the notes on count one of measure 559 are G and D, the dominant of DIA0 or C major. The motive is repeated in measure 560 in diminution after a five-to-one motion in the cello, note D to G. This is similar to the five-to-one motion that occurred in measures 540-541 in dominant rotation at the beginning of the variation. This is reminiscent of Bartók's recapitulation because the thematic material from the exposition returned in the dominant rather than the tonic. In contrast, Ligeti's recapitulation is in C major, a second above the Bb major referential collection at the beginning. It is not a dominant relationship, but it is a thematic return in a different key.

The coda that begins at measure 565 is in the dominant rotation of DIA-2 or Bb major again. Instead of repeating the motivic material from the beginning of the variation, the coda uses the motive that starts on the last count of measure 544 and goes to the end of measure 545. This motive is repeated in measure 567 of the coda. The final sonority that follows this is an E minor chord against an Eb major chord. G natural is common to both of these chords and it is sustained in the first violin throughout the coda. In measure 569, the viola and second violin play an Eb and Bb respectively, while the cello sustains E natural and B natural. Both of these sonorities are approached by five-to-one motion. For instance, the cello plays Bb and F at the end of measure 568. This resolves to Eb and Bb at the beginning of measure 569. At the end of measure 568, the viola and second violin play A and E respectively. This resolves down to an E and B sonority in the cello part at the beginning of measure 569, a kind of one-to-five resolution. Additionally, the Eb and Bb sonority at the end of the coda mirrors the Eb and Bb sonority at the beginning of the development in measure 551, and this sonority is a fourth or inverted fifth relationship to the DIA-2 or Bb collection at the beginning of the variation at measure 539. The E natural to B natural sonority at measure 569 is related by a fifth to the DIA+3 or A major collection at the end of the development, measure 557. Also in measures 549-550 at the end of the exposition, pitch class set [0123] makes an appearance in sustained notes in all voices. It is built on note E, a fifth relationship to measure 557. So there are a lot of sonorities and collections that are related to one another by fifth throughout this variation.

In summary, there are many similarities between the third movement of Bartók's *String Quartet No. 4* and the slow middle variation of Ligeti's *Metamorphoses Nocturnes*. After a close analysis of these two movements, it is clear that Ligeti was very familiar with Bartók's slow movement, and he used it as a model for his own slow variation. The main similarity is that both

movements are in sonata form. Also they both use diatonic collections in homophonic textures as chordal accompaniment. For example, the homophonic sonority in measure 4 of Bartók's third movement is an [024579] pitch class set. The opening sonority in Ligeti's slow movement is [02479]. This means that their interval vectors are very similar. Ligeti's interval vector is <032140>, and Bartók's interval vector is <143250>. These interval vectors have zero tri-tones and very few minor seconds or major sevenths. There are plenty of perfect fourth and fifth intervals in both collections, an important sonority in both pieces. Both collections are rich with major seconds, minor sevenths, minor thirds and major sixths; therefore, they have a similar harmonic sound.

Both composers use these diatonic collections in the exposition and coda. These sections are the most harmonically stable sections of their respective movements. Additionally, both composers use interval class five motion to mark major sections in the movement. For example, in measure 13 of Bartók's quartet the cello plays A to E, interval class five. In measures 540-541 of Ligeti's quartet, the cello plays F to C, interval class five. There are several other examples of small scale structural moments delineated by interval class five motion in both movements. This was discussed in detail above. There are also large-scale structural moments that are delineated by interval class five relationships in both movements. In Bartók's slow movement, the opening diatonic collection is A major or DIA+3. The beginning of the development is preceded by an E major or DIA+4 diatonic collection. These two collections are related by fifth. In Ligeti's string quartet, the opening collection is Bb major or DIA-2. The sonority at the beginning of the development is Eb and Bb. The beginning of the movement is related to the beginning of the development by a fourth, which is an interval class five relationship.

There is another large-scale formal use of fifth relationships in Ligeti's *Metamorphoses Nocturnes*. Freidemann Sallis touches on it in his book, *An Introduction to the Early Works of György Ligeti*. He discusses the fact that the piece begins on note C with a pedal in the cello part. The viola plays an ascending chromatic scale that starts on C then the cello begins a chromatic ascent starting on E. Eventually the second violin enters in measure 5 and all three parts play ascending chromatic scales in an [024] pitch class relationship. Then, starting on note G, the first violin plays the main theme in measure 7. This is the [0123] theme that Ligeti borrowed from Bartók's slow movement. This establishes C as tonic.

First, the note C appears to occupy a role in this work similar to that of a tonic in conventional tonality, but without its normal functional properties. Throughout the work, this pitch is placed at strategically important points. . . C also supports the different pitch class sets found at five crucial formal junctions (cadences) of the quartet. The C occurs either as a pedal, above which symmetric harmonic constructions are placed, or as part of this construction itself and always as the lowest note. The cadential pitch class sets are found at the following points:

- The end of the variations of the second subject (bar 209, second beat);
- The end of the first group of three inventions (bar 533);
- The end of the second group of three inventions (bars 655-659);
- The end of the variations of the third subject (bar 1059);
- The end of the work (bars 1211-1215).

Secondly, we have already noted the importance of C and G in the pitch structure of the first subject and fifth relationships established by the 'first notes' of certain sections (i.e. the opening chromatic scales begin on C, bar 1; the first note of the

first subject is G, bar 7; the canonic imitation following the exposition of the first subject begins on D, bar 20).<sup>8</sup>

Sallis says that theme [0123] and note C play an important formative role in this piece and many of the entrances are fifth-related. [0123] starts on note G measure 7, then note D measure 20. Sallis does not mention that it returns to note G in measure 40 (example 2) and measure 56 (example 3). There is also a version at measure 81 that starts on note D in the viola and is doubled at C# in the cello (example 12). The next clear version of [0123] is in the slow variation that we looked at starting on note A at measure 539 (example 8). [0123] occurs vertically in measures 549-550 starting with the first violin on note E. All of these entrances with the exception of C# are related by fifth. The next distinct version of [0123] theme is at measure 1095 on note C (example 13). It is repeated several times on note C with a “seagull glissando” accompaniment. There is another statement starting on note G four measures from the end at measure 1212 (example 14). The final statement of [0123] is vertical. In the last measure, there is an A# in the second violin, B in the viola, C in the cello, and C# in the first violin. This is a vertical [0123]. What is interesting is the low C harmonic in the cello is the last note to sound in the piece. Taken together the entrances of pitch class set [0123] occur on notes are C, G, D, A, and E; therefore, the [0123] is heard in ascending fifths throughout this piece. It returns to C in measure 1095, and completes a final V to I, G (m. 1212) to C (m. 1215) at the very end. This large-scale formal structure reinforces the importance of the fifth in *Metamorphoses Nocturnes*. The large-scale formal structure of this piece is a C major diatonic referential collection with entrances that occur in circle of fifths order. The slow movement is an

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<sup>8</sup> Friedemann Sallis, *An Introduction to the Early Works of György Ligeti* (Köln: Studio, 1996), 151-152.

encapsulation of this organization because the primary harmonies are fifths organized within a diatonic structure.

In the third movement of Ligeti's *String Quartet No. 2*, there are similar harmonic structures (example four). The piece starts on a dyad, notes A and B. This expands to an [024] pitch class set in measure 8. Then it expands to an [0247] pitch class. Subset [024] is also an important pitch class set in *Metamorphoses Nocturnes*. The plaining chromatic scales at the beginning of the piece are spaced [024]. In the second quartet, measures 3-11 are DIA+2 or D major. There is a G# at the end of measure 11. This suggests an A major, DIA+3 collection, a fifth relationship to the DIA+2 collection. Measures 21-30 are pitch class [0123]. In measure 30, there is an octatonic collection in the cello, Oct. 2. This is doubled at a half-step by the viola part. In measure 35, there is an [0124] collection. [012] is a subset of [0123], and [024] is a subset of [0124]. [0123] occurs in measure 36 and 37. These collections and pitch classes are all part of *Metamorphoses Nocturnes*. This means that the harmonic language is very similar. *String Quartet No. 2* is based on diatonic collections and pitch class sets [0123] and [024], just like *Metamorphoses*.

There are some major harmonic differences in *String Quartet No. 2* compared to *Metamorphoses Nocturnes*. For instance, there is a twelve-tone section in the style of Schoenberg or Babbitt. At the end of measure 30, there are tone rows that begin in the first and second violin parts and continue through measure 33. The viola and cello parts have twelve-tone rows as well. Vertically, the four rows almost make an aggregate every three counts. C natural repeats in the first three counts. This means it actually takes four counts to make an aggregate. Additionally, the four twelve-tone rows are not related to each other. They do not fit into a

single matrix or even two matrices; therefore, this section is not actually combinatorial like Babbit or Schoenberg.

Formally, there are some important differences between *String Quartet No. 2* and *Metamorphoses Nocturnes*. Since there is no melody, thematic return plays no role in formal development. Additionally, Ligeti does not return to the DIA+2 collection in measures 3-11 or at any point in the movement. In fact, he does not repeat any of the pitch collections. The movement starts on notes A and B and ends on unison F#s. Because there is no harmonic or melodic return, it is difficult to give this movement any kind of conventional label. This is consistent with Ligeti's statement, "I gradually evolved a musical style in which I abandoned structures conceived in terms of bars, melodies, lines and conventional forms." The large-scale formal structures are abandoned in this piece, but the localized harmonies are similar to *Metamorphoses Nocturnes* and consequently Bartók's *String Quartet No. 4*.

Despite the abandonment of "conventional forms," there are sections in this movement. The notes in measures 1-11 are all part of DIA-2. They are more harmonically stable than the notes in measures 31-33, which are part of four unrelated twelve-tone rows that create a nearly complete aggregate. Also the notes in measures 21-30 are all part of a relatively unstable cluster, [0123]. In contrast, the movement ends on an F# unison note. This means that the movement begins diatonically, moves to a relatively unstable cluster [0123], becomes a very unstable twelve-tone four-voice aggregate and returns to a harmonically-stable F# unison note at the end. In other words, it moves from stability to instability and returns to stability.

Ligeti uses other means to create sections. Increase and decrease in rhythmic activity creates formal sections as well. The movement starts with eighth notes and gradually accelerates

to twelve sixteenth notes per count. This is one way that Ligeti develops the sound mass in the absence of melodic development. The first section ends with a rest in the middle of measure 12. This is enhanced with a change of tempo and dynamic. In measure 30, the unstable twelve-tone section is delineated with rests in all parts, a dynamic change, and greater rhythmic activity and variety in measure 31-33. In measure 34, the last section is preceded by rests and a change of texture. Additionally, the texture at the beginning of this movement is the same as the texture at the end. This draws the first and last parts together, even though they are unrelated harmonically or melodically.

There are other similarities between these quartets other than melody, harmony, and formal devices. For instance, Ligeti uses the same extended techniques as Bartók in both *Metamorphoses Nocturnes* and *String Quartet No. 2*. The most obvious example is the pizzicato fourth movement in Bartók's *String Quartet No. 4* (example nine). The entire movement is played pizzicato, and it contains examples of Bartók pizzicato as well. The third movement of Ligeti's *String Quartet No. 2* is almost entirely pizzicato, and he uses Bartók pizzicato in this movement, too (example four). Even though these movements use the same extended techniques and Ligeti is obviously appropriating a Bartók idea, they are quite different. Bartók's movement is a thematically conceived movement with pizzicato accompaniment, while Ligeti uses the pizzicato to create a "meccanico texture." Meccanico is a melodically static sound mass with gradually shifting rhythmic layers. The layers start together and gradually move out of sync with one another. Ligeti said the effect that he was trying to achieve was like a house full of clocks all ticking at different times.

. . . in the works of Krudy you find again and again a character, a widow whose husband was either a botanist or a meteorologist and has been dead for years. The

widow lives alone in a house, mostly in Nyírség, as Krudy's characters often do, and, another typical feature, she is quite isolated. She would have a house among the dunes which is full of clocks, barometers, hygrometers. . . I was a child, I must have been about five, when I came upon a volume of Krudy's short stories quite unsuitable for children; someone gave it to me by mistake. It was in summer and I remember being overcome by a strange melancholy, perhaps because of the heat, or was it my reading these Krudy stories all alone in the loft? One of the stories was about the widow living in a house full of clocks ticking away all the time. The meccanico-type music really originates from reading that story as a five-year-old, on a hot summer afternoon.<sup>9</sup>

Ligeti uses the pizzicato technique to create the atmosphere of a "house full of clocks ticking away all the time" in the third movement of *String Quartet No. 2*. All of the parts start in eighths (example four). Then Ligeti introduces an eighth note quintuplet in the first violin. This creates a five-against-four pattern that sounds slightly out of sync. In the next two counts, the quintuplet moves into the second violin part and the first violin plays sextuplets. This is four against five against six. The quintuplets move into the viola part and Ligeti's pattern of development repeats until the movement reaches nine sixteenths against ten against eleven against twelve. In measure 23, it eventually becomes thirteen against fourteen against fifteen against sixteen. This kind of development does not precisely mimic the sound of clocks because clocks tick at an even rate. It is more accurate to describe it as gradually accelerating independent mechanisms. Semantics aside, it is a very effective technique that is reminiscent of

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<sup>9</sup> Várnai, Hausler, and Samuel, *György Ligeti*, 16-17.

Ligeti's *Poème Symphonique for 100 metronomes* written in 1962. This is an example of Ligeti's assertion that "my Second Quartet sums up all my previous work."

There is also an example of *meccanico* in Ligeti's *Metamorphoses Nocturnes*. In measure 699, the cello plays an eight note quintuplet gesture that starts with a Bartók pizzicato. It is marked pizzicato and "with mechanical precision." This gesture repeated through measure 725. In the viola part, there is a chromatic eight-measure passage in sixteenth notes. This is gesture is repeated and also ends at measure 725. The cello gesture starts in a different part of the measure every time it repeats, while the viola remains even and agrees with the time signature in each measure. This is an early attempt by Ligeti to create a *meccanico* texture.

. . . *Poème Symphonique* of 1962, written for 100 metronomes, which is the first pure example of *meccanico* music. But the composition of *Poème Symphonique* was preceded by long years of reflection. Traces of it appear in the First Quartet, although no indications refer to it. One of the variations is a quite machine-like movement: a descending chromatic pizzicato of the violoncello and above it the viola and the second violin playing, mechanically, machine-like ornaments.

Micropolyphony is another favorite technique that Ligeti borrowed from Bartók used in *Metamorphoses Nocturnes* and further developed in *String Quartet No. 2*.

. . . [in] my Second Quartet, here I applied a similar process to chamber music. In orchestral works it was relatively easy, technically speaking, to create a dense polyphony; I had as many parts at my disposal as there were instruments in an orchestra. (That is why I broke down a string orchestra into individual instruments, although you cannot hear them as solo instruments.) In the case of a

quartet, the problem was how to realize micropolyphony, a densely woven musical texture in the medium of chamber music. I had an example in my First Quartet, in which the last but one variation, just before the final sections, is a kind of fugato, where the subject emerges from the fusion of two diatonic parts played by solo instruments. It is a chromatic subject. The two instrumental parts – two violins or a violoncello and a viola – are not fused but intertwine much more like twisted strands of a thread. Two diatonic solo parts combine to create a composite chromatic line, which is an idea characteristic of Bartók.<sup>10</sup>

In the second movement, at measure 102, there is a good example of micropolyphony in Bartók's *String Quartet No. 4* (example ten). The time signature is 6/8 with the second violin and cello playing eight notes in 2/4. This creates a three against two rhythmic conflict that lasts until measure 135. The notes in all parts move in contrary motion within a narrow pitch range. Each part is a different pitch collection. In measures 105-109, the first violin plays notes G#, A, B, and C. These four notes are part of either A harmonic minor or AC+2. In measures 108-112, the second violin plays notes G, C, D, E, F, and A. These notes are part of DIA0 or C major. At the same time, the cello plays all sharp notes that are part of DIA+7 or C# major. When these collections occur at the same time, it creates a chromatic sound mass. The contrary motion and two against three rhythm makes this section sound like it is floating. This is very similar to Ligeti's *Atmospheres* and the type of micropolyphony that Ligeti refers to in the above paragraph.

Measures 781-1028 in *Metamorphoses Nocturnes* are a good example of micropolyphony. In measures 781-800, the cello is in DIA-5 or Db major, and the viola is in DIA0 or C major. In

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<sup>10</sup> Várnai, Hausler, and Samuel, *György Ligeti*, 15.

measure 800, all of the parts play different diatonic collections. The cello plays DIA+2 or D major. The viola plays DIA-3 or Eb major. The second violin plays DIA+1 or G major, and the first violin plays DIA-4 or Ab major. Interestingly, G and D collections are a fifth apart, and Ab and Eb are a fifth apart. This passage is a pair of stacked fifths a half-step apart, two common sonorities throughout *Metamorphoses*. Like Bartók, the combination of these two diatonic collections creates a chromatic sound mass, and the parts move in oblique and contrary motion throughout measures 781-1028. This section expands on the micropolyphonic technique found in measures 102-153 of Bartók's *String Quartet No. 4*.

There is also micropolyphony in *String Quartet No. 2*. The beginning of the fifth movement is a good example of Ligeti's mature version of micropolyphony (example eleven). It is a combination of *meccanico* and polyphony. All of the parts start out playing notes D# and F#, so they are related harmonically. Notes are gradually added to each part until they are all playing notes D#, E, F and Gb or [0123]. The texture evolves from this point. Rhythmically, the parts are quite diverse. In measure 1, the movement immediately starts with three against four against five against six, *meccanico*-like texture. All of the parts start off with a descending F# to D# motion, and the diverse rhythmic structure creates a polyphonic web as the movement evolves. It is like Bartók's micropolyphony because the parts move within a narrow pitch range and contain different rhythmic patterns at the same time. The many difference is that Ligeti's second string quartet does not use diatonic collections. The parts are tied together harmonically, yet they are rhythmically and polyphonically contrasting. This focuses the ear of the audience on the gradually fluctuating texture instead of the harmony.

*Metamorphoses Nocturnes* (1954) was an important stepping stone in the development of Ligeti's compositional style. In this piece, he developed many of the compositional techniques

that characterize his more mature pieces by borrowing from Bartók. He borrowed Bartók's use of pitch class sets [0123] and [024], as well as his use of diatonic collections. He used these collections to create chromatic vertical structures in the style of Bartók. He also followed Bartók's lead and used traditional formal structures such as sonata form. He delineated these structures with fifth-related tonal relationships. Ligeti even borrowed his theme directly from the end of Bartók's third movement. He developed his characteristic micropolyphony and *meccanico* textures from examples that he found in Bartók's quartet. He became so familiar with Bartók's style that he felt he could have written Bartók's seventh string quartet. At this point, he realized that if he continued to write like Bartók, he would only be an "annoying" imitation of Bartók's style. Ligeti broke with Bartók's style and decided to "abandon structures conceived in terms of bars, melodies, lines and conventional forms." All of this is evident in Ligeti's *String Quartet No. 2* that he wrote in 1968. There are no melodies or conventional forms or any rhythmic structures that are traditional. Instead, Ligeti focuses on texture, timbre and "fluctuating" sound mass. Yet there are traces of *Metamorphoses Nocturnes* and Bartók's *String Quartet No. 4* in Ligeti's *String Quartet No. 2*. Those traces include pitch class set [0123] and [024] and diatonic collections. Formal structures are transformed into contrasting areas of stability versus instability instead of conventional formal structures. Ligeti's *meccanico* technique that he developed in *Metamorphoses Nocturnes* is even more prominent in the second quartet, and the micropolyphony that he borrowed from Bartók and developed in *Metamorphoses Nocturnes* is even more important in the second quartet. All of these devices that Ligeti borrowed from Bartók and the ones he left behind show a lineage of development that culminates in his *String Quartet No. 2* of 1968. *Metamorphoses Nocturnes* is a perfect example of how composers borrow ideas and use them to forge their own unique style.