Finding Slonimsky’s Thesaurus of Scales and Melodic Patterns in Two Concerti by John Adams

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John Adams has candidly acknowledged the significance of Nicolas Slonimsky’s *Thesaurus of Scales and Melodic Patterns* (1947) in his own compositional output. Recent studies affirm that Adams’s works incorporate patterns from this book of cyclically related musical synonyms, yet there is little understanding of the properties and organizational principles that make up the *Thesaurus* and, most importantly, how Adams integrates these ideas in his music. This study provides a closer look at the *Thesaurus* and examines two representative movements by the composer, drawn from the Violin Concerto (1993) and the piano concerto titled *Century Rolls* (1996).

Keywords: John Adams, minimalism, Nicolas Slonimsky, *Thesaurus of Scales and Melodic Patterns*, Violin Concerto, *Century Rolls*

Ever since its publication in 1947, *The Thesaurus of Scales and Melodic Patterns* by Nicolas Slonimsky has been a widely used source of musical composition and improvisation. The organizing elements of this work remain an enigma to most casual *Thesaurus* practitioners today, but its influence on numerous musicians from vastly different backgrounds is undeniably. In the classical world, important figures such as Henry Cowell, Leonard Bernstein, Virgil Thomson, Howard Hanson, Arthur Honegger, and Arnold Schoenberg have written testimonials that reveal, at least, a passing familiarity with the *Thesaurus*. In the jazz community, too, the *Thesaurus* has gained enormous respect. Several reports on John Coltrane assert that he devoted time studying this book and, in fact, scholars have convincingly demonstrated how part of “Giant Steps” is directly derived from Slonimsky’s work. Another great jazz musician who has been influenced by Slonimsky is Dave Brubeck, whose 2003 album *Park Avenue South* draws directly from the *Thesaurus*. In the rock genre, musicians including Frank Zappa and guitarists Steve Vai and, more recently, Buckethead have candidly acknowledged use of Slonimsky’s patterns.

Another recent musician who has been forthright on his adoption of the materials found in the *Thesaurus* is the composer John Adams. His fascination not only for Slonimsky’s work but also for his charismatic personality stems from their close friendship. Adams describes Slonimsky as a “character of mind-boggling abilities” and a “coiner who never tired of minting his own.” The kind of impact Slonimsky had on Adams carried over to his music. Following Slonimsky’s death in 1995, Adams composed an orchestral work entitled *Slonimsky’s Earbox* (1996), which “memorializes [Slonimsky’s] wit and hyper-energetic activity, but [it] also acknowledges [Adams’s] great debt to his *Thesaurus*.” One of Slonimsky’s “mind-boggling abilities” was his attempt to form scales and melodic patterns “in such a way as to cover every kind of combination.” In the words of Schoenberg, this was “an admirable feat of mental gymnastics.”

Compositional materials and techniques from the *Thesaurus* can be observed in Adams’s works from the 1990s onwards. Yet although Adams has openly acknowledged borrowing from this source, he has not specified the nature or desire of his influence. In this study, I explore the manner in which he incorporates Slonimsky’s patterns and scales, as well as other relevant issues: how does Adams’s employment of these patterns interact within
a surrounding musical passage, how do patterns relate to one another and interact within a musical work, and what is the manner or substance of his application? In other words, does the inclusion of patterns affect merely the surface structure, or does it bear implications for the larger components of a work?

To understand the properties of these musical scales and melodic patterns, and as a precursor to the discussion of Adams’s use of them, I will begin with an exploration of Slonimsky’s *Thesaurus*. Subsequently, my study will consider various ways in which Adams utilizes Slonimsky’s melodic patterns: (1) quoting them in their entirety, (2) gradually mutating them through various kinds of pitch modifications, and (3) paraphrasing them to create unique patterns that resemble those from Slonimsky’s *Thesaurus*. Observing the manner in which melodic patterns function and interact with their surrounding context will help elucidate the kinds of conditions necessary for a seamless incorporation of Slonimsky’s materials and techniques. This final portion of the study will illuminate the types of harmonies that Slonimsky suggests for his patterns and how Adams re-creates them in his instrumental works.

The bulk of material found in the *Thesaurus* contains over one thousand melodic patterns arranged into chapters according to interval cycles (referred to as principal tones) that divide one or more octaves into equal parts. Slonimsky devotes the most attention to patterns whose principal tones divide a single octave into various equal parts, which he labels Semitone, Whole tone, Sesquitone, Ditone, and Tritone Progressions. Slonimsky’s prefix “sesqui” signifies the addition of a semitone to any given interval; thus, a sesquitone corresponds to a minor third. The pitches that divide the octave into equal distances are in turn ornamented through the insertion of notes below (infra-polation), between (interpolation), and/or above (ultrapolation) these given pitches. Slonimsky’s title “Thesaurus” suggests that a composer can look for musical “synonyms” according to their division of the octave, type(s) of inserted pitches, as well as their cardinality. One can observe, for instance, patterns such as Tritone Progressions (or cycles) that contain an interpolation of one pitch (thus a pattern length of four pitches), two pitches (which yields patterns of six pitches), and so on.

Slonimsky’s Progression in Example 1 shows how its ornamentations can be inserted into an interval cycle. Slonimsky classifies Pattern 10 as a Tritone Progression formed through the insertion of two interpolated notes. The melodic pattern in this illustration is shown in ascending and descending form, a feature that is characteristic of nearly all melodic patterns from the *Thesaurus*. Drawing on Stephen Heinemann’s notation for pitch-class set multiplication, the ascending form of Slonimsky’s Pattern 10 can be represented as $0\rightarrow 5 \otimes <06> = 0\rightarrow 2\rightarrow 5\rightarrow 6\rightarrow 8\rightarrow e$, where ordered segment $0\rightarrow 2\rightarrow 5$, referred to as the multiplicand, is transposed using a tritone or interval 6-cycle $<06>$, which is the multiplier. The series that comprises the union of these two operators, called the product, results in pcs $0\rightarrow 2\rightarrow 5\rightarrow 6\rightarrow 8\rightarrow e$, which Slonimsky notates as $\text{C} \rightarrow \text{D} \rightarrow \text{F} \rightarrow \text{G} \rightarrow \text{B}$. Heinemann accurately notes that despite his pitch-class approach to multiplication, Slonimsky’s patterns are realized in pitch space. For instance, patterns that revolve around an interval 3-cycle $<0369>$ can be generated with principal tones using minor thirds, such as the chapter “Sesquiquadritone Progression: Equal Division of One Octave into Four Parts,” or with major sixths, as in “Sesquisequiquadritone Progression: Equal Division of Three Octaves into Four Parts.”

The types of patterns found in Slonimsky’s *Thesaurus* contain interesting musical properties. The main core of Slonimsky’s book consists of patterns that are transpositionally and inversionally symmetrical. Some of the patterns meet Edward Gollin’s criteria for what he calls multi-aggregate cycles, which consist of repeated patterns of two or more distinct intervals that complete the aggregate more than one time before returning to their point of origin. Several theorists have developed methods for predicting when and where pcs are duplicated in patterns such as those found in the *Thesaurus*.11

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10 Sanchez-Behar (2014, 58).
12 Heinemann’s theorems for multiplication could not be expressed as elegantly in pitch space without further refinement of his system.
15 Multi-aggregate cycles are, in fact, quite a common occurrence in the *Thesaurus*, particularly in the chapters titled “Diatessaron Progression,” “Diantepa Progression,” and “Sesquisesquiquadritone Progression,” which generate patterns based on cycles 1 and 5. Diatessaron Patterns 826–829, for instance, illustrate dual–aggregate cycles.
16 Heinemann (1998) discusses how pitch-class duplications can be predicted by comparing the respective interval-class vectors of a multiplicand and multiplier. The number of repeated pcs in the product is derived by multiplying each interval class from the vectors compared and adding their total, with the exception of ic6, which is transpositionally symmetrical and thus yields twice as many duplications. If one interval class other than ic6 is shared between operands, one note will be repeated in the product, resulting in a total cardinality of $|A| \times |B| – 1$ (this method of finding set cardinality is severely limited in most other instances). If there are no interval classes in common, then there are no repeated pitch classes in their product. For example, the interval-class vectors from the operand sets in
If one considered Slonimsky’s melodic patterns as unordered collections of pitch classes, then Richard Cohn’s musical properties detailed for transpositional combination (e.g., the commutative and associate properties) would be fully applicable. Aside from the theoretical properties inherent in these patterns, a broad assertion about their pitch-class content can be made: a compilation of the melodic patterns reveals that nearly all consist of either the octatonic collection (set-class 8–28), the enneatonic collection (set-class 9–12), various subsets of these two collections, including enneatonic subsets such as the hexatonic collection (set-class 6–20) and the whole–tone collection (set-class 6–35), and last, twelve-tone rows and other patterns that complete the chromatic aggregate. The pervasiveness of the octatonic and enneatonic collections is naturally a by-product of transpositional combination through interval cycles that maximize specific intervals, which in turn minimize others; the octatonic has the highest ic3 representation of all octachords, while the enneatonic does the same for ic4.

The patterns within each interval cycle are organized in a systematic manner. Consider Example 2, which illustrates the interpolation of two notes within a 6-cycle. Here, the multiplicands begin with the most compact trichord 0–1–2 and proceed in the following order: 0–1–3, 0–1–4, 0–1–5, 0–2–3, 0–2–5, 0–3–4, 0–3–5, 0–4–5. From this arrangement of patterns, one can surmise that Slonimsky did not consider inversionally or rotationally related sets as equivalent. Given that any of Slonimsky’s patterns “can be transposed to any tonal center according to a composer’s requirements,”18 0–1–2 ⊗ <06>, 0–1–5 ⊗ <06>, and 0–4–5 ⊗ <06> are related by rotation. The proximity of patterns that are inversionally or rotationally equivalent is a by-product of Slonimsky’s order, and for this reason Slonimsky draws close association of this musical relationship through his synonyms. The remaining 6-cycle patterns in Example 2 belong to the same set class, Forte’s 6–30 [013679], and are related by rotation and inversion: 0–1–3 ⊗ <06>, 0–2–5 ⊗ <06>, and 0–3–4 ⊗ <06> are inversionally related to 0–1–4 ⊗ <06>, 0–2–3 ⊗ <06>, and 0–3–5 ⊗ <06>. Slonimsky offers no explanation for why the linear segment 0–2–4 ⊗ <06>, known as the whole-tone collection, does not appear in this list, though it can be found elsewhere in the Thesaurus (Patterns 36 and 569).19 Based on this and other comparable instances, it seems evident that Slonimsky tried to avoid the duplication of this pattern, as well as other “modes of limited transposition” such as the octatonic scale, which can be included within a 3- and a 6-cycle.

Adams’s instrumental works incorporate patterns from the Thesaurus through various means. One of these ways entails the use of exact quotations that stem from Slonimsky’s work. When present, these complete representations assume dominance over an extended passage of music. Adams references Slonimsky’s complete Pattern 425 in the third movement of his piano concerto Century Rolls (1996) in Example 3. Like Slonimsky’s Thesaurus, Adams’s passage features the pattern in prime and retrograde forms. Slonimsky begins all of his patterns on pc 0, but here Adams transposes this pattern to begin on pc 6 (or Gb) to accommodate the surrounding musical space. Slonimsky classifies this pattern as having an ultraposition of three notes within a 3-cycle <0369>. In Heinemann’s notation, Slonimsky’s pattern consists of an ascending 0–4–6 ⊗ <0369>, and the retrograde of its expansion, or 0–3–7–1 ⊗ <0963>. Here, the tetrachord 4–25 [0268], which can be thought of as the familiar Mm7(06) (or less likely thought of as a root-position French augmented-sixth chord), is transposed around a cycle of minor thirds. Adams relegates Slonimsky’s pattern so that each triplet group comprises an ascending or descending major third in the prime form, but because pc 6 is not repeated before beginning the retrograde, the pattern transforms into a series of alternating ascending minor thirds and descending tritones (mainly augmented fourths). The result yields the notes from an octatonic collection, which is one of Adams’s preferred collections in his recent instrumental works.

Pattern 402 = 0–5–4 ⊗ <0369> do not share interval classes; thus, their operation yields twelve pitch classes, resulting in a derived twelve-tone series, which is generated by either one of the recurring operands. In Heinemann’s words, “two operand sets A and B with no interval classes in common will produce a set with a cardinality equal to |A| × |B|” (79). The exact order position of an initial duplication can also be predicted (Lambert [1990]). Lambert details a method for finding the position of the first duplication in what he refers to as a combination cycle, which equates to Slonimsky’s pattern interpolation of one note within an interval cycle.

The enneatonic is also known as the “Tcherepnin” scale in Russia because the composer Alexander Tcherepnin (1899–1977) had used it more extensively than any other composer. It is discussed in a number of writings by John Schuster-Craig and more recently in a dissertation by Kimberly Anne Veenstra [2009]. Incidentally, Olivier Messiaen classifies this collection as his third mode of limited transpositions in Technique de mon langage musical (1944) and refers to it as “the best of all modes [of limited transposition]” (Messiaen [1994, 64]).

18 Slonimsky (1975, vi).
19 One of the forerunners to Slonimsky’s Thesaurus, titled The Schillinger System of Music Composition, likewise lists a series of patterns and symmetrical scales. In the section on the interpolation of two notes within a 6-cycle, the author Joseph Schillinger includes the whole-tone collection and arranges the patterns in a slightly different order: 0–1–2 ⊗ <06>, 0–1–3, 0–2–3, 0–1–4, 0–3–4, 0–1–5, 0–4–5, 0–2–4, 0–2–5, and 0–3–5 (vol. I [148–54]). Schillinger’s monumental treatise on musical composition and his theoretical concepts includes two volumes and extends over 1,500 pages. His work is more highly driven by mathematical logic and its significance on music. The thrust of his ideas revolves around permuted musical structures that create a sense of continuity. The Schillinger System was highly influential during its day; notable musicians such as George Gershwin, Glenn Miller, and Benny Goodman have been known to study under Schillinger’s tutelage. An even earlier attempt at organizing symmetrical scales and patterns, which predate Schillinger’s work, is Alois Hába’s Neue Harmonielehre (1927). However, Hába’s organizing principle combines patterns that solely bear inversional symmetry to others such as those listed in Example 2. Ultimately, Slonimsky’s Thesaurus has proven to be the most successful book of scales and patterns, in part due to its user-friendly approach that attempts to exhaust all patterns with little jargon mostly confined to the book’s preface, rather than present few patterns as germinating ideas for further exploration and creation of other patterns.
works, such as Slonimsky’s Earbox (1996). This pattern has an even distribution of pitch repetitions and therefore projects the octatonic collection twice before returning to its point of origin. Aside from Adams’s own transposition and the added rhythmic swing effect, his excerpt is identical to Slonimsky’s pattern.

Adams presents complete replications of Slonimsky’s patterns without disguise, thereby directly acknowledging the point of origin or source for inspiration and, subsequently, subjects them to a series of pc modifications, such as those found in Example 4. The example shows a straightforward illustration of this process in the opening measures of Adams’s Violin Concerto, first movement (1993). In this incipit, Adams features Slonimsky’s Pattern 10, transposed to begin on E. Imagining E as pc0, Slonimsky’s Pattern 10 can be notated as: ascending 0\text{–}2\text{–}5 \otimes \langle 06 \rangle; descending 0\text{–}e\text{–}8 \otimes \langle 06 \rangle. The set class formed by these pcs consists of the hexachord collection 6\text{–}30 [013679], a subset of the octatonic collection. The ascending pattern first maintains the register of the original, and shortly after Adams transposes various pitches down an octave to

\[ \begin{array}{|c|c|c|} 
\hline 
\text{Pattern} & (\text{Multiplicand} \otimes) & \text{Product} \\
\hline 
5 & 0\text{–}1\text{–}2 \otimes \langle 06 \rangle & 0\text{–}1\text{–}2\text{–}6\text{–}7\text{–}8\text{–}0 \\
6 & 0\text{–}1\text{–}3 \otimes \langle 06 \rangle & 0\text{–}1\text{–}3\text{–}6\text{–}7\text{–}9\text{–}0 \\
7 & 0\text{–}1\text{–}4 \otimes \langle 06 \rangle & 0\text{–}1\text{–}4\text{–}6\text{–}7\text{–}4\text{–}0 \\
8 & 0\text{–}1\text{–}5 \otimes \langle 06 \rangle & 0\text{–}1\text{–}5\text{–}6\text{–}7\text{–}e\text{–}0 \\
9 & 0\text{–}2\text{–}3 \otimes \langle 06 \rangle & 0\text{–}2\text{–}3\text{–}6\text{–}8\text{–}9\text{–}0 \\
10 & 0\text{–}2\text{–}5 \otimes \langle 06 \rangle & 0\text{–}2\text{–}5\text{–}6\text{–}8\text{–}e\text{–}0 \\
11 & 0\text{–}3\text{–}4 \otimes \langle 06 \rangle & 0\text{–}3\text{–}4\text{–}6\text{–}9\text{–}4\text{–}0 \\
12 & 0\text{–}3\text{–}5 \otimes \langle 06 \rangle & 0\text{–}3\text{–}5\text{–}6\text{–}9\text{–}e\text{–}0 \\
13 & 0\text{–}4\text{–}5 \otimes \langle 06 \rangle & 0\text{–}4\text{–}5\text{–}6\text{–}t\text{–}e\text{–}0 \\
\hline 
\end{array} \]

\text{EXAMPLE 2. Interpolation of two notes in a C6-cycle.}


20 Slonimsky’s Pattern 425 reveals a similar characteristic to what Gollin describes as a multi-aggregate cycle, though with the octatonic collection; hence, it produces what I call a multi-octatonic cycle.

21 This musical depiction compiles the highest textures from the violin I, violin II, and viola parts. Occasionally chromatic notes are enharmonically respelled in the score transcribed for violin and piano.
prevent a continuous melodic rise. After commencing the concerto with a transposed replica of Slonimsky’s Pattern 10, Adams begins a process of gradual transformation through the removal of pcs. Each asterisk in the illustration signals omitted pcs from Slonimsky’s ordering. The omitted notes from the ascending patterns (B♭, C, D♯, E, F♯) are generally arranged according to the same structure as Pattern 10, which produces the intervals <+2+3+1>. Thus, the absence of these expected notes reinforces the intervallic structure that defines the initial pattern. Like Slonimsky, Adams also incorporates the retrograde form of the pattern (starting on m. 10), albeit in modified form. Omitted notes in Adams’s retrograde form are far more frequent and occasionally outline A–C–E, or an A-minor triad. In the modification that I refer to as a “pitch-class interchange,” Adams swaps the ordering of two notes. The influence of this pattern on the Violin Concerto can be traced throughout the entire movement to a greater or lesser degree, and its effect bears a direct impact on the surface and structure of the entire movement.

Another compositional technique that displays influence of Slonimsky’s Thesaurus involves paraphrasing a pattern’s continuous melodic ascent and descent (prime and retrograde), guided by a recurring interval to form a cycle. The genesis of Adams’s newly composed patterns can be traced directly to Slonimsky’s work because they appear after a transparent reproduction of one of Slonimsky’s patterns has been introduced. In this manner, a traceable pattern is used as a starting point; Adams’s own twist can be interpreted as variations on a pattern. Example 5 illustrates how Adams reworks Pattern 425 in “Hail Bop” from Century Rolls, given in Example 3 (mm. 128–31). The recurring tetrachord from Pattern 425—by coincidence a member of 4–25 [0268]—has been altered, yet Adams’s new patterns resemble Slonimsky’s in their contour; moreover, both the prime and retrograde forms appear in the score. Adams’s variations alternate between two pitch-class collections, with the exception of the [026] trichord in m. 134, which is nevertheless a subset of the [0258] tetrachord heard in the following measure. Each variation utilizes two pitch-class collections: variation 1 contains [0258] or its subset [026], as well as [0146]; variation 2 includes [0147] and [0135]; variation 3 employs [036] and [0156]. Adams’s newly composed patterns form three different hexachordal collections: 6–21 [023468] in mm. 134–35, 6–Z40 [012358] in mm. 144–47, and 6–Z28 [013569] in mm. 152–55. It is intriguing to discover that none of the hexachords are subsets of Slonimsky’s octatonic pattern. By departing from the parent collection, Adams highlights a process of development in his own variations.

The employment of two set classes to create a new kind of pattern, as Adams develops in Example 5, is not foreign to the context of minimal music, Warburton (1988) refers to this gradual removal of notes from a pattern as a block reductive process.

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23 Timothy A. Johnson’s (2005) presentation “Diatonic Transformations in the Music of John Adams” confirms a similar point on contrasting seemingly unrelated pitch-class collections. Namely, Adams signals new formal sections with pitch collections that have fewer common tones than those maintained within a former section.
treatment of a small number of patterns in the *Thesaurus*, such as those titled “Non-Symmetric Interpolation” (Patterns 49–52), and “Bitonal Arpeggios” (Patterns 1191–1213). However, one of the primary organizing principles of the *Thesaurus* concerns directed intervals, rather than the collection of unordered pcs to form set classes. Therefore, the directed intervals that generate the alternating set classes will remain the same (or at times be inverted) when a set class is produced. Yet Adams’s variations depart from the kind of linear regularity seen in Patterns 49–52 and 1191–1213.

Like Slonimsky’s Pattern 425, Adams’s variations revolve around a 3-cycle <0369>, except that Adams distorts one of the principal cyclic tones with each variation (the only hexachordal collection that allows for a complete 3-cycle is found in variation 3, but Adams chooses to deviate away from Slonimsky’s pattern of transposition).

Although one cannot make a direct one-to-one correlation between Adams’s unique variations and patterns from the *Thesaurus*, each of the variations contains embedded portions from patterns that stem from the same chapter in which one finds Pattern 425, entitled “Sesquitone Progression.” Pattern 425 features the ultrapolation of three notes within a 3-cycle, while traces from Patterns 528, 533, and 540 found in the variations all feature the infra-inter-ultrapolation of three notes, also within a 3-cycle.24 Considering that there are 177 patterns

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24 These three patterns contain the following pcs shown using Heinemann’s notation for multiplication: Pattern 528 = 0–t–1–9 ⊗ <0369>; Pattern 533 = 0–t–2–9 ⊗ <0369>; Pattern 540 = 0–9–2–6 ⊗ <0369>. To trace the resemblance, one must examine Slonimsky’s patterns with directed
found in the chapter “Sesquitone Progression” and 12 subchapters that list the kinds of embellishments added to the principal tones, whether or not one could attribute a direct influence or marginalize it as merely coincidental, it appears that Adams’s choice of patterns from just one subchapter is germane to his musical treatment of Slonimsky’s patterns. Given that Adams sets into motion different kinds of patterns that are related by a binding interval cycle, one could assert through inductive reasoning that his conception of a musical synonym is in this instance broader than that suggested by Slonimsky through his division of cyclically related patterns by processes of inter-, infra-, or ultra-polation. As shown in Example 2, the criteria for Slonimsky’s arrangement are threefold: the cyclic composition of a pattern; its cardinality; and the type of embellishment(s) chosen to realize the pattern. Adams, on the other hand, retains a hexachordal cardinality here, yet relates patterns more broadly as long as they fit within the same pattern length.

The transformation of Adams’s patterns at work in Example 5 can be closely examined using the concept of step classes in modulo-6 space.25 Christoph Neidhöfer defines a step-class interval as the directed distance in steps between two notes of a given collection.26 The step-class sequence \(<+2 +3 –2>\) serves as the driving factor that generates Adams’s variations. By arranging the pitch-class content of the first variation in ascending order \((0, 2, 6, 8, 9, t)\), the resulting step-class intervals can be derived: \(<+3 +3 –2 >+2 +3 –2 -1 +1 +3 -2 -1 +2 +3 -2 >\). Each trichord or tetrachord illustrated in Example 5 is indicated by the underlined, directed step-class intervals, while the connection between them, which highlights the connection between collections within the 3-cycle, is shown by the remaining integers. Any deviation from the generating step-class sequence \(<+2 +3 –2 >\) normally results from the interaction between trichords and tetrachords in this and other variations. The second variation is derived in the same manner \(<+2 +3 –2 -1 +2 +3 –2 -1 +2 +3 –2 >\), as is the third variation \(<+3 +3 –2 -1 +2 +3 –2 -2 +2 +3 –2 +1 +2 +3 -2 >\). The end result of Adams’s method for composing variations reveals the malleable nature of Slonimsky’s patterns as they transform into new kinds of patterns that draw from the original in their contour and emphasis on a specific interval cycle, yet incorporate recurring embedded step-class intervals at each variation.

The method in which Adams integrates and transforms Slonimsky’s patterns does not appear to occur simply at the surface level but rather at the very core, retaining motivic and structural relationships that bind a whole work. In the third movement from Century Rolls, the octavonic collection comes to the fore subsequent to Slonimsky’s pattern and Adams’s unique molding of Pattern 425 that ensues in mm. 126–57. The movement continues with a particularly lucid manipulation of the octavonic collection represented through scales and other motivic material reminiscent of Adams’s earlier handling of this collection. Moreover, the musical setting preceding m. 126 associates motivic interrelationships through octavonic subsets as well as a rhythmic character that augurs the syncopated figures found subsequently. In the first movement of the Violin Concerto, Adams’s opening, stemming directly from Slonimsky’s Pattern 10, virtually shapes and molds the entire movement. Adams describes the first movement, which bears some resemblance to a concerto in its use and placement of a cadenza for the soloist: “The large organism is a picture of the smallest cellular structure. For example, in the first movement, those rising waves of triads become basic genetic material for the entire movement. They make their effect felt everywhere, even in the cadenza.”27 Adams candidly acknowledges that the source of the smallest cellular structure derives from the Thesaurus.28 The opening pattern is subjected to various transpositions juxtaposed to create parallel second-inversion major triads.

Formal development in the Violin Concerto, arising from Adams’s microcosmic treatment of Pattern 10, shapes the larger gestalt. Adams’s more extensive approach to implementing Slonimsky’s patterns in the Violin Concerto departs from the occasional use found in Century Rolls. Close examination of Adams’s works appears to pinpoint the Violin Concerto as the composer’s initial and deliberate adoption of this resource. In this regard, the first movement can be understood as an experimental study of sorts, as one musical realization derived from Slonimsky’s raw materials and molded by Adams. In the Violin Concerto, Pattern 10 develops in a variety of ways, some of which I will illustrate; moreover, Pattern 10 interacts with other closely related patterns. Pattern 9 = \(0–2–3 \otimes \langle06\rangle\) and Pattern 10 = \(0–2–5 \otimes \langle06\rangle\) are the most prominent ones; they are typically established in a contrasting fashion. These two patterns feature the interpolation of one note in a 6-cycle; thus, Adams heeds Slonimsky’s recommendation for finding related synonyms.

Example 6 illustrates various other patterns from the first movement of the Violin Concerto. In mm. 11–12, the violin solo features a complete octavonic collection \((\text{OCT}_{10})\), which is classified as Pattern 392, a 3-cycle Progression appearing as the first pattern under the section entitled Sesquitone Progression. Although Patterns 10 and 392 appear in different sections in Slonimsky’s book, Pattern 10 shares a subset relationship to the parent octavonic collection. In mm. 18–20, the violin solo plays Slonimsky’s Pattern 11 = \(0–3–4 \otimes \langle06\rangle\) (as marked in an

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25 For a discussion and application of the term “step class,” refer to Neidhöfer (2005) and Santa (1999).

26 The significance of step-class intervallic analysis in Adams’s instrumental works from the 1990s onwards has been raised by Sanchez-Behar (2008), and the earliest trace of Adams’s initial workings in step classes has been documented in China Gates (1977), which Adams and scholars alike regard as his first opus (Sanchez-Behar [2014]). Closer examination of Adams’s works reveals that the notion of interval transposition in diatonic space or a modulo-space of smaller cardinality is pervasive as a means of motivic development.


28 Ibid., 99.
Earlier example, the asterisk symbol highlights the notes that are sporadically omitted from the pattern). Pattern 11 can also be thought of as a rotation of Pattern 10, and naturally, it also forms a subset of the octatonic collection. Measure 45 illustrates one instance in the concerto of Slonimsky’s Pattern 3 = \(0 \rightarrow 4\) \(\otimes\) \(\langle 06\rangle\), a subset of Pattern 10. In mm. 302–5, the violin solo features the retrograde form of Pattern 9, written as \(0 \rightarrow 9 \rightarrow 8 \otimes \langle 06\rangle\).

Close examination of the Violin Concerto reveals that Adams’s notion of musical “synonyms” at times is as Slonimsky prescribes, and at times departs from the method for resemblance set up in the Thesaurus. Adams does not restrict his choice of patterns to a single cardinality, but rather relates patterns through set/subset relations. Considering Slonimsky’s “synonyms” in Example 2 (Patterns 5–13), only those patterns that formed subsets to the octatonic collection—such as 9, 10, and 11—appear prominently in the first movement of the Violin Concerto. The melodic patterns utilized by Adams in the Violin Concerto share a common property: maximal saturation of ic6 given their cardinality. The tetrachord 4–25 [0268] formed by Pattern 3 has two tritones, the hexachord 6–30 [013679] formed by Patterns 9, 10, 11 has three tritones, and the octatonic collection has four tritones.

A summary of my findings thus far shows that, after presenting a pattern from the Thesaurus and gradually altering it through various pitch and rhythmic modifications, Adams creates his own patterns that are nevertheless influenced by the Thesaurus. In other instances, he gradually introduces various patterns from the Thesaurus that interact with one another and are related in pitch content. In the Violin Concerto, Adams handles the interaction of patterns in a variety of ways. An overview of the compositional techniques from the Violin Concerto that are coupled with Slonimsky’s patterns will help elucidate his synthesis of raw materials and their manipulation through his unique minimalist treatment.

Transposition is the most pervasive operation Adams applies to Slonimsky’s patterns. The first approach for integrating transposition involves the use of a single pattern. Example 7 illustrates the various transpositions of Pattern 10 and their employment in the solo violin part in mm. 27–30; these measures are emblematic of Adams’s method for transposition throughout the concerto. Due to the transpositional symmetry of Pattern 10, there are six possible transpositions; the remaining six patterns form rotational equivalents to the ones shown in the chart below. The product of \(T_6\), for instance, yields a rotation of \(T_0\) with pcs \(6 \rightarrow 8 \rightarrow 0 \rightarrow 2 \rightarrow 5\). Adams employs all transpositions of Pattern 10, giving rise to a highly chromatic passage.29

In an interview with Adams, Rebecca Jemian and Anne Marie de Zeeuw (1996) noted that in the opening measures of the Violin Concerto “the solo instrument seems to have free access to the twelve tones” (98). The melodic line expressed in the opening has an improvisational quality that is
The chromatic aggregate results from the combination of pcs from at least three Pattern 10 transpositions. Transpositions of this kind tend to overlap with one another, and the higher the invariance between transpositions, the longer the overlapping span tends to be: the Pattern 10 interval-class vector <224223> reveals four common notes between T₀–T₃ and T₄–T₁. After a brief passage of double stops leading up to m. 27, Adams reintroduces Pattern 10 in a straightforward manner that adheres to Slonimsky’s own succession of intervals <+2+3+1>, and soon afterwards, patterns are modified either through rotation, sporadic omission of one or more pcs or rejection of the scalar order established by Slonimsky. The transposition of a single pattern can also be associated with certain formal functions within the structure of this movement. In the return of the primary violin solo theme (starting in m. 184), Adams uses a transposition of Pattern 10 (see the violin solo in mm. 181–87) that progresses from T₀ to T₁. The only pcs shared between these two transpositions are those that formed the parent 6-cycle. This relationship seems meaningful in light of Johnson’s (2005) findings that demonstrate how Adams often develops formal sections by maintaining a high degree of common tones, and, conversely, highlights the arrival of subsequent sections with pitch collections that retain a limited number of shared notes.30

The second approach to transposition entails the interaction between two patterns from the Thesaurus. One of the most visible procedures in the Violin Concerto concerns the interplay of Pattern 9 = 0–2–3 ⊗ <06> and Pattern 10 = 0–2–5 ⊗ <06> while keeping the level of transposition between the two intact. This technique can be found in virtually all instruments at various times, including the violin solo and other instrument parts, and it is particularly noticeable in the Synthesizer 1 line (for a transparent example, turn to the Synthesizer 1 in mm. 1–22). Utilizing the same level of transposition between Patterns 9 and 10 enables a high retention of common tones. Adams’s penchant for utilizing this technique with greatest clarity at formal beginnings—rather than as concluding or transitional gestures—bears parallels to the methods for elaboration and development considered part and parcel of the minimalist style. He stretches the presentation of each pattern for a substantial period and gradually subjects them to a type of fragmentation that expedites the alternation of patterns.

The third and final technique is central to the types of transformations encountered in the Violin Concerto; it consolidates transposition with step-class intervals drawn from Patterns 9 and 10. Example 8 illustrates the Synthesizer 1 texture from mm. 49–55, doubled by the lowest pitches found in the dovetailed string section. Subsequent to his manipulation of Patterns 9 and 10 in the opening measures of the concerto, Adams concocts a melodic rise that highlights not only the interaction between patterns but, at times, also their unification through patterns that periodically utilize only invariant pcs. An examination of traditional ordered pitch-intervals would reveal unequal diatonic collections implied by musical context. For additional information on Johnson’s analytical model, please refer to his 1991 dissertation.

30 Johnson’s model, called the common-tone index (CTI), tallies pc relationships retained between chords, sonorities, and fields. Johnson describes the term “sonority” as all sounding pitches, whereas “field” consists of the

distances to generate each transposition, but step-class intervals
appropriately illustrate intervallic consistency measured in scale steps according to Slonimsky’s patterns. Adams
again creates variety by exhausting all transpositions from Pattern 9 (and nearly all from Pattern 10). Moreover, the rota-
tion of the borrowed patterns is frequent; in other words, he begins a pattern with any desired note from that collection.
Considering the transpositional level between contiguous pat-
tterns, Adams focuses on those that are one or two levels apart. This passage can be perceived as creating a closing gesture
through an ascending figure reminiscent of the opening but
fragmented to half its duration. The texture that follows the
fragmentation of this motivic material “achieves a shifting of
gears in [the] music” through a gradual accelerando and shortly
after a metric modulation.31

The types of harmonic structures that accompany Adams’s
borrowed patterns at times parallel Slonimsky’s approach to harmonizing his own patterns. In several appendices from the
Thesaurus, Slonimsky suggests one or more possible harmoniza-
tions for many of his patterns (Patterns 1–568).32 Slonimsky
primarily recommends the use of “master chords” to harmonize
the linear patterns. These master chords consist of Mm7 chords
without a chordal fifth. In 3-cycle patterns, Slonimsky suggests
as little as one harmonization, and as many as six possible
harmonizations. These harmonizations differ in their transposi-
tional levels, at times blending well with the melodic patterns
by using the same pcs, and at times clashing strongly with con-
trasting notes. Example 9 shows the only harmonization sug-
gested for Slonimsky’s Pattern 425, first introduced in
Example 3 to interpret a passage from the third movement of
Century Rolls. Slonimsky prescribes the use of cyclically revolv-
ing master chords at T3 for all 3-cycle patterns in ascending and
descending form. The bass of each root-position chord is a
tritone apart from the melodic notes that fall on each beat.


32 Yet his book is arranged according to linear patterns, which suggests that
harmony was a secondary consideration—indeed, most of the harmoniza-
tions are shown in the appendices.
Together the harmonization and the melody notes on the beat form the whole-tone subset 4–25 [0268]. While the vertical aspect of this pattern forms the 4–25 collection, the linear unfolding of Pattern 425 segmented into tetrachords also generates the same collection.

When Adams borrows Slonimsky’s patterns, he either uses Slonimsky’s prescribed harmonization when first presenting the melodic pattern in its untouched state, or he conceives new harmonies following an initial introduction to a melodic pattern. In “Hail Bop” from Century Rolls, for example, Adams harmonizes the ascending form of Pattern 425 in the manner suggested by Slonimsky, though with the addition of an added perfect fifth above the bass (this harmonization begins in mm. 126). Once Adams begins to develop Slonimsky’s patterns, the accompanying harmonic structures also begin to take their own form. Example 10 revisits variation 1 from Example 5, where I described how the melodic pattern retains the same pitch contour as Pattern 425 (in mm. 134–41). The harmonic accompaniment in the piano in Example 10 is generated by the notes expressed melodically. In the Thesaurus, Slonimsky derives a related technique in his chapter “Authochordal Harmonization,” where new scales are harmonized “with the aid of chords formed by the notes of the scale itself.”

Slonimsky utilizes root-position major and minor triads for each note of a melodic pattern. Adams’s approach differs from Slonimsky in that each melodic segment circled in the example is represented harmonically on each offbeat (I have only circled the first three measures, but this process applies to the entire passage). When Adams’s melodic segments form a trichord in the excerpt from “Hail Bop,” the respective harmony will contain three distinct notes, whereas when a segment consists of a tetrachord, its harmony will yield four notes. Unlike Slonimsky’s prearranged harmonizations, Adams’s harmonies are not drawn from a recurring master chord subjected to $T_3$ operations; instead, the woodwinds and piano illustrate linear and vertical expressions of the same process. As a direct result, his harmonic structures diversify their content through various dyads, triads, and tetrachords that form subsets of the parent collection 6–21 [023468] formed by the melodic pattern.

Another formula Adams employs for the harmonization of melodic patterns concerns the use of root-position major triads. The opening measures of the Violin Concerto, shown in Example 11, illustrate Adams’s harmonization of Slonimsky’s Pattern 10 discussed earlier in Examples 1, 2, and 4. In an interview, Adams recalled how he “derived the rising figure as a diatonic figure which [he] then submitted to modal transpositions.”

The result in Example 11 and throughout the movement is a linear succession of Pattern 10 in three different and simultaneous transpositions, vertically forming second-inversion major triads. Adams’s triadic approach to the harmonization of melodic patterns has a precedent in the Thesaurus. Slonimsky derives another formula for his scales and patterns that strictly engages root-position major triads. Each note of a pattern is harmonized with a new triad, and notes from the melodic pattern consist of either a root, third, or fifth. This technique diverges from “Authochordal Harmonization” in that the harmonies do not stem directly from the melody; rather, major triads are matched with the melody’s root, third, or fifth, while remaining notes can lie outside the collection of the melodic pattern itself. Concerning Adams’s triadic approach, the composer states that we perceive the linear aspect of these measures more strongly than the vertical structures: “A major triad is a very pleasant and sonically user-friendly interval. But when they’re perfectly parallel and follow lines that are essentially atonal, it creates a very interesting effect where I think the atonality dominates over the tonality of the vertical arrangement.”

This statement is significant in light of Adams’s compositional approach to instrumental works from the 1990s onwards, which receive greater emphasis on counterpoint and polyphony than his earlier works written in the 1970s and 80s. The Violin Concerto, Century Rolls, and other works from the 1990s achieve “a successful integration of the older minimalist techniques (repetitive motifs, steady background pulse and stable harmonic areas) [to] the more complex, more actively contrapuntal language of the post-Klinghoffer pieces.” In this light, Adams’s greater interest in contrapuntal writing during this period offers a plausible explanation for his adoption of the linear patterns found in the Thesaurus.

I have presented an overview of Adams’s method of integrating and molding patterns and accompanying harmonies from the Thesaurus in individual movements from two concerti. This practice naturally extends to other movements, as well as instrumental works from the 1990s onwards, including Slonimsky’s Earbox and Scratchband (both composed in 1996). In the second movement from the Violin Concerto, a Chaconne that quotes Pachelbel’s celebrated Canon in D, Adams employs the octatonic collection as a preamble to Slonimsky’s melodic patterns and scales. The octatonic collection serves as a primary organizational strategy that helps generate melodic subsets and structure the work. During the opening measures, the second synthesizer chords outline a major-triad harmonization around a complete 3-cycle, exhausting all the notes from an octatonic collection. The solo violin begins with a free counterpoint that frequently employs notes from the same collection, but with added embellishments. Adams gradually morphs the tonally derived ostinato into the whole-tone subset 4–24 [0248] in mm. 62–71 and subsequently into the octatonic subset 5–19 [01367] in mm. 119–32 while keeping the original contour intact. This movement of the Violin Concerto also makes pervasive use of numerous heptatonic scales, which are also

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33 Slonimsky (1975, vi).
35 Another instance of this technique can be observed in Adams’s American Berserk, composed in 2001.
38 Whole-tone and octatonic collections are well represented in the Thesaurus, comprising over 200 patterns.
The orchestral work *Slonimsky’s Earbox* features octatonicism prominently, and its transpositionally symmetrical melodic patterns can frequently be traced to 3-cycle and 6-cycle patterns from the *Thesaurus*. The opening loosely models Stravinsky’s symphonic poem *Le chant du rossignol*, a work that has been examined by scholars for its pentatonic-diatonic-octatonic interaction and appeals to Adams for its “brilliant eruption of colors, shapes, and sounds.” The opening scalar passages suggest a melodic-minor scale that leads to an octatonic collection in m. 5. He borrows Slonimsky’s Pattern 6 in the second clarinets in mm. 6–7, an octatonic subset containing $0–1\oplus0$ $\langle06\rangle = 0–1–3–6–7–9–0$, then superimposes its two other rotations, Pattern 10, or $0–2–5 \oplus \langle06\rangle$, and Pattern 11, or $0–3–4 \oplus \langle06\rangle$, in the piccolo and first clarinets. Slonimsky’s patterns and various other octatonic subsets appear in prime and/ or retrograde form. Throughout the work, Adams employs patterns from Slonimsky’s Tritone Progression (6-cycle) or Sesquitone Progression (3-cycle), though he also balances the symmetrical nature of these patterns with nonsymmetrical ones whose exact origin in Slonimskian antecedents is at times difficult to pinpoint.

There is little doubt that Slonimsky’s *Thesaurus* informs one important facet of Adams’s compositional technique. Yet it is the manner in which Adams employs Slonimsky’s melodic patterns that is most telling. Initially Adams incorporates a single pattern or a variety of musical synonyms according to their intervallic cycle and cardinality, while in subsequent statements the patterns serve as a model for creating newly composed patterns. This method for employing and reworking Slonimsky’s melodic patterns is particularly notable in the third movement from *Century Rolls*. Likewise, the first movement of the Violin Concerto presents another study of Adams’s procedure for employing and developing Slonimsky’s patterns. From the onset, Slonimsky’s Pattern 10 assumes a role akin to a Grundgestalt, by which other patterns revolve around and transform through transpositional operations into myriad shapes and forms. In reading Slonimsky’s own words for composing with the *Thesaurus*, I cannot help but feel a sense that Slonimsky never meant for these patterns to be used with any degree of rigidity. Slonimsky encouraged *Thesaurus* users to transpose his patterns to suit a composition and explained that “fragments of the scales and patterns in the *Thesaurus* may be used as motives and themes. The rhythmical elaboration is left to the imagination of the composer.”

Exemplifying this attitude, Slonimsky ventured composing fifty-one short piano pieces, titled *Minitudes* (1972–76), which occasionally showcase patterns from the *Thesaurus* in an unrestricted manner. Adams’s handling of these patterns, first presenting the germinating idea and then gradually molding the basic shape into his own, exemplifies the kind of flexible approach that is implicit in Slonimsky’s writing and music devoted to or influenced by his *Thesaurus*.

**Works Cited**


