Carl Ruggles's Cadential Complex*

Stephen Slottow

Carl Ruggles placed maximum emphasis on the melodic line. In a 1927 letter to Henry Cowell about *Sun-Treader*, he wrote: "More and more I'm gaining that complete command of line which, to me, is the basis of all music."[1] Charles Seeger wrote about their working sessions: "One could keep at it for the better part of a whole night, as we did once with *Angels*. The criteria were very seldom vertical but almost invariably horizontal—the momentum, the goal, of the melodic line."[2] Ruggles stressed the point in a 1967 interview conducted by John Carton:

Carton: What is the most important element in your music?
Ruggles: Melody.
Carton: What do you feel about rhythm, harmony...
Ruggles: (interrupting) Melody, line is everything!
Carton: What should a composer do who has trouble dealing with melody?
Ruggles: Drive a truck.[3]

Besides his general emphasis on the line, Ruggles held certain opinions about melodic contour. In 1966, five years before his death, he told a *Newsweek* interviewer: "There shouldn't be any straight lines. It's against nature. Did you ever see straight lines in a bunch of flowers, in the sea, on a mountain?"[4] In that same year he said something similar about music and painting to his biographer Marilyn Ziffrin. "He always started with 'the line,' adding that there were not straight lines in nature, so he didn't use

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* This paper is based on a talk given at the 1997 annual meeting of the Society for Music Theory in Phoenix, Arizona.

[1] John Kirkpatrick, "The Evolution of Carl Ruggles: A Chronicle Largely in his Own Words," *Perspectives of New Music* 6/2 (1968): 146-166.

[2] Charles Seeger, "In Memoriam: Carl Ruggles (1876-1971)," *Perspectives of New Music* 10/2 (1972): 171-174.

[3] John Carton, "Carl Ruggles: A Treader of the Sun," typescript for Bennington College, VT; quoted in Robert McMahan, "*The Sunken Bell*, by Carl Ruggles" (D.M.A. diss., Peabody Institute of John Hopkins University, 1990): 46-50.

[4] "Carl Ruggles' Season in the Sun," *Newsweek*, February 7, 1966: 80.

any either. Then we talked about his way of writing music, for painting and composing were closely related in his mind. Everything in his music stemmed from the line, too, he said."[5]

As regards his music,[6] Ruggles's statement is plausible in the sense that his signature melodic shape is the jagged arch, "jagged" referring to the interruption of the ascent/descent by switchbacks that break up the long steep rising/falling stretches into a series of zigzags.[7] Sometimes only one side of the arch—usually ascending—is presented, followed by a disjuncture of some kind.

However, despite Ruggles's disapproval of straight lines as "against nature," at times he abandons his usual jagged contours for extended straight lines. These "unnatural" straight lines often occur at cadences: ends of phrases, movements, or entire pieces. They may descend at the ends of phrases or sections but almost always ascend at the ends of movements or pieces.

These lines form one component of what I term Ruggles's *cadential complex*, a confluence of characteristics that tend to recur as cadential gestures. These traits include sequences (usually of straight-line segments), often followed by extended simple straight lines; and, particularly in the earlier works, whole-tone collections. No one of these elements always keeps company with the others, but they are often found together, forming an association of elements. The whole-tone passages contrast with Ruggles's habitual dissonant chromatic ic1-saturated landscape, just as the extended upward straight lines contrast with his usual jagged lines. The contrast of the straight-line/whole-tone with the jagged/chromatic creates an especially strong cadential effect.

Ascending lines in particular play an important cadential role. Traditional tonal cadences tend to descend to the tonic note, the center of tonal gravity, and closure involves a relaxation of melodic

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[5] Marilyn J. Ziffrin, *Carl Ruggles: Composer, Painter, and Storyteller* (Urbana/Chicago: University of Illinois Press, 1994): 250.

[6] For a discussion of Ruggles's painting, see Nina Marchetti Archabal, "Carl Ruggles: An Ultramodern Composer as Painter" (Ph.D. diss., University of Minnesota, 1979).

[7] I will sometimes use *twisty, crooked,* or *sawtooth* as synonyms for *jagged. Switchback* is a term used in the construction of roads, trails, or railroads, referring to a series of zigzags that lessen a steep grade.

tension and the arrival at a point of resolution. Ruggles's rising cadential lines are just the opposite: they heighten tension, and seem to end at the farthest point possible from rest or resolution. The increase in tension is often reinforced by other parameters: louder dynamics, thicker textures, added dissonances, and very high registers. The ascending straight lines don't relax; rather, they reach out towards the firmament, often at the highest pitch of effort. As such, I feel that they form an audible expression of the composer's preoccupation with the aesthetic of the transcendent and the sublime; I will discuss this more in the article's conclusion.

I will first discuss Ruggles's jagged arch shapes and then proceed to the cadential complex proper. This examination focuses mainly on what Ruggles termed "principal voices": usually the highest moving voice, less often two or more homophonic lines, and occasionally the outer voices.[8]

Jagged Arches

As indicated, for the most part Ruggles's lines conform to nature (as he saw it): they are twisty, full of sawtooths and switchbacks. They do not, however, meander aimlessly, but exist within strongly goal-directed overall ascending or descending motion. Ruggles's linear landscape resembles mountain terrain: foothills mounting to summits and slopes descending to deep valleys, jagged ridges and twisting trails in between.[9]

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[8] Arrows or brackets indicating where principal voices start and stop (rather like Schoenberg's *Hauptstimme* signs) are found in *Angels* (1925, 1943), *Men and Mountains* (1927), and *Portals* (1930). All such signs were removed in the later American Music editions of these works (*Angels*, 1960; *Men and Mountains*, 1970; and *Portals*, 1957). Evidently, Ruggles felt that they were no longer needed. In the later works—*Sun-Treader* (1934), *Evocations* (1943, 1945), *Organum* (1947), and *Exaltation* (1958)—they never appeared at all. These indications also appear in some sketches.

[9] The resemblance of Ruggles's large-scale contours to mountain terrain is most clearly depicted in the contour graphs in Paul Orkiszewski, "An Analytic Overview of the Music of Carl Ruggles" (M.M. diss., Rice University, 1988): 29-40. The image, although perhaps fanciful, is consistent with adjectives that persistently turn up in descriptions of both Ruggles and his music, such as "craggy," "jagged," and "rugged."

The pervasive crooked contours are in part a consequence of the fact that in Ruggles's lines, much as in species counterpoint, large leaps are often followed by contrary motion, either by step or smaller leap.[10] This gives rise to twist contours: <021> in upward leaps and its inverse <201> in downward leaps.[11] Often these CSEGs occur in successive or overlapping chains, creating switchback ascents and descents with Csupersegs composed of linked <021> and <201> segments (sometimes discrete and sometimes overlapping). The full jagged arch usually consists of a switchback ascent to a registral and dynamic peak, followed by a shorter and smoother but still jagged descent.

This shape can be seen at its simplest in the opening phrase of *Angels*, shown in Example 1 (1945 edition).[12] The treble line as a

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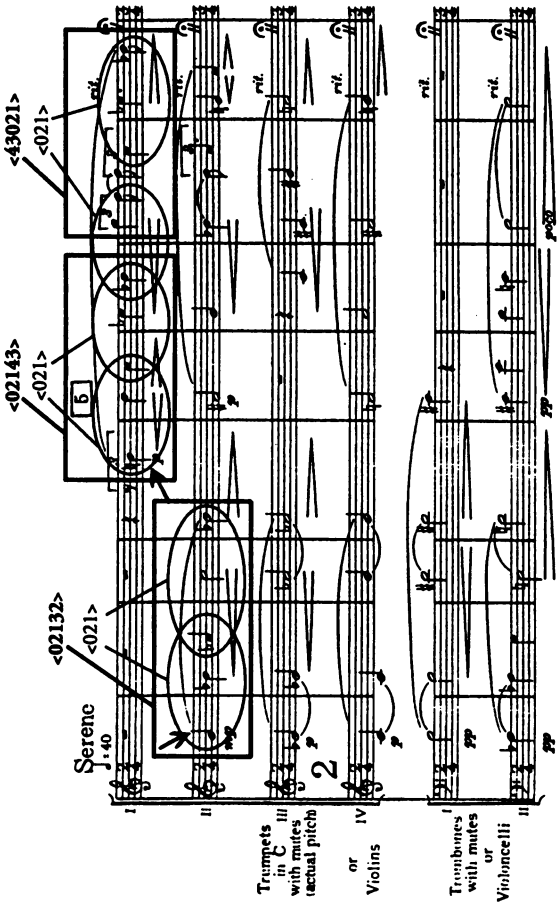
[10] This prototypical contour is related to a statistical dissimilarity in Ruggles's treatment of ascending and descending intervals pointed out in James Tenney, "The Chronological Development of Carl Ruggles' Melodic Style," *Perspectives of New Music* 16/1 (1977): 38-39. Intervals smaller and equal to a tritone occur most often in descending form, intervals larger than a tritone in ascending form.

[11] Numbers within angled brackets denote relative registral position, with 0 as the lowest. I use the term *contour segment* (CSEG) for these, after Elizabeth West Marvin and Paul A. Laprade, "Relating Music Contours: Extensions of a Theory for Contour," *Journal of Music Theory* 31 (1987): 225-267. CSEGs can contain Csubsegments (abbreviated Csubsegs) or be contained within Csupersegments (abbreviated Csupersegs). Marvin's and Laprade's CSEG is termed simply *Contour* in Robert Morris, *Composition with Pitch-Classes* (New Haven: Yale University Press, 1987) and *Contour Class* (CC) in Michael Friedmann, "A Methodology for the Discussion of Contour: Its Application to Schoenberg's Music," *Journal of Music Theory* 29/2 (1985): 223-248. I also occasionally refer to twist contours or twist neumes, meaning simply a crooked CSEG. This usage of "neume" borrows informally from the more precise terminology in Charles Seeger, *Studies in Musicology II: 1929-1979*, ed. Ann Pescatello, (Berkeley and Los Angeles: University of California Press, 1994): 138-143, and summarized in Joseph N. Straus, *The Music of Ruth Crawford Seeger* (Cambridge: Cambridge University Press, 1995): 20-22. Seeger would have described CSEG <021> as an "up-down binary twist neume": "neume" denoting the smallest melodic unit, "binary" referring to the two adjacent intervals in the three-note neume, and "up-down" specifying the direction of each interval. Seeger's terminology is similar to Michael Friedmann's (1985: 226-227) *contour adjacency series* (CAS), which shows up and down motions between adjacent pitches without registral ranking (Friedmann, "Methodology," 226-227).

[12] In the 1945 edition arrows point out the principal voice, replacing the brackets used in the 1921 and 1925 editions.

Example 1. Angels, *opening. Jagged arch with CSEG <021> building blocks.*



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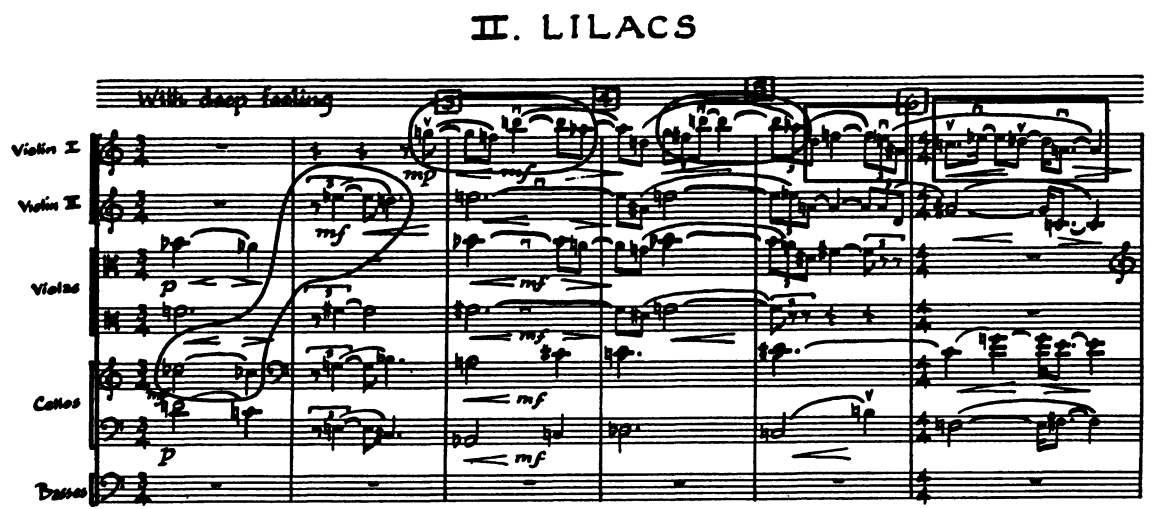
whole rises from G4 to G5 and then descends to D♭5; it is presented in three sections. The first traces a switchback ascent from G4 to B♭4, creating the CSEG <02132>, which can in turn be considered the result of two overlapping <021> neumes in ascending sequence. The second section, initiated by a change from Trumpet II to I and from decrescendo to crescendo, resumes the ascent, now from B♮4 to D♭5, creating CSEG <02143>, again resulting from ascending overlapping <021> neumes. Each <021> contains a leap up (either a minor or major third), followed by a whole step down: thus the ascent includes a rising series of descending whole steps.

The third section can be read in two ways: either as CSEG <143021>, composed of two <021> CSEGs (the first overlapping with the last note of the ascent) in descending sequence: D♭5-G5-F5 and C5-E♭5-D♭5; or as CSEG <43021>, which can be read as a stepwise descent (no overlap) from G5 to D♭5 (G-F-E♭-D♭) "broken up" by a low C escape tone between F and E♭. I prefer the latter reading, partly because G5 is the goal of the ascent from G4 and is therefore heard as an upper boundary; partly because, unlike the ascent, the descent includes a falling series of descending whole steps, which tend to aurally link up into a stepwise line; and partly because the falling tritone is an important motive which is repeated and expanded in the rest of the piece (see Examples 10-12). Nonetheless, both aspects are present and can be readily heard. I have tried to indicate this on Example 1 by boxing the G-F-C-E♭-D♭ <43021> but circling the <021> CSEG D♭-G-F, although it crosses the larger segmentation lines.

Both the second and third sections end with C-E♭-D♭, a <021> neume and ending marker that confirms that D♭5 is reached twice, first from below (G4) and then from above (G5).

The jagged wave prototype is slightly more developed in the opening of "Lilacs," the second movement of *Men and Mountains* (Example 2). The principal line starts on D♭5 and rises, again via a series of switchbacks, to B5. This registral peak is sustained for two measures via a varied repetition of D-G-F-B-A♭ (F changed to F♯ and the rhythm altered), followed by a short but circuitous descent to A♮4. In "Lilacs" the linear high point is sustained longer than in *Angels*—less of a peak and more of a plateau—and the descent is less direct. The line is saturated with two-note stepwise descents

Example 2. "Lilacs," opening. Jagged arch with CSEG <1032> (circled) and <1320> (boxed) building blocks.



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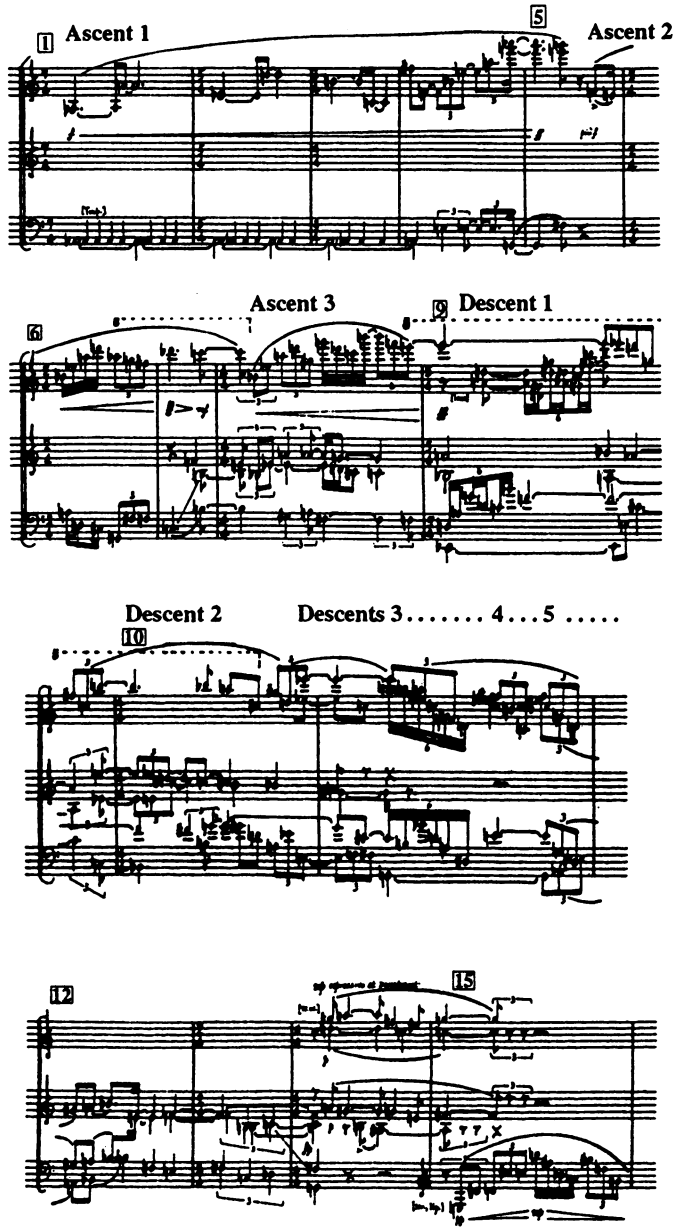
Example 3. Sun-Treader, *opening. Jagged arch (expanded).*



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which, even more than in *Angels*, recall traditional sigh motives.[13] The line is saturated, like *Angels*, with descending steps. In *Angels*, as discussed, the contoural pattern is an ascending leap followed by a descending step, producing recurring <021> shapes. In "Lilacs," in a sort of permutation from the *Angels* configuration, a pattern of descending steps separated by upward leaps is established from the outset; these are grouped into pairs (four notes divided 2+2), creating <1032> CSEGs (circled in the example). In each <1032> the last three notes form Csubseg <021>. After the high "plateau", the motivic contour changes to <1320> (boxed in the example) in the descent to the concluding A♮.[14] Now the Csubseg <021> has shifted to the first three notes.

By *Sun-Treader* (Example 3),[15] the basic crooked wave shape has been greatly elaborated and expanded. *Sun-Treader* opens with three small jagged ascents (marked ascent 1, 2 and 3 on the example), each lasting a shorter time and climaxing at a higher pitch. Each successive ascent begins with an approximate retake of a group of notes near the end of the previous wave[16] (shown by the vertically juxtaposed notes in Example 4). The first wave states the basic "motto" theme (which recurs periodically throughout the work) and proceeds with a rising gesture that ends with an A♭6-G6 semitone descent. The next two waves are variants of this rising gesture, the first ending in m. 7 with a D♭7-C7 semitone descent and the second in m. 8 with a major 7th ascent from F6 to a sustained E7, the registral and dynamic peak of the phrase. From here the line cascades down in a series of progressively shorter descents to end on C4. As in *Angels* and "Lilacs," the descent takes considerably less time than the ascent.

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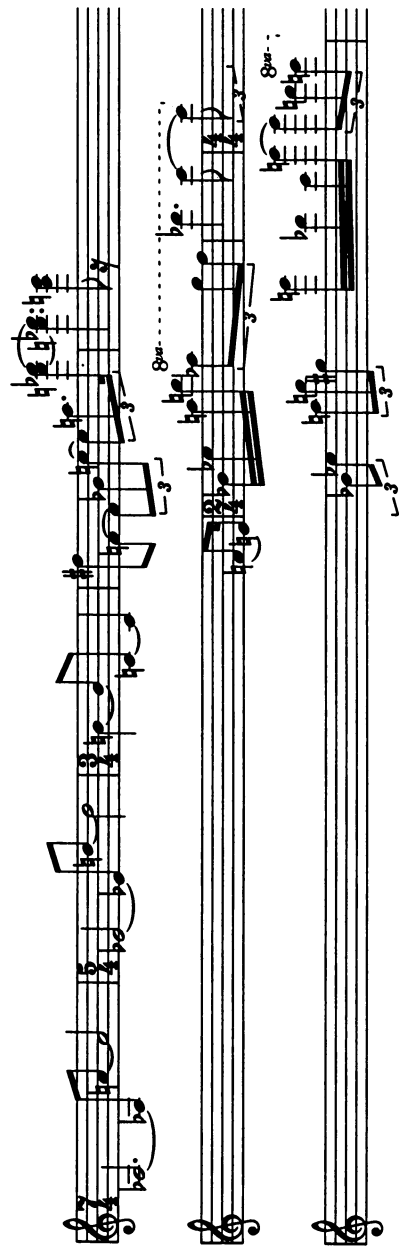
[13] The descending step (whole or half) is an important motive in Ruggles's music in general and in *Men and Mountains* in particular, serving as a motto that begins each movement.

[14] <0132> continues to be the dominant motivic CSEG for the next two measures, and again in the varied repeat in mm. 25-27.

[15] Reduction from Steven E. Gilbert, "Carl Ruggles and Total Chromaticism," *Yearbook for Inter-American Musical Research* 7 (1971): 42-50.

[16] The opening of *Organum* is another example of overlapping phrase construction.



Example 4. Sun-Treader, *opening. Overlapping phrases.*

Note that these lines contain straight-line segments: the descent, for instance, begins with five such segments, the first three consisting of six notes each, the last two of three notes. These form smaller descents within the larger descent, a roughly sequential effect which creates twists in the larger line. Similarly, there are straight segments in the ascent, such as the series of upward skips in m. 4 and 6, but the subsequent semitone descents introduce a change of direction before the end of the phrase.

The Cadential Complex

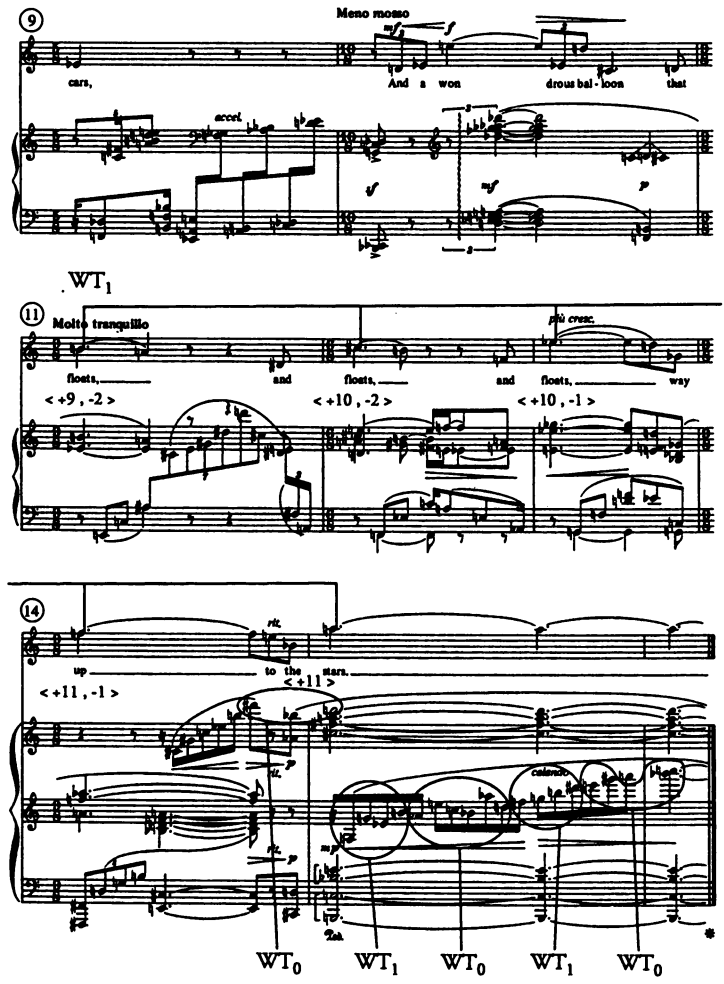
Although Ruggles's habitual linear style is chronically twisty, occasionally he writes melodic lines that continue a steady ascending or descending direction to the end of a phrase without twisting back. These stand out against the usual linear texture. As stated earlier, these straight lines often occur at cadences—ends of phrases, movements, or entire pieces. They may descend at the ends of phrases or sections but almost always ascend at the ends of movements or pieces. They occur throughout his work, from "Toys" (1919) to *Organum* (1947).

When Ruggles said that he never wrote straight lines, I am sure that he was referring to straight lines composed of adjacent notes—what I will call simple straight lines. But I would like to expand the concept a little to admit connections between nonadjacent notes,[17] especially sequences, which are ubiquitous in Ruggles's music. There is little doubt that Ruggles would have considered sequences as natural phenomena, but since the sequential unit as a whole and its cognate notes individually travel along ascending or descending lines, sequences can be considered as crooked straight lines, so to speak: straight lines once removed.

As mentioned in the introduction, there is an association in Ruggles's music between cadences, sequences followed by ascending simple straight lines, and, particularly in the earlier works, whole-tone collections. No one of these elements always

[17] A simple example is the G-F-(C)-E♭-D♭ descent at the end of the first phrase of *Angels* (Example 1), where the whole-tone descent is "broken up" by the low C.

Example 5. "Toys," end. Whole-tone segments.



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keeps company with the others, but they are often found together, forming an association of elements, a cadential complex.[18]

An early example of this association occurs in "Toys," which ends with an ascending sequence in the voice followed by a rising line in the piano (see Example 5). The rhythmic groupings in the vocal sequence suggest a partition into a succession of <021> contours. The upward leaps become larger, moving from pitch intervals 9 to 10 to 11, and the descending steps become smaller, moving from a whole step to a half step, as indicated in the numbers within the staves. Consequently, the trichord set classes (and the ending dyad set class) become tighter as the sequence progresses:

(D B A)	(D♯ C♯ B)	(F E♭ D♮)	(G♭ F E♮)	(B♭ A)
[025]	[024]	[013]	[012]	[01]

The highest notes (the second notes) of each group of three form an ascending WT_1 line[19]: B-C♯-E♭-F-A♮, skipping G, which, however, appears almost immediately (in a lower register) in the subsequent piano line as the highest note of its own <021> CSEG. After the final voice note is reached, the piano line ascends via a series of switchbacks against the sustained piano-voice chord. This line continues both <021> contours (usually with the last note of one group elided with the first note of the next) and whole-tone groupings, alternating WT_1 with WT_0—the only note out of place is the penultimate A♮6. About halfway through, the line untangles from the ascending <021> series to end with a simple straight ascent to C7, the highest note in the piece. All the elements of the complex are present in this example: whole-tone associations, a rising sequence, a subsequent ascending simple straight line, and cadential function.

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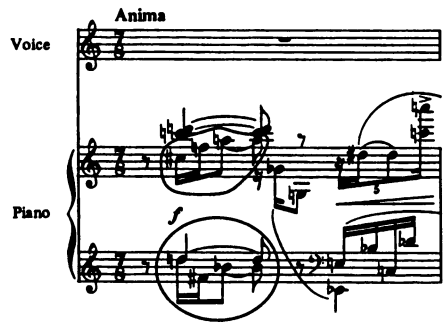
[18] This is not to say that all simple straight lines are part of a cadential complex—*Evocations* 1 and 4, for instance, begin with ascending and descending straight-line motives, respectively. But the association of ascending straight lines with cadential function is strong in Ruggles's music.

[19] Whole tone collection 1 (WT_1) includes C♮; whole tone collection 0 (WT_0) includes C♮.

Notice that towards the end of m. 14 the piano treble line is F♮-B♭-D, an augmented triad in a <201> contour, the inverse of the prevailing <021> contour. This WT_0 augmented triad refers to the opening of the piece (see Example 6), where the piano has C♯-F-A in the right hand against D-F♮-B♭ in the left hand.[20] The juxtaposition of WT_0 and WT_1 augmented triads at the very beginning of the piece establishes competing whole-tone collections as a continuing preoccupation of "Toys."

Example 6. "Toys," beginning. Augmented triads.



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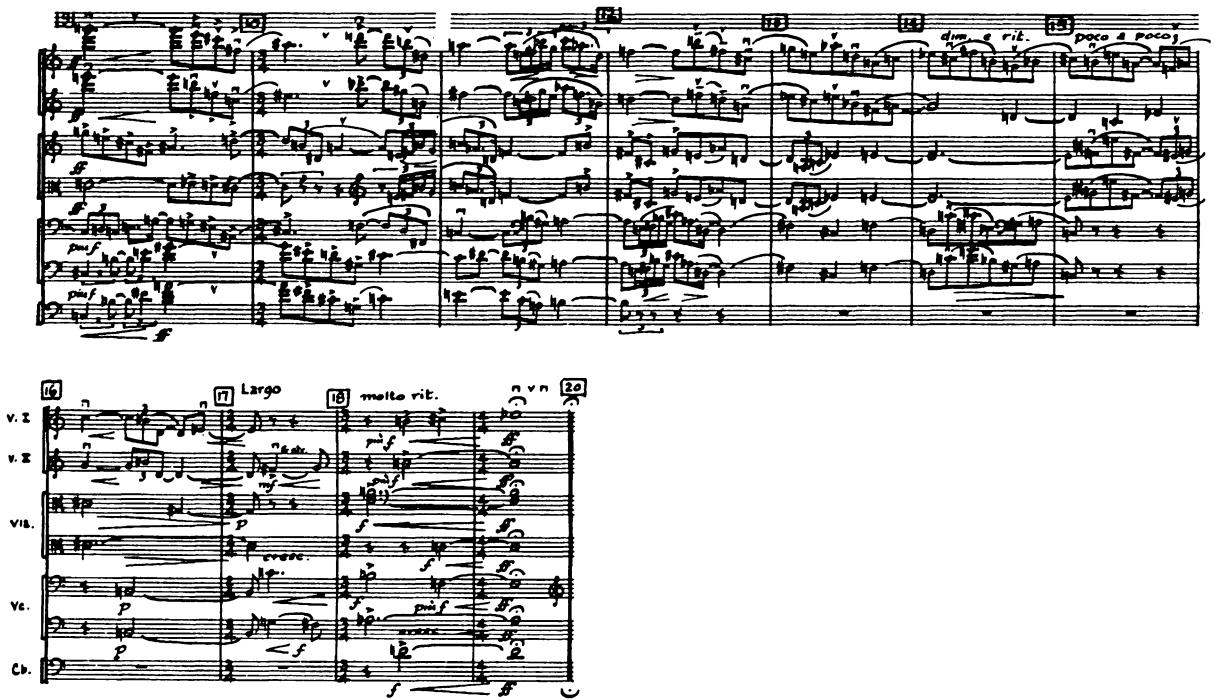
Ruggles's cadential rising lines are often characterized by a sense of effort, of striving upward against gravity towards the transcendent. But in "Toys" the vocal ascent is relatively easy, and the final piano ascent seems totally effortless, spinning upward, the only moving line against the final sustained chord. These lines, of course, illustrate the image expressed in the lyrics: a "wondrous balloon that floats way up to the stars." The balloon starts slowly floating upward in the vocal line, represented not only by the rising

[20] The crooked/straight contrast between the contours of the two augmented triads in m. 1 is suggestive. The WT_0 augmented triad D5-F♮4-B♭4 is a twist neume—a <201> CSEG—both here and in its return (now F♮6-B♭5-D6) in mm. 14-15 (see Example 5). The WT_1 augmented triad C♯5-F5-A5 in m. 1 is an ascending straight neume, but does not recur in mm. 14-15. However, it is embedded without registral change in the preceding vocal WT_1 line (as the second, fourth, and fifth notes)—an ascending straight line, but sequential rather than simple.

Example 7. "Lilacs," mm. 9-20. Cadential sequence and ascent.



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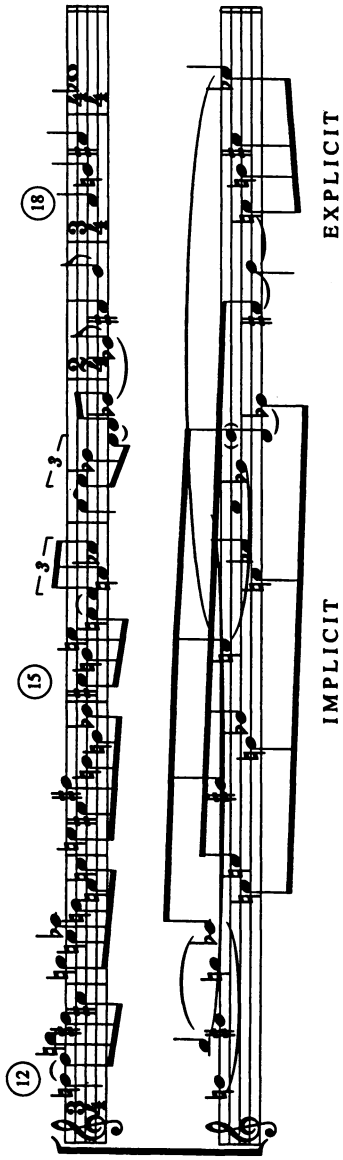
Example 8. "Lilacs." Whole-tone lines.



whole-tone line but also by the increasingly larger upward leaps. In the piano line it rises faster and faster, becoming smaller and smaller, and finally vanishes into the night-time sky. This image, I think, resonates strongly with Ruggles's aesthetic of the transcendent, as if the balloon corresponded to the idea of the individual soul rising effortlessly higher and higher to finally disappear into the infinite star-studded expanse.

Ruggles often rearranges the elements of the cadential complex, presenting them in different combinations. "Toys" ends with an ascending sequence containing a WT_1 line, followed by an ascent (first sequential, then simple) that alternates WT_0 and WT_1 segments. In contrast, the first section of "Lilacs" (Examples 7 and 8) ends with a descending sequence containing staggered WT_0 and WT_1 lines, followed by a WT_1 simple ascent.[21] The sequence starts forming at m. 9, and by the A♭5 in m. 13 has coalesced to a stable length of six notes and runs through three more repetitions before dissipating. Considered as a single line, the sequence is not noticeably whole-tone in character, as it contains pitch-class intervals 3, 5, 7, and 11. Considered polyphonically, however, it is possible to discern three whole-tone lines defined by register and note placement at cognate points in the sequence: (1) an upper A♭5-F♯5-E5-D4 WT_0 line;[22] (2) a lower A♮4-G4-F♯4-E♭4 WT_1 line; and (3) a middle WT_0 C5-B♭4-A♭4-F♯4 line (the last note arrives after the end of the sequence). The lines are not highlighted, but embedded, and their presentation is implicit rather than explicit. Together the upper and middle lines present the complete WT_0 collection, but the WT_1 collection is left incomplete.

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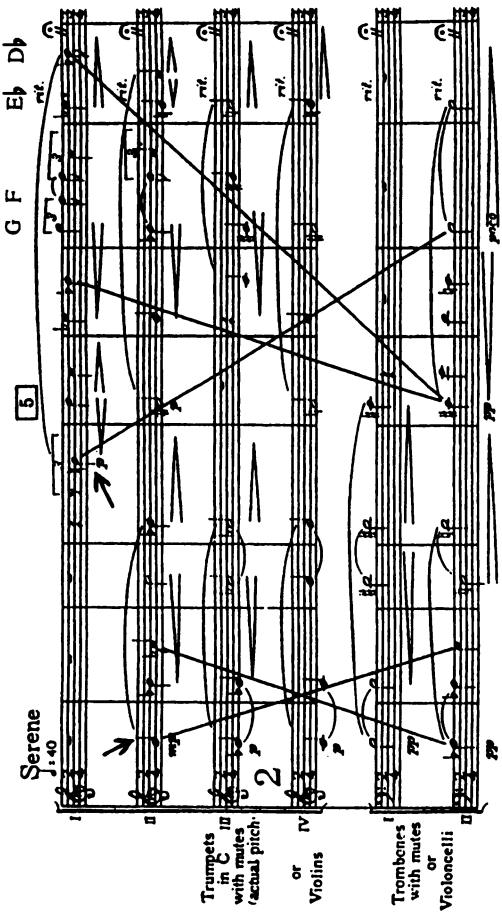
[21] Here I am referring to the "principal voice"—the Violin I line. Taken as a whole, this passage forms a three-voice canon with both strict and free *comites* at half-note intervals. I discuss the canon in my dissertation, "A Vast Simplicity: Pitch Organization in the Works of Carl Ruggles" (Ph.D. diss., City University of New York, 2001): 205-206. The canon begins to dissipate in m. 14.

[22] In the upper WT_0 line, E5 (m. 15) and D4 (m. 16) are separated by C5-B♮4. It is interesting that in both the "Toys" and "Lilacs" sequences an expected stepwise note in a nonadjacent whole-tone line is evaded by the skip of a third, only to reappear soon afterwards out of order and an octave lower. In "Lilacs," E5 leaps down to C5 (proceeding in the WT_0 path to B♮4) and D4 appears two notes later. In "Toys" (mm. 14-15) F5 leaps up to A5 in the voice and G4 unobtrusively appears two notes later in the piano (see Example 5).

Example 9. Angels, *opening. Whole-tone descent and voice exchanges.*



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In m. 16, D appears in the upper WT_0 line in the wrong octave: a D4 instead of the expected D5. This registral disjunction (along with the out-of-order C5 in m. 16) weakens the effect of the upper WT_0 line, and the WT_1 line, which keeps its descent to the same register, emerges in a stronger position, confirmed by the following WT_1 A-B-C♯-E♭ simple cadential ascent. This ascent, which is highlighted rather than embedded—explicit rather than implicit—completes the WT_1 collection.[23]

Unlike the freely spinning piano ascent at the end of "Toys," the simple straight cadential ascent G-A-B-C♯-E♭ gives a strong impression of effort, of striving to make one step after another against the accumulating glue of the sustained notes that merge into the final chord, an effect heightened by the *crescendo*, the *ritardando*, and the accents on each ascending note (see Example 7). This is another example, I feel, of the link between Ruggles's cadential ascending lines and his striving towards the transcendent, but here the ascent is much more difficult: the stepwise WT_1 line slowly rises against an accumulating weight of gravity and density, each step harder than the last, until finally (all the other instrumental parts having ceased moving) it reaches the culminating E♭.

Example 9 returns to the opening of *Angels*, but in greater detail. The first phrase ends with a G-F-E♭-D♭ descent embellished by a low C escape tone. The effect of this WT_1 descent is strengthened by the B/D♭(C♯) outer-voice exchange[24] and by the total WT_1 content of the final chord (D♭/F/A/G/B).

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[23] Registrally, the final E♭5 in m. 19 comes from the earlier E♮5 in m. 15. This nonadjacent semitone descent from E♮5 to E♭5 corresponds to the adjacent semitone ascent in m. 16 from D4 to E♭4, on the whole creating a sort of nested semitone convergence in contrary motion on upper and lower E♭'s, the latter within the former.

[24] The bass C♯ in m. 5 connects to the treble D♭ in both mm. 6 and 8. The B/D♭(C♯) outer-voice exchange corresponds to an A♭/G voice exchange at the beginning of the first phrase. *Voice exchange* has the same meaning here as in tonal music, except that in Ruggles's music they usually connect dissonant intervals (ic1 or, less often, ic2). A voice exchange can be loosely defined as an operation that transforms a vertical ordered pitch-class interval into its complement, with diagonals connecting instances of the same pitch class.

The G-F-E♭-D♭ descent at the end of this phrase forms a whole-tone motive that becomes intensively developed later on in *Angels*. The next four examples sketch the progress of this elaboration. First the G-F-E♭-D♭ is transposed by T_3 to B♭-A♭-F♮-E♮ (Example 10a). In the first edition of *Angels* (1921), this motive is extended, very simply, into a descending WT_0 scale that ends with a repetition of the motive an octave lower.[25] The original four-note descent expands into a longer, and entirely undeflected, ten-note descent (Example 10b, Trumpet 1). This could also be viewed as a registral expansion of the B♭-A♭-F♮-E♮ motive incorporating a lower octave transfer. Other instrumental parts support the treble with WT_0 segments, and the bass contains a contrasting WT_1 passage, but the whole-tone content of the other voices is fairly sporadic.

In the 1943 version (Example 11) the progress of elaboration is far more advanced.[26] The length is double that of the 1921 version, and almost every instrument participates in the bifurcation of virtually the entire passage into competing vertically and horizontally juxtaposed WT_1 and WT_0 segments. The 1921 simple treble WT_0 descent has evolved into multiple descending sequences which involve every instrument except Trumpet IV. The sequential interval is a descending semitone, but the sequential units themselves are descending straight-line whole-tone segments.

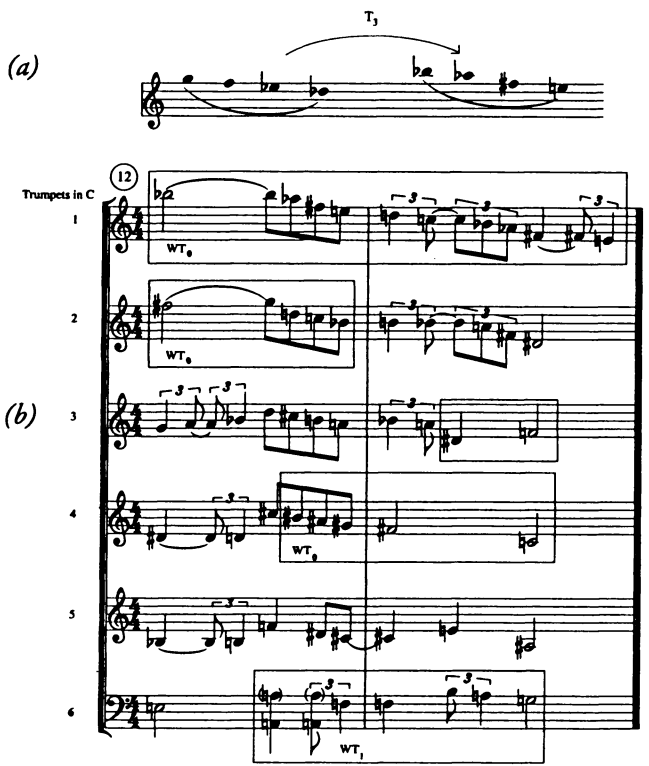
In the treble line the initial 4-note descending linear motive is steadily augmented, first to 5 notes (m. 26), then 6 (m. 27) (most of this line is in Trumpet II), then to 7 (mm. 28-29), finally adding an 8th note (E♮), the last note of the section.

As shown in Example 12, the starting points of the first three segments in the treble are B♭, A♮, and A♭. Then there is a jump down to F (skipping the expected G), which initiates a descent down the entire WT_1 scale to low G. WT_0 is regained by the semitone descent from G into the F♮-E♮ closing. In my reading, this whole line expands the initial WT_0 B♭-A♭-F♮-E♮ motive in a large-scale replication. The initial B♭ moves through an A♮ passing note to A♭. The descent from F to G effects a transfer to the lower

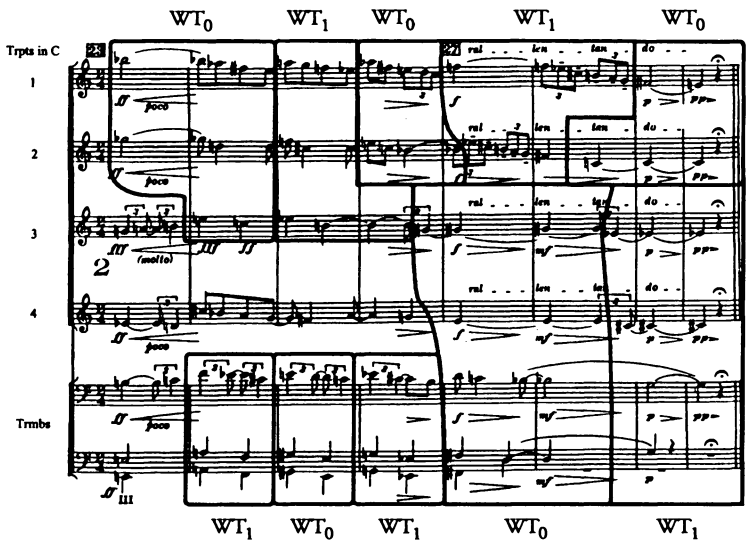
[25] This excerpt from the 1921 version is transposed down three semitones to facilitate comparison with the untransposed 1943/1960 version given in Example 11.

[26] I have used the 1960 edition, but the passage is identical.

Example 10. Angels, *1921. (a) Transposition by T_3, (b) extended into WT_0 and WT_1 segments.*



Example 11. Angels, *1943 (=1960). Sequential elaboration of whole-tone descent.*



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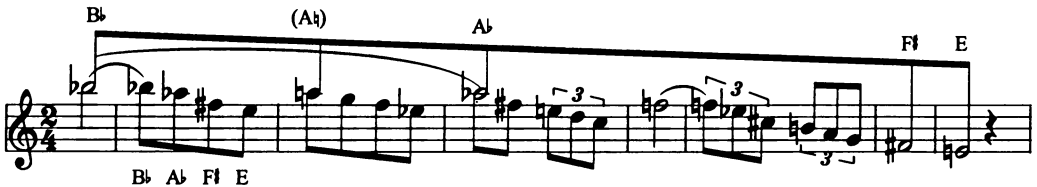
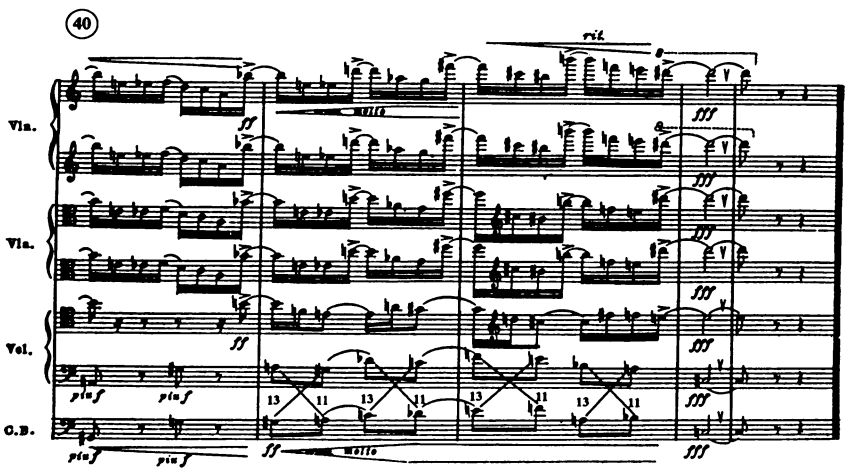
Example 12. Angels, *mm. 23-30. B♭ - A♭ - F♯ - E linear expansion in treble line.*



Example 13. "Marching Mountains" (1924). Ending.



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register F♯ by means of the opposing WT_1 scale, and the motive is completed with the final E♮.

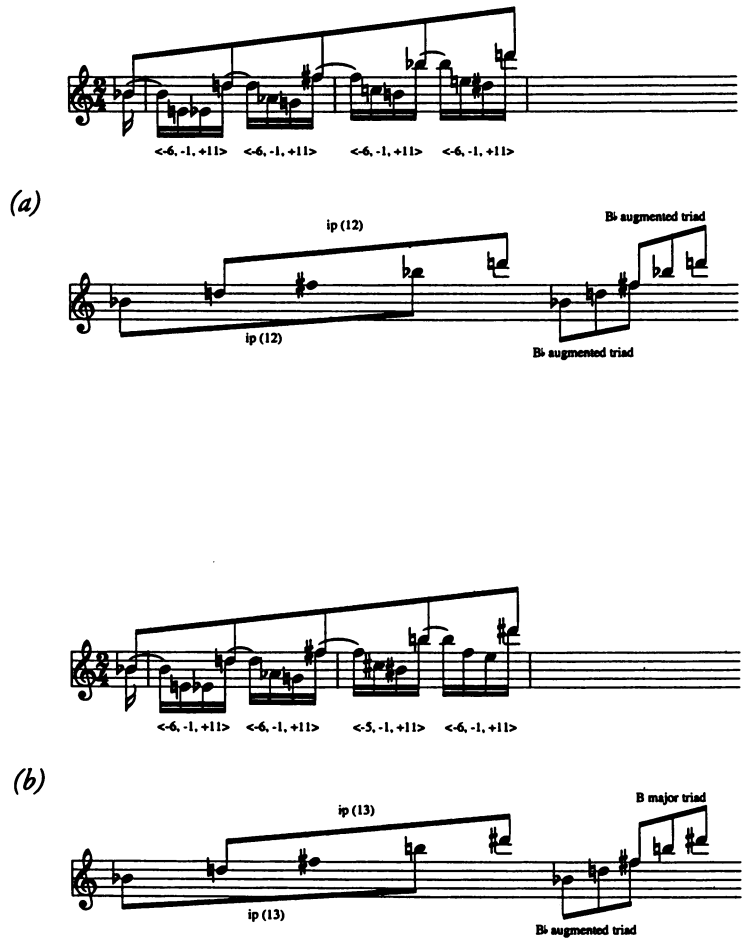
Whole-tone content is not an invariable component of the cadential complex, as shown in the final two passages discussed in this paper. Indeed, sometimes Ruggles goes out of his way to avoid it. Example 13 shows the conclusion of the 1924 version of "Marching Mountains" (*Men and Mountains*, III).[27] Unlike the previous examples, it contains no simple straight lines, but only a cadential ascending sequence. In the last four measures, the treble line consists of an ascending sequence over dissonant (13-11) voice exchanges in the lower voices. The sequence arrives after an obsessive *marcato* motive (B♭-E♮-E♭-F-D-C-A-B♭) has been repeated eight times in a mounting maniacal frenzy at continuously higher registers and faster speeds (its last appearance is in m. 40 of the example). Four measures before the ending the motive is shortened to its first three notes—a member of set class [016]—and transposed three times in an ascending sequence. The interval pattern is <-6, -1, +11>, which, if followed faithfully, transposes each three-note group by T_4, as shown in Example 14a. But the interval cycle as realized in "Marching Mountains" is slightly skewed, as shown in Example 14b. The first seven notes faithfully follow the <-6, -1, +11> pattern, resulting in the pitch sequence (B♭4-E♮4-E♭4-D5-A♭4-G4-F♯5). But the next interval, <-6>, is contracted to <-5>, resulting in a descent to C♯5 rather than to C♮5. The remaining notes of the passage are a semitone too high.

If the cycle had been strictly adhered to, the stressed (accented and syncopated) notes of the first and last groups would form two octaves: B♭-B♭ and D-D (Example 14a). The repetitive (and consonant) effect of the octaves would have been reinforced by the B♭ interlocking augmented triads outlined by the stressed notes: B♭-D-F♯ and F♯-B♭-D, creating an entirely WT_0 top line.

The shrinkage of ip<-6> to ip<-5>, as shown in Example 14b, changes the B♭-B♭ and D-D octaves to B♭-B♮ and D♮-D♯ augmented octaves; and the interlocking augmented triads are changed into interlocking B♭ augmented and B major triads, creating a less repetitive and more dissonant effect. But the resulting cadential

[27] In the 1951 revision a ten-measure descending passage was added to form a new ending.

Example 14. "Marching Mountains," mm. 41-42.
(a) Consistent <-6,-1,+11> cycle (hypothesized);
(b) Skewed <-6,-1,+11> cycle (actual)



rising sequence has less whole-tone content, because the alteration avoids the WT_0 resonances of the six-note arpeggiated augmented triad that would have resulted from the unaltered cycle.

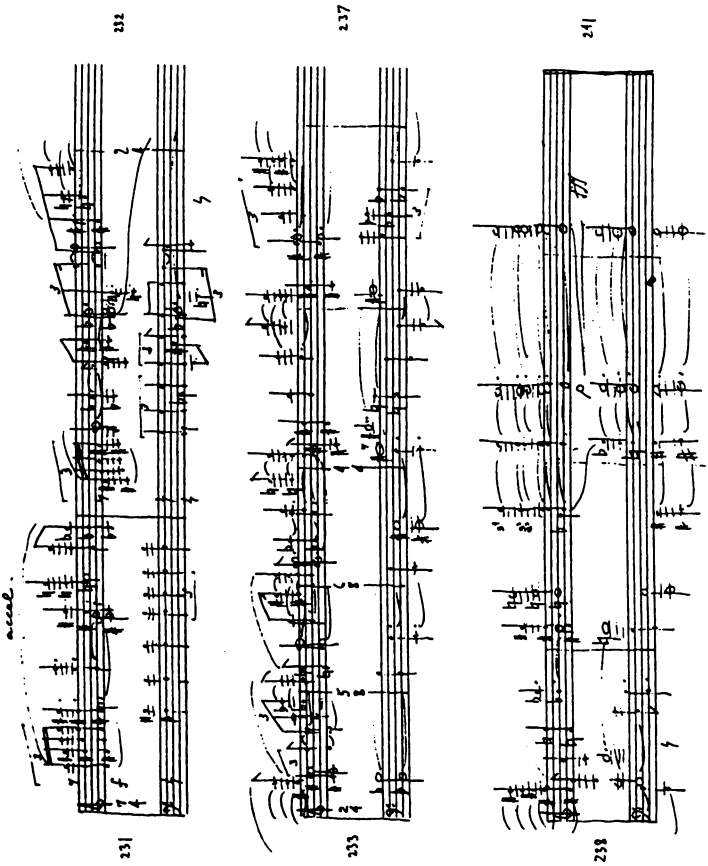
In Ruggles's later works—*Sun-Treader*, *Evocations*, and *Organum*—whole-tone collections recede in importance. My final example, the conclusion to *Sun-Treader*, is octatonic rather than whole-tone, but the other aspects of the cadential complex are strongly present. The conclusion consists of two ascending treble sequences (counterpointed by descents in the bass) composed of rising linear segments, in which the final segment is extended into a simple ascending straight line leading to a concluding registral peak.

In m. 221 (not shown), the opening theme returns in a series of five abbreviated retakes at different pitch levels, decreasing lengths, and accelerating tempos. The first three retakes are separated by jagged, rapid, recitative-like lines. But from m. 232 to the end of the piece (see Example 15)[28] the entire contoural landscape dramatically and completely changes. From a texture of circuitous and twisty lines, the music abruptly enters a world of shifting slanted planes, of simple straight lines—an ascending series of overlapping ascents in the treble counterpointed by descents in the bass. The turn towards the cadence, signaled by the change from crooked to straight contours, is reinforced by the increasing length of the treble ascents, which contrasts with the diminishing lengths of the preceding thematic retakes. From m. 233 to the end, the number of notes in each treble segment gradually increases from 4 to 7, and the total length of each segment (reckoned in eighth-note durations) increases from 5 to 28.

The turn towards the cadence is also marked by a change in affect from the urgency and jerkiness of the thematic retakes to a sense of serene clarity created by the steadily augmenting rising and falling lines. The sense of calm inevitability also partly derives from recurring linear intervallic patterns. These occur in both outer voices, but are more comprehensive and systematic in the

[28] Excerpted from John Kirkpatrick's piano arrangement of *Sun-Treader*, John Kirkpatrick Papers, Yale University Music Library.

Example 15. Sun-Treader, *ending.*



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treble.[29] The end of the piece is organized into two sections defined by two related, but different, treble sequential intervallic patterns: one from the end of m. 232 to m. 235, the other from m. 235 to the end of the piece.

As shown in Example 16, from the end of m. 232 to m. 235, the treble consists of successive interval patterns <+1, +6, +7>, <+1, +7, +6>, <+1, +6, +7>, and <+1, +6, +7>. Starting with the second phrase (m. 233), the last note of each segment descends <-11> to the first note of the next, and each segment begins T_3 higher than the last—on C♯, E, and G, leading to A♯ (m. 236), the first note of the second pattern.[30] These notes constitute the enharmonic equivalent of a diminished seventh chord. Meanwhile, the bass descends in long notes from B♭ to E to C♯, all notes from the same diminished 7th collection as in the treble (Example 17). The T_9 between the treble C♯ and A♯ is balanced in contrary motion by the T_3 between the bass B♭ and C♯, creating a slightly skewed voice exchange. The skew comes from the fact that the treble A♯ in m. 236 actually does not belong to the first pattern, but starts the second, forming an overlap.

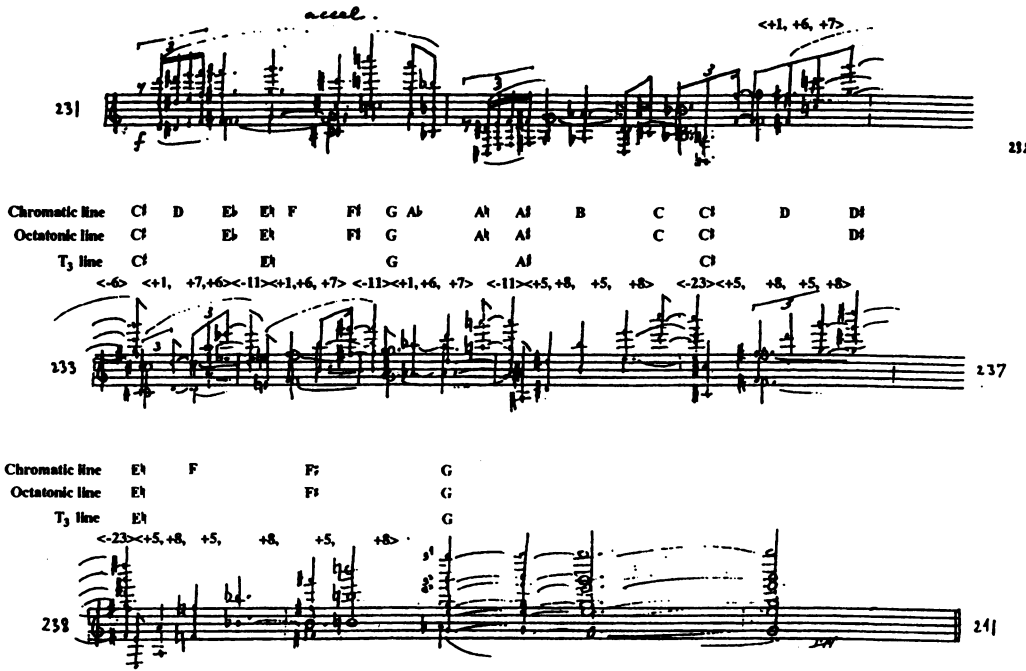
Within each treble segment, the registral span from the first to the last note is pitch interval (14). Arranged as an ordered line, the beginning and ending notes of the segments form an incomplete octatonic scale that fills in the T_3 cycle: C♯-E♭-E♮-F♯-G♮-A♮ (return to Example 16). The octatonic scale notes are highlighted by means of both register and order positions (the first and last notes of each sequential segment). The second notes in the pattern fill in the chromatic gaps in the scale: C♯-D-E♭-E♮-F♮-F♯-G♮-A♭-A♮.

In m. 236, a new intervallic pattern begins in the treble: <+5, +8, +5, +8>. The new cycle preserves many of the qualities of the preceding cycle but also increases the length and

[29] The treble voice is highlighted in virtually all of Ruggles's cadential straight lines, reflecting the need for the principle voice to ascend to the highest register.

[30] It is largely because of the T_3 cycle that I regard the cadential section as starting in m. 233 and the <+1,+6,+7> F♮-F♯-C-G treble segment at the end of m. 232 as transitional (Example 15). Nonetheless, these pitch classes return in retrograde at the very end of *Sun-Treader*, but now mainly in the bass. The final three bass notes (m. 239) descend G-C-F♯, and F♮ immediately follows in a higher register. Even E♮, which was below the segment at the end of m. 232, now returns above the segment in the sustained chord that ends the piece.

Example 16. Sun-Treader, *mm. 231-241, treble sequences. Chromatic, octatonic, and T_3 lines.*



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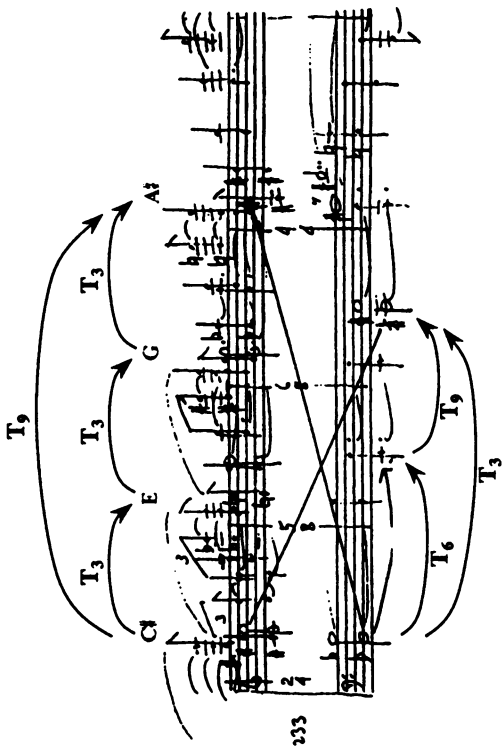
Example 17. Sun-Treader, *mm. 233-235. Voice exchange within set [C♯, E, G, B♭].*



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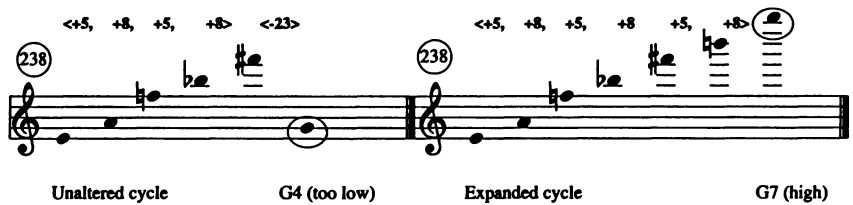
registral span of the segments. The number of notes in each segment increases from four to five, and the registral span from the first to the last note expands from pitch interval (14) to (26); that is, from a whole tone plus an octave to a whole tone plus two octaves. Similarly, the descending interval from the last note of each segment to the first note of the next expands from <-11> to its mod 12 equivalent <-23>, another octave expansion. The T_3 pattern continues from where it left off: the initial notes of the first three segments are A♮, C♮, and E; G, the final note of the piece, completes the cycle. The T_9 relation from C♮ to A♮ in the first part is matched in the second part by T_9 from A♮ to G.

Similarly, the octatonic scale formed by the first and last notes of each segment also continues: A♮-C♮-C♯-D♯-E-F♯-G, F♯ arriving midway through the expanded final segment (m. 239:1). In the new pattern, as with the previous, each octatonic segment is chromatically filled in, now by the third note instead of the second.

The final segment further increases the number of notes from 5 to 7, and extends the <+5, +8, +5, +8> pattern to <+5, +8, +5, +8, +5, +8> (Example 18). This expansion ensures that the final ascending straight line is the longest in terms of number of notes, total duration, registral span, and registral height, a treatment wholly in keeping with Ruggles's cadential practice. The final note, G7, is the highest note of the entire section. The arrival on G in this register is entirely due to the pattern expansion. Had a new <+5, +8, +5, +8> pattern begun after the F♯6 (m. 239:1), G would have arrived three octaves lower (G4) as the first note in the new segment. The expansion of the cycle in the last phrase delays the arrival of G, places it at the end of the pattern, and ensures its arrival in the highest register.

The bass consists entirely of descending lines, counterpointing the treble's ascents. In the first treble sequence (m. 232:5 to m. 235), the bass is rhythmically quite distinct from the treble—just three long descending notes to the treble's sixteen. In the second sequence (mm. 236-241), the outer voices are far more closely matched rhythmically; they even maintain a consistent intervallic pattern (Example 19). The last three bass notes of each segment descend by pitch intervals <-7, -6>, totaling <-13>. The pitch intervals for the corresponding three treble notes

Example 18. Sun-Treader, *m. 238. Expansion of cycle to ensure arrival of G in the highest register.*



are <+5, +8>, also totaling <+13>.[31] Together the two voices form voice exchanges between the first and third notes of each of the three segments: C/B, E♭/D, and G/F♯, recalling the single large voice-exchange in the first section (shown in Example 17).[32] In each of the voice exchanges the outer voices maintain the dissonant interval pattern (11-11-13).

In the last two segments, the first bass note of the voice exchange is preceded by a descent of <-4>, complementing the corresponding treble ascent <+8>. This prefix expands the succession of vertical icl intervals to (11-11-11-13)[33] and the bass pattern becomes <-4, -7, -6>, counterpointing <+8, -5, +8> in the treble. Indeed, in each segment of the second sequence the progression of icl vertical intervals becomes longer: (11-11-13) in m. 236 (C/B, F/E, B/C), (11-11-11-13) in m. 227 (G/F♯, E♭/D, A♭/G, D/D♯), and (11-11-11-11-13) in mm. 238-39 (E/F, B/B♭, G/F♯, C/B, F♯/G). The augmentation of the icl vertical interval chains is of a piece with the gradual expansion of temporal and registral space that characterizes the cadential section of *Sun-Treader.*

The conclusion of *Sun-Treader* is a highly developed example of the cadential complex. Although it lacks the whole-tone parameter typical of earlier Ruggles works, the cadential effect of the ascending straight lines is reinforced to an unusual extent by mirroring bass descending lines, temporal and registral expansion, linked treble and bass intervallic patterns, and the marked contrast of all these with the preceding musical material.

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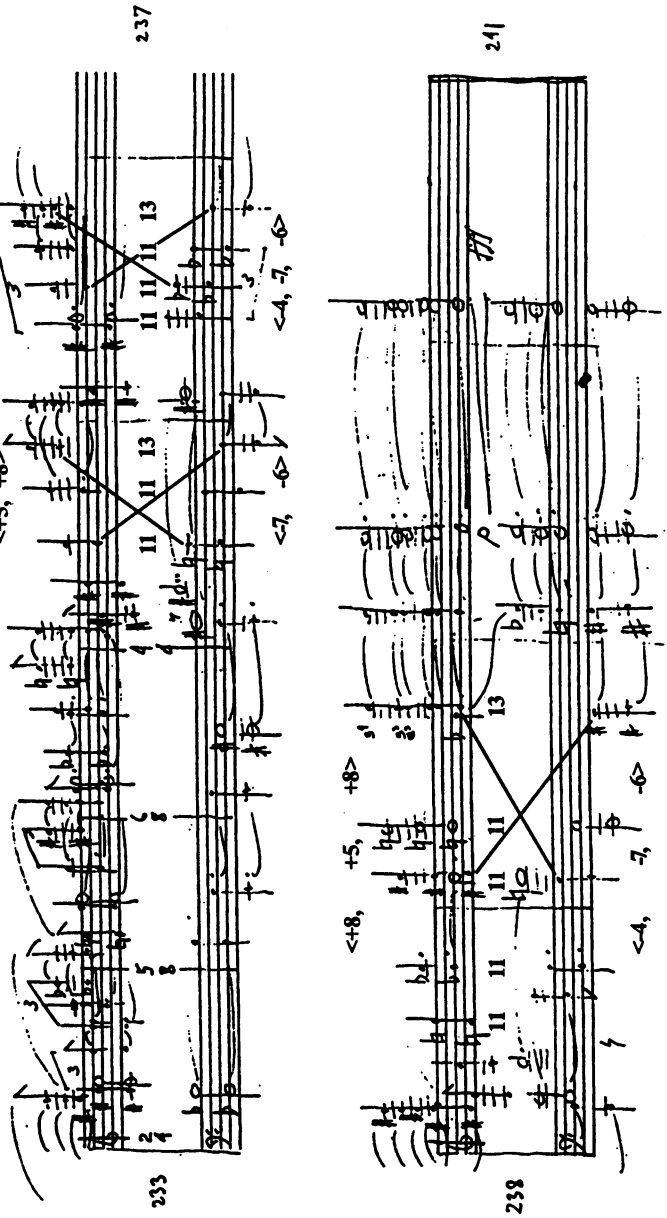
[31] The bass <-7, -6> uses intervals from the first treble pattern (mm. 232-235).

[32] The successive voice-exchanges C/B, E♭/D, and G/F♯ trace a transpositional path of T_3-T_3-T_4. The final T_4 appears to contradict the prevailing T_3 path in the treble line as a whole. But the T_4 results from the expanded <+5, +8, +5, +8, +5, +8> interval pattern. The voice exchanges consistently occur between the last and the third-to-last verticalities of each segment. In the first two segments, these are the 3rd and 5th verticalities. But in the final segment, they are the 5th and 7th verticalities, and the pitch classes have shifted by pitch class interval <1> from what they would have been in the 3rd and 5th verticalities of the unexpanded pattern (e.g., F♮ to F♯ in the treble).

[33] These dissonant voice-exchanges are a typical feature of Ruggles's outer voice counterpoint, as are icl intervals between outer voices in general (see Example 10 for an earlier example in *Angels*).

Example 19. Sun-Treader, *ending. Dissonant voice exchanges.*



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Ruggles's Aesthetic of the Transcendent and the Sublime

In Ruggles's music, cadential rising lines often bear an expressive meaning of effort and struggle, connotations reinforced by texture, dynamics, attack, and treatment of leaps. Moreover, since Ruggles's lines are intensely sequential, straight ascents and descents underlie the myriad twists and turns of the linear surface. At cadences, especially at the ends of pieces or movements, these implied straight lines often reveal themselves explicitly, and, abandoning the evasions of the direct ascent, finally march resolutely upward.

I believe that Ruggles's cadential straight lines are a musical manifestation of his preoccupation with the aesthetic of the transcendent and the sublime. This aesthetic has been commented on, among others, by Charles Seeger, Lou Harrison, Dane Rudhyar, and Peter Yates.

> To Carl Ruggles, there are not different kinds of beauty: there is only one kind, and that he prefers to call the sublime...You cannot point out any melody, passage or detail that even represents it or can be characterized as such. But you know, just as surely, that in hearing the work you have been in touch with or have had intimations of the sublime.[34]

> The quality of sublimity which Ruggles professes as his desideratum is surely native to the spirit of great religious or philosophic composition in any age...Sublimity in the sense of an elevated, individual, new, explorative, serious adventure on the edge of faith; sublimity in this sense Ruggles aims towards and to a great measure sets forth.[35]

> "Music which does not surge is not great music," Carl Ruggles said recently, and he intensified the term surge by means of a gripping motion of the hands used by conductors to rouse an intense vibrato in the violin section of the orchestra. Significant words these are, especially today! Music must surge, must rouse the fire of human emotions or energies, must be dynamic life flowing with power—be

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[34] Charles Seeger, "Carl Ruggles," in *American Composers on American Music: A Symposium*, ed. Henry Cowell (Palo Alto: Stanford University Press, 1933; repr., New York: Frederick Ungar, 1961): 17, 32.

[35] Lou Harrison, "Carl Ruggles," *The Score and I.M.A. Magazine* 12 (1955): 19. Originally *About Carl Ruggles: Section Four of a Book on Ruggles, with a Note by Henry Cowell* (Yonkers: Author, 1946); repr. in *Soundings: Ruggles, Ives, Varèse*, ed. Peter Garland (n.p., Soundings, 1974): 47-60.

this power majestic or vehement—from the subjective consciousness of man. It must have what Arthur Machen called ecstasy...[36]

The melody is there, a jagged figuration, always striving to rise, to achieve sublimity, twisted and thrown back. The harmony results from the vertical simultaneity of disparate effect. Gaps open in the firmament, and sounds break through them; the musical design is continually exfoliating outward. Heights and deeps respond; one recognizes the determining presence of the melody, in broad-reaching curves upward and downward, interwoven with brief periods of softly twisting lyricism...The movement is that of water boiling in a pot—an expanding universe which is at the same time necessarily contracting, a motion without external limit...[37]

I haven't yet found the word "sublime" in Ruggles's correspondence—usually the word "fine" is his highest accolade—but in a dour 1954 letter to John Kirkpatrick, he criticizes a passage from *Evocations* 2 (m. 13), saying, "It's dull, heavy, and without the slightest ecstasy." Example 20 reproduces Rockwell Kent's 1930 drawing of Ruggles in the character of Captain Ahab, possessed, driven, and ecstatic, capturing this aspect of his character. This emphasis is also reflected in the titles of his pieces: *Sun-Treader* (from Browning's "Pauline"), *Men and Mountains* (taken from Blake's "Gnomic Verses"), *Evocations*, and *Exaltation*. The title page of *Portals* quotes the poem of the same name from Whitman's *Leaves of Grass*: "What are those of the known but to ascend and enter the unknown?" In light of this preoccupation, if crooked lines are natural, the straight lines—especially the ascending lines—that so often end his compositions are perhaps not so much unnatural in the sense of perverse, but supernatural, or, better, transcendent. These linear ascents resist the "natural" impulse to twist and turn back and meander, and reach out with maximum effort past the mundane towards the sublime.

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[36] Dane Rudhyar, "Carl Ruggles, Pioneer: As Seen by a Fellow-Modernist," *Musical America* (August 27, 1927): 3.

[37] Peter Yates, *Twentieth Century Music: Its Evolution from the End of the Harmonic Era to the Present Era of Sound* (n.p., Minerva Press, 1967): 280-281.

Example 20. Rockwell Kent's illustration of Ruggles as Captain Ahab.

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