
THE ZWÖLFTONSPIEL OF JOSEF

MATTHIAS HAUSER

John R. Covach

Introduction

This study focuses on the music of the Austrian composer and theorist Josef Matthias Hauer. It is probably safe to assume that Hauer is usually remembered, by English-speaking musicians at least, as the composer who developed a theory of tropes at about the same time as Schoenberg developed the twelve-tone system. One is generally aware that Hauer’s thought may have influenced Schoenberg in the early twenties, even if it only prodded Schoenberg to publicize his discovery sooner than he planned.1 Beyond this, however, Hauer usually recedes from musicological view, and less is generally known about his work from the thirties, forties and fifties. Perhaps it would surprise some to discover that Hauer, born in 1883—he was nine years younger than Schoenberg and two years older than Berg—composed music until his death in Vienna in 1959.

Hauer certainly played a crucial role in the birth of the twelve-tone system in the Vienna of the early 1920’s. It is well known that, at least for a time, Schoenberg took Hauer’s ideas very seriously. Schoenberg even saw enough similarity between his work and Hauer’s to fear the charge of plagiarism.2 Right from the start, however, Schoenberg also realized that he and Hauer held very different aesthetic stances. In an
essay begun on 9 November 1923, Schoenberg, reacting to Hauer's article "Atonale Musik," assessed the situation as follows:

He [Hauer] sought his solution in the cosmos. I limited my solution to the human brain available to me; what was to be discovered here would necessarily correspond to the cosmos, if brain and cosmos have anything at all in common with each other. Either we are tied to universal laws, in which case they are also at work within us, or our brain creates independently of the cosmic laws, in which case it is superfluous to search among the latter, since we can neither comprehend nor perceive them.  

Whereas Hauer, in the tradition of speculative music, was seeking the order of the cosmos in the twelve-tone system, Schoenberg, in the tradition of Western art music, was using the twelve-tone system to create the coherence necessary to accommodate personal artistic expression. While twelve-tone composition enabled Schoenberg to "... compose as freely and fantastically as one otherwise does only in one's youth," Hauer began to move away from the entire notion of "composition." Instead, Hauer demanded that music must arise through an "interpretation of the Melos" (Deutung des Melos), a process that amounts to an objective contemplation of the twelve-tone universe. As a consequence, Hauer no longer "composed" music in the Western sense. Schoenberg was fully aware of Hauer's aesthetic stance when he made the following famous remarks in a letter to Rudolf Kolisch on 27 July 1932:

I can't utter too many warnings against these analyses, since after all they only lead to what I have always been dead against: seeing how it is done; whereas I have always helped people to see: what it is ... I can't say it often enough: my works are twelve-note compositions, not twelve-note compositions: in this respect people go on confusing me with Hauer, to whom composition is only of secondary importance.

Despite this fundamental difference—clearly perceived by both men—Schoenberg was able to pose a solution for the purposes of collaborating on a book on twelve-tone music:

What I suggest is therefore, let us take what is common to our results and regard it as "possibilities of achieving logical form by the use of 12 notes" ... Each of us has discovered the possibility of a new form of composition and we agree that it is advisable, not to say necessary, to proceed thus and thus. On the other hand, we differ in this and that respect.

Schoenberg's twelve-tone solutions to the problem of "logical form" have received much analytical attention since the mid-1920s.

One could trace at least one analytical reception history moving from Erwin Stein through Richard Hill and René Leibowitz to Luigi Rognoni, George Perle, Milton Babbitt, and David Lewin, and finally to Martha Hyde and Andrew Mead.

Hauer's solutions, perhaps because the resulting music differs drastically from the Western notion of "artwork," have been less often studied. While Hauer unrelentingly explored the possibilities of the twelve-tone system (as he understood it) during the period between 1919 and 1939, he arrived at what he considered to be his final solution only in the "Zwölftonspiel," the title he gave to virtually all of the pieces he composed after 1940. Rudolf Stefan reports that Hauer may have created as many as one thousand of these pieces. Most of them are dated by Hauer, and it is therefore common to refer to a specific work by its dates given.

Hauer's Zwölftonspiele contrast strongly with the music of Schoenberg and so offer a clear example of a distinctly different twelve-tone "logic"—a logic arising from a different aesthetic orientation. For Hauer, the "twelve-tone universe" was an object for a kind of "selfless contemplation"; he rejected the notion of music as self-expression, embracing instead the idea that music should reflect "the order of the cosmos." While I will take up some of these aesthetic issues again at the end of this study, my main objective will be to survey the many twelve-tone techniques that Hauer developed in the course of his "twelve-tone contemplations," beginning with his manipulation of the row to produce harmony, melody, and rhythm. I will then examine the various textures that appear in the Zwölftonspiele, and finally I will consider some of the possible formal structures of these works.

The Row: Harmony, Melody, and Rhythm

Let us first turn our attention to the Zwölftonspiel of 19. Februar 1953. Example 1A shows the first five bars of the piece, while 1B is the transcription of mm. 2–5 into integer notation (one beat in 1A corresponds to one column in 1B). The four-note sonorities in the right-hand part lead one into the next in the following way: first, there is a four-voice structure in which the pc's 0, 1, and 2 comprise the bottom voice; the pc's 3, 4, and 5 make up the next highest; 6, 7, and 8 the next highest; and 9, t, and e the highest. Since we commonly define pitch class under octave equivalence, there is not necessarily any sense in which these voices must appear higher or lower than one another in the registral dimension of the music. For purposes of the present discussion, let us consider the structure as it appears in example 1 to be
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Example 1. Zwölftonspiel für Klavier, 19. Februar 1953 (Vienna: Doblinger, 1979; used by permission). A) mm. 1–5, B) Kontinuum, C) Z-dyads, D) two other possible partitionings, E) mm. 6–9, F) “first inversion” of the Kontinuum, G) Z-dyads of the retrograde of the Kontinuum, H) Kontinuum of the retrograded row.

Secondly, we may notice that only one tone per sonority changes, leaving three common tones from chord to chord. If we trace these new tones we arrive at the eleven-tone row

\[ t 1 3 5 2 6 8 9 e 7 0 \]

Since there is no new tone in the first sonority, or rather they are all new, we must look forward to m. 6 to find the twelfth tone, pc 4,
Example 1 (continued)

constrained to a one-octave range but able to appear in any register so long as the pitch class C is the lowest and B the highest.

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\[
\begin{align*}
\text{t}1 & \ 3 & 5 & 2 & 6 & 8 & 9 & e & 0.
\end{align*}
\]

Since there is no new tone in the first sonority, or rather they are all new, we must look forward to m. 6 to find the twelfth tone, pc 4,
which, being present in the first sonority of the piece, we can posit as
the first note of the twelve-tone row upon which the piece is built. This
row is shown in example 1B.

The twelve four-voice sonorities are constructed according to the
following prescriptions: first, take the above-stated twelve-tone row
and partition the octave into four adjacent trichordal voices, \( \{0,1,2\},
\{3,4,5\}, \{6,7,8\}, \{9,10,11\} \), each note then appears in its assigned reg-is
tral spot (see 1B where the row is shown above the four-voice structure).
To create a harmonic structure, each voice should be restruck
(or as Hauer said, "left lying") until it is displaced by another note
from the same trichord; thus pc t displaces e in the second chord, 1
displaces 0 in the second, and so on. Finally, each voice "wraps
around" the end and re-enters at the beginning to complete the harmon-
ization; in this way pcs 0, 7, and e from the last sonority are held
as common tones into the first.

This type of four-voice structure based on a twelve-tone row will be
termed a Kontinuum after the usage of Hauer's student, Victor
Sokolowski. Some form of Kontinuum will form the basis of every
Zwölftonspiel that we will investigate.

Turning our attention to the left-hand part, we notice immediately
that this "melody" is simply an arpeggiation of the Kontinuum, but it
arpeggiates the Kontinuum in an interesting and systematic way.
B-flat is the new tone at beat two, measure two, and C\# is the new
tone at beat three. The melody traverses down the four-voice sonority
over beat two, articulating as well the G and E that sit between the
B-flat and C and creating sixteenth-note motion. On beat three C\# and
E appear as eighth notes, and the new tones, C\# and E-flat, are in
adjacent voices. From beat one to beat two of measure three, the new
tones are E-flat and F respectively. The E-flat is articulated as a dotted
eighth and sixteenth, this E-flat and the subsequent F are in the same
voice. At beat two of measure three, eighth-note motion again con-
nects two new tones in adjacent voices, and at beat three, triplets con-
nect the new tones D and G-flat, which lie two voices apart.

Hauer's technique as described here is applied consistently
throughout this piece and may be generalized as follows: Where two
new tones lie in the outermost voices, a sixteenth-note arpeggio will
result. Where there is a voice in between two new tones, triplets are
used, and where new tones lie in adjacent voices, eighth notes result.
When two new tones are in the same voice, the dotted-eighth-
sixteenth-note rhythmic figure is employed. Because of the consist-
tent use of this technique, it would be possible to derive the
Kontinuum from the left-hand part alone. Hauer's intent is to use
rhythmic figuration in the service of articulating pitch relationships.

In Hauer's music pitch must be considered the primary dimension, to
which all other dimensions remain subordinate. Returning to examples in 1A
and 1B, note that each new tone is directly preceded in the same voice by the tone that it will displace.
This preparation tone and the new tone form a dyad, and the Kont-
inuum contains twelve such dyads; these appear in example 1C. They
will be referred to as Z-dyads and are of critical importance in the
workings of the Zwölftonspiel generally.

I would now like to introduce some additional terms that will ap-
pear throughout my discussion. A melody derived in the same manner
as the left-hand part in example 1A will be termed a Z-melody. The
first tone in a Z-dyad will be called the preparation tone, and the sec-
ond tone in a Z-dyad ("new tone") will henceforth be termed the
Z-tone. Finally, when two adjacent Z-tones occur in the same voice,
their connection will be referred to as a "direct step." 17

According to the trichordal partitioning scheme as it appears in ex-
ample 1B, any twelve-tone row will produce no more than three dis-
tinct Kontinua; the row used in this particular example is capable of
producing two additional Kontinua (see ex. 1D). A second Kontinuum
could be produced by partitioning the row into the trichords \( \{1,2,3\},
\{4,5,6\}, \{7,8,9\}, \{10,11,12\} \); and a third could be created with the trich-
ords \( \{2,3,4\}, \{5,6,7\}, \{8,9,10\}, \{11,12,0\} \). Hauer, however, infre-
quently repartitions a row in this way. Rather, he varies the
Kontinuum through the so-called "Stockwerktechnik." This tech-
nique, translated loosely as "root-inversion technique," involves main-
taining the octave range boundary but changing the voice that appears
as the lowest. In 19 Februar 1953, the first five measures see the
\( \{0,1,2\} \) trichord as the lowest; then in measures 6–9 that \( \{0,1,2\} \) trich-
ord becomes the highest, making the \( \{3,4,5\} \) trichord the lowest
and creating a kind of "first inversion" situation. This is shown in ex-
amples 1E and F.

Such a repositioning forces a change in the Z-melody. The trans-
formation of rhythmic figures remains constant, however, as sixteenth
notes become eighth notes, and eighths either remain eighths or be-
come sixteenths. Triplets remain triplets and direct steps remain direct
steps. The Z-melody is always different between any two inversions,
though never completely.

Once the Kontinuum of a Zwölftonspiel is established, the rest of
the piece presents a series of variations based upon it. The Stockwerk-
technik is used in the service of variation and is a device frequently
used to establish overall form in a work. The Zwölftonspiel that we
have been examining continues in mm. 10–17 to exploit this tech-
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which, being present in the first sonority of the piece, we can posit as the first note of the twelve-tone row upon which the piece is built. This row is shown in example 1B.

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According to the trichordal partitioning scheme as it appears in example 1B, any twelve-tone row will produce no more than three distinct Kontinua; the row used in this particular example is capable of producing two additional Kontinua (see ex. 1D). A second Kontinuum could be produced by partitioning the row into the trichords \{1,2,3\}, \{4,5,6\}, \{7,8,9\}, and \{t,e,0\}; and a third could be created with the trichords \{2,3,4\}, \{5,6,7\}, \{8,9,t\}, and \{e,0,1\}. Hauer, however, infrequently repartitions a row in this way. Rather, he varies the Kontinuum through the so-called “Stockwerktechnik.” This technique, translated loosely as “root-inversion technique,” involves maintaining the octave range boundary but changing the voice that appears as the lowest. In 19, Februar 1953, the first five measures see the \{0,1,2\} trichord as the lowest; then in measures 6–9 that \{0,1,2\} trichord becomes the highest, making the \{3,4,5\} trichord the lowest and creating a kind of “first inversion” situation. This is shown in examples 1E and F.

Such a repositioning forces a change in the Z-melody. The transformation of rhythmic figures remains constant, however, as sixteenth notes become eighth notes, and eighths either remain eighths or become sixteeths. Triplets remain triplets and direct steps remain direct steps. The Z-melody is always different between any two inversions, though never completely.

Once the Kontinuum of a Zwölftechnik is established, the rest of the piece presents a series of variations based upon it. The Stockwerktechnik is used in the service of variation and is a device frequently used to establish overall form in a work. The Zwölftechnik that we have been examining continues in mm. 10–17 to exploit this technique. In mm. 10–13, the inversion that uses the trichord \{6,7,8\} as the
bottom voice appears, and in mm. 14–17 the trichord \{9, t, e\} is at the bottom of the *Kontinuum*. Thus we see in mm. 1–17 four statements of the *Kontinuum* in its four “inversions.” The procedure is carried out in register; as the right and left-hand parts ascend together, the music gets gradually higher.

The end of this fourth statement of the *Kontinuum* marks the midpoint of the piece, and the remainder consists of four statements of the retrograde of the *Kontinuum*, the first being the highest (with the trichord \{9, t, e\} on the bottom) and the last the lowest (\{0, 1, 2\} on the bottom). Thus the form consists of four statements of the *Kontinuum* followed by four statements of its retrograde, with an overall registral arc effected by the *Stockwerktechnik*. I will return to the topic of form later in this study.

The retrograde procedure used in this *Zwölftonspiel* from 1953 differs from another retrograde procedure Hauer had used in earlier *Zwölftonspiele* from the 1940’s. In the present example the entire *Kontinuum* is simply retrograded. This means that the Z-dyads appear in reverse order, as do their dyadic functions: the Z-tone becomes the preparation tone and the preparation tone becomes the Z-tone (see ex. 1G). If we simply took any version of the *Kontinuum* from the second half of this piece and applied to it the analytical technique that we used on mm. 1–5, we would discover that a new twelve-tone row emerges, one not necessarily related to that used in the first half of the piece. The presence of the sonorities from the first *Kontinuum* in reverse order, though, makes the retrograde obvious. The new twelve-tone row, produced from the retrograde of the *Kontinuum*, is in fact latent (albeit in rotated order) in the progressive form of the *Kontinuum*, appearing as the successive preparation tones; here, in the retrograde *Kontinuum*, it comes to the fore as the succession of Z-tones, while the previous Z-tone row retreats into its preparatory role (compare exx. 1G and 1C). The succession of Z-dyads is thus more central to the structure of the *Kontinuum* and its retrograde than either row alone. Because the succession of Z-dyads is derived from the *Kontinuum*, it appears as a product of the combination of the progressive row with the trichordal partitioning scheme.

Hauer’s earlier retrograde procedure from the 1940’s involves constructing a second *Kontinuum*, sometimes even with a different partitioning, based on the retrograde of the row. Because of the procedure of row harmonization that produces a *Kontinuum*, the *Kontinuum* of a retrograde row and a retrograde *Kontinuum* are two different twelve-chord successions. Example 1H shows the *Kontinuum* of the retrograde; compare this with the *Kontinuum* shown at 1B. Note also that the *Kontinuum* of the retrograde produces new Z-dyads. The difference between the *Kontinuum* produced by these two types of retrograde procedures arises because the “harmonization” technique that creates the *Kontinuum* always proceeds from left to right. Reversing this procedure so that it moves from right to left will have substantial consequences in the *Kontinuum* produced. I will return to the earlier retrograde technique in connection with “row-splicing,” but for now, it suffices to distinguish the retrograde *Kontinuum*, which maintains Z-dyads but creates a new row, from the *Kontinuum* of a retrograde row, which maintains the row but creates new Z-dyads.19

Thus far, then, we have investigated Hauer’s use of the *Kontinuum* and identified the Z-dyads, explained his derivation of a Z-melody from the *Kontinuum*, taken note of his “root-inversion” technique to structure the music, and distinguished between two types of retrograde procedures. These procedures have all been based on the understanding of the *Kontinuum* as a twelve-chord entity. We must now examine cases in which Hauer works with a *Kontinuum* of twenty-four sonorities.

Row Splicing

Let us now turn to the *Zwölftonspiel* marked “Neujahr 1947.” The first eight measures present the succession of twenty-four pc’s shown in examples 2A and B. Note that the too-early return of pc 3 in m. 4 provides the first clue that we do not have a simple twelve-tone row statement before us. In fact, this twenty-four note succession can be broken up into two rows (see ex. 2C) where the second row is the order-number inversion of the first at \(I_p\).20 One may also observe that the retrograde is “spliced” into the prime form between the prime form’s 1 and 2 (see ex. 2D). This procedure of inserting a retrograde form of a row between some two adjacent members of a forward-running form will be termed “row splicing.”21

Measures 9–16 present the *Kontinuum* of this spliced row. If we observe the partitioning of the \(T_1\) form only, we see that the trichords \{2,0,1\}, \{2,3,4\}, \{5,6,7\}, and \{8,9,t\} are used. The retrograded form, however, uses the \{0,1,2\}, \{3,4,5\}, \{6,7,8\}, and \{9,t,e\} partition scheme (see ex. 2E). In addition, one may note that the two structures overlap at the \{1,3,6,9\} sonority, a “common chord” shared between them. Through this common chord, Hauer shifts from one *Kontinuum* to the other, despite the differing partitioning schemes. This creates one smooth “super-*Kontinuum*” that governs the remainder of the work.22

Another instance of row splicing appears in a *Zwölftonspiel* dated Christmas 1946, written just a week prior to the previous example. As example 3 shows, the twenty-four–pc series is created by splicing a
bottom voice appears, and in mm. 14–17 the trichord \{9,t,e\} is at the bottom of the Kontinuum. Thus we see in mm. 1–17 four statements of the Kontinuum in its four “inversions.” The procedure is carried out in register; as the right and left-hand parts ascend together, the music gets gradually higher.

The end of this fourth statement of the Kontinuum marks the midpoint of the piece, and the remainder consists of four statements of the retrograde of the Kontinuum, the first being the highest (with the trichord \{9,t,e\} on the bottom) and the last the lowest (\{0,1,2\} on the bottom). Thus the form consists of four statements of the Kontinuum followed by four statements of its retrograde, with an overall regisstral arch effected by the Stockwerktechnik. I will return to the topic of form later in this study.

The retrograde procedure used in this Zwölftonspiel from 1953 differs from another retrograde procedure Hauer had used in earlier Zwölften playes from the 1940’s. In the present example the entire Kontinuum is simply retrograded. This means that the Z-dyads appear in reverse order, as do their dyadic functions: the Z-tone becomes the preparation tone and the preparation tone becomes the Z-tone (see ex. 1G). If we simply took any version of the Kontinuum from the second half of this piece and applied to it the analytical technique that we used on mm. 1–5, we would discover that a new twelve-tone row emerges, one not necessarily related to that used in the first half of the piece. The presence of the sonorities from the first Kontinuum in reverse order, though, make the retrograde obvious. The new twelve-tone row, produced from the retrograde of the Kontinuum, is in fact latent (albeit in rotated order) in the progressive form of the Kontinuum, appearing as the successive preparation tone; here, in the retrograde Kontinuum, it comes to the fore as the succession of Z-tones, while the previous Z-tone row retreats into its preparatory role (compare exx. 1G and 1C). The succession of Z-dyads is thus more central to the structure of the Kontinuum and its retrograde than either row alone. Because the succession of Z-dyads is derived from the Kontinuum, it appears as a product of the combination of the progressive row with the trichordal partitioning scheme.

Hauer’s earlier retrograde procedure from the 1940’s involves constructing a second Kontinuum, sometimes even with a different partitioning, based on the retrograde of the row. Because of the procedure of row harmonization that produces a Kontinuum, the Kontinuum of a retrograde row and a retrograde Kontinuum are two different twelve-chord successions. Example 1H shows the Kontinuum of the retrograde; compare this with the Kontinuum shown at 1B. Note also that the Kontinuum of the retrograde produces new Z-dyads. The difference between the Kontinuum produced by these two types of retrograde procedures arises because the “harmonization” technique that creates the Kontinuum always proceeds from left to right. Reversing this procedure so that it moves from right to left will have substantial consequences in the Kontinuum produced. I will return to the earlier retrograde technique in connection with “row-splicing,” but for now, it suffices to distinguish the retrograde Kontinuum, which maintains Z-dyads but creates a new row, from the Kontinuum of a retrograde row, which maintains the row but creates new Z-dyads.19

Thus far, then, we have investigated Hauer’s use of the Kontinuum and identified the Z-dyads, explained his derivation of a Z-melody from the Kontinuum, taken note of his “root-inversion” technique to structure the music, and distinguished between two types of retrograde procedures. These procedures have all been based on the understanding of the Kontinuum as a twelve-chord entity. We must now examine cases in which Hauer works with a Kontinuum of twenty-four sonorities.

Row Splicing

Let us now turn to the Zwölftonspiel marked “Neujahr 1947.” The first eight measures present the succession of twenty-four pc’s shown in examples 2A and B. Note that the too-early return of pc 3 in m. 4 provides the first clue that we do not have a simple twelve-tone row statement before us. In fact, this twenty-four note succession can be broken up into two rows (see ex. 2C) where the second row is the order-number inversion of the first at Ie.20 One may also observe that the retrograde is “spliced” into the prime form between the prime form’s 1 and 2 (see ex. 2D). This procedure of inserting a retrograde form of a row between some two adjacent members of a forward-running form will be termed “row splicing.”

Measures 9–16 present the Kontinuum of this spliced row. If we observe the partitioning of the T, form only, we see that the trichords \{e,0,1\}, \{2,3,4\} \{5,6,7\}, and \{8,9,t\} are used. The retrograded form, however, uses the \{0,1,2\}, \{3,4,5\}, \{6,7,8\}, and \{9,t,e\} partition scheme (see ex. 2E). In addition, one may note that the two structures overlap at the \{1,3,6,9\} sonority, a “common chord” shared between them. Through this common chord, Hauer shifts from one Kontinuum to the other, despite the differing partitioning schemes. This creates one smooth “super Kontinuum” that governs the remainder of the work.22

Another instance of row splicing appears in a Zwölftonspiel dated Christmas 1946, written just a week prior to the previous example. As example 3 shows, the twenty-four–pc series is created by splicing a
Example 2. *Zwölftonspiel* für Klavier, Neujahr 1947 (Vienna: Fortissimo Verlag, 1962; used by permission). A) mm. 1–16, B) 24-tone row, C) two 12-tone rows, D) row splicing, E) super-Kontinuum. N.B. The G* in m. 1 (circled in the example) is presumably a misprint for E*.


transposed and rotated retrograde form into the space between 3 and 4 of a prime form. Here the index of order-number inversion is t and the transposition value is 6.

The *Kontinuum* of T₀ partitions the aggregate into the trichords \{5,6,7\} and \{8,9,t\}, the tetrachord \{1,2,3,4\}, and the dyad \{e,o\}. The *Kontinuum* T₀;I*₁ is partitioned into the trichords \{e,o,1\}, \{2,3,4\},
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Example 3. *Zwölftonspiel* für Klavier, Weihnachten 1946 (Vienna: Fortissimo Verlag, 1965; used by permission). A) first two statements of the super-Kontinuum, B) spliced rows, C) super-Kontinuum. transposed and rotated retrograde form into the space between 3 and 4 of a prime form. Here the index of order-number inversion is t and the transposition value is 6.

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\{5,6,7\}, and \{8,9,1\}. In this example, then, three new features arise. First, the retrograde is a transposed and rotated permutation of the prime form; second, the prime form Kontinuum uses an asymmetrical partitioning of the aggregate into a 3 + 3 + 2 + 4 configuration; and third, this asymmetrical partitioning is combined with the symmetrical partitioning of the retrograde in forming the super-Kontinuum. One may also note that the sonority \{0,2,6,8\} serves as the common chord.  

Texture

Let us return for a moment to the Zwölftonspiel of 19. Februar 1953 and example 1. I noted previously that the left hand part is a Z-melody and that this Z-melody is constantly transformed by Hauer's use of root-inversion technique, or the retrograde of the Kontinuum, or both. The Z-melody is accompanied in the right hand by the chords of the Kontinuum, these voicings matching the root inversion or retrograde form in use by the Z-melody. This texture remains unchanged throughout this short piece. The accompaniment of a Z-melody by four-voice sonorities is termed "homophony," a term that follows its traditional usage.

It is not necessary for the Z-melody to remain in one part throughout a piece as it does here; frequently the Z-melody is limited to the highest or lowest sounding parts, sometimes even with the two outer voices arranged to form a Z-melody separated by three octaves.

The Zwölftonspiel dated "März 1953" (see ex. 4), demonstrates another common texture found in Hauer's work. In this texture the Z-melody is doubled at the octave, with a third, inner part added. This third note is drawn in each instance from the non-adjacent voice. So, for example, in the C-F-C sonority which opens m. 2, the C is the Z-melody tone and resides in the \{5,0,8\} trichord while the F is drawn from the \{5,6,7\} trichord; these two trichords are separated from one another by the \{2,3,4\} trichord.

Note that Hauer takes certain registral liberties in constructing the Z-melody. The triplet figure, which could have ascended by relatively small intervals in the Kontinuum 0-4-5, is inverted to descend by larger intervals, while the subsequent eighth-notes on beats two and three are displayed by two octaves from where they might have occurred. This kind of parallel-doubling texture will be referred to as "planing."

In this example Hauer relaxes the octave limit on the Kontinuum that he observed in previous examples. The relaxation of the octave limit is frequently accompanied, as it is here, by the absence of the root-inversion technique. That the relaxation of the octave boundary necessarily negates the root-inversion technique seems plausible at first, since the root-inversion technique depends to a large degree on the octave boundary itself. It is, however, possible to adhere to the octave boundary in determining the Z-melody and then to displace some of the pitches so that the tessitura of the Z-melody encompasses more than the one octave boundary of some inversion of the Kontinuum.
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Example 5 is drawn from the Zwölftonspiel of Oktober 1956. Here the Z-melody is broken up, in a hocket-like manner, between the lowest and highest voices. The lowest pc in either part is 0 and the highest is e, while the range of each part is restricted to one octave. Thus, despite the registral displacement of the Z-melody, the integrity of \{0,1,2\} as the bottom trichord in the Kontinuum is maintained, and the root-inversion technique, in fact, figures prominently in the formal design of this piece.

A closely related texture is shown in example 6 from the Zwölftonspiel of 30. Jänner 1957. In these opening measures the Z-melody is doubled two octaves apart in the 1st violin and cello. As in example 5, the Z-melody observes the octave boundary, in this case projecting \{8,9,1\} as the bottom trichord.

The Zwölftonspiel dated 24. Dezember 1946 (ex. 7) is based on the same super-Kontinuum as the piece he wrote the next day, Christmas 1946 (example 3), and it exemplifies “monophonic texture.” Here one must infer the underlying Kontinuum from the unaccompanied Z-melody. The resemblance between Hauer’s Z-melody technique and the “polyphonic melody” to be found in, say, Bach’s works for unaccompanied cello or violin is especially pronounced in this example.25

Example 8 is drawn from the piece dated Christmas 1946. Here one notes a texture in which the right hand is assigned the Z-melody while the left moves almost exactly contrary to it within the Kontinuum. The
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Example 7. Zwölftonspiel für Klavier, 24. Dezember 1946 (Vienna: Doblinger, 1979; used by permission); mm. 1–5.

Example 8. Zwölftonspiel für Klavier, Weihnachten 1946 (Vienna: Fortissimo Verlag, 1965; used by permission); beginning of the fourth statement of the Kontinuum.

Z-dyads appear only in the right hand, which results in the tied notes across the beat in the left hand. This texture I refer to as “contrary motion.”

By combining the contrary motion and planning textures, one arrives at a new texture shown in example 9. Here the Z-melody appears in the lowest voice and is planned in the next highest. The right hand moves in contrary motion against the left and supplies the missing notes from the Kontinuum in each instance. This results in a constant exchange of voices between the parts and the constant presence of all four voices of the Kontinuum.

Example 10, taken from mm. 9–16 of the Zwölftonspiel dated 8.

Example 9. Zwölftonspiel für Klavier, 17. Juli 1952 (Vienna: Doblinger, 1979; used by permission); mm. 1–5.

Juli 1957, is an instance of the texture I call “polyphony.” Here the Z-dyads are distributed among the four parts (as circled in the example). The parts consist of lines drawn from the Kontinuum such that all four voices are constantly present. Fragments of Z-melodies will frequently be found in some part but they break off when the Z-dyad is projected in another part. The polyphonic texture introduces what might be thought of as a third dimension to the music; the Z-dyads, rather than adhering to one part as in previous examples, may appear in various parts successively. This effect is underscored more dramatically when an ensemble, such as a string quartet, projects the polyphonic texture, and the motion between voices of the Z-dyads, through timbral differences and the acoustic placement of the instruments.

Example 10 also illustrates another technique that arises here on a very limited scale. Notice that the highest part of mm. 9–12 reappears, transposed down three octaves, in the lowest in mm. 13–16. The second highest part from mm. 9–12 appears as the third highest in mm. 13–16, and the third highest from mm. 9–12 appears as the highest in mm. 13–16. Finally, the lowest part in mm. 9–12 appears as the second highest in mm. 13–16. This wholesale exchange of parts can deploy over much longer spans as a means of articulating form (see below). Here we merely note it as a technique of variation.
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Example 8. Zwölftonspiel für Klavier, Weihnachten 1946 (Vienna: Fortissimo Verlag, 1965; used by permission); beginning of the fourth statement of the Kontinuum.

Z-dyads, rather than adhering to one part as in previous examples, may appear in various parts successively. This effect is underscored more dramatically when an ensemble, such as a string quartet, projects the polyphonic texture, and the motion between voices of the Z-dyads, through timbral differences and the acoustic placement of the instruments.

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Finally, Example 11 illustrates the texture I term “arpeggiation” for obvious reasons. Notice that the two members of the Z-dyad always appear in the same register, though the registers in which successive dyads appear is frequently varied. In fact, the registers in which the various Z-dyads appear is varied here systematically.

The piece consists of sixteen repetitions of the Kontinuum, with not one appearance of its retrograde. If we establish four operative registers in this piece—each starting on F and ending on E with the lowest starting on the F below the bass clef staff and the highest terminating on the E above the treble staff (as shown in Example 11B)—then we may chart the registral appearance of each of the twelve Z-dyads, which are shown in Example 11C. Let us refer to the lowest register as the first, the next highest as the second, the next highest as the third, and the highest as the fourth. So, for example, in the second measure the pc 0–e dyad appears in the second register, the 5–6 dyad appears in the second register, the 2–4 dyad appears in the second register and so on.

After inventorying the registral placement of each dyad, it is possible to derive a “register vector” for each. I do this by enclosing four integers between angle brackets; proceeding left to right, the first entry stands for the number of appearances of that dyad in the first register, the next entry stands for the number of occurrences in the second register, and so forth. The results (see ex. 11D) show that dyads 5–6, 6–7, and 7–5 have the identical vector <1573>. The dyads 9–1, t–8, and 8–9 share the vector <2662>; the dyads 2–4, 4–3 and 3–2 share the vector <4840>; and the dyads 0–e, 1–0, and e–1 share the vector <3751>. These dyadic groupings reflect the partitioning structure of the Kontinuum, which is {e,0,1}, {2,3,4}, {5,6,7}, and {8,9,t}; thus, a dyad’s membership in a particular trichord determines how many times it will appear in each register.

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The dyads 6–7 and 7–5 are linked in an additional way; besides appearing in each register the same number of times, they always share
the same register within any statement of the Kontinuum. This same relationship holds for the dyads 2–4 and 4–3. What emerges is Hauer’s concern for the ordering of pitch classes in space as well as in time, a concern that is not unique to this example. In passing it should be noted that the vector <4840> for the dyads in the trichord (2, 3, 4) indicates that the pcs 2, 3, and 4 never appear in the topmost register, and that the highest pitch in the piece is the C#/D-flat above the treble staff.

Finally, notice that one can count from one to eight and back to zero by proceeding from left to right within the same vector entry. Thus, in range one we get 1, 2, 3, 4; in range two, 5, 6, 7, 8; in range three, 7, 6, 5, 4; and in range four, 3, 2, 1, 0.

Form

The issues arising in example 11 leads us to considerations of form. There are three general formal types. In the first, two main areas interact to determine form in the Zwölftonspiel: matters of texture; and the organization of the Kontinuum, its root inversions, and the retrogrades. The second formal type depends upon MS/M7 order-number procedures, and the third uses a type of canonic part-swapping that Hauer called Kanontechnik.

We turn first to the first formal type and an examination of the use of texture to define form. The Zwölftonspiel dated 3. Februar 1954 (ex. 11) exemplifies one of three general procedures that I distinguish on the basis of texture. In this example, only a single texture is used, and each statement of the Kontinuum is a variation of the textures described above. Example 1, for example, is a single-texture piece (using the homophonic texture), as are the Zwölftonspiele of März 1953 (planing, ex. 4), 24. December 1946 (monophony, ex. 6) and 17. Juli 1952 (planing in contrary motion, ex. 9).

A second textual procedure I call “successive textures.” In a successive-texture piece, each new statement of the Kontinuum appears in a new texture; this procedure is most analogous to traditional variation technique. So in the Zwölftonspiel from Christmas 1946 (see ex. 12), the first statement of the super-Kontinuum is in half-note octaves, the second is a bare Kontinuum, the third is in homophony, the fourth is in contrary motion, the fifth is arpeggiated, and the last is a series of rolled chords.

A closely-related scheme unfolds in the Zwölftonspiel from Neujahr 1947 (ex. 13). Here one finds a succession of seven textures, counting the repeated contrary-motion texture at mm. 41–48 separately from the preceding measures (note that m. 41 exchanges parts.
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from m. 33). In both this piece and the one previously cited, the Kontinuum (specifically, the super-Kontinuum) serves as the basic unit upon which each successive texture is built.

A third textural procedure involves what I term “textural blocks.” Each block can comprise more than one type of texture. In the Zwölftonspiel dated 4. September 1956 (ex. 14), for example, Hauer creates a textural block by using one statement of the Kontinuum in homophony, another statement in contrary motion, and a third statement in arpeggiation. This textural block then remains intact as he cycles through the root inversions and retrogrades of the Kontinuum.

Given these three general textural procedures, we can further discriminate two general categories of Kontinuum patterns within the first formal type. The first pattern appears when four forms of the Kontinuum, one for each root inversion, proceed in ascending order. This is followed by the four positions of the retrograde of the Kontinuum, descending to end on the starting position of the first Kontinuum. This pattern informed example 1. The entire pattern is mapped out in example 15 where K stands for Kontinuum, KR stands for the retrograde of the Kontinuum, and the subscript 012 stands for the trichord in the lowest voice. The second typical pattern is shown in example 15 as well, and consists of an interleaving of the retrograde form with the progressive one. Note that, as in the first pattern, each voicing of the Kontinuum and its retrograde appears once and that the ascending and descending voicing pattern remains intact.27

The Zwölftonspiel for piano, four hands, dated Oktober 1956, shows the combination of texture and Kontinuum pattern to construct a piece of some length (almost two hundred measures, see ex. 16). The piece uses a textural block of six textures, and these textures are enumerated in example 16. Each texture corresponds to one statement of the Kontinuum and lasts four measures, with the entire block
from m. 33). In both this piece and the one previously cited, the Kontinuum (specifically, the super-Kontinuum) serves as the basic unit upon which each successive texture is built.

A third textural procedure involves what I term "textural blocks." Each block can comprise more than one type of texture. In the Zwölftonspiel dated 4. September 1956 (ex. 14), for example, Hauer creates a textural block by using one statement of the Kontinuum in homophony, another statement in contrary motion, and a third statement in arpeggiation. This textural block then remains intact as he cycles through the root inversions and retrogrades of the Kontinuum.

Given these three general textural procedures, we can further discriminate two general categories of Kontinuum patterns within the first formal type. The first pattern appears when four forms of the Kontinuum, one for each root inversion, proceed in ascending order. This is followed by the four positions of the retrograde of the Kontinuum, descending to end on the starting position of the first Kontinuum. This pattern informed example 1. The entire pattern is mapped out in example 15 where K stands for Kontinuum, KR stands for the retrograde of the Kontinuum, and the subscript 012 stands for the trichord in the lowest voice. The second typical pattern is shown in example 15 as well, and consists of an interleaving of the retrograde form with the progressive one. Note that, as in the first pattern, each voicing of the Kontinuum and its retrograde appears once and that the ascending and descending voicing pattern remains intact.

The Zwölftonspiel for piano, four hands, dated Oktober 1956, shows the combination of texture and Kontinuum pattern to construct a piece of some length (almost two hundred measures, see ex. 16). The piece uses a textural block of six textures, and these textures are enumerated in example 16. Each texture corresponds to one statement of the Kontinuum and lasts four measures, with the entire block...
Example 13 (continued)

spanning twenty-four measures. The Kontinuum pattern is the second one mentioned, the one with interleaved retrogrades, so that the Kontinuum pattern can be represented as in ex. 16, with the understanding that K_{012} is repeated six times and so on.

The second formal type uses M5/M7 order-number procedures, as in the Zwölftonspiel for piano and string quartet dated 2. Juni 1948 (ex. 17). Here we find seven statements of the Kontinuum followed by seven statements of its retrograde. The root-inversion technique is not used to create an overall design, but rather the Z-dyads are presented melodically with a cadence emphasizing each seventh one. Thus, seven Kontinuum statements will produce a cadence on each of the twelve Z-dyads according to a predictable M7 order-number operation. The surface of the piece is controlled by the seven-dyad statements rather than by the statements of the Kontinuum, and this process on the surface is further heightened by the use of successive textures. Six textures are used, one texture to each two seven-note statements. After these twelve seven-note statements (seven Kontinuum statements) are completed, the piece repeats the procedure using the same succession of textures over seven statements of the retrograde of the Kontinuum. In other Zwölftonspiele, Hauer also makes use of an M5 procedure in a similar way. Frequently M7 and M5 are used in the same piece. This formal type appears in both the earliest and latest Zwölftonspiele.

A third formal type informs the Zwölftonspiel for violin, cello, accordion, and piano four hands dated Oktober 1957 (ex. 18). The Kontinuum pattern is the second of the two represented in example 15 (eight Kontinuum statements that alternate prime and retrograde forms). This eight-Kontinuum pattern is repeated four times. The piano part exploits a technique that Hauer called the Kanontechnik. That is, in the second unfolding of the Kontinuum pattern, the parts exchange according to a four-way scheme as shown in the example. This exchange pattern is replicated on the subsequent statements of
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Example 13 (continued)

Example 15. Two typical Kontinuum disposition patterns.


the Kontinuum pattern, so that every line of the canon occurs in each voice once. Throughout the first two unfoldings of the Kontinuum pattern, the violin and cello play a Z-melody in dialogue. At the halfway point they switch parts and so form a large-scale canon as well. The accordion articulates the Kontinuum statements throughout.

The four-way exchange of parts, while present in the earliest Zwölf tonspiele, appears to be especially common in those pieces
Example 15. Two typical Kontinuum disposition patterns.

\[ \begin{align*}
K_{012} & \quad (six \ statements) \quad texture \ block \ (six \ textures) \\
KR_{345} & \quad texture \ block \\
K_{078} & \quad texture \ block \\
KR_{912} & \quad texture \ block \\
K_{912} & \quad texture \ block \\
KR_{012} & \quad texture \ block \\
KR_{345} & \quad texture \ block \\
K_{012} & \quad texture \ block
\end{align*} \]

(One texture block = monophony/contrary motion/polyphony in eighth notes/polyphony in triplets/hocket/polyphony in mixed rhythmic values.)


\[ \begin{align*}
K_{e01}: \\
89t & \quad 8-t \ t \ t-9 \ 9-8 \ 8 \ 8 \ 8 \ 8 \ 8-t \ t \ t-9 \ 9-8 \ 8 \ 8 \ 8 \\
567 & \quad 7-7-5 \ 5-5-6 \ 6 \ 6 \ 6 \ 6 \ 6 \ 6 \ 6 \ 6 \ 6-7-7-5 \ 5-5-6 \ 6 \ 6 \ 6 \ 6 \ 6 \ 6-7 \\
234 & \quad 3 \ 3 \ 3 \ 3 \ 3 \ 3 \ 3 \ 3 \ 3-2-4 \ 4-3 \ 3 \ 3 \ 3 \ 3 \ 3 \ 3-2-4 \ 4-3 \\
e01 & \quad 0 \ 0 \ 0-1 \ 1 \ 1-1 \ 1-1-e \ e \ e-0 \ 0 \ 0 \ 0 \ 0 \ 0-1 \ 1 \ 1-1 \ 1-1-e \ e-0 \ 0
\end{align*} \]


the Kontinuum pattern, so that every line of the canon occurs in each voice once. Throughout the first two unfoldings of the Kontinuum pattern, the violin and cello play a Z-melody in dialogue. At the halfway point they switch parts and so form a large-scale canon as well. The accordion articulates the Kontinuum statements throughout.

The four-way exchange of parts, while present in the earliest Z\"wolftonspiele, appears to be especially common in those pieces.
The able characterizes further, predictably, the possible twelve-tone activity. The accordion: continuously the cello:

| 176 | 177 |

K x 8 \times 8 K x 8 K x 8

piano 4 hands \{ A \}

\{ T \}

\{ B \}

\{ S \}

violin: melody a melody c melody b melody d

cello: melody b melody d melody a melody c

accordion: Kontinuum Kontinuum Kontinuum Kontinuum

Example 18. Zwölftonspiel für Heimorchester, Oktober 1957.

composed after 1952. The two-way exchange of solo parts and the continuously sustained Kontinuum occur less frequently and usually only in ensemble pieces where timbral contrasts create different levels of activity.

The Melische Entwurf

In organizing his Zwölftonspiele, Hauer used a device he termed the melische Entwurf, literally translated as "melic design" (see example 19). This design consists of the Kontinuum, written in Hauer's twelve-tone notation (Zwölftonschrift), with each of its four voices traced in a different color. Thus, in a contrapuntal texture it was possible for Hauer to see which instruments were playing which "voice." Further, Hauer would use the four-color square above the Entwurf to assign voices in canon. For example, the voice that is traced in green terminates on D at the end of the design. This D is the same pitch class as the D at the beginning (previously taken by the red voice). The green voice therefore takes the red line the second time through the Entwurf. Notice that the top row of the square proceeds green to red. Predictably, then, this voice takes the blue path through the Entwurf the third time through and the orange path the fourth. The second row on the square proceeds orange, green, red, blue: this represents the progression of a second voice through the four statements of the Entwurf. A similar reading of the blue and red horizontal rows can be made.

The melische Entwurf apparently allowed Hauer to conceptualize the Zwölftonspiel in its entirety. Working from this design, he was able to track the complex exchange of voices that particularly characterizes his contrapuntal textures.

Conclusion

A survey of these thirteen Zwölftonspiele raises some historical and cultural issues. Hauer's technical procedures find resonances in a number of repertoires. His trichordal partitioning, the M5-M7 order number procedures, and the "pre-compositional" nature of many of his techniques parallel developments in European and American serialism of the 1950's and later. On the other hand, his harmonic language and insistence on chromatic voice-leading, at least on the surface, point toward late nineteenth-century and early twentieth-century practices.

Many of the technical procedures that are in force in the late pieces are traceable to Hauer's music of the teens and twenties. Hauer's Nomos, op. 19 of 1919 contains much that will be refined in his late works. In his first theoretical treatise, Über die Klangfarbe, op. 13 of 1918, Hauer already establishes his aesthetic of atonal music. While many of the techniques in the Zwölftonspiel refine earlier ones employed in the 1920's, these techniques are only tools in what Hauer termed the Deutung des Melos. While space does not permit a thorough investigation of this notion, it might suffice to say that Hauer, in his composing, attempted to cast out all that was sensual, subjective, and material in music. Music is a "movement of the spirit," and Hauer was convinced that he had only rediscovered something that had been fundamental in ancient cultures, China especially. He began to step away from the traditional Western conception of musical composition and embraced instead a notion of musical interpretation (musikalisches Denken, Deutung des Melos).

In the Zwölftonspiel one finds Hauer's aesthetic in its full maturity. These are not pieces to be performed in the concert tradition, not works of art, but rather interpretations of the twelve pitch classes of the aggregate as represented in the row; they are contemplations of the "twelve-tone universe." The Zwölftonspiel is a means and not an end. The textures and Kontinuum patterns are merely tools for bringing out the "truth" that Hauer believed lies between the tones. In fact, any order of the twelve-tones suited his purpose, and Hauer often came to his rows by chance, sometimes employing the Chinese Book of Changes, the I Ching. One can note the parallels between the hexagrams of the I Ching, with their upper, lower, and inner trigrams and Hauer's table of tropes, divided by hexachords. Hauer always examined all six pairs of hexachords of any given twelve-tone row before beginning his interpretations.

In Hauer's twelve-tone contemplations, then, the technical procedures must be viewed as "ways in" to the twelve-tone world, and not—and this is the crucial aesthetic point—as technical ends in
Further, the melische Entwurf, which Hauer termed Zwölftonspieler, raises some historical and cultural issues. Hauer’s technical procedures find resonances in a number of repertoires. His trichordal partitioning, the M5–M7 order number procedures, and the “pre-compositional” nature of many of his techniques parallel developments in European and American serialism of the 1950’s and later. On the other hand, his harmonic language and insistence on chromatic voice-leading, at least on the surface, point toward late nineteenth-century and early twentieth-century practices.

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themselves. In Hauer's attempt to ponder the vast number of possibilities within his twelve-tone world, a music-technical apparatus becomes a sort of "lens" with which to capture some aspect of the larger picture. He chooses some ordering of the aggregate, forms a Kontinuum, and proceeds to examine the Kontinuum using some combination of textures and formal designs. Ultimately, it is the working-out of the Zwölftonspiel, and not its performance—especially not its performance in the traditional Western sense—that is of greatest value; the score becomes the mere document of a "spiritual-musical exercise."  

Arguably, there are more interesting paths through the twelve-tone universe than those of Hauer's Zwölftonspiele; that Hauer believed the twelve-tone system to be the source of the "truth of the universe," and that he developed some rather advanced ways of maneuvering around it, certainly suggests that there are alternative views of the twelve-tone system. With regard to Schoenberg and Schoenberg scholarship, it is worth noting that Hauer's alternative perspective was present from the very inception of the twelve-tone idea itself. In fact, it was Hauer's aesthetic position that led him to his version of the twelve-tone system in the first place.  

While Schoenberg produced a number of "twelve-tone masterworks," Hauer's place in the history of the twelve-tone idea should not be overlooked merely because he turned the twelve-tone system to different ends. It would be unfair to judge Hauer's music according to the Western musical aesthetic of "composer-as-expressive artist." Hauer clearly had different concerns, but his contribution to the history of the development of the twelve-tone system must be acknowledged.


Note: The "color square" appears in four colors. The top row reads green, red, blue, and yellow; the next row down is yellow, green, red, and blue; the third from the top reads blue, yellow, green, and red; and the bottom row is red, blue, yellow, and green. The Entwurf begins with the soprano parts as green, the alto as blue, the tenor as yellow, and the bass as red.

**Example 19 (continued)**

Hauer's aesthetics lead one into many perhaps less-familiar thought systems. While it is a fascinating study to determine the influence on Hauer of such Germans as Winckelmann, Goethe, Ferdinand Ebner, Richard Wilhelm, and perhaps even Rudolph Steiner on the one hand, and such ancients as Pythagoras and Confucius on the other, the Entstehungsgeschichte of Hauer's aesthetics is a study that lies beyond the scope of the present paper.

**ABSTRACT**

Compositions of the Austrian musician Josef Matthias Hauer (1883-1959) are surveyed in order to investigate his use of the twelve-tone system. This study is restricted to the examination of works from Hauer's late period (1940-59), pieces simply titled Zwölftonspiel. A variety of techniques that produce texture and form in these Zwölftonspiele are examined in an effort to provide a balanced sampling of Hauer's late twelve-tone procedures.
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5. Hauer’s aesthetic ideas are laid out in detail in his *Deutung des Melos: Eine Präge an die Künstler und Denker unserer Zeit* (Leipzig, Vienna and Zurich, 1923).


7. Ibid., 106.


This is, of course, an arbitrary sampling of Schoenberg scholarship. That one finds an Austrian, a Frenchman, an Italian, and a number of Americans only emphasizes the broad attention that Schoenberg’s twelve-tone music has received.


10. “Zwölftonspiel” would be rendered into English literally as “twelve-tone game.” But this use of the word “game” misses the sense of the German which also has the meaning of “play.” In English, “a play of the twelve tones” gives a more accurate sense of the term.

11. Stefan, “Hauer,” 291. Stefan appends a work-list that is substantially up-dated by Szmolyan.

12. In this example and in those that follow, I will use f for pc 10 and e for pc 11.


15. I have a photo-copy of a small sheet of paper on which Hauer illustrates the procedure that I have described; this was given to me by Hauer’s son, Mr. Inno Hauer. I would like to thank Mr. Hauer for sharing many other rare documents from his private archive with me during the course of my research.

16. Though space does not permit, it would be possible to trace the notion of the primacy of pitch back to Hauer’s first published writing, *Über die Klangefarbe* (Vienna, 1918). In this matter it should be stressed that Hauer viewed the harmony as a consequence of the melody (see n. 25 below). Though space does not permit a detailed examination of Hauer’s orchestration, it should be noted that he uses timbre to underscore pitch procedures: in any setting where a timbral contrast is possible, Hauer will tend to exploit this to reflect different levels of pitch activity in the music (see n. 26, for example). This is especially true in the Zwölftonspiels set for orchestra.

17. The terms “Z-tone” and “direct step” are taken from Sokolowski’s teaching as represented in Robert Michael Weiss’s important thesis “Das Zwölftonspiel von Josef Matthias Hauer” (Hausarbeit, Hochschule für Musik und Darstellende Kunst in Wien, 1980). Weiss uses the terms “Zwölfton” and “direktter Schritt” respectively. My “preparation tone” corresponds to Weiss’s “Wendeton.” Weiss further uses the term “Achsenton” for the tones that do not change from chord to chord (pp. 40–1). Weiss’s use of these terms, as he has related to me personally, follows Sokolowski’s use of them. Since Sokolowski published little on the Zwölftonspiel and Weiss was his long-time student, Weiss’s writing offers an important articulation of Sokolowski’s teaching of the Zwölftonspiel.

18. Szmolyan, *Hauer*, p. 69. For an exceptional instance of a piece based on the use of all three possible *Kontinua* derived from the trichordal partition scheme, see
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4. Schoenberg, Letters, 104. Hauer’s aesthetic position is stated very clearly in “Atonale Musik.”

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18. Szmylon, Hauer, p. 69. For an exceptional instance of a piece based on the use of all three possible Kontinua derived from the trichordal partition scheme, see
the Zwölfspiele für Klavier, 17. July 1952, in which three Kontinua of a single row are followed by the retrogrades of those Kontinua (in reverse order and with slight changes); Sieben Zwölfspiele (Vienna and Munich: Doblinger Verlag, 1979), D. 16 083, 19.


20. According to Andrew Mead’s terminology, retrogrades and retrograde rotations are termed “order-number inversions,” where the subscript denotes the index of inversion; thus, under index 9, 9 maps into 0, 8 into 1, etc. See Mead, “Some Implications of the Pitch-Class/Order-Number Isomorphism Inherent in the Twelve-Tone System: Part One,” Perspectives in New Music, 26 (1988): 96–163. Order number operations will be italicized. I would like to thank Andrew Mead for reading an earlier version of this paper and for offering many valuable suggestions.

21. Weiss uses the term Verflochtene Paar to describe this relationship (p. 50). I have chosen to avoid the direct translation, “interleaved pair,” and have opted for the term “row-splicing” to describe the procedure, and “super-Kontinuum” to describe its result.

22. I have not yet discovered a “retrograde of the super-Kontinuum.” Perhaps this is because the retrograde is contained in the super-Kontinuum.

23. As mentioned above, Hauer abandoned the Kontinuum of the retrograde for the retrograde of the Kontinuum (Weiss); apparently “row-splicing” was also abandoned. Hauer may have considered a super-Kontinuum made up of the Kontinuum and its retrograde redundant because of the identical series of sonorities that it and KR share. If, however, some Kontinuum were to contain a pair of tetrachords that were transpositionally equivalent (not counting T = 0), then a transposed form of KR could be spliced in and a super-Kontinuum created.

24. Sokolowski developed a series of terms for describing the various textures found in the Zwölfspiel. In some cases I have carried over these terms from the German and in other cases not. I have attempted to avoid creating new terms wherever a generic one would do. A 1983 prospectus of Hauer’s compositions prepared by Weiss and distributed by Hauer’s publisher, Doblinger Vienna, provides a brief overview of these terms.

25. Because Hauer instructs the pianist to sustain the melody notes as long as possible (“Jeder gespielte Ton soll möglichst lange liegen bleiben”), this texture resembles the arpeggiated one described below in the text. If one considers the Zwölfspiel für Klarinetten allein of 1947 (Vienna and Munich: Doblinger Verlag, 1975), D. 14 842, however, one finds a clear monophonic texture. Hauer claims in his early theoretical writing that harmony arises from melody, that one must hear the harmony out of the single-voice melody. The clarinet piece is especially interesting in that it is a super-Kontinuum piece with no common chord; the individual voices are left lying from one Kontinuum into the retrograde of the Kontinuum, each changing when the Z-tone arrives. This result in a kind of “partition modulation” where certain sonorities arise that do not belong to either Kontinuum viewed in isolation. But, since no simultaneities are present in the music, all this must be "heard out" from the single-line surface.

26. In the Zwölfspiel für Violine und Cembalo of 28. August 1948 (Vienna and Munich: Doblinger Verlag, 1975), D. 14 845, Hauer uses the violin to articulate trichordal partitions of the Kontinuum. Melody notes in the violin are drawn from a particular trichord on each pass through the Kontinuum and its retrograde; with each successive Kontinuum statement the violin articulates a different trichord drawn from the trichordal partitioning of the Kontinuum.

27. Sokolowski’s terms for formal description can be found in Weiss, pp. 54–56. The patterns are “Spielpläne”; once through the Kontinuum constitutes a “Periode.” My first pattern would be rendered as “Getrennte Epochen,” and my second as “Gekoppelte Periomen.” His third Spielplan, “Gestaffelte Periomen,” is my “texture block in the second pattern” (see ex. 16).

28. This procedure is a development of a technique found in the earliest Zwölfspiele. I have studied three early pieces called Zwölfspiele, each for orchestra and from 1942–43 (A Wst, MH 14124, 14125, 14126, and 14127). The following procedure is identical in the three that I studied: A Kontinuum, articulated in an M7 manner (pause on each seventh chord), is led through seven statements in a single texture. This is repeated for four more textures, making 5 × 7 (= 35) statements of the Kontinuum. A Kontinuum of the retrograde is then presented in the same sequence of textures as before but articulated in an M5 manner. Each of these pieces is almost nine hundred (!) measures in length. The technique employed in example 17 is thus a shortening of the earlier procedure.

With regard to the M5/M7 technique, it is obvious that this technique creates cadences on each of the twelve Z-dyads. This technique was first employed by Hauer in his Nomos, op. 19 (1919). In this early piece it is clear that a derived row is produced from every fifth note in the original row (see my “Nomos: The Twelve-Tone Law of Josef Matthias Hauer,” in preparation). In the Zwölfspiel, however, the M5/M7 procedure would seem to be more a mapping in the domain of what might be termed “unit cardinality”; that is, the procedure maps twelve units of one sonority each into twelve units of five each (or seven, as the case may be). Unit cardinality M5/M7 becomes a way of enlarging the “aggregate” by a factor of five (or seven).

29. The example is taken from Sokolowski’s edition of Hauer’s Vom Wesen des Musikalisichen. The reader is invited to seek out a copy in order to see the example in its four colors. Sokolowski also provides the corresponding Zwölfspiel (5. Juli 1952), so that it is possible to trace the colored voices from the Entwurf onto the score.

30. The Zwölfspielkribel is set up to reflect the keyboard. Thus one sees an alternation between groups of three lines and groups of two lines; these lines represent the black keys, while the spaces in between represent the white keys. Note, for example, the larger space between the three-line and the two-line configurations; this accommodates the two white keys that intervene.

31. Each horizontal line is a color rotation with regard to any other horizontal line in the square.

32. Hauer appears to have used this colored square technique as an aide-mémoire; in the melodic designs that I have seen, only the first three vertical columns are scratched over in pencil. This indicates that Hauer must have scratched out
the Zwölfonspielfür Klarinette, 17. July 1952, in which three Kontinuum of a single row are followed by the retrogrades of those Kontinua (in reverse order and with slight changes); Sieben Zwölfonspiele (Vienna and Munich: Doblinger Verlag, 1979), D. 16 083, 19.


20. According to Andrew Mead’s terminology, retrogrades and retrograde rotations are termed "order-number inversions," where the subscript denotes the index of inversion; thus, under index 9, 9 maps into 0, 8 into 1, etc. See Mead, "Some Implications of the Pitch-Class/Order-Number Isomorphism Inherent in the Twelve-Tone System: Part One," Perspectives in New Music, 26 (1988): 96–163. Order number operations will be italicized. I would like to thank Andrew Mead for reading an earlier version of this paper and for offering many valuable suggestions.

21. Weiss uses the term Verflochtene Paar to describe this relationship (p. 50). I have chosen to avoid the direct translation, "interleaved pair," and have opted for the term "row-splicing" to describe the procedure, and "super-Kontinuum" to describe its result.

22. I have not yet discovered a "retrograde of the super-Kontinuum." Perhaps this is because the retrograde is contained in the super-Kontinuum.

23. As mentioned above, Hauer abandoned the Kontinuum of the retrograde for the retrograde of the Kontinuum (Weiss); apparently "row-splicing" was also abandoned. Hauer may have considered a super-Kontinuum made up of the Kontinuum and its retrograde redundant because of the identical series of sonorities that K and KR share. If, however, some Kontinuum were to contain a pair of tetrachords that were transpositionally equivalent (not counting $T = 0$), then a transposed form of KR could be spliced in and a super-Kontinuum created.

24. Sokolowski developed a series of terms for describing the various textures found in the Zwölfonspielf. In some cases I have carried over these terms from the German and in other cases not. I have attempted to avoid creating new terms wherever a generic one would do. A 1983 prospectus of Hauer’s compositions prepared by Weiss and distributed by Hauer’s publisher, Doblinger Vienna, provides a brief overview of these terms.

25. Because Hauer instructs the pianist to sustain the melody notes as long as possible ("Jeder gespielte Ton soll möglichst lange liegen bleiben"), this texture resembles the arpeggiated one described below in the text. If one considers the Zwölfonspielfür Klarinette allein of 1947 (Vienna and Munich: Doblinger Verlag, 1975), D. 14 842; however, one finds a clear monophonic texture. Hauer claims in his early theoretical writing that harmony arises from melody, that one must hear the harmony out of the single-voice melody. The clarinet piece is especially interesting in that it is a super-Kontinuum piece with no common chord; the individual voices are left lying from one Kontinuum into the retrograde of the Kontinuum, each changing when the Z-tone arrives. This results in a kind of "partition modulation" where certain sonorities arise that do not belong to either Kontinuum viewed in isolation. But, since no simultaneities are present in the music, all this must be "heard out" from the single-line surface.

26. In the Zwölfonspielfür Violine und Cembalo of 28. August 1948 (Vienna and Munich: Doblinger Verlag, 1975), D. 14 845, Hauer uses the violin to articulate trichordal partitions of the Kontinuum. Melody notes in the violin are drawn from a particular trichord on each pass through the Kontinuum and its retrograde; with each successive Kontinuum statement the violin articulates a different trichord drawn from the trichordal partitioning of the Kontinuum.

27. Sokolowski’s terms for formal description can be found in Weiss, pp. 54–56. The patterns are "Spielpläne;" once through the Kontinuum constitutes a "Periode." My first pattern would be rendered as "Getrennte Perioden," and my second as "Gekoppelte Perioden." His third Spielplan, "Gestaffelte Perioden," is my "texture block in the second pattern" (see ex. 16).

28. This procedure is a development of a technique found in the earliest Zwölfonspiele. I have studied three early pieces called Zwölfonspiele, each for orchestra and from 1942–43 (A Wst, MH 14124, 14125, 14126, and 14127). The following procedure is identical in the three that I studied: A Kontinuum, articulated in an $M^7$ manner (pause on each seventh chord), is led through seven statements in a single texture. This is repeated for four more textures, making $5 \times 7 = 35$ statements of the Kontinuum. A Kontinuum of the retrograde is then presented in the same sequence of textures as before but articulated in an $M^5$ manner. Each of these pieces is almost nine hundred (!) measures in length. The technique employed in example 17 is thus a shortening of the earlier procedure.

With regard to the $M5/M7$ technique, it is obvious that this technique creates cadences on each of the twelve $Z$-dyads. This technique was first employed by Hauer in his Nomos, op. 19 (1919). In this early piece it is clear that a derived row is produced from every fifth note in the original row (see my "Nomos: The Twelve-Tone Law of Josef Matthias Hauer," in preparation). In the Zwölfonspielf, however, the $M5/M7$ procedure would seem to more a mapping in the domain of what might be termed "unit cardinality"; that is, the procedure maps twelve units of one sonority each into twelve units of five each (or seven, as the case may be). Unit cardinality $M5/M7$ becomes a way of enlarging the "aggregate" by a factor of five (or seven).

29. The example is taken from Sokolowski’s edition of Hauer’s Vom Wesen des Musikalisichen. The reader is invited to seek out a copy in order to see the example in its four colors. Sokolowski also provides the corresponding Zwölfonspielf (5. Juli 1952), so that it is possible to trace the colored voices from the Entwurf onto the score.

30. The Zwölfonsschrift is set up to reflect the keyboard. Thus one sees an alternation between groups of three lines and groups of two lines; these lines represent the black keys, while the spaces in between represent the white keys. Note, for example, the larger space between the three-line and the two-line configurations; this accommodates the two white keys that intervene.

31. Each horizontal line is a color rotation with regard to any other horizontal line in the square.

32. Hauer appears to have used this colored square technique as an aide-mémoire; in the melodic designs that I have seen, only the first three vertical columns are scratched over in pencil. This indicates that Hauer must have scratched out
each column as he copied it into the music; the last column, therefore, did not need to be scratched out.

33. Hauer, Über die Klangfarbe.

34. The melische Entwurf can be traced directly back to Hauer's 1926 brochure, Zwölftontechnik (Vienna, 1926), pp. 10–23, as can the Kanontechnik. For more on Hauer's middle period (1919–1940) practice, see Johann Sengstschmid, Zwischen Trope; Lichtenfeld, Untersuchung; Stefan, "Hauer"; and Szmolyan, Hauer.


36. Reproductions of trope tables from 1925 and 1948 are provided by Szmolyan, Hauer, pp. 54–55.

37. The Hauer student Oswald Franz Ferdinand Poestinger, in his "Musik und Meditation," Musikeryziehung (October 1978): 23, even characterizes the Zwölfonspiel as an "auditory meditation exercise" (auditiv Meditationsüb ung).


THEORY FORUM

Still More on the Cadential Six-Four:

Responses to David Beach