

SYMMETRY IN MUSIC

**SYMMETRY AND DISSYMMETRY
IN PAUL HINDEMITH'S *LUDUS TONALIS***

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Publications: (1986) *Die musikalische Darstellung psychologischer
Wirklichkeit in Alban Berg's "Wozzeck"*, Bern/Frankfurt: Peter
Lang; (1992) Symmetry and irreversibility in the musical language(s)
of the twentieth century, *Symmetry: Culture and Science*, vol. 3, no.
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Symmetry: Culture and Science, vol. 6, no. 4.



Abstract: *The piano cycle Ludus Tonalis by Paul Hindemith is much more than a "tonal play", or a play with tones and tonalities. It is not even merely "playful" in the sense that it contains an almost complete array of keyboard techniques and performance colors, and in that the capturing characteristics of many of the fugues and interludes are suggestive of dramatic characters. The layout of this cycle contains - perceptible for the analyst but skillfully concealed from listeners who might feel disturbed by too pronounced a sense of "craft" - a wonderful play with symmetries, reflections, symmetrically ordered groups and, last but by no means least, just the right amount of symmetry breaking.*

1. INTRODUCTION

This year marks the 100th birthday of the German composer Paul Hindemith (1895-1963). On the occasion of this centennial, I have chosen to look at Hindemith's piano cycle *Ludus Tonalis*. First, however, allow me to introduce the composer.

Five traits characterize the man Paul Hindemith: his extensive experience as a performing artist; his endeavors to bring contemporary music to a wider audience; his enthusiasm with education; his respect for, and active promotion of, early music; and his outstanding wit and sense of humor. Hindemith began as a violinist, being appointed concert-master at the Frankfurt Opera at age 19. He later had a brilliant career as one of Europe's foremost viola soloists and founded the famous Amar Quartet with whom he toured widely. Other instruments on which he was an accomplished performer include the viola d'amore, the piano, and the clarinet.

As a composer, Hindemith wrote for almost every type of musical medium, from large orchestral scores, operas (*Mathis the Painter*, *Cardillac*, *The Harmony of the World* and three one-act operas), oratorios and ballets to concertos (see *Four Temperaments* for piano and strings, *Funeral Music* for viola and strings), chamber music for all instruments, and song cycles (see e.g. *The Life of Mary*). His work also includes much music of deliberately functional intent (he coined the word *Gebrauchsmusik*, utility music). Already at the age of 28 he was appointed professor of composition at the prestigious *Hochschule für Musik* in Berlin. Hindemith was one of the leaders in the Donaueschingen Festival for New Music for which, apart from contributing his own compositions, he commissioned and premiered works by a large number of other composers of his time. In his effort to make contemporary music more easily accessible to the audience, he wrote very spirited introductory articles, enlivened with his own witty illustrations.

Having been banned by the Nazis as musically 'degenerate', he emigrated to the U.S. where he taught at Yale University, holding the position of professor of music theory from 1940 to 1953. There he founded, coached and participated in several ensembles for early music, stressing on the students' awareness for both early-music compositional techniques and performance practices.

2. GENERAL INTRODUCTION TO THE *LUDUS TONALIS*

The title *Ludus Tonalis* can be translated as "Tonal game". However, such a rendition gives only part of the meaning implied in the Latin wording. The term *ludus* (from Latin *ludere* = to play) can refer to three different scenarios: the playing of an instrument, the playing of a drama on stage, and the playing of games. (Historically, the word "ludus" often described medieval liturgical dramas.) I will show that Hindemith probably had all three meanings in mind when he chose this particular title. The work

PRELUDE

2

The musical score for the Prelude by S. Bruhn is presented in two systems. The first system (measures 1-72) begins with a *ff* dynamic and a *free* tempo marking. It includes a *broad* section and a *Moderate* section (marked *♩ ca. 72*). The second system (measures 72-100) features an *Adagio, quasi* tempo marking (marked *♩ 92-100*). The score includes various musical notations such as *cresc.*, *decresc.*, *dim.*, *acc.*, *stacc.*, and *ff*. The music is written for piano and consists of two systems of staves.

POSTLUDE

First system of the musical score. It consists of three staves. The left staff has a tempo marking 'Solemn, broad (♩ 50-54)' and a dynamic marking 'pp'. The middle staff has a dynamic marking 'mf' and a 'dim.' marking. The right staff has a dynamic marking 'pp' and a 'dim.' marking. The music is written in a complex, atonal style with many accidentals.

Second system of the musical score. It consists of five staves. The first staff has a dynamic marking 'p'. The second staff has a 'free' marking. The third staff has a 'cresc.' marking and a 'dim.' marking. The fourth staff has a 'Slow (♩ 66)' marking and a 'hesitating' marking. The fifth staff has a 'p' marking and a 'hesitating' marking. The music continues with complex, atonal passages.

contains an almost complete array of keyboard techniques and performance “colors”; many of the fugues and interludes suggest of dramatic characters; and the entire cycle expresses wonderful fun - fun for the composer who wrote this significant work within a few weeks, and fun for the performers, especially for those who undertake to play the entire cycle.

The *Ludus Tonalis* consists of twelve fugues that are linked by eleven interludes and wrapped by a prelude and a postlude. This layout, with pieces on each of the twelve semitones, recalls several forerunners. However, the tonal organization of the fugues is neither chromatic (as in Bach’s Well-Tempered Clavier) nor in fifths and their relative minors (as in Chopin’s or Scriabin’s 24 Preludes). Instead, Hindemith uses a tonal organization in which the succession of pitches is determined by their continually lessening relationship to the central note C.

Of particular interest are the framing pieces. The Praeludium (see the music excerpt on the following pages) is built on two contrasting central notes: C (bars 1-32) and F[#] (bars 34-37). This piece thus anticipates, as it were, the entire tonal argument of the composition in contraction. It leaves us where the fugues will eventually leave us - at the tritone. Having launched the *Ludus Tonalis* with a piece so fraught with allusions to the main body of the work, the question arises - and must have arisen to Hindemith - what kind of *finale* would be a match, rounding off the cycle in a meaningful way. Hindemith’s solution is ingenious; he composed the Postludium as a special kind of retrograde inversion of the Praeludium: one in which the page can literally be turned upside down and read backwards! (Read ex. 1, turned upside down from the word “Postlude”.) While this may seem as a fancy game, it constitutes in fact one of the most haunting compositional tasks - quite certainly a good reason why, since Bach’s Art of the Fugue, no work of similar dimensions has been written in this technique. That Hindemith struggled to meet his own demands can be seen from his sketch book. A prolific composer, he usually took down no more than one draft, followed by a correction and a fair copy. But while this is true for each of the fugues and interludes in the *Ludus Tonalis*, there are more than twenty sketches for the Prelude-Postlude pair. What is at stake is this: an ascent in the lowest part must make musical sense when recurring as a descent in the upper part; the opening of a phrase must sound convincing when appearing, upside down and read backwards, as a close; strong beats must be useful as weak beats and vice versa; even dynamic and agogic motions must literally be designed as reversible. (The only adjustment allowed are the accidentals which must necessarily be relocated before the note.) As if this was not enough, the true problem for such an undertaking lies in the tonal organization. Hindemith’s sketches reveal that he discovered after several attempts that there are only five scales which, when read in retrograde inversion, give the same pitches: C, C[#] and C^b major, and Phrygian on C and on C[#]. In Hindemith’s final solution, each of the two pieces appears as beautifully accomplished music in its own right: a triumph of art over technique, and a fitting frame for this major work.

Previous pages:

Figure 1: Hindemith’s Visual

3. SYMMETRY AND DISSYMMETRY IN THE INTERLUDES

The twelve fugues and eleven preludes framed by these remarkable examples of musico-visual symmetry are arranged in such a way as to establish various kinds of intricately mirroring patterns, all the while attentive to the other aspects of the title word *ludus*. Let us first take a closer look at the interludes.

In the center of the cycle we find a March. This interlude differs from all others in almost every respect and thus constitutes a genuine, "unique" center piece. The tonal language is very easy to grasp, containing predominantly consonant chords, double octaves, and many superimposed fifths or fourths. These prime intervals, together with the somewhat raucous rhythm in the main section, ensure an unmistakably humorous atmosphere. In conjunction with the stilted melody in the middle section that is suggestive of tin soldiers (and, perhaps, their tin brides), this march strikes us as a wonderful parody, reminiscent of fair grounds and the likes.

The interludes preceding and following the central March correspond symmetrically with one another in that both are Romantic piano miniatures. Interlude 5 imitates - in Hindemithian tonal language, of course - the typical melodic gestures of a Chopin piece; Interlude 7 with its heaviness and thick texture recalls the keyboard style of Brahms. On either side of the symmetry center, Hindemith placed interludes in "Baroque" style. Interlude 4 with its rhythmic uniformity and swift finger-work is

reminiscent of preludes from the turn of the eighteenth century, and Interlude 8 with its texture built significantly on an attack pattern of alternating hands is a typical *toccata*. Both are fast; both are virtuoso in their design, with lines that do not form melodic motifs. Meanwhile, the layouts of the two pieces, while symmetric in themselves, are unusual: the "toccata" is in bridge form (A B A'), while the "prelude" comes as a rondo, complete with three recurrences of a refrain, a first episode rooted in the lowest ranges of the keyboard and a second episode that explores the extremely high register.

The central symmetry among the interludes (as shown in ex. 2) is flanked on either side by three romantic pieces that create a significant and charming dissymmetry. Interludes 3 and 10 (not 9) are folk dances; interludes 2 and 9 (not 10) are pastorales; and the Romantic improvisation that constitutes the very first interlude is counter-balanced by a Romantic waltz in the very last

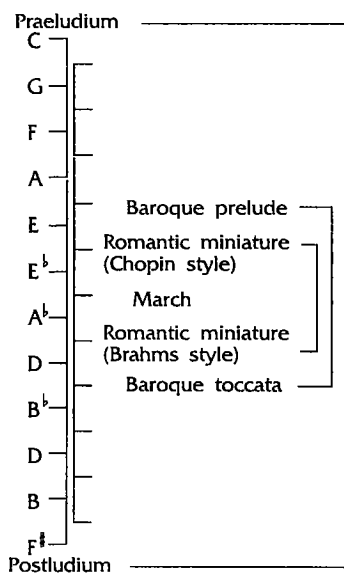
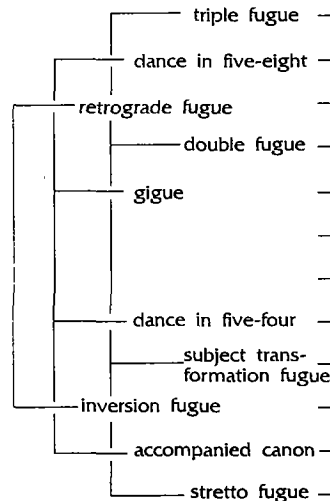


Figure 2:
Hindemith, *Ludus Tonalis*,

interlude. Among the two folk dances, the earlier one is conceived as a *Gavotte*. Like the French peasant dance that was, in the course of the 17th century, adopted by the courtiers as an expression of "forthright and unsophisticated charm", Hindemith also gives the dance a somewhat heavy duple time with a half-measure upbeat. As a counterpart, the other folk dance is reminiscent of the *Courante*. The traditional *Courante* is characterized by a specific device: while the six beats of each bar appear through most of the piece in a metric order of - - - | - - -, there are invariably a few bars that disturb this order by stressing - - | - -. Hindemith exacerbates this phenomenon. The regular sextuple time of the beginning (- - - | - - -, here emphasized with a bass *ostinato*, a "stubborn" figure that keeps repeating) is interrupted by various metric arrangements that offset the initial order: stresses on every fourth beat (- - | - -), on every third beat (- - | - -), and even at two points groupings of five beats. (The latter would logically remain out of sync for quite a while, but the composer makes the unruly voice rejoin the metric order by "cheating.") The two pastorales are both in slow and languishing character and feature treble voices in flute style. The "improvisation" of the initial interlude, while actually notated with a time signature, contains so many elements that overrun the metric order that one hears the piece as if "without bar lines".

By contrast, the final interlude in an elegant waltz very much reminiscent of those written for the piano in the middle of the 19th century.



4. SYMMETRY AND DISSYMETRY IN THE FUGUES

The symmetric patterns in the fugues are laid out differently. Textures, rhythmic particularities, symmetry transformations and styles are employed in such a way as to allow us to distinguish four groups. Here is a short overview, followed by a more detailed discussion.

Figure 4:
Hindemith, *Ludus Tonalis*, Symmetry in the Fugues

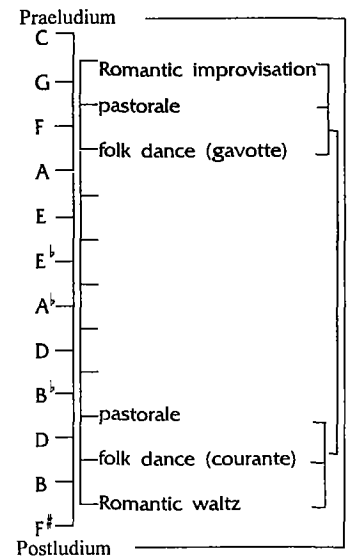


Figure 3: Hindemith, *Ludus Tonalis*, Interludes 1-3 and 9-11

One group contains the first and last as well as the fourth and fourth-from-last fugues; all these are determined by contrapuntal devices. Another group encompasses the second and fifth as well as the second-from-last and fifth-from-last fugues; these are distinguished by metric devices, often in the form of dances. A third group contains the third and the third-from-last fugues. They share the fact that in both, the second half is a mirror image of the first half: one presents a horizontal, the other a vertical mirror image. Finally, the conspicuous symmetry outlined so far is broken in the two central fugues, which have no functional features in common.

Returning to the first group, it helps to know a little about contrapuntal devices. "Contrapuntal" stems from *punctus contra punctum* and is about the question what is set against what, or what happens simultaneously with what. The first and fourth fugues constitute a triple and double fugue respectively; these are fugues that do not build, as is normal, on a single subject, but feature instead two independent subjects or, in the case of the initial fugue, even three. And while the word "subject" is commonly used to designate the principal, recurring melodic phrase of a fugue, in the context of Hindemith's *Ludus* (= play) it takes on additional meaning. The characterization given by the composer invites us to discern these subjects as personas put on stage. Each of these personas has a distinct character, which in turn has considerable impact on its surroundings. Subject 1 appears as serene and composed; it envelopes itself with very harmonious chords.

The image displays three musical subjects from Hindemith's *Ludus Tonalis*, Fugue no. 1 in C. Each subject is presented on a single staff with a treble clef and a key signature of one flat (B-flat). Subject 1 is a calm, flowing melody. Subject 2 is a more agitated, dissonant melody. Subject 3 is a complex, distorted-sounding melody. Below these are two staves showing the subjects combined in a fugue texture.

Subject 2 is sorrowful, expressing itself in a series of sighs followed by gradual appeasement; it is wrapped in 'unresolved' intervals and diminished chords.

Subject 3 is aggressive; correspondingly it creates strong dissonances (including those particularly distorted-sounding intervals like the augmented octave and the minor ninth).

When all three subjects finally meet, laments and aggression are absorbed by the soothing calm of subject 1.

Figure 5: Hindemith, *Ludus Tonalis*, Fugue no. 1 in C

In another scenario, found in the fourth fugue, the outcome is quite different. A distinctly “male”, somewhat rough-hewn first subject dominates the first section, while the second section exposes a very graceful, soft and fragile second subject. As the graphic representation shows, the first subject portrays a person who is fairly uninhibited and fond of himself. He makes a great many entrances and even reflects himself in a mirror (see bars 24/25). The second subject, by contrast, portrays a gracious person, very much restrained, interrupting herself for long episodes. When these two very different characters intertwine in the third section, one of them obviously has to adapt. As it happens here, the soft and gentle “female” turns into an angry bitch, causing some of the worst clashes in the entire cycle - clashes that only subside as “she” leaves the scene (with bar 69) and “he” regains sole control.

The figure illustrates the structure of Hindemith's Fugue no. 4 in A from *Ludus Tonalis*. It consists of a graphic representation of the fugue's form and musical notation for the subjects.

Graphic Representation:

- Bars 1-18:** Subject 1 (SI) enters, followed by a pedal note (E¹). The subject is marked "pedal note" and "SI_{inv}".
- Bars 19-27:** Subject 1 (SI) continues, marked "SI_{inv}" and "SI_{inv}".
- Bars 28-36:** Subject 2 (SI²) enters, marked "SI²".
- Bars 37-44:** Subject 2 (SI²) continues, marked "SI²".
- Bars 45-57:** Subject 1 (SI) and Subject 2 (SI²) are combined, marked "SI²" and "SI_{inv}".
- Bars 58-75:** Subject 1 (SI) and Subject 2 (SI²) are combined, marked "SI_{inv}" and "SI_{inv}".

Musical Notation:

- SUBJECT 1:** Musical notation for Subject 1, marked "SI_{inv}" and "SI_{inv}".
- SUBJECT 2:** Musical notation for Subject 2, marked "SI²" and "SI²".
- SUBJ.1 / SUBJ.2 varied:** Musical notation for the combined section, marked "SI_{inv}" and "SI_{inv}".

Figure 6: Hindemith, *Ludus Tonalis*, Fugue no. 4 in A

The cycle's final fugue is a *stretto* fugue, featuring the subject always in overlay with itself. (*Stretto* means "contracted"; the device used is a regular overlap of two consecutive subject entries, whereby one is still unfolding when the 'head' of the other appears.) The *stretto* entries are separated by episodes. (For those who are interested: the overall design of this fugue creates some additional symmetries. The first half of the piece contains two pairs of entries in bars 1-8 followed by one pair in bars 11-14; the second half reverses the grouping, with one pair in bars 18-22 followed by two pairs in bars 26-33. Overriding this structural mirror symmetry there is translational symmetry in the way subject entries alternate with episodes. Both halves contain a single episode between the *stretto* entries, and both close with two shorter episodes. Musically, episodes 2a and 2b correspond with episodes 4a and 4b, thus corroborating this part of the symmetry.)

The subject swings very gently in nine-eighth time. The repeated attempt, as it were, to leave the initial C[#], the fifth of F[#], for the sixth degree of the minor scale, gives the fugue its particular color. This step would sound languishing in any compositional context; it does so all the more if it is followed not by the minor but by the major third. Later in the piece, the two identical episodes that conclude both halves play in a similarly subdued way with the major/minor modal interpretation of the central pitch F[#]. Thus Hindemith's tonal argument, ostensibly designed to conclude uncompromisingly on the pitch that is farthest removed from the cycle's central C, reveals second thoughts by presenting the piece on the tritone as the mellowest fugue of the entire *Ludus Tonalis*.

The figure displays musical notation and bar charts for Fugue no. 12 in F[#]. The top section shows a musical staff in 9/8 time with two entries of the subject, labeled (a) and (b), illustrating the *stretto* technique where entries overlap. Below the staff, the text "SUBJECT IN STRETTO" is written. The bottom section contains four bar charts arranged in a 2x2 grid, showing the distribution of subject entries (indicated by black bars) and episodes (indicated by white bars) across the 33 bars of the fugue. The charts are labeled with bar numbers: 1-14, 15-25, 26-33, and 34-41. The first chart (1-14) shows two pairs of entries in bars 1-8 and one pair in bars 11-14. The second chart (15-25) shows one pair in bars 18-22 and two pairs in bars 26-33. The third chart (26-33) shows one pair in bars 18-22 and two pairs in bars 26-33. The fourth chart (34-41) shows two pairs in bars 26-33 and one pair in bars 34-41.

Figure 7: Hindemith, *Ludus Tonalis*, Fugue no. 12 in F[#]

The fourth-from-last is a transformation fugue, in which the subject - a charming phrase reminiscent of Viennese classic style - undergoes a number of reflection processes. The first section presents it in each of the three voices in the original; the second section follows with three entries of the inverted shape, one of them (the third) overlaid with an extra entry of the original (see bars 25-29). Correspondingly, the third section introduces not only the next transformation, the retrograde, in all three voices, but concomitantly complicates the situation with a *stretto* (bars 34-38) and a juxtaposition of the retrograde with the original (bars 38-41). The fourth section is even more complex. It introduces the retrograde inversion which, however, wanders from one voice to another and appears in *stretto* as well as in overlay with the simple retrograde. The fifth section brings the climax, with two entries of the augmented subject (stretched to twice its length) set against part of an original entry and two inversions. The relaxation is given an entire section here, in which the simple state of the initial section, with exclusively original entries and no overlay, is reinstated.

The figure displays the musical notation and a schematic diagram for Hindemith's Fugue no. 9 in B $\flat$ from *Ludus Tonalis*. The musical notation at the top shows four staves: 'SUBJECT' (original), 'INVERSION' (inverted), 'RETROGRADE' (reversed), and 'RETROGRADE INVERSION' (reversed and inverted). The schematic diagram below illustrates the sequence of these transformations across 80 measures. The diagram uses black bars to represent the duration of each transformation and labels them as 'SUBJECT', 'INVERSION', 'RETROGRADE', and 'RETROGRADE INVERSION'. The sequence shows the original subject in measures 1-10, followed by its inversion in measures 11-20, then the retrograde in measures 21-30, and the retrograde inversion in measures 31-40. The diagram also shows the complex interplay of these transformations in the subsequent sections, including the climax and the final relaxation section.

Figure 8: Hindemith, *Ludus Tonalis*, Fugue no. 9 in B $\flat$

The second fugue comes in the unusual five-eight time and, launched from a five-fold *staccato* repetition and peaking in a syncopation, sounds very bouncy. It is structured in three sections, with a subdivision in the middle. The first section presents the subject itself and closes with a motif derived from the subject, thus staying very close to the original color. The two structurally corresponding halves of the second section each begin with a three-fold *stretto* (see bars 24-28 and 36-39); these are followed with unique and unrelated episodes that introduce three contrapuntally connected motifs that unfold in various vertical arrangements (see bars 29-34 and 40-45). The fugue's final section, having begin innocently enough with two separate entries that suggest a reprise, switch to two devices that are unusual in a fugue but very much in keeping with Hindemith's second incentive, that of a mischievous dance. First the middle voice gets locked in a repeated entry, thus powerfully increasing the dynamic intensity. Then, after a short link, the bass takes up the idea of repetition. However, it does so with an added extra "tail", with the result that each consecutive subject entry "arrives late" by one beat and one gets the impression that the boisterous playfulness inherent in the subject has completely taken over.

The figure displays musical notation for Fugue no. 2 in G by Hindemith. At the top, two short musical excerpts are shown: the first is labeled 'SUBJECT' and the second is labeled 'subject-derived motif (M4)'. Below these, a large musical score is presented, featuring a piano (pp) dynamic marking. The score includes a treble clef and a bass clef, with various musical notations such as notes, rests, and accidentals. The score is divided into sections, with bar numbers 1 through 76 indicated at the top. The notation includes a 'SUBJECT' label and a 'subject-derived motif (M4)' label. The score also features a 'pp' (piano) dynamic marking and a 'M3' label. The notation includes a treble clef and a bass clef, with various musical notations such as notes, rests, and accidentals. The score is divided into sections, with bar numbers 1 through 76 indicated at the top.

Figure 9: Hindemith, *Ludus Tonalis*, Fugue no. 2 in G

The fifth fugue is conceived as a gigue. The subject is based on the short-long, short-long rhythm that invariably reminds people of cobble-stoned streets and the jolting experienced in a carriage - or "gig" - when passing through them. The phrase is simply structured. Its sequenced broken chords, especially in their *staccato* version, provide material for the episodes. Although the fugue's two halves are not repeated as they would be in the traditional dance form, they are clearly set apart, and the fact that the first two subject entries in the second half are inverted is also reminiscent of the gigue.

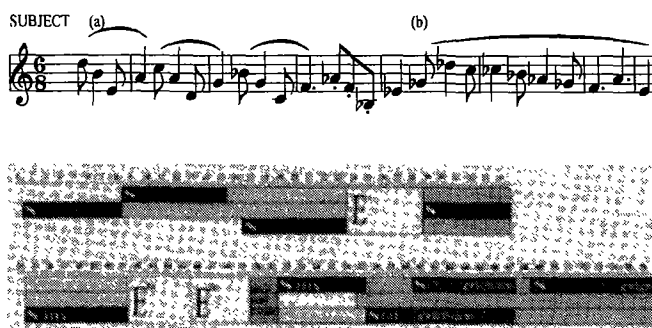


Figure 10: Hindemith, *Ludus Tonalis*, Fugue no. 5 in E

The fifth-from-last fugue sounds like yet another gleeful dance. Though notated with four-four time signature, its subject span of five quarter-notes and the consecutive entries after every fifth beat give the listener the impression that this piece is in five-four time. The character thus created is matched in the interval structure of the subject, which includes three perfect-fifth leaps and one leap of a major ninth, heard in this context as a "double perfect fifth" and thus underscoring the rambunctiousness of the dance. The persona that comes to mind here is a jester.

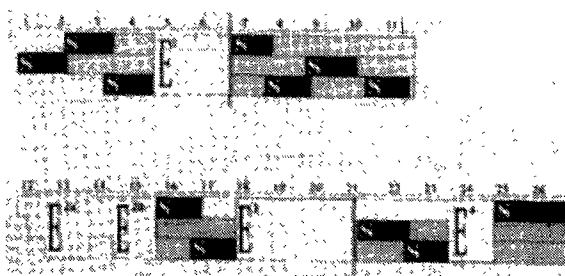
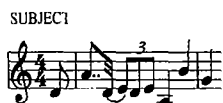


Figure 11:
Hindemith, *Ludus Tonalis*,
Fugue no. 8 in D

The fourth fugue in this group is not a fugue at all. It shares with the remaining eleven fugues the fact that it is contrapuntal and includes extensive imitative passages, and with the three fugues collected in my present group the fact that it is strongly metricized and thus in a way dance-like. This is achieved here by a bass line that does not take part in the contrapuntal interplay but contributes instead an accompaniment in almost entirely regular pulses. The throbbing sensation thus created is reminiscent of movement, though not necessarily in a style that the West considers dance.

Meanwhile, the middle and upper voices are engaged in a canon. Instead of the recurring thematic material in a fugue, this form presents a chain of motifs in one voice (here labeled a, b, c, c', d, d'), which is imitated at the distance of roughly the length of the first motif in the second voice. In the second half of the canon, Hindemith does not follow established practice to allow the originally imitating voice to lead, but keeps the original order when creating a slightly varied new chain (a, e, b'', b'''). As becomes obvious from looking at the letter-name representation of the motifs, "b" is by far the most prominent. With it, then, the most prominent figure is the syncopated half-note descent, circled in the score excerpt and marked in the graph by its characteristic *diminuendo* fork. With this figure, well-known in Renaissance rhetoric as a "sigh" and abundantly used in that sense especially in the German polyphonic Baroque, Hindemith seems to pay a special tribute to J. S. Bach.

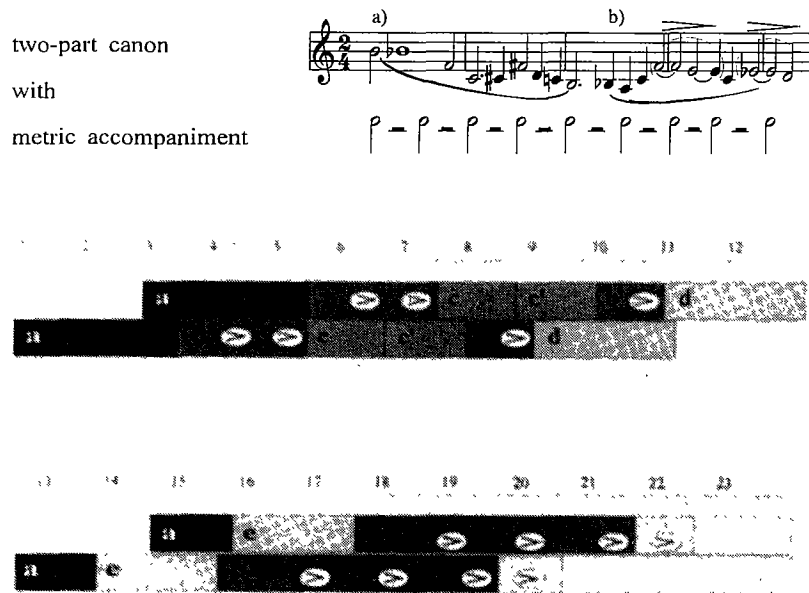


Figure 12: Hindemith, *Ludus Tonalis*, Fugue no. 11 (= canon) in B

The next pair of fugues I wish to discuss encompasses the two pieces that employ mirror reflection. The pace in this fugue is slow, the pitch pattern highly chromatic, and all notes are linked under *legato* slurs. (The persona thus represented can usefully be pictured as seeker.) The score excerpts below give both the subject and the main episode as they appear in each half of the fugue. They show that Hindemith reads the entire musical phrase backwards, retaining all rhythmic values. After three subject entries and an episode, as he approaches what is to be the middle of the piece, the composer adds an overlay of the subject inversion over the original form of the subject. The midpoint itself is marked by a little three-note gesture, sounding single-voiced and distinguished from the remainder of the piece by the sudden absence of the otherwise all-pervasive slurs.

The figure displays four musical staves and their corresponding piano keyboard diagrams. The top row shows the 'SUBJECT' and its 'SUBJ retrograde'. The bottom row shows the 'EPISODE' and its 'EPISODE retrograde'. Each staff features a melodic line with a slur. Below each staff is a piano keyboard diagram with the notes of the subject or episode highlighted. The 'SUBJ retrograde' and 'EPISODE retrograde' staves show the original melodic line reversed. Below the 'EPISODE retrograde' staff is a small three-note gesture.

Figure 13: Hindemith, *Ludus Tonalis*, Fugue no. 3 in F

In the third-from-last fugue, Hindemith employs the vertical mirror reflection. As the graph confirms, the first fifteen bars of the first section recur in direct correspondence in the second half; only towards the end of each half is there a very slight irregularity. (The fact that the first half is notated in D^b and the second half in $C^\sharp$ is probably a concession to performers; the second half written with D^b as a tonal center would have been crowded with accidentals, as would the first half on $C^\sharp$.) The character of this fugue is given as *grazioso*, and the gestures both in the subject and counter-subject and in the lovely episodes confirm this gracefulness.

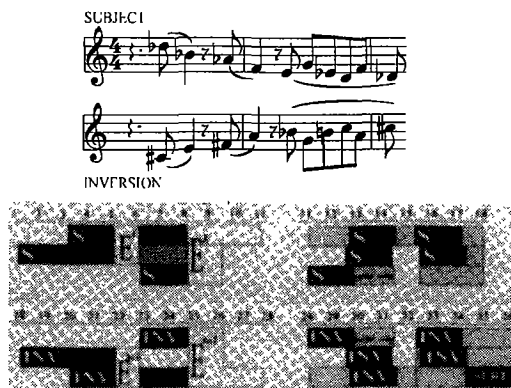


Figure 14: Hindemith, *Ludus Tonalis*, Fugue no. 10 in D[♭]

The two remaining fugues, central in the *LUDUS TONALIS*, share no structural, contrapuntal or rhythmic features, and thus create another gentle breaking of the symmetry within the layout of the cycle. Fugue no. 7 strikes us as a piece in Rococo fashion. This impression is achieved by the lilt of the many dotted-note rhythms and, especially in the two initial bars, the strikingly frequent return to the pitch B[♭]. One imagines an 18th-century courtier with white-powdered wig and black patent leather shoes, dancing towards his porcelain-faced, fragile-waisted lady.

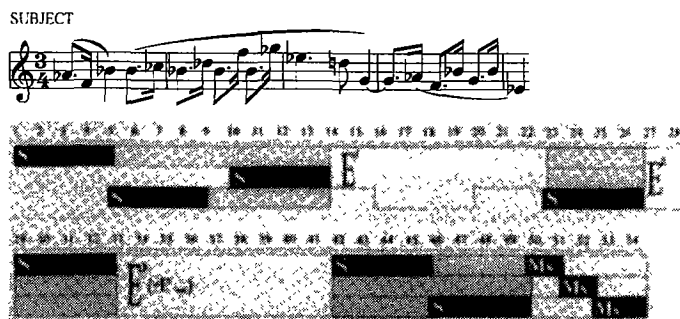


Figure 15: Hindemith, *Ludus Tonalis*, Fugue no. 7 in A[♭]

Fugue no. 6, despite its dense chromaticism (it employs all but one of the semitones between E[♭] and C), is heard as strikingly tonal in language. It contrasts the Rococo style of the other “dissymmetric” fugue with a distinctly Romantic mood. Where the subsequent piece is charming and coquettish, this fugue is dreamy. The melodic line is soothing and easily memorable, owing to the facts that its first motif is repeated in bar 2 and that these two bars are complemented with another two bars to form a very regular phrase. The structural layout of the piece is also unpretentious, so that the listener believes to have been led into a dream rather than into a three-part polyphonic composition.

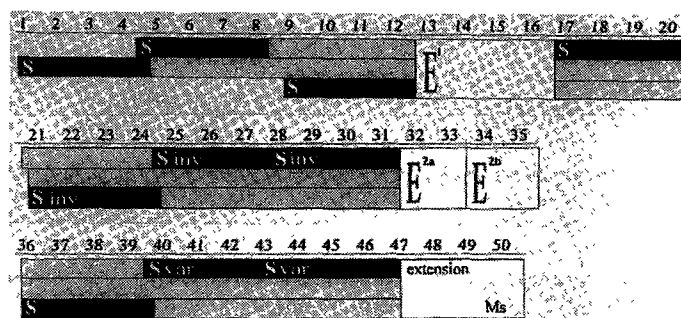


Figure 16: Hindemith, *Ludus Tonalis*, Fugue no. 6 in E^b

5. AFTERTHOUGHT

After this detailed discussion, it may surprise many readers to learn that Hindemith's *Ludus Tonalis* is not generally known as a play with symmetries! The curiosity that the postlude is a visual retrograde inversion of the prelude is regularly mentioned in the literature, and the two fugues using *mirror-reflection strike the eyes* (not the ears!) of most people who spend time with the score. However, all the other structural devices used by Hindemith for grouping the fugues, as well as the (to me) striking symmetry in the characterization of the interludes, is not established wisdom. Much less so the fact that what Hindemith created is not an artful yet lifeless construct of perfect man-made order, but a skillful mix of correspondence and deviation, regularity and freedom, symmetry and symmetry breaking. In the interludes, the switched order of the *pastorale/folk-dance* pair constitutes a gentle, almost tongue-in-cheek irregularity. In the fugues, the complete absence of any correspondence among the two central fugues appears as a conscious “no” to ultimate consistency.

At this point one wonders about the prelude-postlude relationship that seemed the strictest of them all. But here is the charm: the postlude, after having retraced the entire prelude upside-down and backwards, adds an “extra” chord at the very end. This unexpected C major chord, syncopated and suddenly hushed after the energetic *martellato*, should be translated as the composer's slightly mischievous smile.