A PHENOMENOLOGY OF "SHIMMER": *KLANGTYPEN* AND *ARPEGGIO* IN LIZA LIM'S *INVISIBILITY* (2009)

HAOTIAN YU

Existing literature on the music of Liza Lim (b. 1966, Australia) has centered on aspects of transculturalism (Lim's preferred term for ethnographically-inspired research as a foundation for new musical work) and radically collaborative composition.[1] Lim and Rutherford-Johnson identify the aesthetics of shimmer or brilliance—*bir'yun*, "an effect of flickering light or a pulsing aural quality" fundamental to traditional Yolngu art—as an important transcultural source in much of Lim's work from the 2000s.[2] This study examines the phenomenological structures of musical perception, as categorized by Helmut Lachenmann, that produce an aesthetic of shimmer in Lim's *Invisibility* (2009; for solo 'cello with two bows, dedicated to 'cellist Séverine Ballon). By phenomenological, I specifically mean that Lachenmann's tools of analysis, indebted to the thought of Husserl and Heidegger, form an analytical practice rooted in understanding the *structures of*

listening as an element of listening-in-time, rather than one that strictly identifies (abstract) *musical structure* as manifest in diverse single musical parameters. A phenomenological approach is employed here not least because a traditional parametrical analysis of *Invisibility* (for example, a pitch-structure analysis) would be ill-suited to addressing the perceptual polyphony associated with an aesthetic of shimmer: shimmer can be characterized as an overlap of differing activity in several parameters, indeed of competing or oscillating planes of perception. A useful analysis of shimmer, therefore, must take into account the perceived sum of the various parameters of musical activity, rather than the formal unfolding of a single, isolated parameter. By understanding how shimmer is phenomenologically manifest in *Invisibility*, we develop a concrete and technical framework for understanding how transcultural sources may be developed across the breadth of Lim's work.

EXAMPLE 1: THE GUIRO BOW

(still from "Liza Lim – Invisibility (2009)," video file, YouTube, posted by mondayeveningconcert, September 17, 2017, https://youtu.be/6jqNGQfil08.)

1. SHIMMER

Jennifer Deger identifies shimmer as a kind of *axis mundi*, a meeting point between visible and invisible worlds—a work which demonstrates shimmer suggests a numinous plane that underlies the tangible world.[3] In the Yolngu worldview, the visible world is "flecked with light" from the numinous plane; ancestral light "break[s] open the surface of the visible."[4] Visually, this may manifest in transient and layered phenomena, such as grain, line, and superimposition: effects which suggest the layering of (or a depth of) complementary realities and planes of

sensation.[5] Major Aboriginal visual artists working within this aesthetic framework include Gawarrin Gumana, Uni Nampijinpa Martin, and Wally Mandarrk.[6] In *Invisibility*, a straightforward example of shimmer is the implementation of the "serrated" guiro bow, one of two bows called for in the piece. (See Example 1.)

The guiro bow entails bow hair wrapped (according to the score's front matter) "around the length of the bow stick in a spiral," thereby superimposing two sound-producing media which alternate fluidly and unpredictably when the bow is drawn across the strings. We could interpret the bow stick to represent the continuous presence of the visible world, and the bow hair spiral, which irregularly "breaks through" this continuity, to be the aforementioned "flecks of light" from the numinous realm (although an interpretation this literal may seem somewhat heavy-handed, it serves to illustrate the realization of shimmer in its most direct guise).

Comparably direct superimpositions—for instance, the superimposition of two contrasting rhythms (polyrhythm) in m. 45 and elsewhere—can all be considered variant examples of shimmer in *Invisibility*. However, these simple parametrical superimpositions (a pair of overlapping rhythms, timbres, or pitches) can only describe single sonorities or events, without taking into account temporal/formal context and without considering sound events which unfold simultaneously through several parameters. A phenomenological approach, on the other hand, considers both how successions of gestures, at the level of our time-based experience of the piece (whether in sections and segments or as a continual unfolding), can also manifest shimmer, and how parametrically-layered sound events can be heard as networks/assemblages of perceptual archetypes.

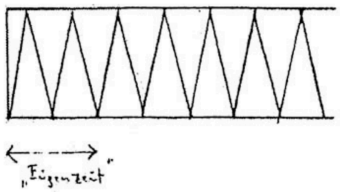
2. LACHENMANN'S *KLANGTYPEN*

In "Klangtypen der Neuen Musik" ("Sound-types for New Music," 1966), Lachenmann proposes a phenomenological lexicon for music analysis based on a dual taxonomy of gesture, in which a musical event can either represent sound as process or sound as object.[7] Although Lachenmann, to my knowledge, has never explicitly described his compositional/analytical approach as a phenomenological one, Laurence Osborn's paper on Lachenmann's only opera refers to Lachenmann's "phenomenology of sound" as an attempt to escape "cultural baggage" and create music "tied to the perceptual and cognitive capacities of listeners."[8] Additionally, *musique concrète*—to which Lachenmann, as a practitioner of *musique concrète instrumentale*, is indebted[9]—has a notably Husserlian philosophical foundation, as Demers notes.[10] In any case, Lachenmann's is a phenomenological mode of analysis in two important senses. First, Lachenmann's approach to structure as *Strukturklang* (discussed below) centers on music as temporal experience; second, Lachenmann's analytical lexicon is non-parametrical—as such, it "brackets out," in a typically

Husserlian fashion, the particular aesthetics of a given historical period or culture that would inevitably color a parametrical analysis (beginning with the choice of parameter[s] itself). [11] Ming Tsao's "Helmut Lachenmann's 'Sound Types'" provides a comprehensive discussion (in English) of Lachenmann's lexicon and applies it in an analysis of Lachenmann's own first string quartet, *Gran Torso*.[12] For the purposes of this paper, however, I will briefly resummarize the lexicon here, with a particular emphasis on those aspects of Lachenmann's analytical vocabulary which are especially pertinent to *Invisibility*.

Sound events can be categorized as process or object by comparing their *Eigenzeit*—that is, their self-time, the time it takes for the identity and characteristics of the sound event to be perceived—with their real duration. Sound as process has an identical *Eigenzeit* and real duration, such that the identity and characteristics of a sound event are continuously unfolding and evolving throughout its duration[13] (the identity and characteristics should evolve in a perceptibly consequential way, although in such a definition we already introduce the seeds of ambiguity that give Lachenmann's lexicon a useful flexibility). In other words, the total duration of the sound event is a single process of cadence, of resolution: in the most literal form, a *Kadenzklang* (cadence sound). An example of *Kadenzklang* is *Impulsklang* (impulse sound), in which an attack or series of attacks (*Einschwingklang*) produces a resonance (*Ausschwingklang*). Furthermore, this can be a physically real *Impulsklang*, like a single piano note allowed to decay naturally, or a synthesized one, in which a number of instruments, performing an orchestrated gesture, simulate the envelope of a physical impulse, *Ausschwingklang* included (in this case, some kind of simulated resonance).[14] Sound as object, on the other hand, has an *Eigenzeit* which is notably shorter than its real duration, such that the significant identity and characteristics of the sound event are perceived long before the event's actual end.[15] The simplest kind of sound as object is the *Farbklang*, a single sonority (a clarinet multiphonic, a violin harmonic, an organ chord) held for a significant duration. At a certain approximate point, this sonority no longer presents new information, new unfolding: it becomes an object, a fixed entity. A more complex variant of this is the *Fluktuationsklang* (fluctuation sound), in which this fixed identity might be articulated as a fluctuation at the local level. (See Example 2.) For instance, in the case of a sustained chord, a *Fluktuationsklang* might entail this chord being continually arpeggiated. In the case of the even more complex *Texturklang*, any number of elements might occur, but these are perceived as a homogenous static cloud. In other words, there is such a saturation of sound density or such a homogeneity of sound identity in *Texturklang* that the assemblage blurs into a field.[16] Finally, in the *Strukturklang*, the structure sound, formal and sonic presentation occur simultaneously. Lachenmann applies a *Strukturklang*-based approach to analyses of Beethoven, Webern, and his own work in "Hören ist wehrlos ohne

hören"[17] (Hearing is Defenseless without Listening"): in essence, in Strukturklang, new sonorities recontextualize and triangulate past sound events, forming a network, gradually articulated in time, of relations. In this case, the *Eigenzeit*—the time necessary to perceive the global network of sonorities—is equal to the real time of the structure.[18]



EXAMPLE 2: A SCHEMATIC DRAWING OF *FLUKTUATIONSKLANG*

(Lachenmann, "Klangtypen der Neuen Musik" in *Musik als Existentielle Erfahrung,* 11)

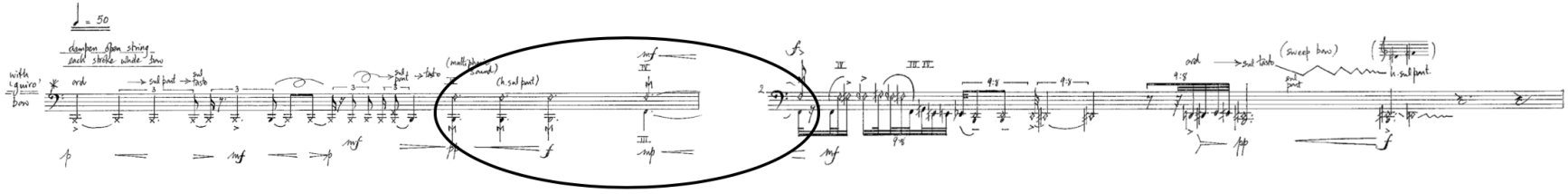
Lachenmann's system of *Klangtypen*, like a true phenomenological system of analysis, is anti-reductionist; his basic categories are not closed species but rather permeable archetypes. For instance, consider a rhythmic acceleration on a single pitch: the *Eigenzeit* proper of the acceleration lasts until the end of the acceleration (until the process plays itself out). Yet, the identity of the process, the characteristic of acceleration, can be perceived before the end of the acceleration proper. This kind of ambiguity, in the correct context, can create a sound event which oscillates or modulates between several *Klangtypen*. The perceptual shimmer of such an oscillation is akin to the effect of layering and depth, engendered by superimposed line and grain, in Yolngu visual media. Indeed, as will be discussed below, *Invisibility* is viscerally experienced (with a few notable breaks) as a complex surface formed by ephemeral and extremely layered sound events: a complex surface in which the ear is rarely able to ground itself in a single *Klangtyp*. This immediate surface of seething, perceptually complex sound events is then superimposed with a polyphony of structural processes, which themselves overlap to form a depth of structural significance for any given sound event.

3. GESTURAL ANALYSIS (MM. 1-2)

In considering several gestures in the first subsection of the piece (mm. 1-2), a segment of continuous music delineated on both ends by silence, one can identify how modulations between or superimpositions of various *Klangtypen*, in addition to overarching structural layerings, create a complex experience of shimmer. Lim notes in the front matter that *Invisibility* "is a study in flickering modulations between states of relative opacity/dullness and transparency/brightness, between resistance (noise, multiphonics and other distorted sounds) and ease of flow (harmonics, clear sonorities)." This first subsection (mm. 1-2) is characterized by a movement from resistance (the opening repeated note, which consists of noise produced by a dampened string) to clarity (natural harmonics and "normal" tones, particularly the rapid flickering of natural harmonics in the first two beats of m. 2); the multiphonics in m. 1 are an intermediary timbre, with characteristics of both. (See Example 3.) This is, in effect, a local *Strukturklang*, a process of timbral unfolding: the *Klangtypen* that manifest in the moment-to-moment unfolding of single sound events in this subsection are, therefore, already superimposed with their particular structural significance in the overarching *Strukturklang*.

The opening "repeated note" figure superimposes at least four *Klangtypen* and is an example of how a single sound event can create a depth of perception (i.e. a quality of shimmer) via superimposition. (See Example 4.) First, each rhythmic event is to be played with the whole bow. (See Example 4, A.) On the purely gestural level, what we perceive, therefore, is a series of *Kadenzklänge*: single gestures, of organic durations and envelopes determined by the length and shape of the bow. Second, the guiro bow employed produces a timbre best described as a stream of grains. This gestalt is primarily achieved via the irregular periodic interruptions caused by the wound bow hairs. (See Example 4, B.) What this means, perceptually, is a *Farbklang*: we perceive the identity of this sonority—a stream of grains over a fixed bandwidth noise (the noise being the sound of the dampened string)—before the stream of grains itself ends. Third, this repeated note figure is animated by an underlying rhythmic acceleration. (Example 4, C.) As already discussed, accelerations are phenomenologically somewhere between a *Fluktuationsklang* and a *Strukturklang*, since the *actual* unfolding of the process outlasts the time it takes to perceive the process of acceleration itself as an object. Fourthly, the acceleration is highly irregular, rather than straightforwardly linear. A linear acceleration might be perceived more readily as an object—thus tending towards *Fluktuationsklang*—because the process of acceleration becomes predictable early on in the actual process; an irregular acceleration, on the other hand, is particularly ambiguous. As such, this initial figure superimposes the gestural *Kadenzklang* of the single whole bow strokes, the *Farbklang* of the guiro-bow grains, and the ambiguous *Fluktua-*

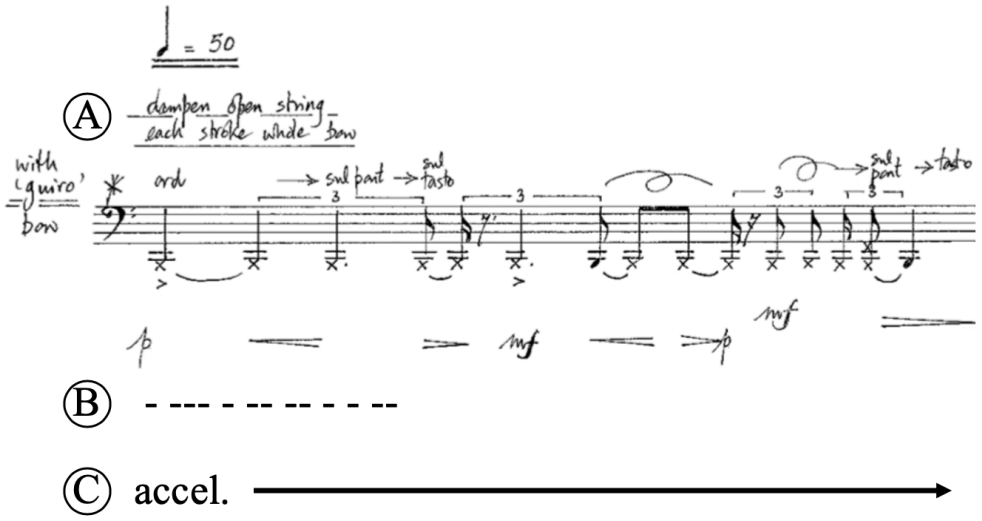
resistant noise – dampened string → clarity – clear pitches/harmonics



multiphonics as intermediary timbre

EXAMPLE 3

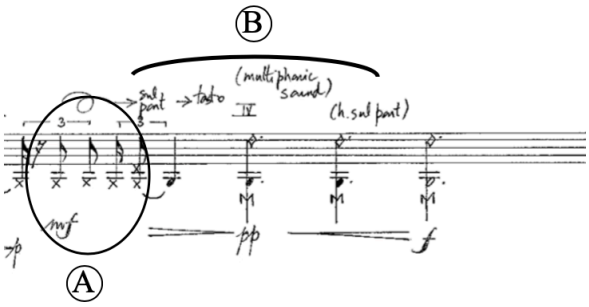
tionsklang and *Strukturklang* oscillation of the underlying irregular acceleration to create a perceptually unstable conglomerate.



EXAMPLE 4

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: annotated excerpt from m. 1.

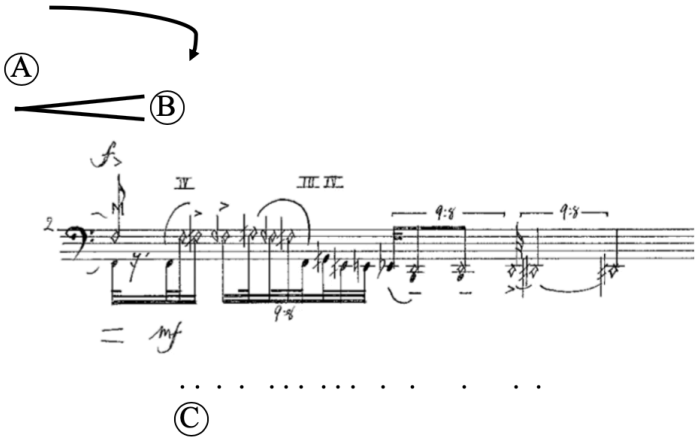
In the context of the *Strukturklang* formed by this first subsection, the multiphonic is an intermediary timbre in an overarching timbral trajectory: that is, in a string multiphonic of this kind, especially in combination with the guiro bow, the unstable high harmonics oscillate rapidly with the fundamental pitch[19] (these two timbres, a low fundamental pitch and flickering high partials, mark the beginning and end of this subsection, respectively). This formal context overlaps with a more immediate local *Klangtyp*: the multiphonic emerges as simulated resonance, *pianissimo*, from the preceding *mezzo forte* attack. (See Example 5.) This is an *Impulsklang*, with the *mezzo forte* attack an *Einschwingklang* (Example 5, A), and the multiphonic following as *Ausschwingklang* (Example 5, B). The multiphonic, therefore, superimposes a local *Klangtyp* with a contrasting structural significance, producing a layering of meanings that oscillates between two temporal scales.



EXAMPLE 5

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: annotated excerpt from m. 1.

The flickering run of natural harmonics in the first two beats of m. 2 superimposes several local *Klangtypen*, which are in turn layered with this passage's structural significance in the overall *Strukturklang*. (See Example 6.) This flourish is the first instance of harmonics in the piece thus far (harmonics, according to Lim's dichotomy of resistance vs. ease of flow, being a "clear" sound), and thus represents the culmination of the local Strukturklang's characteristic movement from resistant noise to flowing harmonics. The flourish simultaneously presents at least three superimposed *Klangtypen*. First, the "outburst" nature of this gesture (Example 6, A)—the *mezzo forte* dynamic, the sudden increase in note density—can be interpreted as an *Impulsklang*: the *Einschwingklang* being the initial flurry of natural harmonics culminating from the preceding crescendo (the crescendo beginning at the very end of m. 1; Example 6, B); the *Ausschwingklang* the simulated decay of the subsequent rhythmic deceleration (a simulated dissipation of energy; Example 6, C). Second, the gesture can be broken down into two oscillatory figures: a harmonic flickering around the F3 node on the B string, and microtonal movement about an octave below. This gesture could, therefore, be heard as two very brief *Fluktuationsklänge*, of which the most salient feature is an identity of "oscillation." Finally, the guiro bow obscures the articulation of these individual movements, such that the effect is somewhat comparable to a hybrid glissando/oscillation gesture. The *Fluktuationsklang* of the discrete pitches, in this case, is heard gesturally as a sliding, nebulous *Kadenzklang*. Thus, by considering this initial subsection (mm. 1-2), it is evident that the superimposition of varying *Klangtypen*, whether accomplished within a given gesture or contextually in relation to an overarching *Strukturklang*, can create a shimmer effect not unlike the effect of layering, striation, and grain in visual media.



EXAMPLE 6

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: annotated excerpt from m. 2.

4. *ARPEGGIO*

In "Hören ist wehrlos ohne Hören," Lachenmann describes musical form phenomenologically as an *Arpeggio* (an extension of the notion of *Strukturklang*), in which sound-character and sound-structure are inseparable.[20] This contrasts with parametrical forms of analysis (the most generic example being the pitch-centric Schenkerian mode) in which an underlying form is abstracted from the immediate experiential space of listening. In Lachenmann's *Strukturklang*, the entire baggage of listening—especially intuitive connections and suggestive connotations—are considered as integral to the formal experience.[21]

A piece demonstrating *Arpeggio*, for Lachenmann, can be likened to a virtual harp glissando (a scalar arpeggio), in which the strings of the harp are the chronological sequence of sound events in the piece. The harp is a metaphor for an "imaginary sound-form-instrument built specifically by the composer."[22] There are two significant and related aspects to this metaphor. First, the *Arpeggio* unfolds in time as a linear process; our immediate impression of form as listening-in-time is quasi-narrative (a chronological series of sound events). Second, the form of the glissando is not merely this linear movement but also, simultaneously, the content communicated by the strings of the virtual harp—the strings on a real harp being a

deliberately ordered series of intervals, a structured pattern of recurring pitches—revealed in the process of glissando. The strings of this virtual harp, however, are not merely pitches, as in a literal scalar glissando, but a series of successive sound events (with all of their inherent complexity). If we consider a piece as an *Arpeggio*, we therefore understand it as a linear revealing/unfolding (structure-sound) of an ordered structure (sound-structure), which in itself contains a latent, complex network of references and connections. Each new sound reveals new strings of this virtual harp, filling out this network and recontextualizing preceding material.

Within this *Arpeggio*, a single string may contain a multiplicity of superimposed structural significances: this polyphony of significance may unfold and articulate itself over time—that is, new sound events retrospectively adding new meaning to past sound events. Furthermore, *Strukturklänge* exist at various temporal scales, from the largest formal level (the entire piece) to passages of a few measures. In this network of relations, a single sound event may have a multiplicity of different and, indeed, contradictory structural meanings. In this sense, in a structure of *Arpeggio*, the layering and superimposition of structural meanings may imbue a sound event with shimmer: perceptually, the sound event has an apparent ability to both oscillate between different time scales and to transform over time as new meanings are accumulated.

5. FORMAL ANALYSIS (MM. 1-30)

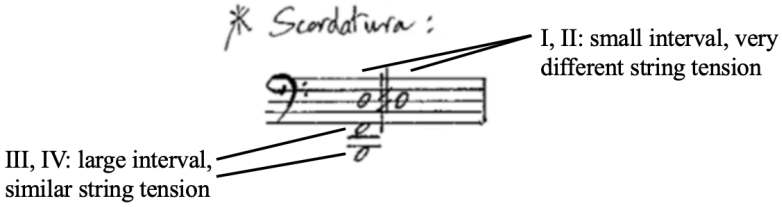
The simultaneous uncovering and recontextualizing that characterizes an *Arpeggio*-form is manifest in *Invisibility* at the largest formal level of sectional divisions. The piece is divided into three large sections which together produce an additive form: an initial section played with the guiro bow (mm. 1-30), a second section played with the normal bow (mm. 31-53), and a final section played with both bows (mm. 54-61). On one level, this additive form embodies the concept of superimposition so central to the aesthetic of shimmer, with the final section superimposing the two preceding sonic planes. However, this form also embodies *Arpeggio* in that the final section recontextualizes and triangulates the initial two sections. Although this is a rather pedantic comparison, one can liken an experience of the additive form to an implied mathematical equation, with the two single-bowed sections corresponding to two integers—let us say 1 and 3. The precise relationship between these two integers can only be guessed until a third integer, 4, elucidates the overarching equation. *Arpeggio*, therefore, simultaneously entails sound events creating context for future sound events (in this case, the integers 1 and 3 creating a certain set of expectations for the third integer) and new sound events recontextualizing past sound events (in this case, the third integer defining the

relationship between the initial two integers). This Janus-like structural function of sound events is in constant play in *Invisibility.*

In the first "integer" of this additive form, or, in other words, in the guiro bow section (mm. 1-30; I will be, from this point forward, referring to these three different bow sections simply as "sections"), we have several processes of revealing, including one in which the expressive possibilities of the *upper two strings* gradually unfold, such that the section itself can be characterized as a *Strukturklang*. Already, the unfolding of this smaller *Strukturklang* is superimposed with the overall additive form. I should note here that, although the front matter notes that the radical scordatura B-F-D-D♯ creates a differentiated geography of tension on the four strings, the varying string tensions manifest, in the piece, as paired strings. (See Example 7.) First, in considering the string tensions, the lower strings are both tuned down by a similar degree of tension, such that they are of comparable tension; the higher strings are of vastly differing tension. Second, in terms of pitch space, the lower strings are spaced widely apart, whereas the upper strings are spaced only a semitone apart. Therefore, in *Invisibility*, the gradual movement into the upper strings is not merely an expansion of register but a revealing of the inherent physical tensions of the instrumental setup. These contrasting tensions are foregrounded by the prevalence of open string notes and natural harmonics throughout the piece (the latter both because harmonics speak differently on strings with differing tensions, and because the spacing of matching partials on each string follows the same spacing as the open strings). In this sense, we have two important physical dichotomies—that of the guiro and regular bow, and that of the upper and lower string pairs.

This first section (again, itself a *Strukturklang*), mm. 1-30, is divided experientially into subsections, each framed by significant silences. In the overall formal *Arpeggio* of this section, we can consider each of these silence-delineated subsections as a single string—alternatively, we can use Lachenmann's terminology and describe each of these subsections, which themselves contain a whole succession of shorter sound events (*Kadenzklänge*, *Fluktuationsklänge*, and the like), as a *string bundle*. According to Lachenmann, "perhaps many of [the] imaginary strings" on his metaphorical arpeggio-harp "would consist, for their part, of little sub-instruments, practically of string bundles."[23] For Lachenmann, these bundles might refer to subordinate *Strukturklänge* (each an instrument within an instrument, or a piece within a piece); consider, for example, how a sixteen-measure binary form might appear as a piece-within-a-piece in a longer Mozart sonata form. In *Invisibility*, there is considerable structural transparency. Each of these subordinate *Strukurklänge*, in general, is separated from the others by significant notated silences. The majority of these subsections can be characterized as bundles because they contain their own particular formal unfoldings; we have already discussed how the

first bundle, for instance, outlines a self-contained timbral trajectory. (See Example 8.)

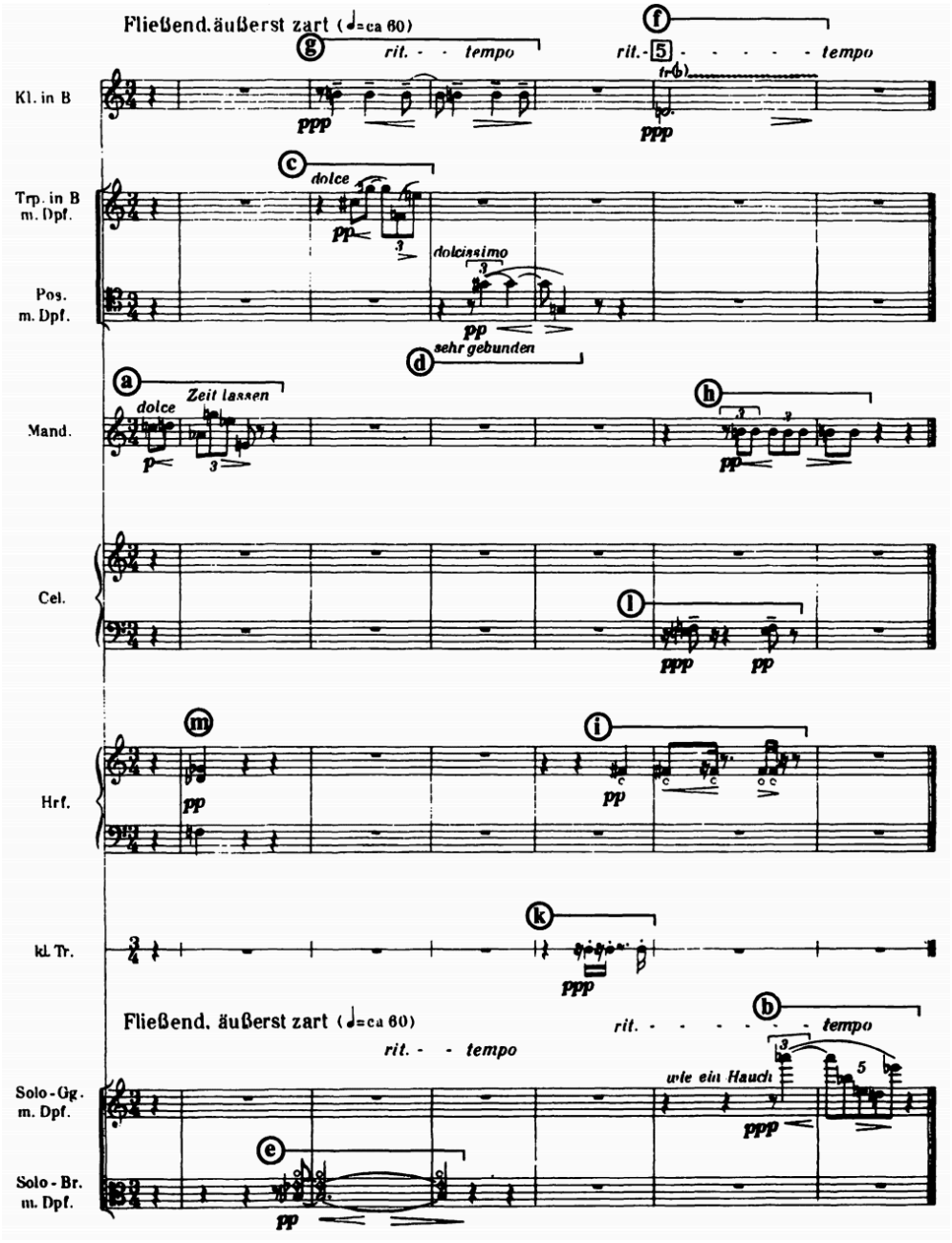


EXAMPLE 7

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: annotated scordatura diagram (front matter).

1 (mm. 1-2)
2 (mm. 3-9)
3 (mm. 10-11)
4 (mm. 12-17)
5 (mm. 18-20)
6 (m. 21)
7 (mm. 22-30)

EXAMPLE 8: BUNDLE DIVISIONS IN THE FIRST SECTION (MM. 1-30)



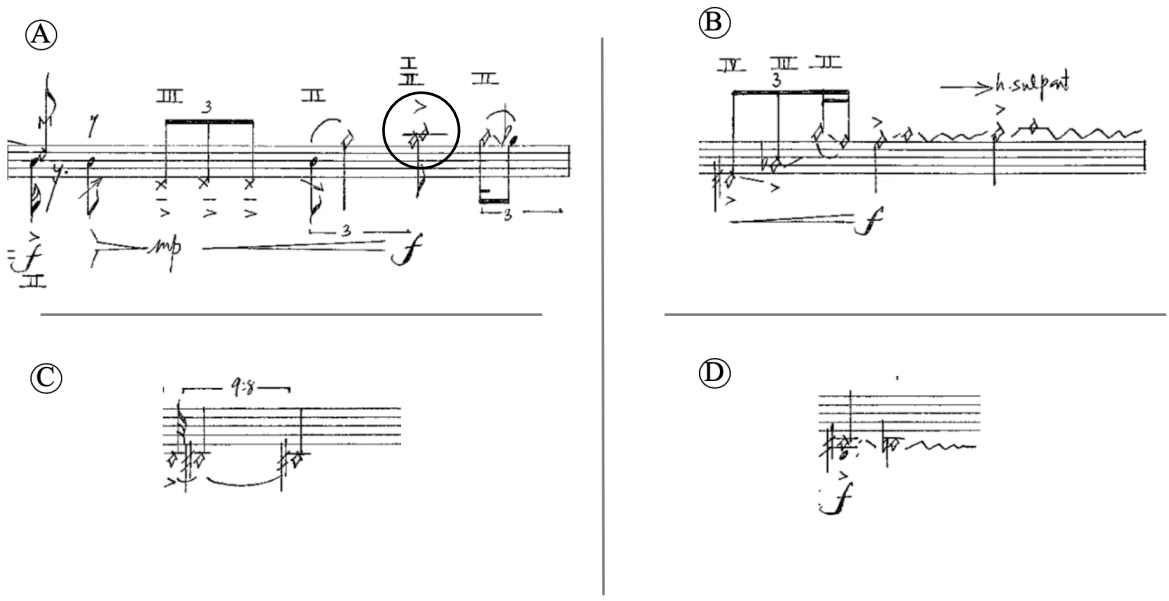
EXAMPLE 9: ANTON WEBERN: NO. 4, FROM 5 PIECES FOR ORCHESTRA, OP. 10, WITH ANALYSIS BY HELMUT LACHENMANN. THE ELEMENTS AT M AND E ARE CONSIDERED ZERO-POINTS, IN WHICH THE MELODIC FIGURE (A, B, C, D) AND REPEATED (GENERALLY IRREGULAR) RHYTHM FIGURE (F, G, H, I, K, L) CATEGORIES ARE BRIDGED.

(see Lachenmann, “Hearing is Defenseless,” 34)

In the first bundle (mm. 1-2), discussed in the gestural analysis section of this paper, all of the sounds are generated on the lower two strings. On the one hand, this is, of course, a ground zero, a point of nil, for the upper two strings. Zero-points are an important element of Lachenmann's analytical vocabulary. Lachenmann writes that "there are events that despite all difference between them are nonetheless mutually bound to a single character, a sound idea that links them." In other words, sound events that are reduced to an absolute (a single note, for instance, being the absolute zero point of the category we could describe as "melody") become pivot points into other categories of sound events: in his analysis of Webern's op. 10, no. 4 Piece for Orchestra, Lachenmann notes how a plucked harp chord and a sustained viola note could simultaneously both be heard as the zero-point of a melodic figure category and the zero-point of a repeated note category, these being the two major categories of sound events in the piece.[24] (See Example 9.) The zero point, therefore, becomes a bridge between the two "families" of sound events[25] (note that when I employ the terms zero-point and maximum-point, these are only differentiated for the sake of written clarity, not because there is a real perceptual difference: a zero-point becomes a maximum point when viewed from the other side of the continuum, and vice versa). But even in the absence of the upper two strings, the first bundle actually summarizes much of the structural development to occur in this first section, as will be elucidated in the following discussion. Consider three defining aspects of this opening bundle: first, the aforementioned movement from opacity to clarity, which maps on to an overall change in timbral "groupings" in the entire mm. 1-30 section; second, the movement from the low to high register, especially the outburst in beat two of m. 2, which, though collapsing to the low register almost immediately, is an initial "striving" or "yearning" for the upper strings (the upper strings, which become increasingly prevalent throughout mm. 1-30); third, the movement from stasis to fluidity, with the figure in beat two of m. 2 representing a local culmination of this movement—a similar movement from stasis to fluidity also characterizes material in the upper strings from mm. 1-30. Thus, the opening bundle of *Invisibility* presents several experiential continua through which the unfolding of the piece is experienced. These "premonitions" retrospectively add several layers of structural significance to this opening bundle, which initially manifests as a seemingly independent *Strukturklang*; these retrospective layerings accumulate over time, representing a kind of structural shimmer.

The second bundle (mm. 3-9) is predominantly low string material, with two very brief ventures into the high string pair. (See Example 10, A and B.) Note that these two high string passages echo material from the first bundle (mm. 1-2): namely, the accented harmonic and "node vibrato" (rapid natural harmonic glissando) heard here are first associated with the D2 and D♯2 nodes on string IV in the first bundle (m. 2; Example 10, C and D)—and, indeed, in the same order there as here. Because

the natural harmonics in the first bundle arrive as the culmination of a transition from resistance to ease of flow and now appear (transformed) in the second bundle as our first introduction to the upper strings, our recollection of the first bundle is recontextualized, such that the entire bundle can be heard as a "striving" for the ascension to the upper strings finally achieved in the second bundle. Additionally, both of these incursions in the second bundle occur near the same nodal area: indeed, the major sixth nodes on the first and second string occur consistently, to the extent that the string I and II natural harmonic dyad can be labeled, as Rutherford-Johnson notes, a motif.[26] But such a term hardly captures the multiplicity of experiences contained in the various appearances of this dyad to have a place in a phenomenological analysis. Indeed, Rutherford-Johnson argues against the motif label, suggesting that the repeated appearance of this dyad is a demonstration of the physical instrumental apparatus: the two harmonic nodes are located on the same place on both strings, but the difference in tension produces harmonics which speak very differently when activated by the same bow. As such, this is a demonstration of the aforementioned duality of tension established by the scordatura[27]— it is perhaps consequential that no double stop harmonics are ever employed on strings IV and III in the entire section. Equally important, the first double harmonic in the upper strings (a single, sustained dyad) is a zero point of stasis. As the piece unfolds, the material in the upper two strings gradually evolves towards increasing fluidity, beginning from this extremely static zero point (by fluidity, I specifically mean the degree to which the pitch space is either highly discrete, as in the case of a fixed note, or highly fluid, as in the case of pitch glissando—with microtonal scalar motion, for instance, being an example of high fluidity). Finally, with regards to Lim's established timbral duality of resistance vs. flow, this second bundle is saturated with rapid changes between the two timbral states. Whereas the first bundle was a gradual progression from resistance to flow, the second subsection is a kind of mosaic, in which resistance, flow and intermediary timbres alternate abruptly. Note, for instance, the sound events in mm. 6-7: noisy, dampened string bow strokes and clear harmonics alternating in quick succession, often within the same beat. What is important to note here, in terms of shimmer, is that several independent processes are simultaneously unfolding, and their unfolding is by no means aligned. For instance, while the two upper string passages in this second bundle evolve (with little morphological change) from their predecessors in the first bundle, the totally chaotic distribution of timbre (that is, of resistant and clear timbres) in the second bundle contrasts violently with the very gradual unfolding of timbre that characterizes the first bundle. Therefore, this passage oscillates between several very different structural dimensions—a superimposition of non-aligned processes again demonstrating structural shimmer.

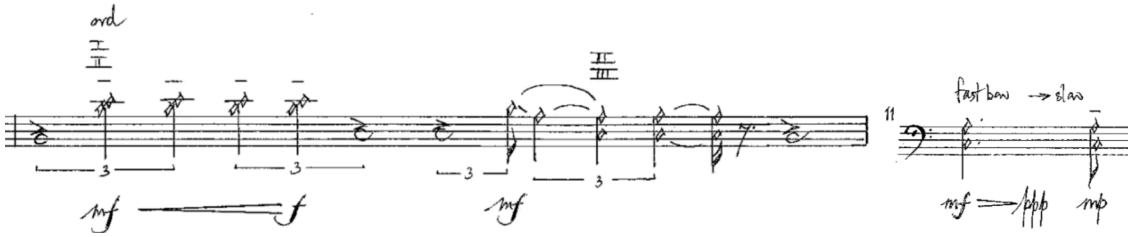


EXAMPLE 10

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: excerpts from A, m. 6; B, m. 9; C and D, m. 2.

The third bundle (mm. 10-11) is one of four very short subsections in the piece (together with m. 21, m. 39, and m. 40) that would probably be better characterized as single strings, as they are hardly *Strukturklänge* in their own right. (See Example 11.) These relatively simple bundles (simple compared to the saturation of activity that characterizes neighboring bundles) are particularly salient in our experience of the form, articulated, as they are, by the long silences preceding and succeeding them, by their relative simplicity/transparency, and by their brevity. This third bundle, the first of these short bundles, is a structurally charged passage. First, it isolates the harmonic dyad first introduced in the second bundle (mm. 3-9), showing this important zero point in isolation. Second, the simplicity of this bundle and the subsequent short bundles present another kind of transparency or ease of flow, but now on a continuum of parsability. Parsability, in the context of Lachenmann's *Strukturklang*, can be considered in the context of *Klangtypen* and the complexity of their superimpositions. Here, unlike virtually anywhere else in the piece, there is a single *Klangtyp*—a regular repetition of an unchanging harmonic dyad (again, there is no local *Strukturklang* at work here: no network of connections and continua, but

a single timbre presented as a *Farbklang*). This, and the other three short bundles, in this very different sense, represent a flickering of light in an otherwise dense, "overgrown" musical foliage. Finally, as an entire bundle without any kind of noise timbre, this third bundle represents the maximum point of flow in Lim's resistance vs. ease of flow duality: in effect, another zero point. Like in the aforementioned Webern analysis by Lachenmann, the zero point here becomes a bridge between various experiential continua. The harmonic dyad here is simultaneously a zero point in terms of the resistance/flow duality and a zero point in terms of upper string fluidity. Of course, this also means that in such a zero point, several structural meanings can be superimposed, creating a brief moment of shimmer.

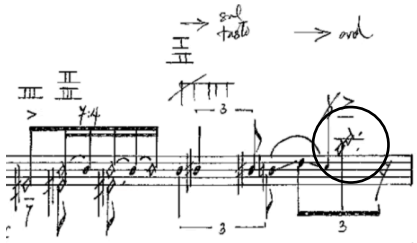


EXAMPLE 11

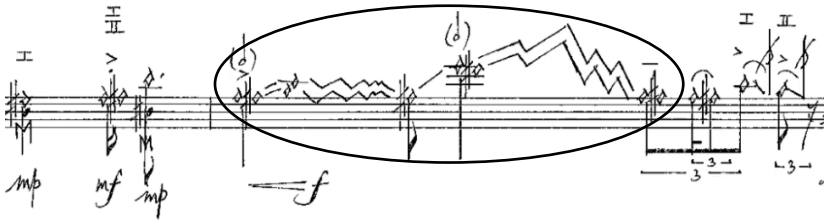
Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: excerpts from mm. 10-11.

In effect, this short bundle interrupts the organic temporal flow of listening; the fourth bundle (mm. 12-17) begins with the same pitch configuration as the second bundle (mm. 3-9), so as to reestablish continuity. As a whole, it can be heard as a continuation of the processes already at work in the second bundle. There is, for instance, an increase in and a diversification of high string material: notably, the two most prominent upper string gestures remain derived from the initial dyad, and, moreover, in the precise order of accent and oscillation, with the latter erupting in a dramatic natural harmonic glissando. (See Example 12.) This introduces what seems like an abrupt increase in fluidity (keeping in mind the process of increasing fluidity in the upper strings that characterizes the entire first section) but is still not far from the initial zero point of the harmonic dyad: a natural harmonic glissando is not a real pitch glissando per se but rather an oscillation around various different harmonics (a movement in discrete pitch space). This fourth bundle, however, is not nearly as saturated with timbral change as the second bundle. Significantly, the only unpitched noise sounds, the gritty slow bow (Example 13, B) and the bow sweep (Example 13,

A), are relatively brief. Following the zero point of maximal clarity in the third bundle (mm. 10-11), this scarcity of noise can be heard as a reversal of the second string bundle: the two tentative, ephemeral incursions into the upper string territory in the second bundle are analogous to the two likewise ephemeral forays into the territory of resistance/noise in this fourth bundle. One might go so far as to say that the bow slide and slow bow, as *Kadenzklang* and *Fluktuationsklang*/*Farbklang*, correspond to the second bundle's harmonic accent and harmonic oscillation, respectively (although appearing in this fourth bundle in reverse order). (See Example 13, C and D.) Moreover, the initial "phrase" (all of m. 12) of this bundle is, similarly, a "translation" of the first bundle. That is, in contrast to the abrupt juxtapositions of the second bundle, this first "phrase" of the fourth bundle begins on the fourth string and gradually feels its way across the four strings, culminating with the harmonic dyad. This gradual transformation from low strings to high strings replicates the gradual movement from resistance to flow in the first bundle. This is, first, a continuation of the structural shimmer of the second bundle and its unfolding of several asynchronous processes; at the same time, these processes are layered with references to previous bundles, representing a kind of temporal shimmer.

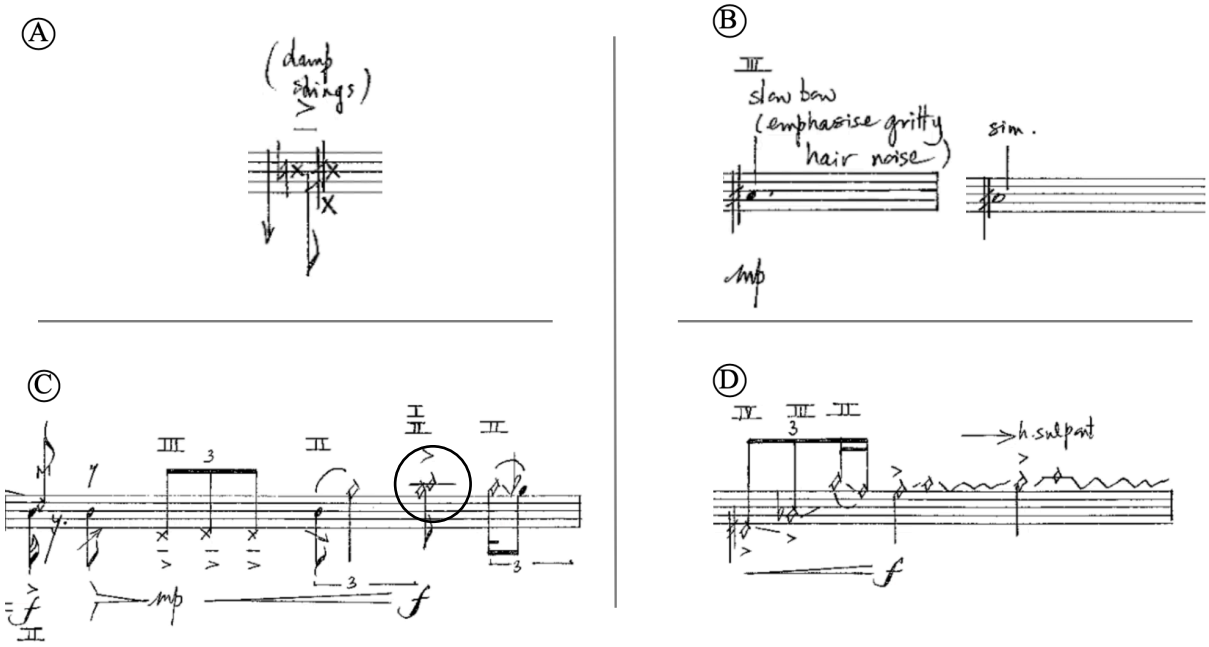


m. 12



mm. 13-14

EXAMPLE 12



EXAMPLE 13

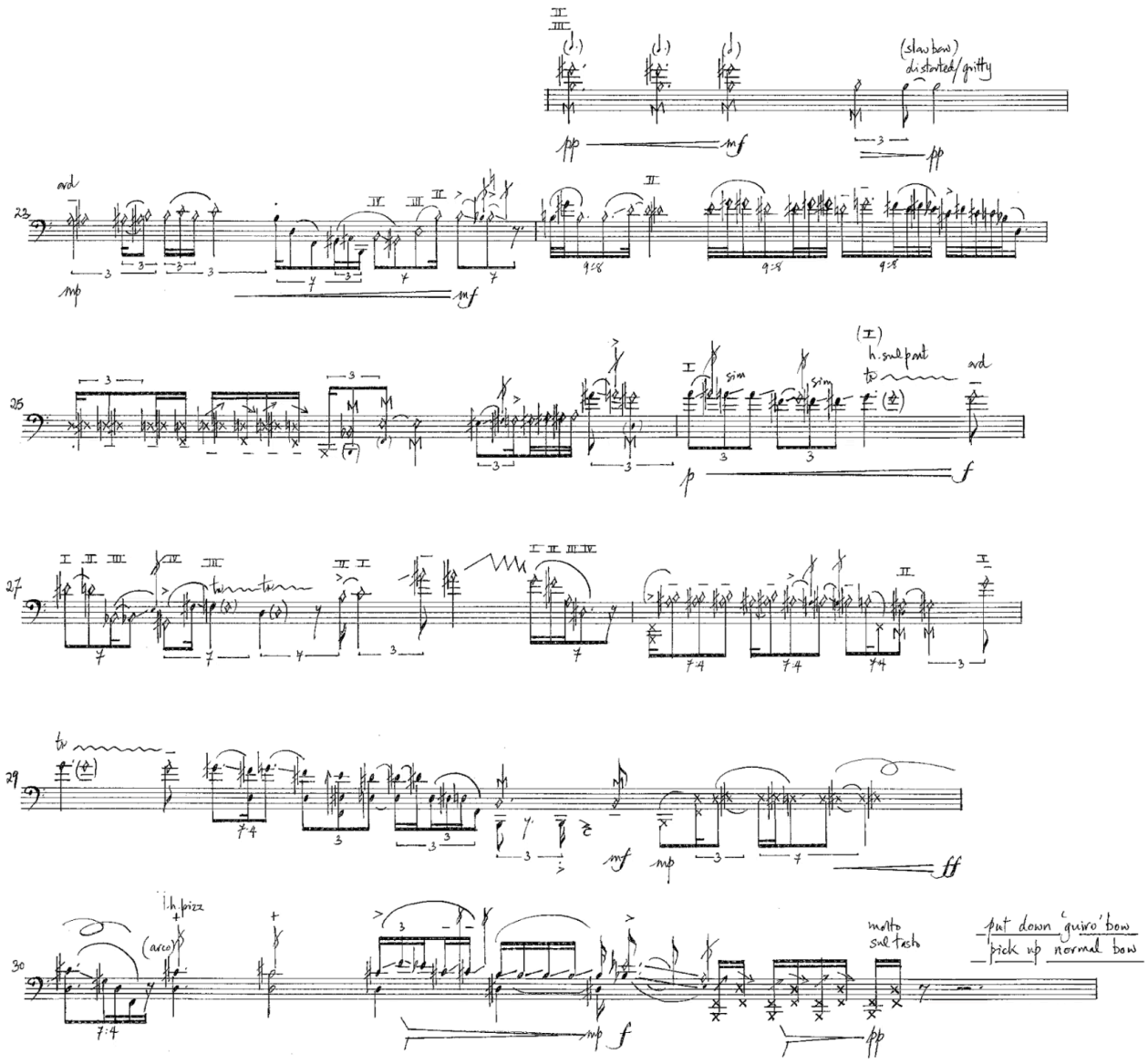
Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: excerpts from A, m. 15; B, mm. 14-15; C, m. 6; D, m. 8.

Similar instances of shimmer occur throughout this first section (mm. 1-30): the fifth bundle (mm. 18-20) can likewise be understood as a reversal of the first bundle (mm. 1-2)—note, to begin with, its comparable duration. This is a timbral retrograde, moving from clarity (harmonic) to noise (dampened string), with the half-harmonic passage as an intermediary gesture. Additionally, in following the process of upper string material fluidity, this passage has substantial fluidity in the form of rapid, closely spaced scalar movement.

The sixth bundle (m. 21) is one of the aforementioned short bundles, representing a maximum point of resistance (pure noise, an antithesis of the third bundle, mm. 10-11), and, representing, like the third bundle, a maximum point of

parsability (being a remarkably simple slow-arpeggio gesture). Simultaneously, it encapsulates and summarizes one of the primary processes in this whole first section: that is, the movement from lower string to higher string predominance is presented here in skeletal form. This bundle, therefore, like the entire first section, is a gradual revealing of the total expressive geography of the instrumental apparatus.

The seventh and final bundle (mm. 22-30) of this first section (mm. 1-30) represents the culmination of several processes. (See Example 14.) First, the initial relationship between upper and lower strings established in the first (mm. 1-2) and second bundles (mm. 3-9) has been reversed. In this last bundle, brief lower string passages are interspersed throughout predominantly high string material. This is the culmination of a gradual increase in the prevalence of upper string material throughout the first section. Second, the particular upper string passages in this last bundle are highly fluid; upper string material in the first section becomes progressively more fluid—beginning with the zero point in the second and third bundles (mm. 10-11) of the fixed natural harmonic dyad, moving to natural harmonic glissandi (partial sweeps) in the second and fourth (mm. 12-17) bundles, and then to scalar motion in the fifth (mm. 18-20) and seventh bundles. This process culminates in the maximum point of the artificial harmonic glissando, which occurs at the very end of this bundle (m. 30) and, therefore, the very end of the entire first section. The upper string material has effectively evolved from the discrete realm of natural harmonics to the absolute fluidity of glissandi—significantly, this artificial harmonic glissando is the first to occur on the high strings in the piece up to this point. (See Example 15.) Indeed, it is significant that the next section of the piece, played with the normal bow, begins with prominent artificial harmonic glissandi. Finally, the density of timbral change—between resistance and clarity—in this seventh bundle is at its lowest in any of the longer bundles since the first bundle. Indeed, in this seventh bundle, resistance and clarity alternate in self-contained, "unadulterated" cells, generally lasting several beats, with only two brief multiphonics being exceptions; this is a culmination of a process of deltafication between noise and clarity beginning with the high density of change—the "overgrown" foliage—of the second bundle. Here, in the last bundle of the first section, the asynchronous processes finally align, with these three important transformational trajectories—increasingly prevalent upper strings, increasingly fluid upper string material, and increasing deltafication between noise and pitch timbres—all reaching a terminal point within this bundle. It is therefore a natural ending point for the *Arpeggio* that is the first section.



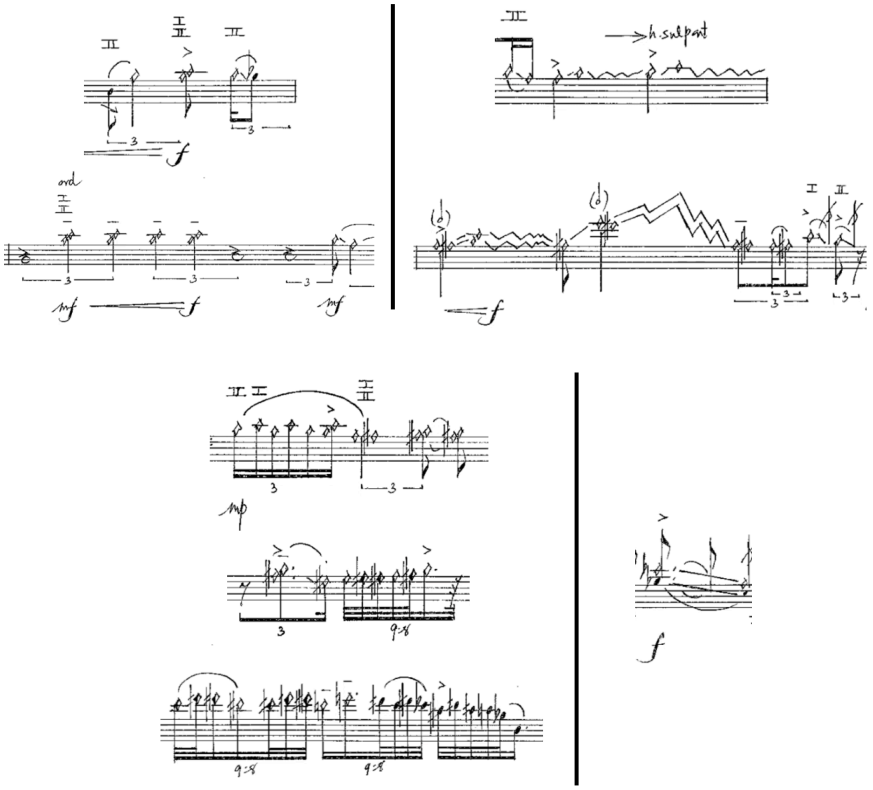
EXAMPLE 14: SEVENTH BUNDLE

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH: mm. 22-30.

6. ADDITIONAL OBSERVATIONS

The above analysis of the first section (mm. 1-30) of *Invisibility* demonstrates that the piece is a clearly defined *Arpeggio*-form, in which new unfoldings holistically give new context and meaning to preceding sound events. The forms of recontextualization at play in *Invisibility* could generally be characterized, in their

gradual realization and diversification throughout several bundles, as processes of revelation or obstruction: formal manifestations of an aesthetic of shimmer, which are replicated at the small, gestural scale by the complex superimposition of *Klangtypen*. These unfoldings do not proceed synchronously as parallel processes but as temporally intertwined, asynchronous knots which intersect at notable zero points.



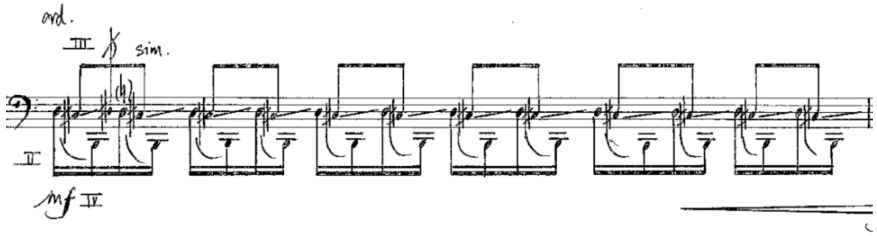
EXAMPLE 15 DEMONSTRATING EVOLUTION OF FLUIDITY IN UPPER STRINGS: FIXED HARMONIC DYADS M. 6, M. 10; HARMONIC GLISSANDO (PARTIAL OSCILLATION), M. 8, M. 14; SCALAR, STEPWISE MOTION, M. 18, M. 19, M. 24; ARTIFICIAL HARMONIC GLISSANDO, M. 30.

The succeeding normal bow and double bow sections of the overall additive form will not be discussed in the same detail as the first section—these subsequent sections both continue and subvert the processes established in the first section: some important examples of this continuity/subversion, and how they manifest shimmer, should be discussed.

The "moto perpetuo" bundle, mm. 41-50, can, on one level, be understood as a straightforward example of shimmer manifest in layering or superimposition: polyrhythm as layered rhythm, polyphony as layered activity/strings. However, this bundle is also structurally significant, in relation to the first section, as a maximal point of fluid movement between the upper/lower string pairs. That is, while the gradual "revealing" of the upper two strings was a key process of the first section, there is absolute fluidity between the upper and lower "regions" in this bundle. Case in point, the ostinato figure in m. 48 consists of a two-voice polyphony, with one voice being performed on the third string, and another voice consisting of a bow trill performed on the second and fourth strings; this grouping of strings II and IV is a clear disintegration of the string pairings established in the first section. (See Example 16.) This is also a shimmer in the sense that it is a superimposition: the duality between the high and low string pairs being so firmly established in the first section, the erosion of this boundary is heard as a superimposition of the two pairs. Also, note that I have described this passage as a bundle, but this subsection progresses seamlessly (in terms of there being no intermediary silence) into the final double bow section. Whereas the first section had clearly defined "strings"—defined by both long silences and by content (the latter in terms of there being two distinct kinds of string bundles, one long and "overgrown," the other short and sparse)—the second and third section feature more ambiguous string "bundling." There are, of course, the very prominent short bundles at m. 39 and m. 40, the former being a clear reference to the first short bundle at mm. 10-11. Note, however, the opening of the second section: immediately, there are three distinct subsections separated by considerable silences and each, to some extent, gesturally unique. These subsections are of a length comparable to the short string bundles, but do not share in their parsability—each of these quasi-bundles superimposes various *Klangtypen*. Likewise, the parsability associated earlier in the piece exclusively with short bundles now finds its way into the longer sections in the form of ostinato: first, as a rather insistent B3 node multiphonic from mm. 36-37; then, as a stream of ostinati between mm. 41-50 and mm. 54-58. This ambiguity culminates in the seamless movement from single bow to double bow—the importance of silence in delineating string bundles in the first section of the piece has been eroded. The breakdown of

this boundary, like that of the division of string pairs, likewise suggests a superimposition. The bundles themselves have overlapped.

The short bundle at m. 39, as discussed, is a reference back to the first short bundle at mm. 10-11. But in this case, the double stop has been decomposed into its two constituents. This is certainly not the first occurrence of such a decomposition, but certainly the most salient instance. This short bundle precedes the "moto perpetuo" bundle (mm. 41-50), in which, as discussed, the initial pairing of strings falls apart completely. The decomposition of the double stop here is a premonition of that coming disintegration. However, perhaps more importantly, it is also a moment of revealing: the components of the dyad have been separated; the superimposed elements now become independently audible. Revealing, in *Invisibility*, can also mean processes wherein the components of a superimposition are revealed as separate. This is a retrograde of the additive form. With the additive form, the bows are employed separately, then superimposed in the final, double bow section; with the harmonic dyad, the dyad is initially a superimposition, then a succession of two independent entities.



EXAMPLE 16

Invisibility, © 2009 by G. Ricordi & Co. Beuhnen- und Musikverlag GmbH.: m. 48.

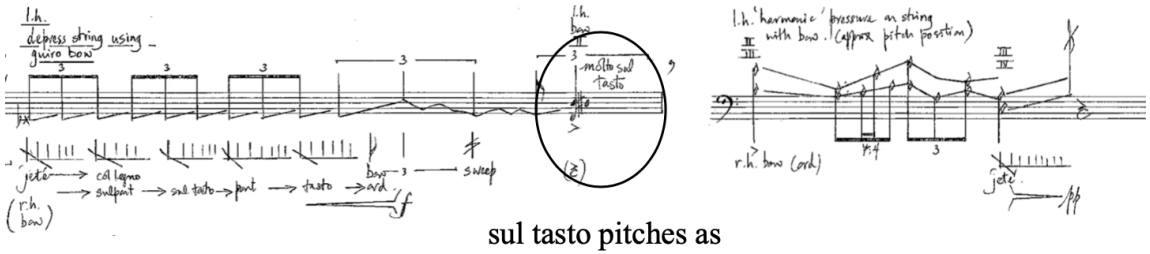
It is probably appropriate to end this discussion of *Invisibility* by considering the piece's closing passage, beginning with the superimposed jeté and glissando gesture on the fifth beat of m. 58. Following the first half of the double bow section, in which all four strings are sounded in a polyrhythmic texture, this passage employs the guiro bow as a "hand," applying pressure to the string while the normal bow continues to bow. This unusual physical setup flourishes with a sweeping natural harmonic glissando in m. 59.

This entire passage replicates the transformative trajectory of the first bundle (mm. 1-2), moving from a granulated noise (resistance) to the clarity of the harmonic glissando. (See Example 17.) The ricochet-glissando gesture in particular recalls the

opening passage of the piece—the repeated dampened string IV rhythm—not only because the ricochet-glissando is also a "granulated" timbre but also because it likewise juxtaposes similar *Klangtypen*: first, the *Kadenzklang* of the jeté gesture, a single physical throw with a natural decay; second, the *Fluktuationsklang* of the continuous stream of grains produced by a series of jetés; third, the underlying *Fluktuationsklang* of the polyrhythm animating this passage (the polyrhythm aligns every two beats, but is not particularly discernible because of the small range of the left-hand glissando).

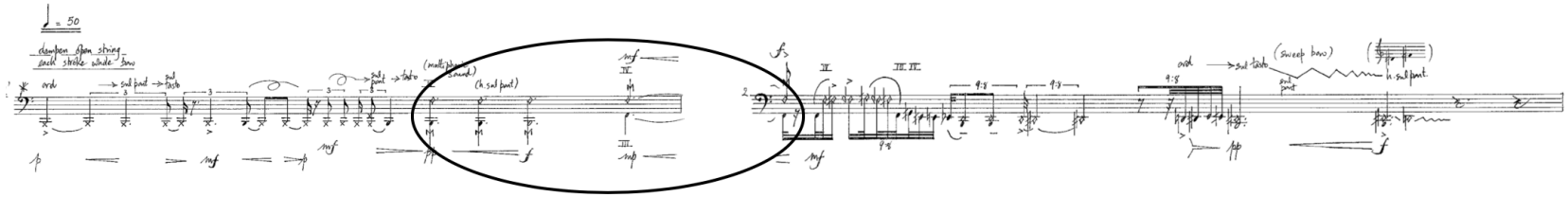
This similar trajectory shapes our listening of this passage—this new, unusual physical setup is not heard as a radical other but as a transformation of preceding material. To describe the guiro bow as a "hand" here might not be as accurate as to say that the "hand-like" activity of the guiro bow in this passage effectively blurs the boundary of bow and hand (at the very least, it certainly recontextualizes all the vertical bow sweeps heard earlier in the piece; see mm. 4-9, m. 25, mm. 30-31). The passage suggests that hands and bows are simply different actors navigating over a physical geography dictated by the string scordatura—moving vertically on a string or horizontally across strings, applying pressure to stop the string or simply gliding over the strings lightly. The hands and bows could, in this conceptual framework, be understood as the "other realm," the "ancestral reality," which continually acts upon the tangible material world (the four strings of this inherent physical geography) to create a perceived human reality—an aesthetic of shimmer is encoded into the very act of bowing and touching (or feeling out and activating) the instrument. In *Invisibility*, the very act of performance is charged with numinous power.

resistant noise – dampened string ⟶ clarity – clear pitches/harmonics



sul tasto pitches as intermediary timbre

resistant noise – dampened string ⟶ clarity – clear pitches/harmonics



multiphonics as intermediary timbre

EXAMPLE 17: ANNOTATED COMPARISON OF MM. 58-59, MM. 1-2

NOTES

1. See Eric Clarke, Mark Doffman, and Liza Lim, "Distributed Creativity and Ecological Dynamics: A Case Study of Liza Lim's 'Tongue of the Invisible,'" *Music & Letters* 94, no. 4 (2013): 628-663; Liza Lim, "A 'Hidden Centre': Crossing cultural boundaries and ecstatic transformation," *Sound Scripts: Proceedings of the Inaugural Totally Huge New Music Festival Conference 2005* 1 (2005): 9-19; Liza Lim, "A Mycelial Model for Understanding Distributed Creativity: Collaborative Partnership in the making of 'Axis Mundi' (2013) for solo bassoon," *Proceedings of the CMPCP Performance Studies Network Conference, Cambridge*, CMPCP Performance Studies Network, Cambridge, 2013; Liza Lim, "Staging an Aesthetics of Presence," *Search: Journal for New Music and Culture* no. 6 (2009), accessed June 25, 2020, http://www.searchnewmusic.org/index6.html; Tim Rutherford-Johnson, "Patterns of Shimmer: Liza Lim's Compositional Ethnography," *Tempo* 65, no. 258 (2011): 2-9.

2. Lim, "Staging an Aesthetics," 2; Rutherford-Johnson, "Patterns of Shimmer," 3-4.

3. Jennifer Deger, "Shimmer," *The International Encyclopedia of Anthropology* (2018).

4. Deger, "Shimmer."

5. Jennifer Biddle, "Inscribing identity: Skin as country in the Central Desert," *Thinking through the Skin* (London: Routledge, 2011), 71-2; Myfany Turpin and Nigel Fabb, "Brilliance as Cognitive Complexity in Aboriginal Australia," *Oceania* 87, no. 2 (2017): 210.

6. See Judith Ryan, "The Raw and the Cooked: The Aesthetic Principle in Aboriginal Art," *Art Bulletin of Victoria* 36 (1996): 31-50.

7. Helmut Lachenmann, *Musik als existentielle Erfahrung: Schriften 1966-1995* (Wiesbaden: Breitkopf & Härtel, 1996), 1-20.

8. Laurence Osborn, "Sound, Meaning, and Music Drama in Lachenmann's *Das Mädchen mit den Schwefelhölzern*," *Tempo* 68, no. 268 (2014): 20-33

9. Alastair Williams, *Music in Germany Since 1968* (Cambridge, UK: Cambridge University Press, 2013), 76. "Lachenmann derived the notion of 'musique concrete instrumentale from Pierre Schaeffer's concept, originating in the 1940s, of 'musique concrete.'"

10. Joanna Demers, *Listening through the Noise: The Aesthetics of Experimental Electronic Music* (Oxford: Oxford University Press, 2010), 27-29.

11. For an overview of Husserlian approaches to music, see David Clarke, "Music, phenomenology, time consciousness: meditations after Husserl," *Music and Consciousness: Philosophical, Psychological, and Cultural Perspectives* (Oxford: Oxford University Press, 2011): 1-28.

12. Ming Tsao, “Helmut Lachenmann’s ‘Sound Types,’” *Perspectives of New Music* 52, no. 1 (2014): 217-238.

13. Tsao, ““Helmut Lachenmann’s ‘Sound Types,’” 217.

14. Tsao, ““Helmut Lachenmann’s ‘Sound Types,’” 218.

15. Tsao, ““Helmut Lachenmann’s ‘Sound Types,’” 218.

16. Tsao, ““Helmut Lachenmann’s ‘Sound Types,’” 220.

17. Helmut Lachenmann, “Hearing [Hören] is Defenseless—without Listening [Hören]: On Possibilities and Difficulties,” trans. Derrick Calandrella, *Circuit* 13, no. 2 (2003): 30-48.

18. Tsao, ““Helmut Lachenmann’s ‘Sound Types,’” 222.

19. For a discussion of the open string fundamentals sounding in multiphonics, see Ellen Fallowfield, “Cello Multiphonics: Technical and Musical Parameters,” *Tempo* 74, no. 291 (2019): 60-62.

20. Lachenmann, “Hearing is Defenseless,” 36.

21. “The experience of form is just as inseperable from the experience of the subordinating sound-character…in other words, construction is just as inseparable from intuition.” Lachenmann, “Hearing is Defenseless,” 36.

22. Lachenmann, “Hearing is Defenseless,” 36.

23. Lachenmann, “Hearing is Defenseless,” 36.

24. “The extreme case, still to come, of a melody made of a *single* note lies in the viola part at the beginning…yet this single viola note also constitutes the extreme null point with respect to the international rhythmic articulation.” Lachenmann, “Hearing is Defenseless,” 33.

25. “At the basis of every such ordering lies a scale of sounding events felt out in some way or another. These are events that despite all difference between them are nonetheless mutually bound to a single character, a sound idea that links them.” Lachenmann, “Hearing is Defenseless,” 37.

26. Rutherford-Johnson, “Patterns of Shimmer,” 7.

27. Rutherford-Johnson, “Patterns of Shimmer,” 8.