

## Coherence and Incoherence in Xenakis's *Embellie*

Article for *Exploring Xenakis*, ed. Sharon Kanach (Pendragon Press, 2012)

Robert Hasegawa, robert.hasegawa@mcgill.ca

I first came across Xenakis's *Embellie* (1981) for solo viola while researching repertoire for a seminar on microtonal music at Eastman: one interesting feature of the work is its frequent use of quartertones. I was immediately struck by the work's expressive power and wild energy—I found particularly compelling the way that *Embellie* condensed into such a compact package so many of the things I loved about Xenakis's larger-scale works. When I started looking for more literature on the piece, I came across Nicholas Hodges's review of Garth Knox's recording. Hodges dismisses the composition brusquely: "Knox makes every effort to save the uncomfortable and incoherent *Embellie* from the oblivion it undoubtedly deserves."<sup>1</sup>

Needless to say, I found this assessment of the work surprising: not only for Hodges's evaluation of the work, which was so different from my own reaction, but also for the terms of its critique. The more I thought about it, the more the adjectives "uncomfortable" and "incoherent" seemed like odd choices. It's hard to imagine anyone characterizing any of Xenakis's works as "comfortable"—we might say they're "challenging," "uncompromising," and so on, but all of these descriptions point to the fact that "comfort" is the last thing we'd expect to associate with Xenakis. Criticizing a work by Xenakis as "uncomfortable" seems to be applying an altogether inappropriate criterion of value.

"Incoherent" is another story. I think that like "uncomfortable," it's not an appropriate term of critique, but as we shall see, the reasons for this are rather more complex. In one sense, I think it's easy to see what led Hodges to his conclusions: I suspect that his criticism is based largely on the rapid succession of highly contrasting materials over the course of the work. (I don't think this quality is unique to *Embellie*—I hear similar disjunctions in much of Xenakis's music.) **Example 1** shows the first 14 measures of the piece.

### **Example 1: *Embellie* (1981), measures 1-14**

Part of what makes these contrasting materials resist combination with one another are their starkly individual profiles. Take for example the ritualistic opening fanfare. The limited pitch palette seems to suggest an archaic mode: a kind of "super-Lydian" modality, with the fourth raised microtonally to just a quartertone below the fifth. The stark simplicity of what we might call "Pythagorean" intervals (whole step, fifth, fourth) is contrasted with the sonic complexity of the biting F  $\frac{3}{4}$ -sharp/G clash. (I don't think the "Pythagorean" connection is far-fetched: interviews with Xenakis show his familiarity with ancient Greek tuning theory, particularly the tetrachordal approach to scale construction.)

Suddenly, this opening section gives way to a texture which seems almost like its opposite: the slowly evolving double-stop glissandi are *pianissimo* rather than *fortissimo*, and treat pitch as a continuum, not a series of discrete points. Measure 6 returns us to a "modal" sound world, now with frequent emphasis on the interval of a fourth. (Xenakis describes the fourth as a musical "universal currency—in India, Africa, Europe, China, Japan.") In his 1989 interview with Balint Andras Varga, Xenakis states that the effect of "modality" is unintentional: these features "look modal but they're not. [...] My work has nothing to do with modal music, but I do admit that it may sometimes create that impression because

---

<sup>1</sup> Nicholas Hodges, Review of Arditti Quartet, *Xenakis: Chamber Music* (Disques Montaigne 782005), *Tempo* 185 (1993), 49.

of the non-tonal or tempered chromatic scale.”<sup>2</sup> Without warning, measure 12 (the fifth system of the page) shifts to an unstable microtonal pitch complex, freely mixing quartertones with the twelve-note chromatic—despite the lurching change in pitch material, the viola writing maintains a similar texture to the modal material just heard.

Arguably then, there *are* elements of the work which are difficult to reconcile with one another. The problem with Hodges’s critique is one of aesthetics: calling the work “incoherent” draws it into a specific (and by no means universal) type of aesthetic discourse: one that above all privileges unity and coherence. This is a shared concern of many modes of analysis which stem from an organicist view of the artwork, including motivic or pitch-class set analysis and hierarchical models like Schenker’s.

I question, however, whether such organicist approaches have any place in the analysis of Xenakis’s works. What does “coherence” mean in the work of a composer whose music is often written with stochastic processes and random walks? Since Xenakis has explicitly criticized the serial aesthetic (see “The Crisis of Serial Music,” 1955), why would we try to project serialism’s organicist concerns onto his music? If we’re not conscientious and critical about the analytical procedures we adopt, it’s all too easy to force aesthetic assumptions from an older era onto works with radically different concerns.

At the beginning of *Formalized Music*, Xenakis seems to offer an alternative to the traditional aesthetic concept of “coherence.” He describes the momentary transcendence that art can create: “Art, and above all, music has a fundamental function, which is to catalyze the sublimation that it can bring about through all means of expression. It must aim through fixations which are landmarks to draw toward a total exaltation in which the individual mingles, losing his consciousness in a truth immediate, rare, enormous, and perfect. If a work of art succeeds in this undertaking even for a single moment, it attains its goal.”<sup>3</sup>

Such an aesthetic of the sublime seems to stand in direct opposition to the “coherence” asserted by organicist analysis. I find that I experience Xenakis’s music much more as a series of powerful moments than as a reasoned, logically unfolding construction. To do justice to this aspect of Xenakis’s work, we need to seek analytical tools that will bring such “moments of intensity” to the fore.<sup>4</sup> Our starting analytical assumptions will determine the kind of analysis that comes out: if we take a motivic-organicist approach, we’ll get an analysis that purports to show a kind of “coherence.” We run the risk of losing the sense of terror and grandeur I hear in Xenakis’s work: such an analysis will describe the music as a pocket watch rather than a thunderstorm. In the case of *Embellie*, I think I’d be quite suspicious of any analysis that *did* claim to “make coherent” all of the work’s contradictions—such an

---

<sup>2</sup> Iannis Xenakis and Bálint András Varga. *Conversations with Iannis Xenakis* (London: Faber and Faber, 1996), 159.

<sup>3</sup> Xenakis, *Formalized Music* (Hillsdale, NY: Pendragon Press, 1992), 1. Note the echoes of Edmund Burke’s idea of the “sublime.” The following passage from Burke’s *A Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful* (1757) would not be out of place in the opening pages of *Formalized Music*: “The passion caused by the great and sublime in nature, when those causes operate most powerfully, is astonishment; and astonishment is that state of the soul, in which all its motions are suspended, with some degree of horror. In this case the mind is so entirely filled with its object, that it cannot entertain any other, nor by consequence reason on that object which employs it.” (Part II, Chapter 1: “Of the Passion Caused by the Sublime”)

<sup>4</sup> Literary theorist Hans Ulrich Gumbrecht makes the distinction between “presence effects” and “meaning effects.” Aesthetic experience, in Gumbrecht’s formulation is marked by an oscillation between presence effects (“moments of intensity”) and meaning effects. (*Production of Presence: What Meaning Cannot Convey*. Stanford, CA: Stanford University Press, 2004.)

analysis would impose a kind of orderliness on the work that seems quite alien to the music's own principles.

While I've outlined some of the pitfalls of applying an inappropriate mode of analysis to Xenakis's music, I think it's going to far to give up on analysis completely. We want to engage with the piece in a thoughtful way—critical engagement can only expand and improve our relation to the work, and analysis is a way of making our hearing of the piece more satisfying and involving. Analysis is also part of what allows a performer to discover a thoroughly committed interpretation of a piece. For these reasons, I'd be very suspicious of any attempt to jettison analysis completely. But how do we find a middle ground between a falsely over-simplifying analytical approach, and a crass refusal to engage with the work on any level beyond the superficial?

One philosophical stance that seems especially productive to me in this regard is William James's pragmatism—not perhaps, a particularly fashionable philosophy today, and maybe an unusual juxtaposition with the aesthetics of Xenakis—but a philosophy that suggests ways of engaging a work without demanding an aesthetically inappropriate “coherence.” James describes pragmatism as an instrumental view of truth: “ideas (which themselves are but parts of our experience) become true just in so far as they help us to get into satisfactory relation with other parts of our experience.” What a pragmatic approach to *Embellie* suggests is: (a) putting the various contrasting elements of the work into “satisfactory relation” with one another, and (b) constructing a temporal view of the work that explores how these relationships unfold in time. In this case, we're not seeking to “crack the code” to reveal some hidden coherence, or to work out the composer's creative process, but to clarify the effects of the work's sonic events, and draw productive links between them.

An alternative to this organicist metaphor of motivic analysis is a *physical* metaphor: one that would capture the sense of force and movement I feel so powerfully while listening to Xenakis's music.<sup>5</sup> By focusing on the physical, we can shift our attention away from motivic or formal coherence to focus instead on the powerful visceral effects of individual moments. If we seek a physical metaphor for listening to Xenakis's music, we will naturally be drawn to a conception of musical space. Space has long been a metaphor central to musical discourse: a few basic examples are the comparison of pitch to a “high and low” axis, or the sense of relative harmonic “distance” in the tonal system. With Xenakis's work as an architect in mind, the concept of space seems particularly relevant to an understanding of his music. The best-known example of the relationship between Xenakis's music and architecture is the conceptual kinship of *Metastasis* (1953/54) and the Philips Pavilion (1958). In *Formalized Music*, Xenakis describes this as a particularly “intimate” connection between music and architecture, and even traces a chain of ideas leading from the musical work to the design of the building.

---

<sup>5</sup> This sense of force and movement as an alternative mode of musical experience has been described in the writings of other composers. In the essay “The Liberation of Sound,” Edgard Varese writes “there is an idea, the basis of an internal structure, expanded and split into different shapes or groups of sounds constantly changing in shape, direction, and speed, attracted and repulsed by various forces. The form of the work is the consequence of this interaction.” More recently, Brian Ferneyhough has quoted Deleuze in describing his own music: “In art, and in painting just as in music, it is not a matter of reproducing or inventing forms, but of capturing forces.” Michael Finnissy has often spoke of searching for musical analogues to cinematic techniques: the zoom, the montage, the tracking shot. Susan Sontag points to cinema as a source for alternatives to “interpretive” criticism: “For the cinema, unlike the novel, possesses a vocabulary of forms—the explicit, complex, and discussable technology of camera movements, cutting, and composition of the frame that goes into the making of a film.” See *Against Interpretation and Other Essays* (New York: Farrar, Straus and Giroux, 1966), 12.

## Example 2: Two figures from *Formalized Music: Sketch for Metastasis* (1953/54) and model of Philips Pavilion (1958)

In this case, the mapping of the musical score onto the architectural object depends on a crucial step: the identification of the *temporal dimension* with one of the spatial dimensions. The audacity of this step is partly tempered by our familiarity with Western musical notation, which Xenakis describes as “no more than space shared by two dimensions having nothing in common: pitch and time.”<sup>6</sup> We must translate a the space of musical notation, a two-dimensional space combining the two *incommensurate* dimensions of pitch and time, into a two-dimensional *spatial* plane.<sup>7</sup> While this mapping of time into space is clearly a productive one for Xenakis, it’s by no means the only way to associate music and space. One criticism we could make of this analogy is that the spatial analog disassociates the viewer—they view the object from a detached position, and without any sense of temporal interaction with the object. In other words, a strongly temporal experience of the music is flattened into a static snapshot. This kind of “spatialization of time” has been perceptively critiqued by Christopher Hasty, who finds this idea operative in music by Ligeti and other composers in the 1950s and later.<sup>8</sup> By translating time into space, we create a metaphor for the music which is strangely non-temporal.

In many ways, this seems like almost the opposite of an architectural conception—surely one of the most central notions of architecture is the way that individuals move in, out, and around a structure, motion that must take place in time. While the structure itself may be static, what’s essential is how the experience of that structure changes over time, as the observer passes through the building in different ways, seeing it from different viewpoints. I’d like to explore whether there’s a more *dynamic* kind of spatial metaphor that might illuminate the piece in a different way.

What happens if instead of translating the time axis of music notation into a spatial dimension, we instead imagine the listener’s experience as a temporal path through a space that is fixed? We can still imagine a static sonic object—but this time the listener is in constant motion, viewing the object from changing viewpoints. We might think of this modified metaphor as comparable to the 3-D architectural animations now created by many architectural studios. Instead of illustrating a planned design through one or more static images, architects create a computer rendering that shows how the surfaces of the building would look as one moves through it.

I would contend that Xenakis’s music often creates effects which give the listener a sense of movement in space: either that we’re observing an object in motion or moving ourselves. It can be tricky to tell which of these is a better analogy for these effects: I suspect, though, that probably both come into play at various times. In fact, it may be the case that the *relative* motion between the “observer” and the “objects” is what really matters. A striking comparison can be drawn with the phenomenon called

---

<sup>6</sup> Xenakis, *Music and Architecture* (Hillsdale, NY: Pendragon Press, 2008), xix. Xenakis says something similar in his 1980 interview with Bálint András Varga (op. cit., 70): “The difference between physical and musical space is that the former is homogenous: both dimensions are lengths and distances. In music, however, the two dimensions, pitch and time, are alien in nature from one another and are connected only by their ordering structure.”

<sup>7</sup> The translation between a spatial and a temporal dimension has been the focus of other investigations of the relation between architecture and music. One well-known historical example is Charles Warren’s controversial attempt to relate the proportions of Dufay’s motet *Nuper Rosarum Flores* and the Florence Cathedral (the motet was written for the consecration of the cathedral in 1436). Charles Warren, “Brunelleschi’s Dome and Dufay’s Motet,” *Musical Quarterly* 59 (1973): 92–105.

<sup>8</sup> Christopher Hasty, “On the Problem of Succession and Continuity in Twentieth-Century Music,” *Music Theory Spectrum* 8 (1986): 58–74.

“induced motion,” an object of study by psychologists researching visual perception. Here’s a textbook example of induced motion: Imagine that you’re looking out the window of a stationary subway train, at another train on the opposite track. You feel your train starting to roll forward, but after a moment realize that you’re actually not moving—the illusory feeling of forward motion was *induced* by your observation of the other train moving in the opposite direction. Though the you are still, the observation of motion outside creates a feeling of *being* in motion. To relate this to our model of musical space: hearing sounds “in motion” can create in the listener a sense that he/she is moving, while the sounds are “staying still.” Note that this idea of induced motion allows us to move from talking about static relationships in the musical structure (like those that a motivic analysis might identify) to talking about the work’s *effects*—what the work *does* to the listener.

This example of an observer in motion, with a constantly changing perspective on a static object, may seem unnecessarily remote from musical experience: perhaps it relies too superficially on the translation of a visual concept to a musical one, though I do find that this metaphor resonates well with my own hearing of *Embellie*. However, we can find an analogous kind of “induced motion” within the domain of sonic experience: the Doppler effect. The Doppler effect is a result of relative spatial motion between the listener and a source of sound. If the two are moving towards each other, the pitch of the source will sound higher than it actually is—if the two are moving apart, the pitch of the source will sound lower. If the velocity of the observer relative to the source is constant, then the alteration of the pitch will remain constant: the familiar glissandi of the Doppler effect are due to *changes* in velocity relative to the sound source.

As a thought experiment, we can use this metaphor of the moving listener to interpret changes in the pitch of the music as describing paths for the listener in space relative to the stationary sound sources. The sense of listener motion is “induced” by the changing pitches—the listener thus engages in a kind of “auditory scene analysis,” processing cues that imply that the listener, not the musical events, are moving in an imaginary space.

### **Example 3a: *Embellie*, measures 4-5: double-stop glissandi**

---

<sup>9</sup> Our model of the “moving listener” seems to engage neatly with Xenakis’s comments on aesthetic transcendence cited earlier. Recall that Xenakis described the goal of art as “aim[ing] through fixations which are landmarks to draw toward a total exaltation in which the individual mingles, losing his consciousness in a truth immediate, rare, enormous, and perfect.” The idea that the artwork draws the listener into itself—and out of his ordinary consciousness—finds a counterpart in the idea of induced motion: that the changing, moving sounds of the work cause the listener to experience a sense of motion himself. In the process of being drawn into the work’s metaphorical physical space, the boundaries between observing subject and observed object are dissolved.

Note the distinct echoes here of David Lewin’s “transformational attitude” towards musical structure, which he offers as an antidote to “Cartesian” measures of extension in space: this is the attitude of a participant “*inside* the music, as idealized dancer and/or singer. No external observer (analyst/listener) is needed.” *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987), 159. Composer Gérard Grisey makes a similar call for a “Copernican revolution” in thinking about music, pulling the listener from a detached position outside of time into the temporal flow (“Tempus ex machina,” *Contemporary Music Review* 2 (1987), 239–75: 243.

The “moving listener” model is valuable in that can help us to more clearly define exactly what it is that we perceive as listeners. To return to the Sontag’s essay “Against Interpretation”: “What is important now is to recover our senses. We must learn to see more, to hear more, to feel more. Our task is not to find the maximum amount of content in a work of art, much less to squeeze more content out of the work than is already there. Our task is to cut back content so that we can see the thing at all. The aim of all commentary on art now should be to make works of art—and, by analogy, our own experience—more, rather than less, real to us. The function of criticism should be to show how it is what it is, even that it is what it is, rather than to show what it means” (op. cit., 14).

### Example 3b: Induced motion via Doppler effects for Example 3a

Example 3b works out this analytical metaphor in more detail for the double-stop glissandi in measures 4 to 5 (Example 3a). Such glissando passages seem particularly appropriate to describe in terms of “induced motion”—listening to such passages can create a sliding feeling similar to vertigo. No attempt has been made here to *literally* match the glissando speed to a physical scale—the space invoked here remains a metaphorical one. The glissandi’s rapid rates of change would correspond to very fast movements in the real world—and paths which pass very close to the sound sources (creating rapid changes in angular velocity). The extreme movement and near misses thus implied correspond well with my hearing of the piece—such sudden changes seem to invoke a palpable sense of high energy and danger.

In example 3b, two imaginary sound sources are represented as points in separate spatial locations. The spatial separation of the sound sources in our model is made necessary by the motion of the glissandi—since sometimes the glissandi move in opposite directions, we need to be able to imagine situations where an accelerando towards one sound source is combined with a decelerando relative to the other source. It is assumed for this analysis that the pitch emitted by each source remains constant, in this case at C-sharp and D three-quarters sharp (the final dyad of the excerpt, as well as the endpoint of the long downward glissando in the middle of the excerpt). All changes in pitch are produced by the Doppler effect of the listener’s movement, shown on Example 3b by a solid black line. The thickness of the line indicates velocity—a thicker line means faster movement. Octagonal “stop signs” indicate points of rest; when the listener is at rest, the sound sources are heard at their actual pitches.

Example 3b divides the compound glissando gesture into four stages:

Stage 1: At the outset (starting pitches E and F), the listener is approaching both sound sources (raising both perceived pitches), but at an angle which approaches C# more quickly than D<sup>3</sup>/<sub>4</sub># (raising its perceived pitch by a greater value, a minor third compared to 1½ semitones). The change in angle midway through this stage reflects the first glissando of Example 3a, as the listener’s changed direction creates an acceleration relative to D<sup>3</sup>/<sub>4</sub># (expressed as an upward gliss in the top voice) and a deceleration relative to C# (a downward gliss in the bottom voice).

Stage 2: Acceleration towards both sound sources, first moving slightly faster towards D<sup>3</sup>/<sub>4</sub># (producing an upward gliss in the top voice), then turning and continuing to accelerate towards C# (keeping a constant velocity relative to D<sup>3</sup>/<sub>4</sub>#), raising the perceived pitch of the lower voice from D# to G.

Stage 3: Deceleration (downward glissando) towards both sound sources, reaching a point of rest (marked by a “stop sign”) where the actual pitches of the sound sources are heard.

Stage 4: Rapid oscillation between motions towards and away from the sound sources. The high point of each glissando is reached as the listener accelerates towards the sound sources; as the listener passes between the sources, the pitch drops to the actual C# and D<sup>3</sup>/<sub>4</sub>#, then even lower as the listener accelerates away from the sources. As the listener decelerates to a stop, the pitch creeps back up to C# and D<sup>3</sup>/<sub>4</sub>#, and then there is a new upward gliss as the listener turns and again accelerates toward the sources.

By developing this “induced motion” model, in which Doppler effects in an imaginary space create a sense of motion for the listener, I hope to refocus our analytical attention from the passive observation of structural relationships to a description of the music’s visceral, physical *effects*. The analytical metaphor is explicitly spatial—but without losing sight of the temporal flow of the music. In fact, the music’s temporal unfolding is now described in terms of motion within a field of static objects, a conception that seems to me deeply “architectural.”<sup>10</sup>

This analytical approach works well for sections based on glissandi, but can it also be applied to other sections of the piece? I find that while a literal application may not be possible for every section of the piece, the idea of a “moving listener” offers a powerful analogy for thinking about the various formal sections and their relation to one another.

In Example 1, one of the main “incoherencies” was the sudden shift at measure 12 from chromatic to quartertone pitch material. I think there’s an argument to be made for thinking of the quartertone section starting at measure 12 as a kind of “skewed” version of the chromatic texture just before. We could imagine the listener’s motion relative to the notional sound sources creating various Doppler distortions of their pitch—the chromatic pitches are shifted by the listener’s motion into microtonally inflected positions. This gives us a new metaphor for thinking of the shift from one texture to the next, a metaphor which places the listener “in and among” the sound sources instead of at a remove.

**Example 4a: *Embellie*, measures 51-56**

**Example 4b: *Embellie*, measures 85-88: a “zoomed-out” version of the arpeggios in Example 4a?**

Also suggestive is the possibility of imaginary “changes of scale” between sections, along the lines of Michael Finnissy’s comments about the musical equivalents of cinematic “zoom” effects. One example might be a comparison between the two excerpts in Example 4a and 4b. In terms of overall shapes, we can recognize a similarity the rising and falling microtonal arpeggios of Example 4a and the harmonic glissandi of Example 4b: with our model of the moving listener in mind, we can imagine the glissandi as a “zoomed-out” version of the arpeggios. At this “distance” from the source, we no longer hear discrete pitches of the scale, but only the general contour—the pianissimo dynamic contributes to this effect of distance. Interestingly, this provides a strong effect of “leaving” the space of the piece—we recede out and away from the sound sources imagined in this analysis.

This analysis of *Embellie* is brief and incomplete—certainly there’s much more to be said about the piece. I hope, though, that the mode of analysis outlined here can suggest some productive approaches to engaging with the work, approaches that emphasize quite different features than a more traditional analysis that is primarily concerned with coherence. I’m not trying to argue here that traditional analysis is a habit that we need to “get out of”—rather, that in Xenakis’s music, the kinds of structures highlighted by traditional modes of analysis need to be counterpointed by a consideration of the music’s less hermeneutic, more visceral effects. We need to supplement our concern for “coherence”

---

<sup>10</sup> In the process, we’ve taken a rather broad view of the pitch material—note that the analysis does not depend on a highly detailed reading of pitch. As a result, the motion described is relatively “robust” as a representation of the work—the same analysis would apply even if there were slight changes in the pitches of the excerpt. Such robustness seems appropriate for me in a Xenakis analysis—in many ways, he seems to be a composer more concerned with overall effect than with details of pitch and rhythm (as evinced in his statements on stochastic music). A more detailed reading of the pitch world of the piece might be achieved through a complementary application of more traditional modes of analysis—this is similar to what Gumbrecht describes as “an oscillation between presence and meaning effects.”

with a recognition of how Xenakis creates moments of “total exaltation” in which the listener can lose himself—while the intensity of these moments may make them resistant to incorporation in a traditionally “coherent” form, to ignore them and their effects would lose sight of the unique power of Xenakis’s music.



$\text{♩} \approx 46 \text{ MM}$   
*legato*  
*ff*

$\text{♩} \approx 40 \text{ MM}$   
*ppp*

[6]  $\text{♩} \approx 46 \text{ MM}$   
*ff*

Example 1: Xenakis, *Embellie* (1981), measures 1-14

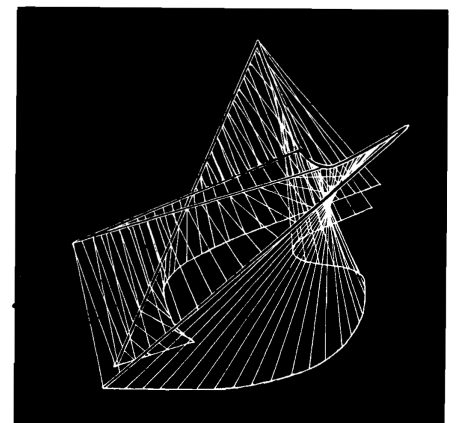
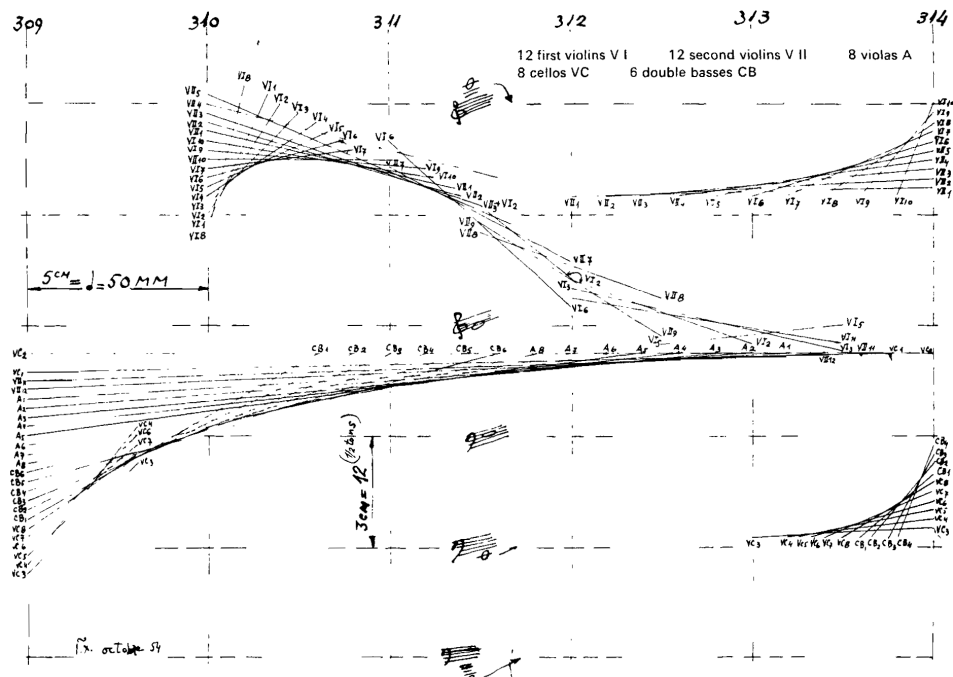


Fig. I-4. First Model of Philips Pavilion

Fig. I-2. String Glissandi, Bars 309-14 of *Metastasis*

Example 2: Two figures from *Formalized Music: Sketch for Metastasis* (1953/54) and model of Philips Pavilion (1958)

Stage 1      Stage 2      Stage 3      Stage 4

Example 3a: *Embellie*, measures 4-5: double-stop glissandi

Example 3b: Induced motion via Doppler effects for Example 3a

*détaché legato, accents très en relief*  
 $\approx 128$  MM

Example 4a: *Embellie*, measures 51-56: microtonal arpeggios

Example 4b: *Embellie*, measures 85-88: a “zoomed-out” version of the arpeggios in Example 4a?