

A chameleon called musical time: Some observations about time and musical time

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In *The Magic Mountain*, Thomas Mann asks about the possibility of narrating time and gives an example from music as part of his answer:

Can one tell—that is to say, narrate—time, time itself, as such, for its own sake? That would surely be an absurd undertaking. A story which read: ‘Time passed, it ran on, the time flowed onward’ and so forth—no one in his senses could consider that a narrative. It would be as though one held a single note or chord for a whole hour, and called it music.¹

A single harmony is sustained for approximately 70 minutes in *Stimmung*, a work which Karlheinz Stockhausen wrote in 1968. The work’s title has several meanings and could be translated as tuning, intonation, atmosphere, or mood. The vocalists in this composition sing the second, third, fourth, fifth, seventh, and ninth overtones of the fundamental note B flat. Because of its static harmony, *Stimmung* has a meditative character which is more readily associated with Eastern culture than with the Western tradition of goal-directed, developmental music. This is not surprising, considering that Stockhausen’s music and writings reflect in many ways the cultural and intellectual climate of the 1960s. He certainly was not alone in his interest in Eastern philosophies and religions.

Thomas Mann—in his time—would most likely have ascribed *Stimmung* to someone out of his senses. Even today, the work’s lack of harmonic change could result in 70 minutes of boredom for the unsympathetic listener. For others, *Stimmung* might invoke a feeling of timelessness—an experience in which the awareness of past, present, and future is replaced by a seemingly all-pervasive simultaneity.

Jonathan Kramer, in *The Time of Music*, associates timelessness with what he calls vertical time. He explains vertical time as a ‘temporal continuum of the unchanging, in which there are no separate events and in which everything seems part of an eternal present’.² He comments further that a composition which is conceived vertically

does not exhibit large-scale closure. It does not

begin but merely starts. It does not build to a climax, does not purposefully set up internal expectations, does not seek to fulfill any expectations that might arise accidentally, does not build or release tension, and does not end but simply ceases.³

Elaborating on the feeling of timelessness, Kramer states that it

can be aroused not only by music but also through other artforms, certain mental illnesses, dreams, unconscious mental processes, drugs, and religious rituals. Vertical music does not create its own temporality but rather makes contact with a deeply human time sense that is often denied in daily living (at least in Western cultures). The significance of vertical compositions, and of many modernist artworks, is that they give voice to a fundamental human experience that is largely unavailable in traditional Western music.⁴

Stockhausen’s *Stimmung* can be compared with the prelude to Wagner’s *Das Rheingold*. As with *Stimmung*, the parameter of harmony remains fixed: a single E flat major chord is held throughout the 136 bars of the prelude. One may ask whether this presents another example of vertical music. The music of the prelude is vertical in the sense that there is a lack of harmonic development, but in terms of rhythm and timbre it is developmental: a continuous increase in rhythmic activity is combined with a timbral *crescendo* (the continuous addition of new instrumental colours within the overall texture). In other words, the prelude contains elements of linearity that are simultaneous with elements of non-linearity. In this, it does not differ from many other musical works in which certain musical parameters are active while others remain fixed. Of course, the prelude does not constitute a self-contained musical work. The composer Peter Tahourdin has remarked that its static harmony prepares the audience for a long musical evening.⁵ Thus, the prelude sets up a time frame for the complete opera.

Another more recent example of this device can be found in Harrison Birtwistle’s opera, *The Mask of Orpheus*. The opening section is characterized

by an extremely slow unfolding of motivic material, while Apollo presides over the birth of Orpheus, and presents to him the gifts of speech, poetry and music. The stage action in this introduction is minimal: all one can see is a type of trapdoor that slowly opens. In fact, the speed at which the trapdoor opens is such that one cannot perceive any motion at all; only after a certain duration, perhaps a minute or two, does one realize that the trapdoor must have moved because now it is more open than it was a while ago.

This is an interesting instance of the perception of time: one could say that time can be perceived through motion in space, but what happens in the case of this trapdoor which moves so slowly that one cannot observe a continuous motion? In such a situation, it is memory that informs us about change, while the actual motion remains hidden from our perceptual faculties.

By the time Orpheus has finally risen through the trapdoor onto the stage, the more open-minded members of the audience might have suspended any expectation of swift changes. They probably will experience even the slightest increase in the rate of musical and dramatic change more intensely than they would have without this almost static introduction. In the following quotation, Birtwistle talks about his interest in circular aspects of music:

Essentially I'm concerned with repetition, with going over and over the same event from different angles so that a multi-dimensional musical object is created, an object that contains a number of contradictions as well as a number of perspectives. I don't create linear music, I move in circles; more precisely, I move in concentric circles. The events I create move as the planets move in the solar system. They rotate at various speeds. Some move through bigger orbits than others and take longer to return.⁶

Birtwistle is only one of several contemporary composers who have verbalized their ideas about musical time; others are Milton Babbitt, Pierre Boulez, John Cage, Elliott Carter, Brian Ferneyhough, György Ligeti, Karlheinz Stockhausen, and Iannis Xenakis, to mention just a few.⁷ The desire to understand the premises of musical time is also reflected in hundreds of articles⁸ and, more recently, in two voluminous books on this topic: Barbara Barry's *Musical Time: The Sense of Order*⁹ and Kramer's *The Time of Music*. It is safe to say that, in the course of the second half

of this century, the investigation into the nature of musical time has become one of the focal points of compositional and musicological thought.

The study of musical time naturally engenders questions about time itself, and anyone who has contemplated time will have been challenged by its elusiveness. Time as a topic is formidably large and by no means exhausted. Restricting one's focus to musical time, however, does not give a licence to exclude from one's field of vision all the other types and dimensions of time. The inquiry about musical time may temporarily evade, but will ultimately have to confront, the arch-question: what is time?

Many people would agree that the continual flow of time is simply a fact of life—a reality that does not need to be questioned. They would also agree that this continual passing of time can be measured objectively—clocks promote a positivistic conception of time. The apriorism of a continual and objectively measurable flow of time is reflected in the often unreflecting use of terms such as *absolute time* and *objective time*. Yet, the apparently indisputable reality implied by these terms presents little more than one of many different and often contradictory conceptualizations of time. There is no single, generally accepted understanding about the nature of time, and there is equally no conclusive evidence for the common sense view that time, always and inevitably, passes at a constant rate.

In *A Brief History of Time*, Stephen W. Hawking shows how the concept of time in Newtonian physics differs from that of Einstein's theory of relativity, and his explanations illustrate that different concepts of time can exist even within a single branch of science.¹⁰ The existence of different concepts of time makes it appropriate to question the notions and—more importantly—the misleading implications of absolute time and objective time. This observation also hints at the problem of defining the term *time*.

Richard Toop, in an article on the alleged new complexity in contemporary music, relates Nietzsche's remark that to define something constitutes the beginning of lying about something.¹¹ Whether one shares Nietzsche's apprehension regarding the act of defining, or whether one agrees with Susanne Langer's assertion that the business of philosophy is to provide definite meanings of the terms we use,¹² time's elusive nature precludes

simple definitions. For one thing, time does not consist of matter. Therefore, the term *time* does not signify a physical object. Instead, it has the potential to refer to a range of different concepts. The particular concept of time that is referred to, at a given time, depends on the context in which the term is used. In philology, such a term is called polysemic—its multiple meanings evade a single definition. So rather than adding another definition of time to the list of already existing ones, the question, what is time, can be better addressed by presenting a broad framework in which the different concepts, properties and aspects of time can be located.

Such a framework is given in the second part of this article. It is called 'the field of time', and the different areas of this field are briefly examined with respect to their relevance to music. It needs to be emphasized that while such a field provides a way of looking at time in a comprehensive and structured way, its present function is to give an idea of the various directions from which musical time can be approached.

The field of time and its relevance to music

1. Time from a linguistic perspective:

The polysemic nature of the term *time* results in an 'openness' which naturally affects the compound term *musical time*. Thus, different understandings of time lead to different understandings of musical time. The number of possible understandings of musical time is further increased through the equally 'open' term *music*. The recent trend towards using the term *music* in its plural form indicates a growing awareness of its complex web of meanings.¹³

The structure and the characteristics of a language (and specific terms of that language) act as a kind of filter through which one perceives the world.¹⁴ This is why the study of musical time should include the examination of linguistic properties of time-related and music-related terms.

2. Time from a semiological perspective:

Any language can be regarded as a system of signs. Approaching time through language entails the use of time-related terms, phrases and expressions, all of which can be regarded as signs, and

these signs can be examined on the basis of various semiotic models.

In the case of musical time, it is possible to employ, for example, Jean-Jacques Nattiez's semiology of music as a theoretical backdrop. Nattiez regards music as a symbolic phenomenon which consists of three dimensions: the first includes everything that constitutes, and is associated with, the act of creating music (composition, sound production, performance, etc.), the second is music in its physical and material embodiment (musical scores, recordings, the physical reality of sound), and the third encompasses the listening process and the vast range of other responses to music.¹⁵ This tripartition can be adapted to musical time in the sense that musical time is understood as (1) something that is brought into existence through a creative process, (2) something that has a physical reality, and (3) something that can be responded to.¹⁶

3. Time as determined by culture:

Ideas about, and attitudes towards, time differ from one culture to the next; within a particular culture they are not stable, but change throughout the course of history.¹⁷ The knowledge of a particular culture's conception of time can provide important clues to the way members of that culture experience music. And conversely, music as a form of expression of a particular culture reflects aspects of that culture's conception of time.

In 'The Shape of Time in African Music', Ruth Stone suggests that African music 'conceptually moves in a three-dimensional volume of expanding moments that contrasts to nineteenth-century Western notions of a flat, linear progression'.¹⁸ Referring to her fieldwork among the Kpelle of Liberia, West Africa, she shows that such a non-linear conception of time can also be found in the narrative structure of a Kpelle epic. Episodes in this epic are developed into what Stone calls 'expandable moments', which 'envelop action with variable propensity to expand outward but not linearly'.¹⁹

4. Time scholarship:

The interdisciplinary work of time scholars plays a vital role in the exploration of musical time. A notable example is the discussion and adaptation

of J. T. Fraser's hierarchical theory of time in Kramer's *The Time of Music*.²⁰

Fraser, the founder of the International Society for the Study of Time, suggests that different 'environments' (species-specific worlds) have different temporalities and that these environments, together with their temporalities, have evolved throughout the history of the universe. Thus, there is a specific temporality for particles that travel at the speed of light, another for nonrelativistic particles, another for the world of Newtonian mechanics, another for the world of living matter (biotemporality), another which is linked to humans as self-aware individuals, and another which is linked to humans as social beings (sociotemporality).²¹ Kramer shows how different types of music can be interpreted as expressions of Fraser's temporalities. The important point here is not so much that there are musical metaphors for Fraser's temporal levels, but that a particular type of music, or even a single musical work, can generate its own type of musical time.²²

5. Time in natural science:

Scientific concepts of time can be applied to the study of certain properties of musical time. Jeff Pressing, in 'Relations between Musical and Scientific Properties of Time', uses the term *scientific time* to designate those properties of time which can be generalized and systematized by means of scientific method and scientific instruments.²³ The classic text which relates physical properties of sound to temporal aspects of music is Karlheinz Stockhausen's article '...How Time Passes...'.²⁴

6. Time in philosophy:

In philosophy the problems of conceptualizing time are emphasized more explicitly than in other disciplines (with the exception, of course, of time scholarship). It was through philosophical discourse that many assumptions about time were discredited, and where, in the same process, numerous concepts of time have been added to an ever-growing list. While philosophy cannot claim to have solved time's puzzle, philosophers have developed numerous workable models of time, many of which can be applied to musical time. As with time scholarship, philosophical discussions about time frequently include explicit references

to music.

One of many composers whose work is informed by philosophical thoughts about time is Elliott Carter.²⁵ In 'Music and the Time Screen' he develops his ideas about musical time with reference to Henri Bergson's *durée réelle* (a type of pure duration that Bergson believes to be fundamental to human consciousness).²⁶ Carter also discusses the concept of virtual time, introduced by Susanne Langer. According to Langer, all music creates virtual time—a semblance of the time that is lived and experienced by humans.²⁷

7. Time in psychology:

There is a vast number of studies which deal with the experience and perception of time. Findings in this area are obviously relevant in examining the effects of music's temporal features on the listener. But there are many more aspects of musical time which can be explored from a psychological perspective: for example, that of the musician's timing during a performance.

Manfred Clynes's and Janice Walker's 'Music as Time's Measure' is an extensive study of musicians' long term ultrastability of timing and the implied existence of psychobiological clocks.²⁸ The two authors suggest that in some cases the total duration of a musical work exists subconsciously in the minds of performers as a stable entity. This means that performances of the same work can have a remarkable stability in terms of the overall duration, without the performer being aware of this.²⁹

8. Time and history:

The Polish musicologist Nina Gierasimowa suggests that there is a link between the changes in time concepts throughout history, on the one hand, and changes in the temporal organization of music from one historical epoch to the next, on the other.³⁰ History itself, of course, is based on a specific conception of time: that of linear time—the continuum of past, present, future. Within this paradigm of linear, historical time it is possible to conceive a history of time concepts, and even of a history of attitudes to, and ideas about, musical time.

Composers' understanding of music history can have a bearing on their creative process. Compos-

ers who interpret the history of music as a linear progression of some type might choose to write music which follows on from what they regard as the latest development in that progression. Important in this respect is the postmodernist debate which frequently addresses the dialectic friction between the progressive elements of the modernist aesthetic (of the recent past) and the regressive features of the postmodernist aesthetic (of the present).³¹

9. Time in the arts:

Music is not the only temporal art. All performing arts can be measured in terms of clock time and rely to various degrees on accurate timing. Comparing film with music, James Monaco points out that 'the mechanical nature of the [film] medium allows strict control of the time line: narrative "melodies" can now be controlled precisely. In the frame, events and images can be counterpo[i]sed harmonically'.³² The wealth of terms relating to time used in film studies, such as *flashback*, *asynchronic sound*, and *fast motion*, gives an indication of the complex temporal relationships associated with film.

A comparison is often made between music and sculpture: music is understood as the temporal art *per se*, and sculpture as a spatial art. While it may be true that most sculptures, unlike musical works, are offered globally to our perceptive faculties,³³ every perceptual process takes time—what may be offered globally is not taken in at once.

The main areas of the field of time presented in this article can be seen in their own right, but are by no means mutually exclusive. For example, linguistic properties of the term *time* affect any concept of time expressed verbally, and time scholarship, being an interdisciplinary study, deals with any of the given areas. Also, the field of time is not limited to the given areas—there are others that could be included. The above observations, however, suffice to give an indication of the vast scope of this field and its many possible applications to musical time.

The study of musical time has already demonstrated its enormous potential to contribute to a wide range of music-related activities. Whether it is performance, compositional thought, music theory, music analysis, ethnomusicology, music

philosophy, or the perception of music, musical time has to be reckoned with. Its role is a compound of many different roles. Much like time itself, musical time changes colour wherever it goes.

NOTES

¹ Thomas Mann, *The Magic Mountain*, trans. H.T. Lowe-Porter (New York: Knopf, 1982), p. 570.

² Jonathan D. Kramer, *The Time of Music* (New York: Schirmer, 1988), p. 454.

³ Kramer, *The Time of Music*, p. 55.

⁴ Kramer, *The Time of Music*, p. 394.

⁵ Conversation with the composer.

⁶ Harrison Birtwistle, programme note to *The Mask of Orpheus* (London: English National Opera, 1986). For a discussion of Birtwistle's opera with respect to Kramer's concept of 'multiply-directed time' see Kramer, *The Time of Music*, p. 49.

⁷ The following is a selection of writings on musical time by the composers mentioned:

Milton Babbitt, 'The Synthesis, Perception, and Specification of Musical Time', *Journal of the International Folk Music Council* 16 (1964): pp. 92-95.

Pierre Boulez, *Boulez on Music Today*, trans. Susan Bradshaw and Richard Rodney Bennett (London: Faber, 1971), pp. 83-98, gives an explication of Boulez's notions of 'smooth time' and 'striated time'.

John Cage, *Silence* (1961; Middletown, Connecticut: Wesleyan University Press, 1973), pp. 62-66, gives Cage's comments on the significance of duration in musical structures.

Elliott Carter, 'The Time Dimension in Music', and 'Music and the Time Screen', in *The Writings of Elliott Carter*, ed. Kurt and Else Stone (Bloomington: Indiana University Press, 1977), pp. 243-47, 343-65.

Brian Ferneyhough, 'Die Taktilität der Zeit', *Musik Texte* 35 (July 1990): pp. 14-17, gives an explication of Ferneyhough's notion of 'temporal tactility' in music.

György Ligeti, 'Metamorphoses of Musical Form', trans. Cornelius Cardew, *Die Reihe* 7 (1965): pp. 5-19, makes a range of interesting comments on aspects of musical time and discusses entropy in music.

Karlheinz Stockhausen, 'Structure and Experiential Time', trans. Leo Black, *Die Reihe* 2 (1959): pp. 64-74.

Iannis Xenakis, *Formalized Music*, trans. Christopher A. Butchers, G. W. Hopkins, and Mr and Mrs John Challifour (Bloomington: Indiana University Press, 1971), pp. 155-77, gives a discussion of Xenakis's concepts of 'in-time' and 'outside-time'.

⁸ Samuel L. Macey, *Time: A Bibliographic Guide* (Hamden: Garland Publishing, 1992), pp. 207-228.

Jonathan D. Kramer, 'Studies of Time and Music: A Bibliography', *Music Theory Spectrum* 7 (1985): pp. 72-106.

⁹ Barbara R. Barry, *Musical Time: The Sense of Order* (New York: Pendragon Press, 1990).

¹⁰ Stephen W. Hawking, *A Brief History of Time* (Toronto: Bantam Press, 1988), pp. 21-22:

'In Newton's theory, if a pulse of light is sent from one place to another, different observers would agree on the time

that the journey took (since time is absolute), but will not always agree on how far the light traveled (since space is not absolute). Since the speed of the light is just the distance it has traveled divided by the time it has taken, different observers would measure different speeds for the light. In relativity, on the other hand, all observers *must* agree on how fast light travels. They still, however, do not agree on the distance the light has traveled, so they must therefore now also disagree over the time it has taken. (The time taken is the distance the light has travelled—which the observers do not agree on—divided by the light's speed—which they do agree on.) In other words, the theory of relativity put an end to the idea of absolute time! It appeared that each observer must have his own measure of time, as recorded by a clock carried with him, and that identical clocks carried by different observers would not necessarily agree'.

¹¹ Richard Toop, 'Mehr Überzeugung als Theorie. Über Komplexität in der neuen Musik', *Musik Texte* 35 (1990): p. 6.

¹² Susanne K. Langer, *Feeling and Form* (London: Routledge, 1953), p. vii.

¹³ For a thorough discussion of this point see Carl Dahlhaus and Hans Heinrich Eggebrecht, *Was ist Musik?* (Wilhelmshaven: Florian Noetzel Verlag, 1987), pp. 9-17.

¹⁴ Lewis Rowell refers to linguists who claim that in the case of technical terminology it is the built-in accumulation of meanings and sound-associations which establishes the filter. See Lewis Rowell, 'The Subconscious Language of Musical Time', *Music Theory Spectrum* 1 (1979): p. 97.

¹⁵ Jean-Jacques Nattiez, *Music and Discourse: Toward a Semiology of Music*, trans. Carolyn Abbate (Princeton: Princeton University Press, 1990), pp.10-16.

¹⁶ The adaptation of Nattiez's semiological tripartition for a model of musical time is the subject of a Ph.D. thesis presently being prepared by the author of this article.

¹⁷ For a discussion of representative ideas of time in Western thought and Oriental concepts of time see J. T. Fraser, *Of Time, Passion, and Knowledge*, 2nd ed. (Princeton: Princeton University Press, 1990): pp. 11-43.

¹⁸ Ruth M. Stone, 'The Shape of Time in African Music', *Time, Science, and Society in China and the West*, vol. 5 of *The Study of Time*, ed. J. T. Fraser, N. Lawrence, and F. C.

Haber (Amherst: Massachusetts University Press, 1986), p.123.

¹⁹ Stone, 'The Shape of Time', p.121.

²⁰ Kramer, *The Time of Music*, pp. 394-397.

²¹ For a brief explication of Fraser's theory see Fraser, *Of Time, Passion, and Knowledge*, pp. 435-446.

²² Another author presently working on a musical application of Fraser's theory is the Polish musicologist, Ludwik Bielawski (conversation with the author). For his theory of zones of musical time see Ludwik Bielawski, 'The Zones of Time in Music and Human Activity', *The Study of Time*, vol. 4, ed. J. T. Fraser, N. Lawrence, and D. Park (New York: Springer Verlag, 1981), pp. 173-179.

²³ Jeff Pressing, 'Relations between Musical and Scientific Properties of Time', *Contemporary Music Review* (in press, 1993).

²⁴ Karlheinz Stockhausen, '...How Time Passes...', trans. Cornelius Cardew, *Die Reihe* 3 (1959): pp.10-40.

²⁵ Another well-known example is Igor Stravinsky, who based his discussion of music's relation to ontological time and psychological time on the work of the Russian philosopher Pierre Souvichinsky. See Igor Stravinsky, *Poetics of Music*, trans. Arthur Knodel and Ingolf Dahl (Cambridge, Massachusetts: Harvard University Press, 1970) and Pierre Souvichinsky, 'La Notion du Temps et la Musique', *Revue musicale* 191 (May-June 1939): pp. 70-80.

²⁶ Carter, 'Music and the Time Screen', pp. 344-346.

²⁷ Langer, *Feeling and Form*, p. 109.

²⁸ Manfred Clynes and Janice Walker, 'Music as Time's Measure', *Music Perception* 4.1 (Fall 1986): pp. 85-119.

²⁹ Clynes and Walker, 'Music as Time's Measure', p. 114.

³⁰ Nina Gierasimova, 'Historical Conditions of the Category of "Time" in Music', *Muzyka* 23.1 (1978): pp. 21-32 (in Polish with English summary).

³¹ For a variety of different views on postmodernism brought together in a collection of articles see Warren Burt, ed., 'Postmodernism', *Sounds Australian* 33 (Autumn 1992): pp. 17-48.

³² James Monaco, *How to Read a Film*, rev. ed. (New York: Oxford University Press, 1981), p. 37.

³³ Nattiez, *Music and Discourse: Toward a Semiology of Music*, p. 85.