The Study of Time in Music: A Quarter-Century Perspective

Lewis Rowell

In this essay I focus upon a collection of fifteen articles on time and music, published over a period of 21 years in a series entitled *The Study of Time*.[1] With the 1996 publication of volume 8, the series now comprises a total of 187 articles representing a wide range of scholarship in the sciences and humanities. Each set of papers was originally presented during one of the triennial conferences of a remarkable organization, the International Society for the Study of Time (hereinafter ISST).

Because of the relatively low visibility and availability of the series, for reasons mentioned below, I thought it would be useful to call attention to this collection of music articles and place them in the wider context of studies on time and music that have been published during the last few decades—surely one of the most active and productive periods in musical scholarship.[2] The publication of this special issue of the *Indiana Theory Review* is proof enough that the study of time in music has broadened from its former preoccupation with issues of rhythm and meter (mostly as delineated by groupings of stress and tonal

---

[1]See pp. 70–71 below for details.

[2]For some earlier reflections on the current wave of studies on time and music, see Lewis Rowell, "The Temporal *Spectrum*," *Music Theory Spectrum* 7 (1985): 1–6.

accents) and made its way into the mainstream of musical scholarship.

Three themes are interwoven throughout this essay: a review and index of this corpus of articles, a personal memoir of the evolution of the ISST, and some reflections on what has been accomplished (and what remains to be accomplished) in recent studies on time and music. These themes are so closely connected that it is quite impossible to discuss them separately. In my review I prefer to avoid evaluation and focus instead on the ideas presented and developed, not only because some of my own work appears in this series, but also because there is more to be gained from examining what we have learned about temporality in music than from bestowing praise and blame.

The ISST was conceived in January 1966, at a conference on "Interdisciplinary Perspectives of Time" (sponsored by the New York Academy of Sciences), and born three years later.[3] The distinguished British mathematician and historian of science Gerald J. Whitrow was elected as the first president, and J. T. Fraser, who was the author of the initial proposal for a society devoted to the interdisciplinary study of time, was elected as secretary. The first conference was held in 1969 at the Institute for Mathematical Research at Oberwolfach, in the Black Forest (Germany), and subsequent meetings have been held at three- or four-year intervals.

My own involvement with the ISST began in the early 1970s when I exchanged letters with J. T. Fraser, after having come across a volume of studies entitled *The Voices of Time*, which he had edited and published in 1966.[4] I recall two first impressions of this extraordinary book: how much musicians had to learn about time from the rich treasury of ideas expressed in other fields of study, and how much

---

[3]The proceedings of this conference (17–20 January 1966) have been published in a monograph entitled *Interdisciplinary Perspectives of Time*, ed. Roland Fischer, *Annals of the New York Academy of Sciences* 138, art. 2 (1967): 367–915.

[4]*The Voices of Time: A Cooperative Survey of Man's Views of Time as Expressed by the Sciences and by the Humanities*, ed. J. T. Fraser (New York: Braziller, 1966). A second edition, containing a valuable new introduction and an appendix entitled "A Mosaic of Metaphors of Time and Images of Transience in the Literature of the West," was published in 1981 by the University of Massachusetts Press.

more musicians had to contribute from their own involvement with time than was evident in the pedestrian article on rhythm and meter in *Voices*. What impressed me even more was the friendly, detailed reply I received from Fraser, and I attended my first ISST conference in 1976, in Alpbach (in the Austrian Tyrol). I was hooked. I have participated in all of the subsequent conferences, served for four terms in as many ISST offices, and have heard all but one of the papers discussed below as originally presented. Readers will understand that what follows is written from an inside perspective, but not, I hope, an unobjective one.

The following booklist and index of the music articles published will provide a base for further comments and reflections. This material is presented in three sections: first, a chronological list of the eight volumes in the series and the relevant articles in each volume; second, an index of names and subjects; and third, an index of composers and compositions. See below for further comments on the indexes and subject headings. In an effort to keep the indexes as simple as possible, I have located each entry and subentry by volume number and inclusive pages, for example, 4:161–72 for Becker 1981. Text references to specific articles, as in the preceding sentence, will consist of the author's name and year of publication.

As far as I can determine, all of the volumes except the first are still in print. Locating library copies is another matter. The series has never sold well and even major research libraries are unlikely to own the complete set. Moreover, the 1986 change of title (from the series title to an individual thematic title for each volume) has absolutely confused catalogers and virtually insured that volumes will not be shelved together. A quick search of major midwestern research library on-line catalogs indicates that most Big Ten library systems own from two to four volumes and that none owns the complete series. QB209 is the standard class number in the Library of Congress system, but individual volumes in the latter half of the series are inconsistent in their classification. Of all the catalogs surveyed, only Notre Dame seems to have gotten it right, and the Hesburgh Library has a complete set. I have not found any of the volumes in any branch music library. Readers are advised to search under individual volume titles *and*

Fraser, J. T. (the only editor responsible for all eight volumes).

A few additional observations on the indexes will prove useful before proceeding to comments on individual volumes and articles. The first index is heavy on concepts and terms and relatively light on personal names. Because this index was designed for a musical readership, I saw no point in indexing the authors of quotations on time in general, or names that are merely mentioned. I have made exceptions in the case of authors of studies on music (e.g., John Cage and Leonard B. Meyer), whose names and ideas are mentioned in several articles. I have provided a detailed index of composers and works analyzed, something I believe that most readers of this journal will find useful. Familiar names (such as Beethoven and Mozart) are well represented, but the list also includes quite a few exotic items and, as one might expect, many works from the twentieth century.

The subject headings are interesting in themselves and can tell us a lot about a particular field of study. The keywords *time*, *rhythm*, and *music* pervade the series to such an extent that they apply to the entire contents of each article and are therefore of limited use as subject headings. The entries under *rhythm* and *time* are therefore, with a few exceptions, guides to a more specific set of terms and concepts, not general discussions. A second group of important terms (e.g., *duration, gesture*, *grouping*, *meter*, *repetition*) is almost as ubiquitous, so I have indexed only passages with substantive, focused discussions and illustrations of these issues. Because Western thinkers, following St. Augustine, have come to think about time as a set of apparent contradictions between reason and experience (what Paul Ricoeur has labeled "the aporetics of temporality"), I have framed many of the basic concepts in terms of oppositions.[5]

With respect to content, how do these articles differ from the studies that appear regularly in "mainstream" music theory or

---

[5]Augustine's discourse on time appears in book 11 of his *Confessions*. For an English translation see Charles M. Sherover, *The Human Experience of Time: The Development of its Philosophic Meaning* (New York: New York University Press, 1975), 81–96. For Ricoeur's analysis of the problematics of time, see his *Time and Narrative*, vol. 3, trans. Kathleen Blamey and David Pellauer (Chicago: University of Chicago Press, 1988), 11–96.

ethnomusicology journals? Readers who are surprised at the small number of entries under headings such as hypermeasure, metrical accent, and structural downbeat will rightly conclude that authors in this series have generally addressed issues other than the popular topic of "phrase rhythm in tonal music," a catch-all topic that includes such important tasks as normalizing structures on various hierarchical levels, determining patterns and groupings of metrical and rhythmic accents, weighing and comparing the various types of accent (agogic, stress, tonal) in given passages, formalizing the instinctive responses of "competent" listeners, and the like. These matters are worth investigating and are not entirely ignored in this series (see, for example, Epstein 1981), but readers for whom they are the main issues in the temporality of music will come away disappointed.

Why have the above topics not been addressed in greater detail in this series? There are several reasons. While the pitch structure of a composition is unquestionably a temporal issue, perhaps even the single most important temporal issue, it is far from the only one. One can argue, as I do argue, that the study of pitch deployment in time is essentially a set of dividing and measuring operations, with the demonstration of structural relationships and unity as their main goal. This is not to be read as a slam. If we have learned to understand the concept of time in spatial terms, as indeed we have, it is hardly surprising that we tend to apply similar metaphors and concepts in our attempt to understand the time of music.[6] Henri Bergson's division of temporal concepts into a set of oppositions (see figure 1)—to which he referred as "spatialized" time and "pure" duration (*durée réelle*)—is an appropriate representation of the difference between what you will read in the pages of *Music Theory Spectrum* and what you will read in those of *The Study of Time*.[7] One common mark of the studies described

---

[6]See Lewis Rowell, "The Subconscious Language of Musical Time," *Music Theory Spectrum* 1 (1979): 96–106; and Peter Westergaard, "Geometries of Sounds in Time," *Music Theory Spectrum* 18, no. 1 (1996): 1–21.

[7]For analysis of Bergson's views on time and music and a more complete table of oppositions, see Lewis Rowell, "El tiempo en las filosofías románticas de la música," *Anuario filosófico* 29, no. 1 (1996): 141–45. For Bergson's final statement on his

Figure 1. Temporal oppositions in the philosophy of Henri Bergson

time as	
experienced (*durée réelle*)	measured ("spatialized time," the physicist's *t*)
human consciousness	the clock
unfolding	the unfolded
qualitative	quantitative
real, concrete	symbolic, an abstraction
succession	juxtaposition
the act of traversing	the space traversed
subjective process	objective dimension
organic	mechanistic
becoming	being
known by intuition	known by intellect
indivisible	divisible, countable
lived intervals	numbered now-points

earlier in this paragraph is a certain reluctance to use *time* as a keyword and few if any references to properties of time in general. I hope musicians will continue to add to our understanding of spatialized time in music, but I do not think such studies will help us learn more about time.

What more then can we hope to learn about time in music by approaching the subject from a different perspective? One answer would go like this: what it feels like; how and why music creates the illusions of motion and continuity; what are the qualities (as opposed to the quantities) of temporal events, motions, and processes; how other cultures understand the structure and experience of time in music; and how we can understand music, not only in terms of the local temporal scaling of individual works but also as it relates to the complete spectrum of periods and frequencies that comprise time in human

---

developing concept of time, see chap. 3 of his *Duration and Simultaneity* (1922), trans. Leon Jacobson, reprinted in Sherover, *Human Experience of Time,* 218–38.

experience and history. If we are willing to accept music not only as a set of permanent objects but also as a cluster of ideas, processes, systems, states, and fields, we have much to learn. As Peter Westergaard put it so eloquently in the conclusion of his keynote address (in verse, mind you) during the 1994 Annual Meeting of the Society for Music Theory,

> . . . we have to find a way to build
> a geometry of sounds in time that shows
> not just how music *is*, but how it goes.[8]

Readers whose curiosity is stimulated by the previous paragraph will find something of value under the following subject headings, among others: *aesthetics*, *becoming-being*, *beginnings (of musical works)*, *continuity*, *endings (of musical works)*, *hierarchy*, *identity*, *metaphors for time in music*, *motion (musical)*, *narrative*, *perception-cognition*, *process*, *silence*, *stasis*, *tempo*, and many of the subentries under *rhythm* and *time*. They will also find relevant material under various geographical areas (e.g., Africa, China, India, Japan, Java) and a substantial cluster of issues that have become important in music of the twentieth century.

It may be tempting to read these subject headings in terms of the conventional opposition between (a) the modernist quest for the rational, objective, orderly, and quantitative in traditional Western classical music and (b) the postmodernist (perhaps one ought to say "romantic") relish for the irrational, subjective, chaotic, and qualitative in music of the "far away" and the "here and now." But that would be too simplistic. If there is an opposition lurking here, it is between the concepts of (a) time as a quantitative dimension articulated by audible events and (b) time in the form of ideas and experiences, with distinct properties and qualities that can be modeled in sound. This is an important matter, and I shall return to it for further discussion.

---

[8]Westergaard, "Geometries," 21.

Articles on Music in The Study of Time, *vols. 1–8*

The Study of Time [vol. 1], ed. J. T. Fraser, F. C. Haber, and G. H. Müller. Proceedings of the First Conference of the International Society for the Study of Time, Oberwolfach (Black Forest),West Germany. New York: Springer-Verlag, 1972.

(no articles on music)

The Study of Time 2, ed. J. T. Fraser and N. Lawrence. Proceedings of the Second Conference of the International Society for the Study of Time, Lake Yamanaka, Japan. New York: Springer-Verlag, 1975.

Rochberg, George. "The Structure of Time in Music: Traditional and Contemporary Ramifications and Consequences." 136–49.

The Study of Time 3, ed. J. T. Fraser, N. Lawrence, and D. Park. Proceedings of the Third Conference of the International Society for the Study of Time, Alpbach, Austria. New York: Springer-Verlag, 1978.

Rowell, Lewis. "Time in the Musical Consciousness of Old High Civilizations—East and West." 578–611.

The Study of Time 4, ed. J. T. Fraser, N. Lawrence, and D. Park. Papers from the Fourth Conference of the International Society for the Study of Time, Alpbach, Austria. New York: Springer-Verlag, 1981.

Becker, Judith. "Hindu-Buddhist Time in Javanese Gamelan Music." 161–72.

Bielawski, Ludwik. "The Zones of Time in Music and Human Activity." 173–79.

Epstein, David. "On Musical Continuity." 180–97.

Rowell, Lewis. "The Creation of Audible Time." 198–210.

Time, Science, and Society in China and the West (*The Study of Time 5*), ed. J. T. Fraser, N. Lawrence, and F. C. Haber. Papers from the Fifth Conference of the International Society for the Study of Time, Monte San Savino, Italy. Amherst, MA: The University of Massachusetts Press, 1986.

Kramer, Jonathan D. "Temporal Linearity and Nonlinearity in Music." 126–37.

Stone, Ruth M. "The Shape of Time in African Music." 113–25.

Time and Mind: Interdisciplinary Issues (*The Study of Time 6*), ed. J. T. Fraser. Papers from the Sixth Conference of the International Society for the Study of Time, Totnes, Devon, England. Madison, CT: International Universities Press, 1989.

Mayr, Albert. "Social Time in Experimental Music and Art." 217–28.

Pasler, Jann. "Narrative and Narrativity in Music." 233–57.

Time and Process: Interdisciplinary Issues (*The Study of Time 7*), ed. J. T. Fraser and Lewis Rowell. Papers from the Seventh Conference of the International Society for the Study of Time, Glacier Park, Montana, USA. Madison, CT: International Universities

Press, 1993.
Brodhead, Garry L. "Metaphor and Deep Time in Music." 167–84.
Hasty, Christopher F. "Duration and Rhythmic Process in Music." 147–66.
Rowell, Lewis. "Music as Process." 127–46.

Dimensions of Time and Life (*The Study of Time 8*), ed. J. T. Fraser and M. P. Soulsby. Papers from the Eighth Conference of the International Society for the Study of Time, Cerisy-la-Salle, Normandy, France. Madison, CT: International Universities Press, 1996.
Lochhead, Judy. "The Expressivity of Tempo and Timing in Musical Performance." 147–60.
Rowell, Lewis. "*Ma*: Time and Timing in the Traditional Arts of Japan." 161–81.

Index of Names and Subjects

Index of Composers and Compositions

Some comments on the series as a whole will provide useful background for a discussion of individual articles and their contents. Volumes 1–4 were published in uniform format by a distinguished German scientific publisher, Springer-Verlag. Disappointed by the generally poor sales and the change to a "thematic" approach in the fourth volume, Springer refused to continue the series, and the University of Massachusetts Press published volume 5—an odd assortment of articles lumped together under the title *Time, Science, and Society in China and the West*. Their book work was elegant, but the volume received poor reviews and sold very few copies. That was it for Massachusetts, and the ISST turned next to International Universities Press, a small press that specializes in medicine and the life sciences. The subject areas of volumes 6 and 8—*Time and Mind*

and *Dimensions of Time and Life*—were appropriate for their list, and the Press gritted its collective teeth and published a very different collection of articles on *Time and Process* as volume 7.

The lessons to be learned here involve issues such as market economics, the tendency for small learned societies to follow (and perhaps to be constrained by) a developing intellectual agenda, the shifting mix of disciplines within a multidisciplinary society, the waxing and waning of fad topics of scholarship, and the sheer struggle for survival in the competition for time, money, and attention. I can do no more than touch briefly upon some of these issues.

One of the strengths of these collections of articles is that they were first presented to a multidisciplinary audience. Supporting technical details have been supplied in the published versions, but the original presentations were at least intended to be intelligible to generalists and specialists in other fields. As far as I am concerned, one of the marks of good scholarship (at least in the humanities) is the ability and desire to explain one's findings to a general audience of intelligent people. The strongest articles in *The Study of Time* series are those that were (a) designed with general readers in mind and (b) informed by insights about time gained from other fields of study. Not all of the articles in the series meet this test, but surprisingly many do.

Building conferences around special themes improves publication possibilities—publishers have no interest at all in subsidizing general collections that don't sell. But moving from one theme to another every three years encourages a "revolving-door" membership. It also means that scholars with defined research agendas will often prefer to follow up with similar studies rather than design a topic to fit the theme of the moment. The ISST began as a scientific society, with a high concentration of members in physics, mathematics, and the philosophy of science. Over the years, the focus has become "softer" (emphasizing in turn psychology, biology, and sociology), and the papers published reflect a gradual loss of interest in time "as it really is" and a growing interest in time "as we think it to be." This has been a welcome development for musicians, as well as for other humanistic fields and the social sciences, but the Society has largely lost its scientific base. An effort was made to appeal to hard scientists with the 1995

conference on "Time, Order, Chaos,"[9] but the practical result was a mélange of studies on the metaphor of chaos in various subjects, not a focused set of studies on classical chaos theory.

The book work in the series is generally good. Volume 5 is weak in content but elegant in appearance; volume 3 was offset from typescript, but contains a rich assortment of solid articles in many different disciplines. Volume 4 is perhaps the most successful of the lot and an example of what can be accomplished by focusing the efforts of many scholarly fields upon a single problem—in this case, beginnings and endings. None of the subsequent thematic volumes comes close to this coordinated assault on a single aspect of time. Editorial standards range from poor to no more than satisfactory, and in the latter category I regret to say that I include a volume for which I was partly responsible. The biggest weakness in the entire series is the failure to assert competent editorial control over the predictable obstacles that arise when small publishing houses tackle technical subjects for which they are not completely prepared. That said, it is probably a minor miracle that the series is as good as it is; it is a pity that it could not have been better.

It should be noted that the articles published in this series have all met the test of peer review, unlike many sets of conference proceedings in which all articles submitted are automatically published. I know of at least one case in which an outstanding article was rejected for publication on the strength of a review that I considered to be biased, but, with this one exception, the process seems to have worked relatively well—at least for the articles on music. I am not as confident about some of the articles in other fields, a few of which are unduly long and self-indulgent. But competence, I believe, is not at issue.

I will conclude the review section of this article with some comments on individual articles. Most of the authors' names will be familiar to readers of this journal, and some of them are featured in this issue. Many books begin their career in the form of articles on more limited aspects of a problem, and at least three articles in this series (Epstein 1981, Kramer 1986, and Hasty 1993) have since developed

[9]2–8 July 1995, Ste-Adèle, Québec, Canada.

into major books.[10] I know of no cases, however, in which material has been mechanically recycled, so the original versions remain valuable sources for the evolution of each author's ideas. The analyses of the second movement of Brahms's Symphony no. 2 in Epstein 1981 and the same author's *Shaping Time*, while reaching similar conclusions, differ in interesting ways.[11] In these three articles, in Brodhead 1993, and to a lesser extent in other articles in the series, readers will find analyses and discussions of many familiar works that turn up again and again in the literature. Beethoven heads the list with thirteen movements discussed, and Mozart runs a distant second with six.

In addition to the studies cited in the previous paragraph, which I would describe as "mainstream" music-theoretical studies on rhythm and meter, two themes are prominent throughout *The Study of Time* series: (1) time organization in twentieth-century music and (2) time concepts in traditional musics of the non-Western world. The first category includes Rochberg 1975, Kramer 1986, Mayr 1989, and Pasler 1989; Rowell 1978, Becker 1981, Stone 1986, and Rowell 1996 belong in the second category. Either set can be read as a series of variations on a common theme. It is puzzling that only one article (Lochhead 1996) focuses on the subject of tempo, one of the slipperiest but most important of all temporal issues. Rates, changes, proportions, and variables of tempo are relatively easy to measure and compare, but the results are generally barren in terms of musical concepts. Is there anything to grasp intellectually in the concept of tempo, or do we limit ourselves to statements such as "do it this way" and "it feels right"? There have been a few exceptions. In a number of valuable studies David Epstein has argued in favor of the concept of proportional

---

[10]David Epstein, *Shaping Time: Music, the Brain, and Performance* (New York: Schirmer Books, 1995); Jonathan D. Kramer, *The Time of Music: New Meanings, New Temporalities, New Listening Strategies* (New York: Schirmer Books, 1988); Christopher F. Hasty's *Meter as Rhythm* will be published in 1997 by the Oxford University Press.

[11]Epstein 1981, 188–92, and *Shaping Time*, 82–88.

tempo,[12] and Lochhead 1996 is a gutsy attempt to grapple with the expressive aspects of musical tempo. I'm not even sure what it is that we want and need to know about tempo, but I'm sure it is a lot more than we now know.[13]

The articles on non-Western music include studies on ancient Asian and Mediterranean cultures, Africa, India, Indonesia, and Japan. Anyone familiar with my own work will recognize that I am not an unbiased critic, so I will merely say that it is good to find in the same series studies that focus on non-Western musics not only in terms of their ethnology and praxis but also in terms of their theory and history. Even those who are relatively uncurious about music beyond the collapsing borders of the Western world can learn a lot about time in their own music from studying the time concepts and timing of other cultures.

I would like to single out four articles for brief discussion: Bielawski 1981, Mayr 1989, Becker 1981, and Pasler 1989. These are not necessarily the articles that made the strongest first impression, but as I look back with some additional perspective, they strike me as exemplary studies of the kind that rarely appear in mainstream journals within a single musical subdiscipline. The first two are especially provocative and suggest useful lines of inquiry.

Bielawski's brief exposition of his "zonal" theory of musical time, in which he builds upon the work of the Polish philosopher Kazimierz Ajdukiewicz, is one of the few studies I have seen on the time of music as a dimension, characterized by seven zones and two distinct scales: a linear scale of durations and a logarithmic scale of frequencies. Bielawski does little with this information in his 4½ pages of text, and the article is obviously a condensed version of a more comprehensive

---

[12]See, for example, *Beyond Orpheus: Studies in Musical Structure* (Cambridge: MIT Press, 1979), 75–98; "Tempo Relations: A Cross-Cultural Study," *Music Theory Spectrum* 7 (1985): 34–71; and *Shaping Time*, 97–363.

[13]Curt Sachs's magisterial *Rhythm and Tempo* (New York: W. W. Norton, 1953) is the most comprehensive historical study of tempo. For a useful bibliography of recent studies on musical tempo, see Jonathan D. Kramer, "Studies of Time and Music: A Bibliography," *Music Theory Spectrum* 7 (1985): 104–106.

program of research which, as far as I can determine, has not yet been translated into English. It is unfortunate that much of the important and distinctive thinking of Soviet and Eastern European scholars remains inaccessible because of language barriers. Anyone who still believes that the theory of music is basically an English-language discipline is in for a rude shock. When Mikhail A. Arkadiev's 1992 dissertation on "The Phenomenon of Musical Time and Modern Science" becomes available in a good English translation,[14] as will soon be the case, we will discover a completely different paradigm for the study of time in music, one that is informed by the insights of a long tradition of Russian scholars. It came as a shock to me to realize that there are actually valuable things to be said about time in music *as a structured dimension,* not only as an inert continuum organized by events of various classes (as Wallace Berry was fond of putting it).[15] And if there is anything to the idea of musical time zones, as I believe there is, music theorists should have interesting things to say about these zones and their borders—especially one of the longer zones which Bielawski identifies as the zone of ecological time.

This line of thought leads naturally to Albert Mayr's provocative article on "Social Time in Experimental Music and Art," and if musicians find Bielawski's vision of musical time "off the wall," wait until they come to Mayr's! Mayr is an Italian composer who has specialized in sound installations that compel listeners to experience musical timing in new and fresh ways. His challenging ideas have been outlined in a series of brief and relatively inaccessible publications, but readers will find an excellent sample of his work in volume 7 of *Music Theory Spectrum.*[16] Mayr is primarily interested in social and ecological time, periods on the scale of frequencies that he refers to as "low frequencies" (because their frequency falls below the so-called fusion

---

[14]Under the title *The Temporal Structure of the New European Music.*

[15]See, for example, his article "Metric and Rhythmic Articulation in Music," *Music Theory Spectrum* 7 (1985): 7–33.

[16]"Sketches for a Low-Frequency Solfège," *Music Theory Spectrum* 7 (1985): 107–13.

threshold). It is totally refreshing, if somewhat mind-boggling, to conceive of music in terms of inaudible frequencies and networks of synchronized and dissynchronized events and behaviors (temporal "consonance" and "dissonance"), but Mayr makes a strong case for his views. The most impressive demonstration of his vision is recorded in a film that he produced for Italian public television,[17] and I recall vividly a "time walk" that Mayr organized through the lovely grounds of the Indira Gandhi National Centre for the Arts in New Delhi, in which he encouraged participants to "frame" spatial and temporal intervals that they encountered. It was a lot more fun than chunking hypermeasures and climbing accent trees. Mayr's articles are diffuse and a bit disorganized, but they are also full of stimulating ideas.

The remaining two articles are easier to categorize. Judith Becker's concise article on "Hindu-Buddhist Time in Javanese Gamelan Music" strikes me as an outstanding example of what historical ethnomusicology has to offer. She draws explicit, convincing connections between time in Indonesian languages, history, and religious ideology and the temporal organization of the traditional gamelan music of Java. The article will be an eye-opener for anyone who still believes that musical time is in any way independent of the time view and time concepts of a parent culture. Moreover, the article is lavishly illustrated and written in a style that evokes the sensuous atmosphere and imagery of a beautiful artistic tradition—one that is as much an endangered species in its own locale as classical music is in the West.

Jann Pasler's essay on "Narrative and Narrativity in Music" is a dense plunge into a subject that has since become a hot topic in French and American scholarship. Her article is largely theoretical, with illustrations drawn mostly from music of the last fifty years, and is an excellent introduction to issues of time and narrative in recent literary theory. Documentation is not among the strong points of the articles under review, but Pasler's study is a welcome exception. It requires slow reading and some "unpacking" at times, but the superb reference list and valuable appendix of terms and definitions (by authors such as

[17]Described in "Sketches," 112–13.

Bal, Barthes, Brémond, Greimas, and Ricoeur) provide a useful guide to the rapidly expanding literature of narrative theory.

One should always hesitate before filing articles away under their separate categories, but in this case there is some value in a survey of the interests represented in this corpus of music articles. Of the fifteen, at least seven fall naturally under the heading of theory and analysis. Three are written from a composer's perspective, another three from the perspective of an ethnomusicologist, and two (Epstein 1981 and Lochhead 1996) focus strongly upon timing in performance. Philosophical and aesthetic issues are prominent in most of the articles, and in only a few passages does one get the impression of technicalities for their own sake. Nowhere in the series do authors appear to be writing for an inner circle of experts in their own fields.

The ISST is now more than a quarter century old, with a membership of approximately 300 distributed over six continents. The life of the Society has revolved around its triennial conferences, which have generally been held in beautiful, secluded surroundings in interesting parts of the world: Japan, the Austrian Alps, Tuscany, Glacier National Park, Normandy, and other attractive places. ISST meetings have been seen (in my opinion, unjustly) by some as gatherings of dilettantes, and it is certainly true that some of the papers read would not have been accepted for delivery at professional meetings within a single discipline. But membership has been controlled through an application process that requires evidence of professional accomplishment, and the Society has done its best to fend off a certain class of enthusiastic cranks (mostly elderly men) who would like to swap stories about time travel, little green men, and grand theories of everything. Nevertheless, the ISST has never quite earned the respect of major learned societies, and many major scholars in the study of time have avoided these conferences, preferring to present their work at more specialized meetings and to publish in their own journals.

If many scientists have disapproved of the general nature of the ISST, some artists have been bemused at the attempt to study time from an objective perspective. I remember vividly a lecture by the English novelist John Fowles, the author of *The French Lieutenant's Woman,* who had sat patiently through a week-long conference at the

Rockefeller Foundation's Bellagio Center on Lake Como.[18] My notes quote him as having remarked, "You all seem to me like a group of bloody schoolmasters chasing time around the room like an unruly schoolboy, and if you ever catch him you'll beat the shit out of him!"

And one learns to be wary of humor columnists who pretend to be earnest seekers after truth! After a telephone conversation with Joel Achenbach, I was jolted by the tone of his article "Warp" in the 22 March 1987 *Sunday Magazine* of the *Miami Herald*.[19] Achenbach's piece is a lively description of his growing befuddlement after a series of conversations with various ISST members. He concludes,

> I escaped from madness through music. Lewis Rowell, the newly elected president of the International Society for the Study of Time, and a professor at Indiana University's Department of Music Theory, told me to go out and buy a recording by avant-garde composer Philip Glass. Glass, he said, knows time.
>
> "Repetition," the professor said. "You'll know it when you hear it: It's a little module recorded over and over again. It's called process music. It doesn't start and it doesn't end."
>
> The album cost $8.95 at Spec's.
>
> This is how it sounded: Doodle-oodle-doodle-oodle-doodle-oodle. . . .
>
> It didn't really start, and it didn't really end. No earlier or later. No past or future. It was beautiful. I was so bored I thought I had died.
>
> Times like this, you need to reach into the fridge for a cold one. They got a term for that, too.
>
> Miller Time.

No account of the ISST can ignore the magnetic ideas and personality of J. T. Fraser, whose intellectual agenda has to a certain extent shaped the development of the Society and its publications.

---

[18]A conference on "Scientific Concepts of Time in Humanistic and Social Perspective," July 1981.

[19]Pp. 8 and 16.

Fraser came to the study of time from a background in science and technology, but he very soon reached the conclusion that time is not a single thing but many, that it is more idea and experience than it is a property of physical reality, that time measurers are more interesting than time measurements, and—most important and controversial of all—that the properties of time depend upon the *Umwelt* of the subject.[20] Time is one thing to a rock, another to my dog, something else to me, and still another thing to the members of the Indiana University Graduate Theory Association. This theory, which Fraser calls the hierarchical theory of time, posits a set of cognitive models for the experience of time and asserts that nature consists of an evolving series of "stable integrative levels" (e.g., cosmic radiation, subatomic particles, life forms, animals, mankind, society) in which each emerging level subsumes the temporal properties of its predecessors.[21] The theory has proved attractive to scholars from many different fields, but our main concern here is for music. My index will direct readers to articles that refer to Fraser's work. For a systematic application of Fraser's hierarchical theory to music, see §12.8 (pp. 394–97) of Jonathan Kramer's *The Time of Music.* Readers who are interested in general questions of time perception and cognition will find valuable material in John A. Michon's article "J. T. Fraser's 'Levels of Temporality' as Cognitive Representations."[22]

I see the following as the two principal achievements of the ISST in its first quarter century: first, the Society has demonstrated what can be accomplished by thematic, interdisciplinary studies; and second, the study of time has now become a standard topic on the intellectual

---

[20]*Umwelt,* a technical term sometimes translated as "perceptive universe" or "species-specific universe," was coined by the biologist Jakob von Uexküll (1864–1944), with reference to the limited ability of a given species to perceive and act upon the world.

[21]For a concise exposition of the theory, see the entry "Hierarchical Theory of Time," in *Encyclopedia of Time,* ed. Samuel L. Macey (New York: Garland, 1994), 263–64. Fraser's major work is *Of Time, Passion and Knowledge* (New York: Braziller, 1975).

[22]In *Time, Science, and Society in China and the West,* ed. J. T. Fraser, N. Lawrence, and F. C. Haber (Amherst: University of Massachusetts Press, 1986), 51–66.

agenda of most humanistic and scientific organizations and their members.

What has been accomplished? What next? In my introductory remarks to volume 7 of *Music Theory Spectrum*, a special issue on "Time and Rhythm in Music," I wrote that "rhythmic speculation seems to have occurred in waves, cresting at times in the history of music when intractable problems required, and sometimes found, solutions. . . . Today we appear to be nearing the crest of another wave, one which began around 1960 and is now reaching significant proportions, as Kramer's bibliography will attest."[23] It seems reasonable to ask where we stand today in terms of this "wave," if indeed the metaphor still seems appropriate.

If what we have been seeking is a "grand solution," an intellectual breakthrough that enables us to understand the temporality of music in fundamentally new and satisfying ways, I fear we are not much nearer than we were in 1960. Westergaard's goal is not yet in sight, at least not from my perspective. Hopes were and probably still are higher than they ought to be. Perhaps we ought rather to adjust our expectations, dampen some of our scholarly hybris, and be content to chip away at issues as they arise. Time cannot articulate itself, as Aristoxenus observed more than two thousand years ago. We grasp it only by means of the events and processes that pass through our experience, and the ways in which we observe, store, manipulate, and retrieve these events and processes. As long as the nature of these events and processes continues to change, so too will our awareness of their temporal construction continue to change.

Part of the problem lies in the word itself. *Time* is such a convenient, all-encompassing term for such a variety of concepts and percepts that it seduces us into believing it to be a single thing. It is not. The idea of time must surely be among the grandest and most persistent contradictions in intellectual history—a contradiction that even the most devout Marxist thinkers have failed to reconcile. There will always remain a contradiction between our common-sense

---

[23]Rowell, "The Temporal Spectrum," 2. The reference is to Jonathan D. Kramer's "Studies of Time and Music: A Bibliography" (see n. 13 above).

understanding of time and the variety of sounding forms in which we experience it.

Just as the rising consciousness of the idea of history in the eighteenth century led to the systematic explorations of the nineteenth century and a period of decline in the twentieth century, I wonder if the idea of time may be following a parallel course. The nineteenth century saw the transformation of the concept of time from a physical to a mental construction. And, similarly, it is in our own century that we have seen the most systematic investigations into time's properties. I write these lines a few days after the death of Thomas Kuhn, whose concept of scientific paradigms has shed new light on how humans ask questions and attempt to solve problems.[24]

Twentieth-century trends in time research seem to demonstrate a clear shift in paradigmatic thinking, of which Fraser's hierarchical theory is an obvious and outstanding example. One of Kuhn's points was that bold (or sometimes, ignorant) disregard for conventional lines of thought serves as a catalyst for shaping new paradigms. This, I believe, is precisely what has happened with respect to the study of time, and the main question in my mind is to what extent it will continue. My guess at this point is that the presently developing changes in music and the other arts (some of which I will mention below) will require yet another shift of mental gears, one that will either raise a different set of temporal issues or, perhaps, divert our attention from the dimension of time. It is paradoxical that our recent obsession with time coincides with the period in which we have been equally obsessed with the development of machines to overcome or neutralize time's properties and consequences.

One illustration of how quickly things can change: Curt Sachs's 1953 *Rhythm and Tempo* seemed like the last word at the time, summing up several streams of inquiry—turn-of-the-century German rhythmic and metric theory, new contributions by comparative musicologists and historical ethnomusicologists, and late nineteenth-century understandings of the principles of ancient Greek rhythmics and

---

[24]See Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962).

metrics—and weaving them into a grand narrative that ranged through the history of music.[25] I suspect Sachs has never been read as carefully as he deserves to be, partly because few Western musicologists of his day were much interested in the music of the ancient and oriental cultures that he knew so well, and partly because they distrusted his old-fashioned, sweeping view of music history. *Style* was the catchword of the 1950s for music theorists, and interest centered around the personal mannerisms of individual composers and the common features of schools and eras in music history.

But by the early 1960s a new generation of studies on rhythm and meter began to appear, of which Cooper and Meyer's *The Rhythmic Structure of Music*[26] is an early landmark. This was the new "wave" to which I referred earlier. The characteristics of this latest wave, as I see them, are as follows (and in no particular order): (1) a focus on theoretical issues, instead of description; (2) widespread and intense interest in identifying normative groupings and patterns of accent, mostly confined to a narrowing canon of Western classical music; (3) growing interest in the *perception* of time in music, which seems still in a relatively formative state; (4) occasional explorations of the aesthetic values and affective properties of musical time; (5) a rapidly increasing number of studies that draw upon the methods and themes of literary criticism; (6) studies that seek to understand and explain temporal trends in twentieth-century music; (7) studies that bring to our attention some of the distinctive temporal practices and concepts of traditional musics of the non-Western world; and (8) growing recognition that time in music involves more than the standard triad of concepts (rhythm, meter, and tempo), and that what we have learned about time in general can inform our understanding of music. The articles under review in this essay represent some of these trends, but by no means all of them. In general, we have learned a lot about time in the form of musical notes. We have a lot more to learn about time

---

[25]See n. 13 above.

[26]Grosvenor W. Cooper and Leonard B. Meyer, *The Rhythmic Structure of Music* (Chicago: University of Chicago Press, 1960).

in the form of musical ideas.

What does the agenda look like today? I can think of three books (or the equivalent) that need to be written. Perhaps they have already been written and are about to be published. First, I would like to see someone begin to pull together what has been learned as a result of the many recent studies on the perception and cognition of time in music. There has been an enormous amount of activity in this area, and it seems about time for some consolidation. Time as a variable is admittedly harder to cope with than some of the other musical dimensions, but I would like to see a few of the gifted researchers in this field shed some of their experimental mentality and risk some generalizations and conclusions.

Second, and perhaps related to my first suggestion, I believe we badly need a major study of musical memory. Having said this, I admit that I don't have specific recommendations for how to proceed, but there are so many questions here and so few answers available. Here is a subject in which the joint efforts of composers, performers, teachers, and critics could be usefully combined. I don't believe we have begun to understand the operations, the limitations, and the potential of musical memory.

And finally, I can think of no more important challenge to advocates of the so-called New Musicology than to train their lens on the politics of time in music. Here, it seems to me, is a dimension in which distinctions of gender, class, ethnicity, and just about everything else play a major role in how we imagine and experience the temporal structure of musical works and performances. I have probably not read as many recent feminist studies as I should, but in what I have read it seems to me that a lot of the self-indulgent subjectivity and wallowing in metaphor could lead to more convincing results if focused more clearly on a single musical dimension. (A typical male recommendation framed in masculine language, but what do readers expect of me?)

I conclude with a short list of relatively new trends and problems

that seem to me to demand attention.[27] All of them will require new ways of thinking about the time of music. My list of topics includes

1. the tendency for music to become more interactive, weakening the composer's traditional control over a fixed musical text;

2. a similar tendency for music to become more communal, blurring the boundaries between individual and collective musical creativity;

3. the digitizing of the world, which seems to have translated into a growing preference for discontinuity in music and the other arts;

4. a return to a concept of time that can best be described as "epic," manifested in such things as flexible scripts, long performance durations, and a change in the nature of artistic apprehension—from a process of continuous sustained attention to a mode of attention in which listeners "tune in" and "tune out" periodically;

5. the diminishing importance of the concepts of opus and genre;

6. the virtual disappearance of "Absolute" music; and

7. a rising interest in musical issues involving longer spans of the temporal hierarchy: musical events, seasons, styles, repertories, creative lifetimes, and musical frameworks that outlast the lifespans of individuals and groups.

This ought to keep us busy.

---

[27]An expanded discussion of the following ideas will appear in an article entitled "Nuevos horizontes del tiempo en la música," *Anuario filosófico* (1996), presented originally in a conference on "El acceso musical al mundo" at the University of Navarra (Pamplona, Spain), 25–27 March 1996.