

# The Function of Time in Art

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### (1962)

1. Along with the history of a given subject runs the history of its importance to people. The two histories do not always depend on or correspond with one another. It may well happen that great ideas further the validity of a thesis just at a moment when the thesis is of no noticeable interest to anybody. On the other hand, a violent grappling and searching for such hidden ideas can be expected as soon as a thesis seems to represent an answer to one of the problems which are called acute by a sufficiently great number of people. Many far-reaching ideas, theories, and inventions were named discoveries only when, long after their creation, their usefulness for solving an important problem became important. It would not be surprising, therefore, if the discovery and fresh application of an old and maybe almost forgotten thought occasionally should become the most influential factor in modern developments of a certain field of knowledge or art.

Such a constellation must under no circumstances be confused with the rather commercial method which creates an atmosphere of acute problems in order to sell old things. How difficult it is to avoid such a confusion will be admitted by everyone who ever tried to become fully conscious of the reasons for buying, liking, or learning something. And strange as it may seem to some, and well known as it is to others: just the successful avoidance of this confusion is the most difficult but also the most necessary condition, under which a genuine contribution to knowledge or art may happen to be created and to be understood (and appreciated). Speaking of avoidance of confusion, I do not wish to say that one of two alternatives would be right and the other wrong under all circumstances. Not to confuse two or more alternatives is only necessary if one desires to make a decision which is based on an understanding as to what exactly will so be decided and what exactly will so be refused. I am quite free to write down my thoughts and opinions relating to the function of time in art at any length and in any order that may seem appropriate to me. But when I offer this as a lecture to be given in public, I have to know that I thereby imply that a problem or a question exists to which I offer some ideas for solutions and answers, or at least a useful commentary.

I shall either have to admit that I simply make people believe that there is a problematical issue at hand, which has something or other to do with the function of time (and what problem hasn't?) so that I can sell my lecture; or I shall have to prove that indeed in some field of knowledge or art a situation has arisen which demands a reorientation and, if possible, additional observations pertaining to time's functioning in that field. Not wishing to be taken for a merchant in sophisticated odds and ends of a discarded personal hobby, I had better proceed and demonstrate that, in our times, for a sufficiently great number of people the time has come to puzzle over the function of time in art, and that some confusion has arisen which seems here and there to obscure the problem, and which ought to be avoided.

2. My special ground of investigation has been the field of music. But certain aspects of what I wish to say have a much more general relevance.

Modern definitions as to what time really is have not yet led to any changes concerning the human perception of time. Wherever anybody has tried to apply contemporary science to analyze the reactions of people to temporary phenomena, the result was valuable for science, but could not take an active influence on the analyzed reaction. In most cases it isn't even a scientist, but some fanatic music lover, who confuses all issues by dreaming of a musical exploitation of the theory of relativity. What people forget is that while new explanations may change the meaning of events, a progress in the power of perception is needed to become aware of new meanings. Explanations can be found anywhere, but perception is private.

Our perception of time is not unlike our perception of space. In both we perceive distances, proportions, extensions; in both we need points or fields of reference in order to place ourselves. Even the perspective view is a reality in time as it is in space. This lecture started exactly at X hours, Y minutes, and Z seconds. It could be referred to by someone in the following order: Tonight's lecture; last night's lecture; last week one evening; in 1962; in the middle of the 20th century; and finally: the evening when I lost my second fountain pen and found my darling Mary.

Anybody who writes a sonata today, be it because that person knows or does not know that it has been successfully done before, will find that by the time the recapitulation section is reached, the duration of the long past exposition appears to have shrunken by half. If classical balance is the aim, the amount of recapitulation will depend on the apparent and not on the real amount of exposition. This understanding of the perspectivic change in time was more than anything else responsible for the development of formal concepts, not only for music, but also for the theater, dance, and poetry. But there is at least one point in which, for the perceiving person, time is different from space. Time appears to be an irreversible dimension, whereas space appears to be reversible. Practical experience seems to teach us that we can go forward and backward in space, but that we can never go back in time. If I say of these common sense observations that they relate to what *appears* and *seems*, then this is to express my respect for modern science and my doubt in common sense. It does not mean that these observations are useless when we wish to organize appearances. They are useless when we wish to investigate the nature of time and space. But even if our observations are limited to appearances, at least we have to know that while we organize these appearances, the nature which causes them is at work at the same time. It doesn't wait for us to copy and imitate it. It sneaks in and dominates the situation anyway and always, sometimes helping our organization along, sometimes destroying it. Such is "true" nature.

3. The apparent irreversibility of time seems to draw a thick line between those arts in which sequences of events are organized, like theater, dance, music, etc., and those arts where simultaneous events present a static order, as painting, sculpture and so on. I hurry to state that I know a lot of wonderful paintings and sculptures, especially some done in the last 10 years, in which the artists successfully have tried to integrate

their concept of certain aspects of time, not only into the working process, but even into the result. There the onlooker is not faced with an organization of time elements, but rather with a suggestive situation which provokes the retracing in the mind of all possible movements of the picture's structural parts, and the choices between many possible shufflings, which all lead to the actually presented momentary tableau. It is not a sequence in time chosen by the artist, as it would be the case in a musical work. It rather leaves this particular choice, of one or several out of all possible time sequences, with the onlooker. So the onlooker would have to be an artist too, if the choice is to be a good one. This matter of "choice" is rather an important and complicated problem, which just today again has become the subject of discussion in several artistic quarters. I'll talk about this discussion later. For the time being we can abide by the traditional situation, where the artist wishes to present one choice of order to the onlooker. If it is an order in time by which something is to be expressed, this artist will usually be a composer of music, a playwright for theater or film, or a choreographer of dance. In these professions the artist is forced to consider not only what time does to the ideas, but also what the ideas are doing to time.

And this interplay between natural force and human device is the battlefield on which alone time can become a function in art. I say "battlefield", although in general I refuse to use analogies of warlike character for instances where apparently peaceful rumblings of the mind are concerned. But time is ruthless and nothing but the most refined strategy and the most precise aiming at its weak points will leave the desired trace in the wake of the awful ever-moving equalizer. This may sound somewhat dramatically put. In reality it is the outrageously ridiculous which happens when time is stronger than the artist. The fine points and the elaborate details simply disappear and get lost in time, when time doesn't cooperate. And the contrast between the importance attached to such work, and the ease and smoothness with which it is swallowed and never heard of again nor remembered . . . this contrast can make everybody grin, except the composer.

**4.** Composers speaking of time mean first of all the part it plays in the terms duration and speed. They describe, with the word *duration*, how long something lasts, and with the word *speed*, how fast something changes or becomes replaced by something else. Duration and speed are not the same, but depend on one another. If a group of tones is to be played, I have to determine the duration of the group, whereby the speed with which the tones have to follow one another will be conditioned. Or I have to determine the speed of playing, whereby the duration of the group will be the result. It seems that speed is a function of quantity and duration. And duration seems to be a function of quantity and speed. So the composer's working idea of time seems to be fixed to quantities of the events one wishes to organize. I do not hope to surprise anybody with so stale a statement. But still I beg your permission to proceed a little further on this wellworn path. What else is pitch but periodic changes at a certain speed? 440 cycles per second is called *a*. All melodies and harmonies can therefore be considered as functions of time in the composer's sense of the word. This leads us directly to the different timbres of the instruments, to the mixtures which instrumentation can achieve. All these are results of the same nature. With the exception of a few percussion

instruments, all instruments used today in the orchestra are built to produce sounds of harmonic frequency spectrums. If the length of a string or of an air-column is fixed, this length will vibrate at a certain speed. At the same time however half of the length will vibrate twice as fast, the third part three times as fast, and so on through the integers up to and over the 16th part. The difference between the timbres of the instruments results mainly from the fact that these fractional co-vibrations, partials, or harmonics, or overtones, as they are called, vary in strength from one kind of instrument to the other. As a matter of fact one could write down a desired color of sound also as a function of time, adding some specification concerning the dynamics. Even in the field of dynamics some possibilities could successfully be explored, to analyze them as combinations of time and distance in some space. But I should like to lead to an aspect of time which everybody experiences, which lies at the root of all efforts to produce forms in time, and which somehow seems to gain importance today, although not yet quite sufficiently, in my opinion. And this is the law of inertia, applied to human ways of perceiving the passing of time.

5. We perceive the passing of time by noticing events. I shall call now an event anything that brings to our awareness some change, be it in ourselves or in our surroundings. When something starts or stops, the change is a very drastic one, and the event accordingly simple:



When something continuously and smoothly changes its shape or intensity or place or color, the situation becomes more complicated:



The difficulty then will be to locate those particular moments of change which are for some reason conspicuous enough to assume the effectiveness of a separate event. If one can not discern such moments, one prefers to follow the whole continuous process as a single event, calling it a movement. Movements are events, in that they have a noticeable beginning and a noticeable end. Most movements even seem to be eventful events, in that they seem to be full of changes. But the exact points and durations of these changes evade the searching eye and ear. If you listen to a short excerpt from a quintet for woodwinds by Karlheinz Stockhausen, you will surely notice how some separate events alternate with movements of event groups.

Karlheinz Stockhausen: *Zeitmasse*

Now there is a broad field for mutual misunderstanding, not only between composers and listeners, but also between composers and performers of music. For whether a process of a certain duration is understood to be a sequence of well ordered and separate events, or to be a single event consisting of a movement, often depends on the wishes and abilities of the listener or performer, and just as often on the composer's concept and notation. But at the root of all this lies the fact that it is difficult to signal exactly that concept of time under which an audible (or visible) process must be perceived according to the author's wishes. It was with a view on this difficulty that I said a few minutes ago: I shall call an event anything that brings to our awareness some change, be it in ourselves or in our surroundings. Not every change in our surroundings creates a corresponding change in ourselves. For instance: we are quite ready to continue beating a certain pulse, even when the quantity of events changes:



What we do is follow the initial pulse, given by the first sequence of events, and then group the ensuing events under this pulse. This is by no means a problem for conductors and musicians only, because the distribution of accents is everybody's concern, while hearing or seeing something attentively. And some kind of accent seems to be the unit with which we measure time. The smallest event which we can possibly perceive and remember as a complete structure, consists of two parts: a strong one and a weak one. One tone, short and simple,



functions in time as tone plus pause.



In a musical context the tone either precedes or follows its partner, the pause, and either the tone or the pause will be the strong part. To prove it, let us take two tones:



If I succeed in playing the two tones with the same strength, it will be your choice how to understand their function in time. If you just happen to think of the word "easy", you'll give the strong accent to the first tone and the weak to the second: *Easy!*

If you wish to say with it “you see”, you’ll find the second tone to be of greater weight:  
You *see*?

The only way to feel a strong accent on both tones is to prepare oneself beforehand with a pulse which beats double time. The unfortunate example I wish to give is this: “He waited for her six years.” Now, if we wish to correct the opinion of somebody who thinks that it was only *three* years, we should say “No, he waited for her *six* years.” And if somebody came along who after six *days* already shows impatience, you would try to console him with the remark: “He waited for her six *years*.” If, at last, you wish to stress both points, then you will have to put it like this: “He waited for her *six years*.” With the words “He waited for her” a pulse is established, which will give the words “six” and “years” two beats each. Thus, both words are equal events, each bedded into a prepared time structure which consists of one strong and one weak part. The word on the strong beat, a pause on the weak. In the same way, the time accent of our two tones (always provided they are equally (evenly) played) depends on what the listener has heard before. I could go on with examples to show that there are events consisting of three or more parts. All of them contain a group of moments of which only one is accented. The number of moments in such a group, and the location of the accented moment in relation to the other, define what is called “the meter” of the event. Every such elementary group appears metrical in time. Language, with its greater frequency of accents, employs fewer different meters than does either music or dance.

**6.** A listener’s perception of time, while something is read or played, is a function of that listener’s inclination to continue as long as possible the latest established meter that listener heard, with the metric changes which the audible impression enforces on the listener. Thus it is important for composers and writers and dancers to know that the element of time in their works will function once more, after they have already finished with it. It will function then as the listener experiences it on the way from one established meter to the next. If a work of art, for extended periods, presents no metrical changes, then listeners gradually will take their attention away from the element of time and transfer it to other elements or parameters of the composition. The informative value of any structure rapidly decreases when this structure is continuously repeated. We may safely assume, that the great authors of poetry and music, who used one single meter for a whole work or for an extended division, always tried to compose the content of a given time pattern, and not the passage of time past given events. (The composition with the element of time is incompatible with the use of invariable meters.) I should like to remind you here again that I am not using these terms as contemporary science would permit. I am speaking of apparent time only, of the relationship between intended and perceived time patterns in the minds of composers and listeners.

In this sense one can say: There are two possibilities of perceiving a change in the element of time. The first and usual way is to count the quantity of events in a given time. In this case one would perceive an event of 10 tones per second as faster when it follows an event of 4 tones per second. Here the applied standard, one beat per second, does not change. That means that it is not time, or the perception of time, that gets faster, but the sequence of tones. Therefore I consider this a quantitative observation,

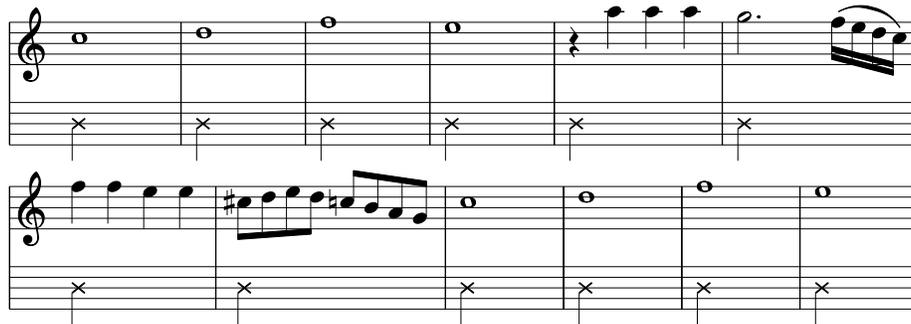
in which the word “faster” is not an adjective of time, but of events.

The other way is to measure the time needed by a given quantity of events. In this case one would perceive an event of 6 tones in one second as faster when it follows an event of 6 tones in two seconds. Here the applied standard, one beat per two seconds, changes to one beat per one second. One covers more ground in a second than before. That means that it is the time, or the perception of time, that gets faster, and not the sequence of tones. Therefore I consider this a temporal observation, in which the word “faster” is not an adjective of the events, but of time.

It is sentences like that which can spoil the appetite for any further listening to a lecture. Let me therefore quickly show you the mentioned two ways of perceiving a change in the element of time, applied to a musical phrase by Mozart.

W.A. Mozart: *Jupiter* Symphony, 4th mvt., first 12 bars

First way: The listener keeps the time and the tones change their tempo. The tones change their duration, and the sequence of tones its velocity, in this order:



The relationship between quantity and velocity remains static. Time stands still. The second way: The tones keep the time and the listener changes tempo. Here the relationship of tone durations to the listener’s velocity are these:



The relationship between quantity and velocity changes. Time gains speed. Mind you, this is only an example which I use to explain my terminology. Mozart did not compose this phrase to support my lectures, and I did not choose Mozart in order to prove that I am right. But you would not find many examples in the music from Bach to Stravinsky which in 12 short bars can lift the listener's perception of time from an Adagio to a Vivace. Because this is what happens when the listener follows elastically the distribution of articulated accents in our example. And I do believe that everyone who has ever heard this symphony properly performed, has felt that the first 4 tones, by the time they are repeated, have gained considerably in drive and apparent speed, without having changed their outward appearance.

But I am not through yet. If one were blindfolded and asked to take one slow step forward, so that it takes one second to comply, one would have an impression of how far along, one has proceeded. If on further request the blindfolded victim would use the one second for six running steps, that person would then assume to have negotiated a much greater distance than the first time with only one step. With a measuring rod, yes even with the naked eye, one can be proven to be quite right. But one's own impression was not gained with the help of rods and eyes, but only by a deduction based on a number of actions and an amount of time. Let the blindfolded person now be the listener, and let the steps taken be the accents given to a sequence of tones.

If, as my last example suggested, the listener gives one accent to the tone *C*, when hearing it for the first time, and if, under the listener's own precipitation, it is given eight accents when heard the second time, must one not gain the impression then, that the second time one hurried past a much longer tone than the first time, when one managed the distance with one single step? "Longer" in some dimension of space-time for which we have neither measuring rods nor time instruments to prove the impression to be right—that is, corresponding to some reality. But, and this is my point, the impression itself, right or wrong, is already a reality in the world of impressions. And the world of impressions is at the same time also the world I call apparent time, of intended and perceived time patterns in the mind of composers and listeners. And in this world it should not surprise those who possess an active power of imagination, a sense of humor and pleasure in letting their impressions live for a while, when under certain circumstances and in certain contexts a short tone of one second duration can become a long tone of one second duration.

7. I hope it is clear by now that I did not use the term "inertia" in a derogatory sense when applying it to a certain useful quality of the receptive human mind. It is this inertia which serves as a kind of memory for the element of time in events. Each new event is first perceived under terms of time which were established by a preceding event. The new event can suggest to listeners one of three procedures:

1. The terms established by the first event are good for the new one too, and need not be changed.
2. The new event can be understood under the formerly established terms, but introduces by some structural characteristic the possibility for revision of terms. Here it is

up to the listeners whether to prefer a status quo to a change.

3. The new event cannot be understood under the formerly established terms and therefore forces listeners to change their time concept.

## String Quartet #2

In a short composition of mine (it lasts only 5 minutes), I have tried to organize these different treatments of the listener's time perception by music. You will notice that it starts with a kind of melody which behaves rather metrically, but which obviously cannot decide which metrum it really prefers. With words used in the present lecture I should say: The meter is changed, sometimes after one, occasionally only after two or more events. But it is never established long enough to permit a precise prediction when the next accent will be. [CD Track 1]

The image shows the first four measures of a musical score for String Quartet #2. The score is written for four instruments: Violin I, Violin II, Viola, and Cello. The tempo is marked as  $\text{♩} = 208$  *leggiero*. The key signature has one sharp (F#). The time signature changes from 3/4 to 4/4 in the second measure, back to 3/4 in the third, and to 4/4 in the fourth. The dynamics are marked as *mf*, *pp*, *p*, *pp*, *p*, *pp*, *mf*, *pp*, and *p*. The Viola part starts with a *pizz.* (pizzicato) marking. The Cello part starts with a *pizz.* marking and then switches to *arco* (arco) in the second measure. The Violin I part has a *mf* marking in the second measure and a *pp* marking in the third. The Violin II part has a *mf* marking in the fourth measure.



17

Violin I:  $f$

Violin II: arco  $f$ , *dim.*,  $pp$

Cello/Double Bass:  $p > pp$  arco,  $f$

Bass:  $f$ ,  $f$ ,  $f$

21

Violin I:  $pp$

Violin II:  $pp$

Cello/Double Bass:  $ff$ ,  $pp$

Bass:  $pp$

27  $\text{♩} = 168$  *con fuoco*

Violin I:  $ff$  pizz., arco  $ff$

Violin II:  $f$ ,  $ff$

Cello/Double Bass:  $f$ ,  $f$

Bass:  $f$ ,  $f$

30

Violin I:  $ff$ ,  $f$

Violin II:  $f$ ,  $f$ ,  $f$

Cello/Double Bass:  $f$ ,  $f$ ,  $ff$  pizz.

Bass:  $f$ ,  $f$ ,  $f$

33 *feroce* *ff* *ff* *f* *ff*

36 *p* *ff* *ff* *ff* *f* *p* *ff* *f*

40 *con sord.* *p* *morendo* *con sord.* *p* *morendo* *morendo* *mf* *morendo* *p* *morendo*

43 *rit.* *pp* *pp* *pp* *pp* *pp* *con sord.* *con sord.* *pp*

$\text{♩} = 144$

The next part is notated and played throughout and correctly in one metrum only. But what you hear is quite a different proposition. The accompanying pulses, which might help to place the metrical accents in time, are too fast and too discreet. What results is a kind of recitativo, which gives one the feeling that its elements fall together with some prepared pattern of time. But the pattern itself remains obscure. [CD Track 3]

46 (♩ = 144)  
*pp*  
*pp*  
*mf*  
*pp*

48  
*mf*  
*pp*

50  
*mf*  
*pp*  
*mf*  
*pp*

The musical score consists of three systems, each with four staves (treble, alto, tenor, and bass). The key signature is one sharp (F#) and the time signature is 4/4. The tempo is marked as quarter note = 144. The first system (measures 46-47) features a piano (*pp*) accompaniment in the treble and bass staves, and a mezzo-forte (*mf*) tenor line. The second system (measures 48-49) continues the piano accompaniment and introduces a mezzo-forte (*mf*) treble line. The third system (measures 50-51) features a mezzo-forte (*mf*) treble line and piano (*pp*) accompaniment in the other staves.

52

Musical score for measures 52-53. The system consists of four staves: Treble, Treble, Alto, and Bass. The key signature has one flat (B-flat). The time signature is 3/4. Measure 52 features a melodic line in the top Treble staff with a slur over a quarter note, followed by eighth notes. The other three staves play a continuous eighth-note triplet accompaniment. Measure 53 continues the melodic line with a slur over a quarter note and eighth notes, while the accompaniment remains.

54

Musical score for measures 54-55. The system consists of four staves: Treble, Treble, Alto, and Bass. The key signature has one flat (B-flat). The time signature is 3/4. Measure 54 features a melodic line in the top Treble staff starting with a piano (*pp*) dynamic and a slur over a quarter note, followed by eighth notes. The other three staves play a continuous eighth-note triplet accompaniment. Measure 55 features a melodic line in the top Treble staff with a slur over a quarter note and eighth notes, and a mezzo-forte (*mf*) dynamic. The other three staves play a continuous eighth-note triplet accompaniment.

56

Musical score for measures 56-57. The system consists of four staves: Treble, Treble, Alto, and Bass. The key signature has one flat (B-flat). The time signature is 3/4. Measure 56 features a melodic line in the top Treble staff with a slur over a quarter note and eighth notes. The other three staves play a continuous eighth-note triplet accompaniment. Measure 57 features a melodic line in the top Treble staff with a slur over a quarter note and eighth notes, and a mezzo-forte (*mf*) dynamic. The other three staves play a continuous eighth-note triplet accompaniment.

58

Musical score for measures 58-59. The system consists of four staves: Treble, Treble, Alto, and Bass. The key signature has one flat (B-flat). The time signature is 3/4. Measure 58 features a melodic line in the top Treble staff with a slur over a quarter note and eighth notes. The other three staves play a continuous eighth-note triplet accompaniment. Measure 59 features a melodic line in the top Treble staff with a slur over a quarter note and eighth notes, and a piano (*pp*) dynamic. The other three staves play a continuous eighth-note triplet accompaniment.

60

Musical score for measures 60-61. The system consists of four staves: two treble clefs and two bass clefs. Measure 60 features a melody in the upper treble staff with a *mf* dynamic, and a piano accompaniment in the lower bass staff with a *mf* dynamic. Measure 61 features a melody in the upper treble staff with a *pp* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Both measures contain triplet markings in the piano parts.

62

Musical score for measures 62-63. The system consists of four staves: two treble clefs and two bass clefs. Measure 62 features a melody in the upper treble staff with a *mf* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Measure 63 features a melody in the upper treble staff with a *mf* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Both measures contain triplet markings in the piano parts.

64

Musical score for measures 64-65. The system consists of four staves: two treble clefs and two bass clefs. Measure 64 features a melody in the upper treble staff with a *mf* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Measure 65 features a melody in the upper treble staff with a *pp* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Both measures contain triplet markings in the piano parts.

66

Musical score for measures 66-67. The system consists of four staves: two treble clefs and two bass clefs. Measure 66 features a melody in the upper treble staff with a *mf* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Measure 67 features a melody in the upper treble staff with a *mf* dynamic, and a piano accompaniment in the lower bass staff with a *pp* dynamic. Both measures contain triplet markings in the piano parts.



76

Musical score for measures 76-77. The system consists of four staves: two treble clefs and two bass clefs. The top two staves are for the right hand, and the bottom two are for the left hand. Measure 76 features a melody in the upper treble staff with a *mf* dynamic and a triplet of eighth notes in the lower treble staff. Measure 77 continues the melody with a *pp* dynamic in the upper treble staff and triplets in the lower treble and both bass staves.

78

Musical score for measures 78-79. Measure 78 shows a melody in the upper treble staff with a *pp* dynamic and a *mf* dynamic in the lower treble staff. Measure 79 features a melody in the upper treble staff with a *pp* dynamic and a *mf* dynamic in the lower treble staff, with *mf* and *pp* dynamics also indicated in the bass staves.

80

Musical score for measures 80-81. Measure 80 contains a continuous triplet of eighth notes in the upper treble staff. Measure 81 continues this triplet in the upper treble staff, with a melody in the lower treble staff and a triplet in the bass staff.

82

Musical score for measures 82-84. Measure 82 features a melody in the upper treble staff with a *mf* dynamic and a *pp sempre* dynamic in the lower treble staff. Measure 83 continues the melody in the upper treble staff and the *pp sempre* dynamic in the lower treble staff. Measure 84 continues the melody in the upper treble staff and the *pp sempre* dynamic in the lower treble staff, with a triplet in the bass staff.

The fourth section has a metrum of dynamics only. There is nothing anymore, by which the so-called rhythmical structure of the music can be fixed. So that in this short episode, the listener will change his perception of time several times. [CD Track 4]

98

104

109

The following two sections, numbers 5 and 6, are both variations on a theme. The theme is a musical one, but also one of movement. In a way, I should say that I tried here to learn from Mozart. In a way, I mean only that particular phenomenon, which I hope to have shown with the *Jupiter* example. But while I can not prove that Mozart thought and worked according to such theories, I can authentically confirm that I did. So I composed the following structures with a method by which durations of tones or phrases gain or lose a kind of extension, which at least reminds one of space. The two sections wish to give to the listener the impression that 14 different durations are in evidence. In fact there are only 6. [CD Track 5]

114  $\text{♩} = 108$  *Passionato*

117

121

124

*ff*, *p*, *pp*, *mf*, *f*, *ff*, *pizz.*, *arco*, *gliss.*



143

*p* *f* *pizz.* *f* *arco* *pp* *mf* *fp* *f* *p*

146

*arco* *pp* *f* *p* *pizz.* *pp* *f* *p* *arco* *f* *p*

151

*f* *p* *f* *p* *pizz.* *f* *p* *f* *p* *arco*

155

*f* *p* *f* *ff* *arco* *f* *f* *p* *ff* *f* *f* *ff*

159

Violin I: *ff*, *f*, *f*, *pizz.*

Violin II: *ff*, *ff*, *p*, *ff*

Viola: *ff*, *f*, *pizz.*

Cello/Double Bass: *p*, *f*, *pizz.*

164

Violin I: *f*, *arco*

Violin II: *p*, *p*, *pizz.*

Viola: *f*, *arco*, *p*, *pp*

Cello/Double Bass: *p*, *p*, *pizz.*

168

Violin I: *p*, *arco*, *f*, *pizz.*, *ff*, *ff*, *ff*

Violin II: *f*, *ff*, *ff*, *pizz.*

Viola: *p*, *f*, *pizz.*, *ff*, *arco*, *ff*

Cello/Double Bass: *f*, *p*, *f*, *ff*, *arco*, *ff*

171

Violin I: *ff*, *pizz.*, *arco*, *f*, *p*, *arco*

Violin II: *pizz.*, *arco*, *f*, *p*, *arco*

Viola: *ff*, *pizz.*, *arco*, *p*, *pizz.*, *p*

Cello/Double Bass: *f*, *pizz.*, *arco*, *p*, *pizz.*, *p*

175

178

182

185



After that, metrical organization sets in again. If the listener has elastically followed up to this point, the piece now becomes easier until the end, an only slightly varied form of the first section. This return to old things, this recapitulation, was designed because I wanted the listener to gain the impression at the end as if no time at all had passed, as if everything was nothing but a dream. [CD Track 6]

204  $\text{♩} = 208$  subito *leggiero*

208

212

*pizz.* *arco*

*mf* *pp* *p* *pp* *f* *f* *mf* *p*

*pizz.* *arco*

*mf* *pp* *f* *arco* *p* *f*

216

*f*

*pizz.*

*f*

*f*

*f*

220

*f*

*dim.*

*arco*

*p*

*pp*

*f*

*f*

*f*

224

*con sord.* *♩. = 92*

*p molto legato e dolcissimo*

*pp*

*ff*

*f*

*ppp*

*p*

*f*

*ppp*

229

*p*

*ppp*

*p*

*pp*

*p*

*ppp*

Munich 3 March 1957

8. All this seems to me rather important for a few reasons, which I now shall try to explain. One frequently meets with composers of music, with poets and painters, who profess to be *completely indifferent* as to how their works are received, understood and interpreted by the public. I have made the observation that remarks of that kind mostly come from young people, who have no public yet (in this case it would not make any difference whether they care or not), or from already famous artists, who can allow themselves to be indifferent to standards which they themselves have succeeded to create. In all cases this kind of remark doesn't ring quite honest to me. It implies, upon nearer investigation, an identification of the person who created the work with the work which the public perceives. This identity is a fiction, promoted by 19th century pseudo-biographical and pseudo-analytical literature on art and culture, and by the commercial usages in the economical exploitation of cultural merchandise. Somewhere during my commentary on the string quartet I mentioned that something was done in such and such a way, "because I wanted the listener to gain the impression", that this and that was, or is, or will be. I should have said, to be precise: "because I wanted the composition at this point to make the listener gain the impression, that etc." What I wish to underline here is that the composer, or poet, or painter shall incorporate in the structure of the composition not only the solution of problems, the fulfillment of demands, but should also articulate the problems and demands themselves. A work of art does not consist of a person plus creation. It has to consist of a creation minus the person who is responsible for its form and shape. This "minus" can make a work of art out of what started as an inspiration, an accident, a confessional, a story, an emotion, and the like. But every branch of art develops in every longer period of time a system of code by which certain musical or physical gestures, certain turns of language, and certain proportions and directions of shape become rather fixedly associated with certain meanings in the mind of the audience. It then does not help when the composer has carefully composed such an event in a context with a perfectly new meaning. The composer must know that the established burden of acquired associations and traditional functions is not easily doffed, just because the composer does not mean it to be there. The composer is responsible for the ways along which the composition leads the listener.

But it seems today that the unprinted dictionary in which one could juxtapose to every form, sequence, or movement, a limited but generally accepted choice of meanings, has grown to such an extent that it threatens to discourage the creative spirit in its search for untrodden ways to communicate unheard of events suggesting not yet absorbed meanings. Here time alone can help; almost the whole dictionary, imagined before, is based on a perception of time, in which time (kept by the listener) plays the role of a steadily moving standard (similar to a watch or a metronome), which measures the quantity, duration, and proportional accent value of the events. It also unequivocally determines what comes earlier and what happens later, thereby once more manifesting its irreversibility. In consequence of another thinking habit, which tells us that the sequence of cause and effect is also irreversible, all the meanings in our dictionary are somehow derived from a world of impressions in which the story is the dominating form of attitude and coherence.

9. Recent developments in all arts seem to announce that a new dictionary is not only planned but already in the making. The most conspicuous characteristic of all attempts in this direction is their preoccupation with the treatment of time. In many varied manners they all show a tendency to relegate to the performer or to the listener, or to both, an important part in the formation of time concepts.

John Cage, for instance, who has become well known in Europe during the past 5 years, has written some pieces in which the distances from one event to the next are not determined in the notation. It is up to the performers to move along Cage's notation according to *their* perception of time, and play the event then, when *their* movement brings *their* eyes to it. Cage is not interested in composing the connection between sounds. He is interested in the disconnected quality of sound production and sound perception as it happens in every instance here and now. The best performers of Cage's music, therefore, are musicians who have developed their instinct for used patterns and their knowledge of established meanings so far as to be able to avoid them or to allow them at will. The best listeners of Cage's music would be those who are able to change, at a moment's notice, from continuous to discontinuous time perception, in short, those who can imagine and realize in themselves a composed attitude of listening, while anything may happen.

Numerous imitations of Cage's method by young composers have proven that it is difficult to compose a music in which the impression that anything may happen is permanently kept up. My trouble with this music lies in the fact that I cannot resist the temptation to anticipate everything, where anything may happen. So that whatever then happens always confirms some of my expectations, thereby making Cage's music, for me, the most conformist music ever written. However, I may not yet have reached the composed attitude of listening required. And as the problem still fascinates me, so does the music of Cage.

Several composers, like Earle Brown, Franco Evangelisti, Karlheinz Stockhausen, to name only some whose works I know well, have tried to solve their problem with time by composing works consisting of numerous structures, without specifications, how-

ever, as to the order in which the structures are to be performed. Thereby it becomes impossible to attach one determined chain of cause and effect to the whole work. It would be necessary, in order to profit from this endeavour, to listen to several different versions of each piece. But then, as I was able to observe, just these compositions gain faster in semantic fixation than any other. A structure changes its quality when it changes its immediate surroundings. In due course, when one knows and recognizes all the structures of such a piece, their changes become the most important events in its performance. Being the effect of order and sequence, every version will thus be an almost convincing example for the story of cause and effect itself. Even if each structure should lead the listener's time concept along intricate ways, the fact that the structure as a whole can be transplanted elsewhere, reverses the achieved function of time back to a function *in* time. Still, the most wonderful music was composed in this way by these composers, which shows that somewhere the experiment was successful, even if it does not meet all requirements. Occupying oneself with the question "what will time do when it is faced with events of nonmetrical and nonperiodic structure?" is a filter through which a great number of time honored patterns of time simply do not pass any longer. This filter and its function, which one may also call taste, instinct, style, talent, musicality, creative spirit, awareness, realism, consciousness, and so forth, is usually not sufficiently taken into account when discussions take place in which the [conversation] partners try to determine the point at which what is called freedom by one, turns into what is called arbitrariness by the other.

If I, at the piano, may choose the moment when to play the next tone, then I manifest freedom, my freedom, if it makes a difference to me, the pianist, which moment I choose. If it doesn't make any difference to me and I still go ahead and play the next tone, then I manifest arbitrariness.

If I carefully choose, when to play the next tone, and if, at the same time, it makes no difference to the listener, then my free and careful choice will be perceived and judged as arbitrariness by that listener.

**10.** There is no way out of this misunderstanding, unless one slowly starts to assume that musicians, poets, dancers and painters more often than not are people to whom, for maybe unfathomable reasons, it makes a lot of difference how and when and where a tone is played, a word is said, a movement is made, a shape, a design, a color is placed. Of course, the quality of results depends lastly on the range of choice at the disposal of the performer; the understanding of the quality on the range of choice at the disposal of the listener. People who disliked the music of Schoenberg called it, at first, arbitrary. After having been taught that "arbitrariness" was lacking in Schoenberg's work, they were disappointed, and from then on despised his music as "contrived". They meant and mean the same with both terms: namely, that the composer, the painter, the poet, the dancer have chosen to organize their material, which they know very well, in a way which the dissatisfied people neither could nor would have chosen. The function between range of choice and precision of selection represents the quality of a person's freedom.

One composer, named György Ligeti, wrote an orchestral composition, the first performance of which, in Donaueschingen, was quite a success. The work is named *Atmospheres*, and I should like to introduce it here, not only because I think it a good composition, but also because it manifests an experimental treatment of time. It seems to be a static piece of music. It almost never moves. Sounds are spread out before the listener without giving any indication as to what function those sounds have in time. Occasionally some movement can be discerned working and trembling agitatedly within a sound. But it doesn't move the sound, and it does not suggest any pulse or meter to the listener. At two or three points, for short moments, real sequences of tones become perceivable; but the next moment already makes it clear that no "events" were intended or generated. Any progress in this piece is imagined only. One could, from a dramatic point of view, listen to all of its parts simultaneously. This shows what Ligeti actually has done. He has composed one complicated, richly differentiated sound, to be produced by an orchestra of nearly 100 musicians. This sound lasts one and a half minutes. Next, Ligeti divided the sound in several layers. These layers, of which each presents another sector of the original sound, he now laid out in time. We never hear the complete sound. But its duration of one and a half minutes is the real time the composition lasts. The 9 minutes which we have to listen to it, are an account of the passing of apparent time only. This may sound absurd, but it is not absurd at all. For if you control your time perception according to the time indications of *Atmospheres*, you will, with the start of each new layer, start again from the beginning. At the end, your watch will show, that during 9 minutes you have been listening to a music which at no point lasted longer than one minute and a half.

György Ligeti: *Atmospheres*

**11.** For some time now it is generally understood that day and night and the seasons are all phenomena due to movements of the earth in relation to the sun. But neither science nor enlightenment nor poetry nor common sense have been able to coin even one single metaphor or phrase to substitute for the obsolete expressions: sunrise, sunset, daybreak, nightfall, etc., all of which imply movements of the sun in relation to the earth. This reluctance of language to go with the times stands in strict contrast to an idea, upheld by many people, that language is a living organism. Language lives only when its creators, its speakers, activate its latent powers under the urge of communicative desires. Some new music today seems to act under such an urge, communicating through form and sound a painfully contemporary question: Are we happier in considering ourselves as a center around which everything moves, or are we happier in considering ourselves moving around everything? Is happiness greater in seeing, or in being the movement?