A Formal Analysis of the Third Movement of the Ninth Symphony of Gustav Mahler

by

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Structural divisions referred to in this paper:

Part		Section		
I_1	mm. 1-346	A_1	mm.	1-108
		B_1	"	109-179
		A_2	"	180-261
		B_2	"	262-310
		A_3	"	311-346
II	" 347-521	C	"	347-521
I_2	" 522-667	A_4	"	522-667

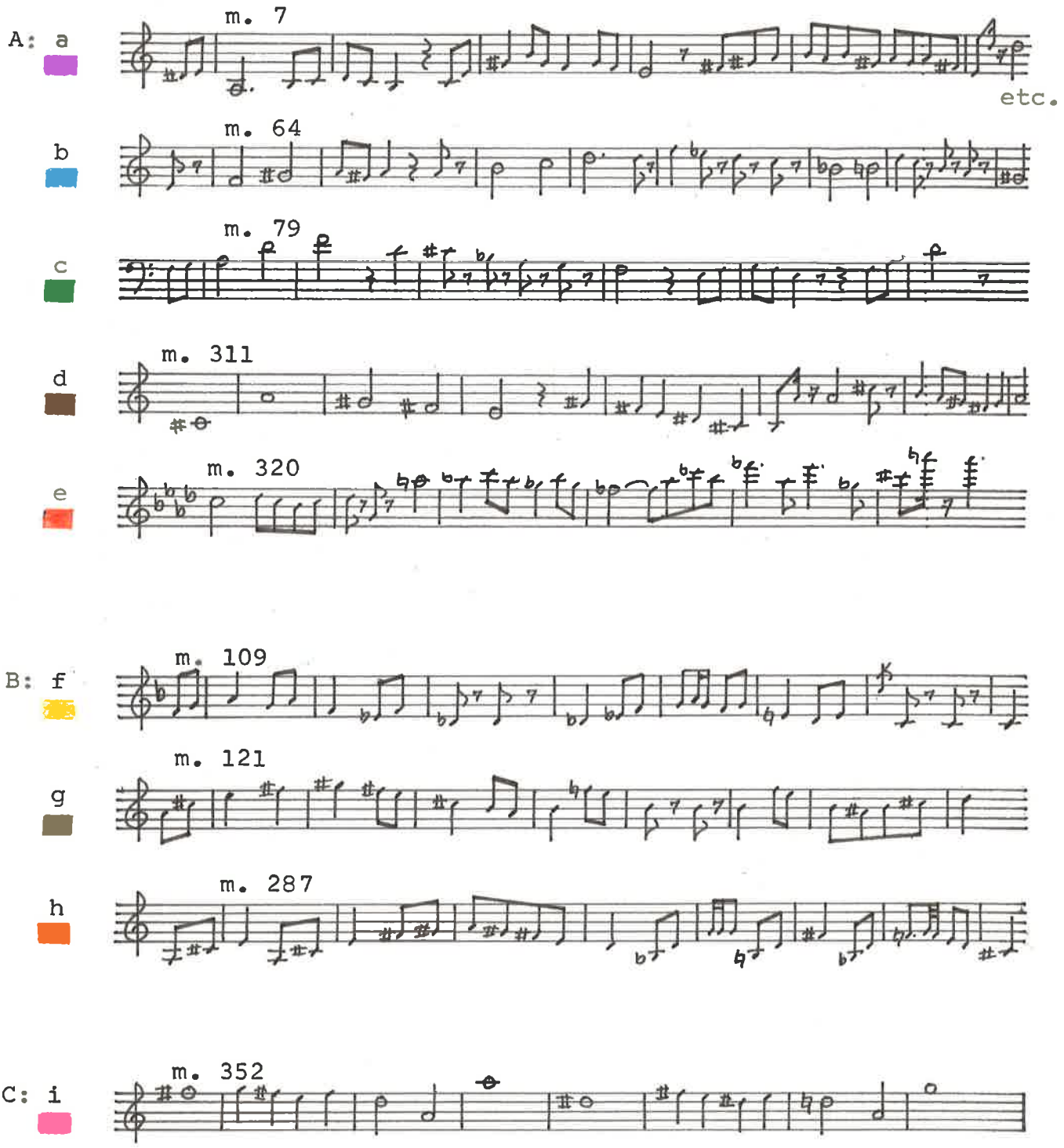
To avoid verbosity, the combined A sections will sometimes be referred to as simply A, and the combined B sections as B; A_1, A_2, and A_3 as A_{123}, etc.

The purpose of this paper is to examine the form of the third movement of Mahler's Ninth Symphony, particularly in two aspects: as macrorhythm, i. e. the underlying temporal structure, and as a dynamic flow of changing and directional intensities. For this purpose it is first necessary to discuss the micro-level motives and structures that simultaneously and on different levels give unity within a section and create diversity by articulating those sections. As an exegetical method, three sets of interrelationships between different rhythmic levels will be investigated: how the motives are used to build themes and phrases; how the sections are articulated by and built out of the phrases; and how the sections and parts determine the form of the entire movement.

1.

On page 2 are listed the major themes of the movement. These themes, when used contrapuntally, generally predominate over the other voices, and at least one of them is almost always present, except during transitions. Subsidiary contrapuntal lines are made from fragments of these themes and vary widely according to their context. These primary themes, however, are relatively stable, and their repetitions establish

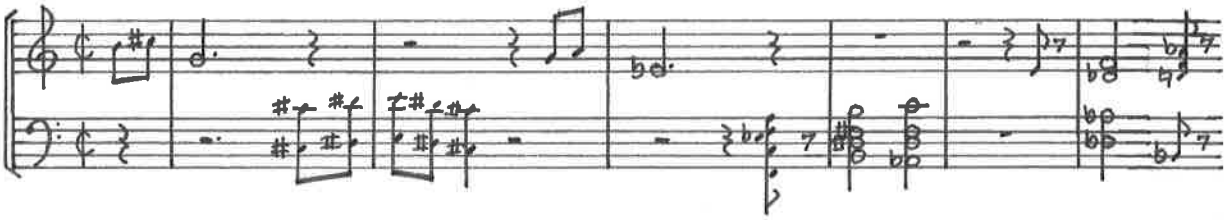
Primary thematic material:



Colors refer to chart K.

the form of the movement.

Various as these themes are, they have in common a small group of rhythmic, melodic and harmonic ideas. The two main rhythmic ideas are presented in the movement's six-measure introduction:



The first idea is really two motives:

Throughout the work, these motives are augmented, diminished, and filled in with subdivisions:

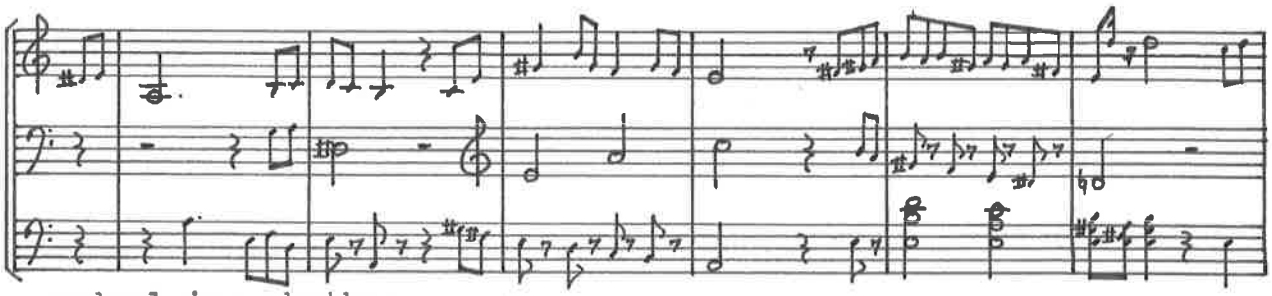
Often the second idea, the two half notes, is inserted within the first, as in theme b:

This second idea is also augmented, diminished, and subdivided (in this case the last two produce the same effect):

A glance at themes a, b, and c reveals that they are constructed entirely of these motives. (Themes d and e will be dealt with later.) The contrapuntal lines Mahler sets against these themes are often (especially in A_1) rhythmic variations of the predominant theme. The effect of combining variations of these rhythms simultaneously in different voices is that there are frequently no attacks on the third ♩ of the measure. (For our purposes,

♪ is assumed to equal ♩ 𝄽.)

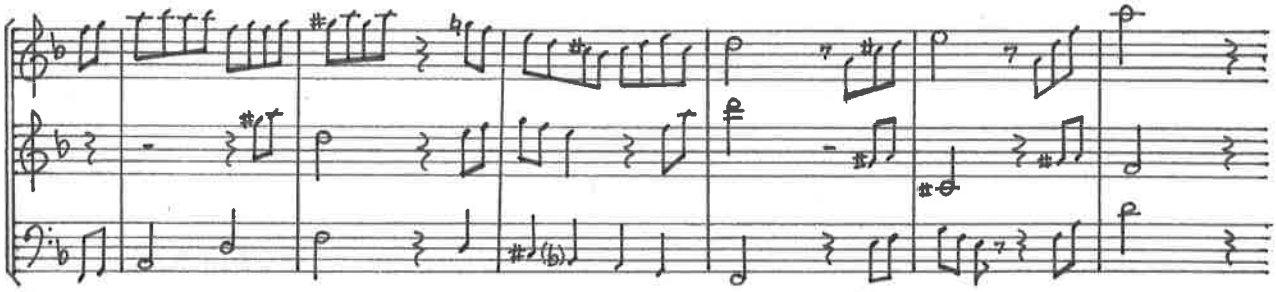
mm. 7-12



underlying rhythm:

and again:

mm. 79-84



This congruence of rhythmic motives has its counterpart in the melodic motives (see diagram J). The most prominent motive in the themes of A is a three note descent spanning a major third. This is preceded, in themes a, c, d, and e, by a rise of either a fourth or sixth. Note that the three descending notes in a are consonant with those in d, and likewise d with e, but a is not consonant with e. Thus in A_{23} themes a and d are heard simultaneously, and later d and e. Theme b is contrasting; its three-note motive is ascending and at the beginning. Its retrograde, therefore, is similar to the other themes, especially if the third B to D is considered an inversion of the sixths with which c, d, and e begin.

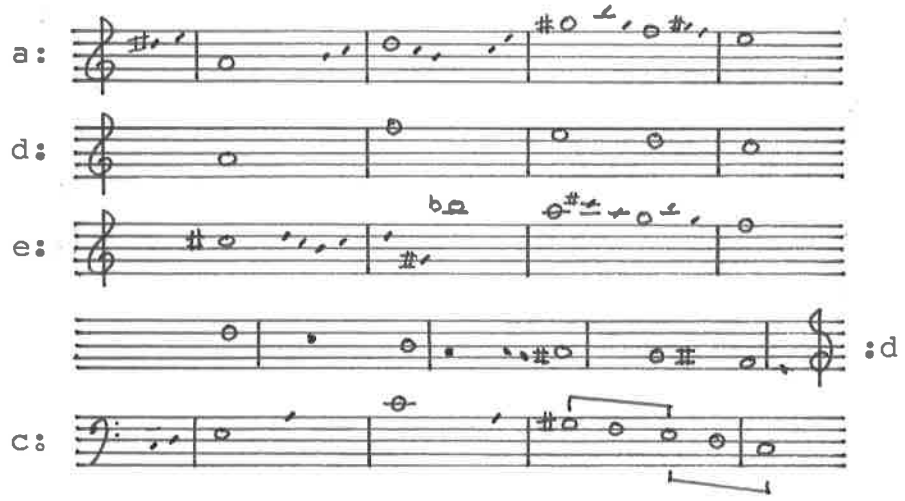


Diagram J

Theme c is also somewhat different. The last two measures are rhythmically diminished, and the melodic motive is augmented. Two major thirds are filled in, $G^{\#}$-E-C. We shall later see how this relates to the themes of section B. The major third motive itself is sort of an augmentation of the descending major second in the first movement, and it becomes an important motive in the fourth movement:

The general concurrence of rhythmic and melodic motives is reflected by an equally general harmonic concurrence (see diagram Q). That Mahler, in his counterpoint, is not concerned with avoiding dissonances between individual notes in different voices, is quickly made (painfully?) clear by the D-$D^{\#}$-E clash on the downbeat of measure 8. The method by which he controls the multifarious threads of his counterpoint is to have each line outline the same chords. Although there may be dissonances

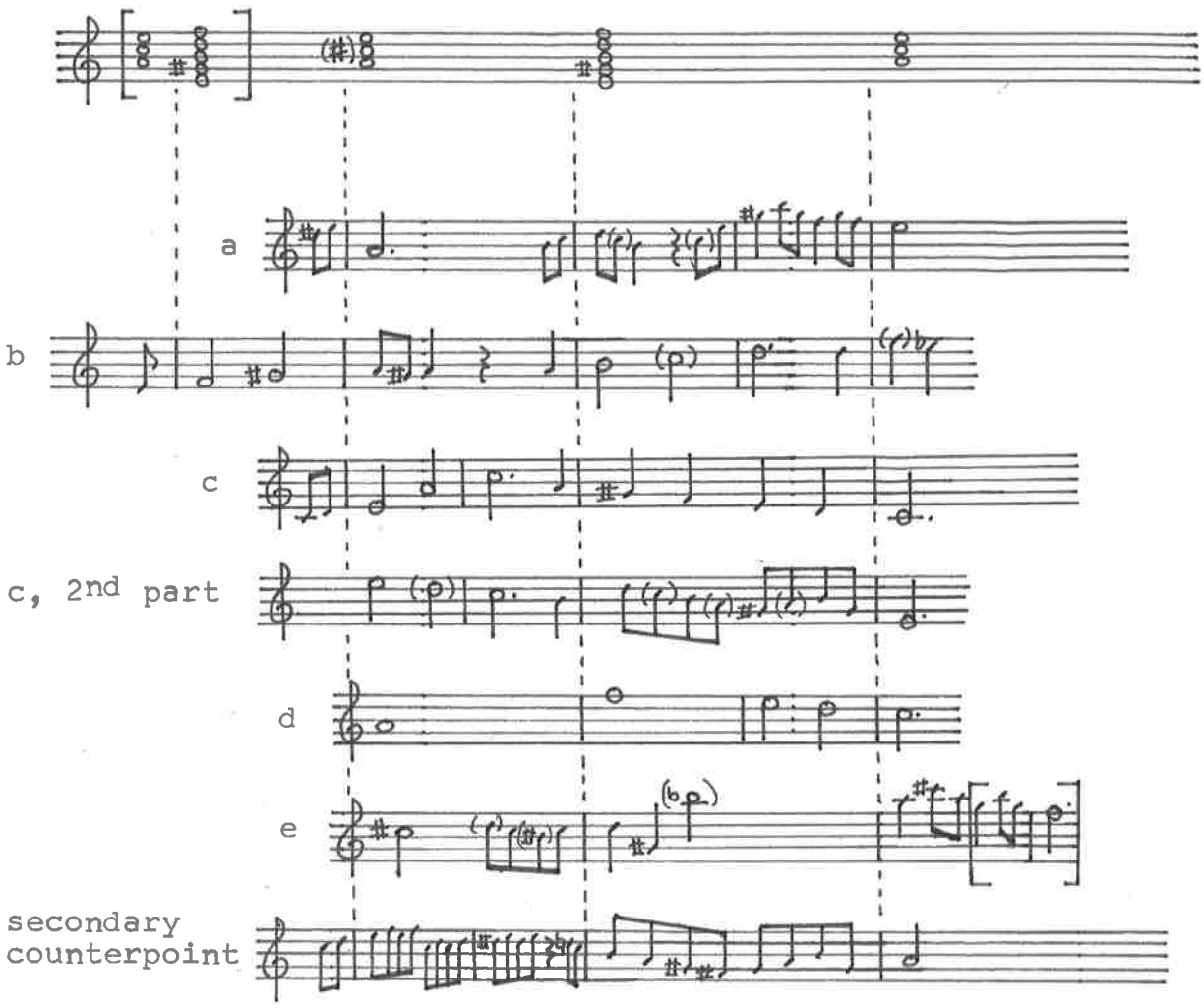


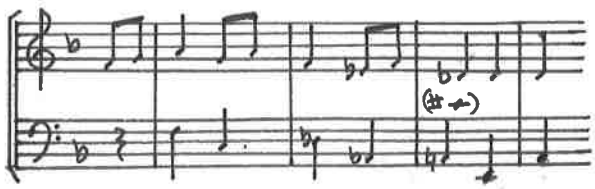
Diagram Q

between two voices, each will start on a member of the tonic triad, pass through some type of dominant, and return to the tonic, thus ensuring general harmonic consonance. Mahler then combines those lines that have the same harmonic rhythm. For example, it is clear from diagram Q that themes a and d can be combined without dissonance, and they are - five times (see chart K). On the other hand, for themes a and c to be combined, a must be delayed one measure (and go to A instead of $G^{\#}$ in the third measure); and this is what happens at mm. 79, 97, and 583.

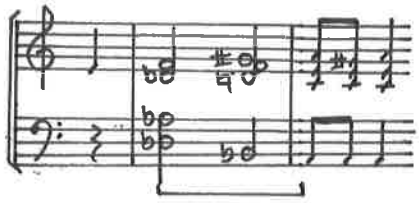
This method governs the susidiary lines as well.

The B sections are based almost entirely on augmentations of two ideas from A. The rhythm is extremely pervasive. Though the note values are the same as in A, this is an augmentation because of the meter change. Themes f, g, and h are based almost exclusively on this motive.

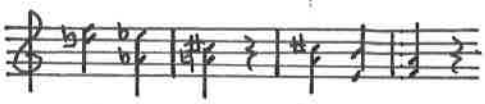
The other idea upon which this section is based is an extension of the three-note melodic motive which now spans a minor sixth, as in theme d. Perhaps the most significant aspect of this idea is its tendency to modulate by major thirds.



This root movement first occurs at mm. 246-250 of the first movement; it is then prevalent in the B section of the second and in the fourth movement. In A of the third movement, it is present in the third and fourth mm. of theme e, and in the first and second of theme b:

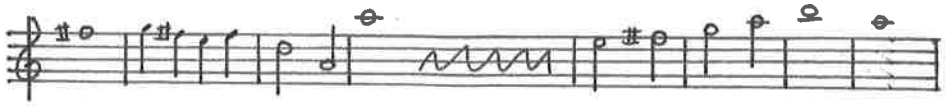


In b the seventh degree of the new tonality is in the melody instead of the bass, and the bass and melody lines mirror each other. In B, this motive is presented (somewhat drolly) in its simplest form:



There is no need in B for the kind of harmonic controls used in A, for this section is much less polyphonic. There are usually two independent lines, and the remaining voices supply harmonic support.

Of the two rhythmic ideas set forth in the introduction, section C is almost totally based on the second one. The rhythms are made from equal division of the whole note.

mm. 352-363 

The rhythm of theme i is subtly related to that of theme a; its retrograde is a simplified rhythmic skeleton of that theme.

theme i, retrograde: 

theme a: 

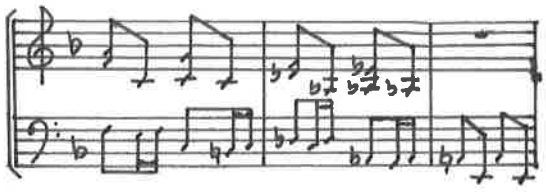
More accurately, theme i is a reversal of the slow: faster: fastest: slow pattern of theme a. The full significance of this relationship will be discussed in Part 3. The rhythm of theme d, hitherto neglected, follows a similar pattern, but even more simplified:  . Indeed, the rhythm of d is first found at m. 19 accompaning theme a:

Theme i is, in addition, an altered augmentation of theme e.

Section C is thematically much freer than the other two, but it does retain the descending major third F#-D in its main theme. The contrapuntal problems are, again, not as complex as those of A, as the section is largely homophonic, the polyphony being largely reduced to voice-leading between chords and imitative ornamentation.

As was mentioned in the introductory paragraph, the lower-level structures that give unity to a section thereby differentiate it from the other sections. Therefore, much of our work in determining how the latter is effected has been done in the discussion of the former. However, there still remain certain generalizations to be made, and also justification for the partial and sectional divisions set forth on the pre-first page.

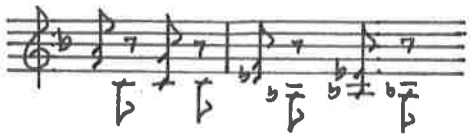
The most obvious way in which those sections called A, B, and C differ is in the themes used in each one (see page 2). But themes from A do appear in B and C, and those from B in A. In addition, the variety of thematic material among the four A sections might as clearly differentiate, e. g., A_1 and A_3 as A_1 and B_1. A somewhat less ambiguous method by which the sections are contrasted is the changes of texture. The A section, with the exceptions of a few chords and some parallel thirds, is almost entirely polyphonic. The number of independent voices ranges from 2 to 5, and averages 4. B has half that number of independent lines, and a homophonic accompaniment (including lines that seem to be independent, but merely outline the root movement:



C, with its one predominating voice (although there are polyphonic moments) is a $\frac{1}{2}$ reduction of B in this respect. The texture of C is made a more radical contrast by the use of long notes sustained over many measures.

Although there are no significant tempo changes indicated until the presto of the last four pages, the three contrasting sections of the movement are differentiated by speed. This is done not so much by the use of different note values, as those used in A and B are much the same (discounting the $\frac{2}{2} = \frac{2}{4}$), as by their coincidence with the pulse, regularity, and augmentation of motives. In A, the rhythmic motives continually bring out the 2nd and 4th ♩ s of the measure, emphasizing the rhythm ♩𝅗𝅥♩ and creating almost a $\frac{4}{4}$ pattern. In B, on the other hand, the second half of each beat clearly receives an inferior stress:

This effect is reinforced by the accompaniment figures:



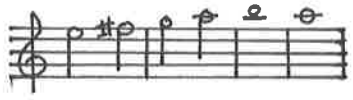
Thus, although the two sections use equivalent note values (the $\frac{1}{4}$ division of the beat is about equally prevalent in each case), A moves primarily in ♩'s while B moves in 𝅗𝅥's.

C is more strongly contrasted by the number of whole notes and longer values. The turn figure,

though in quarter notes, is simple, and easily comprehended

as a whole-note unit. Because C uses no $\frac{1}{8}$ divisions of the measure, and $\frac{1}{4}$ divisions only rarely, and because 𝅗𝅥 is arithmetically closer to ♩ than to 𝅝 , C is more strongly contrasted from both A and B than they are from each other, making the I:II:I (ABA) form audible.

This contrast is brought out well in the treatment of the main rhythmic motive. It has been observed that in B the main motive of A, ♫|♩ is expanded to ♩♩|𝅗𝅥 . Likewise, in C, it is augmented again to 𝅗𝅥𝅗𝅥|𝅝 :

m. 360  m. 500 

as well as in the third and fourth measures of theme i.

Among A, B, and C there is a rough ratio of 4:2:1 among the average number of independent voices; Likewise a 4:2:1 ratio between the small scale rhythmic structure (or 1:2:4, depending on whether you count frequency of attack or duration of ♩, 𝅗𝅥, 𝅝). In addition, there are four A sections, two B sections, and one C section. (One might even add that B doubles the M3 motive of A into a melodic and harmonic m6. And one might want to point out that the climax of C (mm. 421-422) is on a falling M10, four times the M3 and twice the m6. One might, that is, but I won't.)

Each of the sections A, B, and C has its own distinctive harmonic character. As has been mentioned, in B the tonality is unstable and repeatedly modulates by major thirds: F D♭ A F, and later, A♭ E C. Section C exhibits the most stable tonality: it is in D throughout, until the transition back to A4, in which

the tonality changes from D to $B^{\flat}$, then G to B. These major thirds are perhaps the only reference to B in this section. The tonality of A is more variable. A_1 is mostly in A minor, with an episode in C major and a final modulation to D. A_2, after starting out in $A^{\flat}$ minor, alternates between A and D. A_3 acts as if the fourth A to D has finally broken loose: $D^{\flat}$, $A^{\flat}$, $E^{\flat}$, $B^{\flat}$. A_4 reverses the process again, and a final settling back down into A minor for the last few phrases. A characteristically modulates by fourths, B by major thirds, and C not at all.

It will be important to our discussion of the overall form to realize that A, B, and C are differentiated not only vertically, but horizontally. That is, not only are the relationships A_1-B_1 and A_2-B_2 similarly differentiated, but there are processes unifying A_1, A_2, and A_3 and organizing them as a separate level from B_1 and B_2 of which the latter are interruptions. One of these has already been seen: the tonal movement of the A sections:

1		2				3				4				
a	d	a	d	a	d	a	$d^{\flat}$	$a^{\flat}$	$e^{\flat}$	$b^{\flat}$	d	a	d	a	a	a

(This is, of course, greatly simplified.) It is generally a palindrome, and the B and C sections interrupt it. Thus we can talk about form within A_{1234}, as if these sections were contiguous.

A factor that distinguishes the sections both vertically and horizontally is the use of phrases and phrase lengths. This factor is hard to discuss, because in this music phrases

are not articulated in any traditional manner. There is, for example, no significant pause in the rhythmic activity between m. 6 and m. 346; nor do any strong harmonic cadences stand out as articulations (although sometimes the tonality helps to articulate the phrases as in A_3). The most significant articulations seem to be the points where one of the main themes (those listed on page 2) suddenly intrudes itself on the musical texture. This is often emphasized by a return to the tonic, after a transition based on the double-diminished seventh; and by a change in the orchestration, such as the entry of the trombones on theme c at m. 79, their entry with theme a at m. 209, etc.

Each theme is based on an eight-measure phrase divided into 4+4, and often further, 2 + 2 + 2 + 2. Differing phrase lengths are created by three methods: truncation of the phrase by means of another theme entering a measure "early"; extension of the phrase by an additional complementary eight-measure phrase; and extension by a transition based on the motive of the phrase. In many cases, it is hard to draw a distinct line between the theme and the transition, and for this reason the phrases shown in chart K (marked off by single vertical black lines) include the period from the beginning of one theme until the beginning of the next, making the transition part of the preceding phrase. For purposes of this analysis, then, this will be the basis for distinguishing phrases and determining phrase lengths.

Rhythmically there is an overall accelerando throughout part I. To begin with, the second and third A sections each

have less measures than the one before it: 108-82-36. And so with the B sections: 71-49. Thus although there is not a continuous decrease in the lengths of sections, the decrease is continuous on two different planes, which, when juxtaposed, yield a more complex overall decrease. Moreover, the sections get shorter faster: each section is a smaller percentage of the length of the last than that one was of the one before it. The A sections decrease to 76% and then 44%, and the second B section to 69%. This decrease is continuous: 76-69-44.

The phrase-lengths also decrease throughout part I. In the first three A sections, the average phrase-lengths are 17, 12, and 9 measures, respectively. In B, the lengths are 14 and 12 measures. This provides an almost continuous decline throughout the part: 17-14-12-12-9. The decrease in the lengths of phrases and sections makes for an increase in intensity, because the phrase tempo is faster and changes occur more often.

This increase in intensity is reinforced by another phenomenon in the A sections: at first, the phrases move back and forth from one theme to another; but in the second A section, the same themes, a and d, begin to return over and over again. In A_3, theme d dominates every phrase (see chart K). This creates a crescendo of intensity. As in the case of the phrase lengths, this increase has inherent in it a decrease: as less and less motives are used, the texture becomes thinner and the orchestration sparser. This tendency is not linear, but general. (Vide the reduction to just horns and violins at the beginning of A_3.)

The same processes that increase the intensity of A_{123} are also at work in A_4. Again, the phrase lengths start out at over 18 measures and are reduced to 10. Also, all the themes drop out except A and B, the ones used in the Introduction, and these become more and more fragmented, two being reduced to the two opening chords. Intensity is also gained by the increasing insistence

on the A minor tonality, and in the Presto, by the reiteration of A and E in the tympani. This reverses the tendency in A_{123} to wander further and further from the key of A minor in a kind of tonal entropy.

3.

The structure of the entire movement is ambiguous. It can be given different interpretations depending on which parameters and processes are focused upon. For rhythmic and textural reasons already stated, the form on the highest level is ABA- I II I. This form is made audible through the stronger differentiation of section C from A and B than that of B from A. Embedded within this form is a rondo form: ABABACA. This departs from the traditional rondo form by the repetition of the B before the C, and the enlargement of the C section. Besides the fact that Mahler labels this movement a rondo, the processes that run throughout all four A sections and distinguish A as a separate level from B and C lend audibility to this form:

A A A A
B B C

There is a subtle kind of symmetry which divides the movement in half between A_3 and C. The ratio of the length of A_{123} to that of C is approximately the same as that of A_4 to that of B_{12}. The equation is approximated by the numbers of measures in those sections:

$$\frac{A_{123}}{C} = \frac{226 \text{ mm.}}{175 \text{ "}} = 1.2914 \approx 1.2167 = \frac{146 \text{ mm.}}{120 \text{ "}} = \frac{A_4}{B_{12}}$$

The ratios are brought closer together if C is taken at a slightly slower

tempo than the rest, and if A_4 is taken faster at the Presto, as it should be. (See the appendix for a discussion of the achievement of these ratios in performance.) The empirical significance of this form depends on the perception of A_{123} and B_{12} as two different planes, based on the non-linear processes discussed in section 2; also on the perception of A_{123} as an entity independent of A_4, based on the decrease in the lengths of phrases throughout each of them, but which is not continuous between A_3 and A_4, among other things. Of course the equality of ratios A_{123}:C and A_4:B is concurrent with two other equal ratios, A_{123}:A_4 and C:B. Thus there is an interesting "sandwiched" symmetry in the movement:

It is not my intention (and indeed it is impossible) to prove that Mahler was concerned with equalizing the temporal ratios among the sections of the work, but it is an interesting compositional idea, and one that he may have been guided to intuitively by its aesthetic value, as composers and artists have often intuitively structured works according to the golden section, or approximations of it, because of its inherent aesthetic quality. (In fact, the golden section of the movement does occur very close to mm. 421-422, which is the climax of the C section, but that's another paper.)

It has been seen that in many respects A, B, and C bear the ratio 4:2:1. If the ABCA form just proposed is accepted, the ratio of the sections is 4:2:1:4; fast, slower, slowest, fast. This pattern is a sort of retrograde inversion of the basic rhythm of some of the themes discussed before:

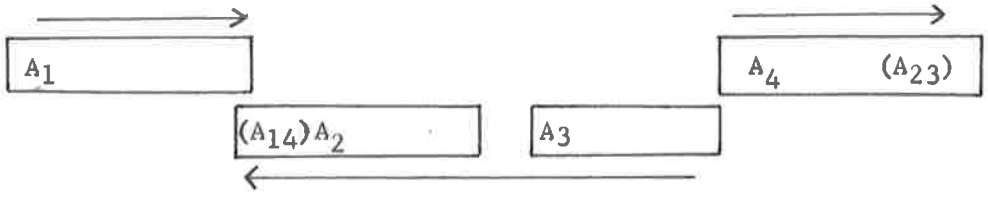
Theme i: 

Overall form: 

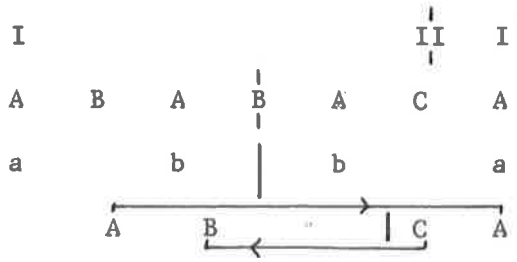
These latter follow the pattern slow, fastest, fast, slow. Thus theme i is

somewhat of a retrograde inversion of the movement as a whole in miniature, and theme a is based on the inversion. What is important here is not the hypothetical derivation of the themes from the form, or vice versa, nor the perception of an artificial ABCA form, but the process of rhythmic augmentation and diminution as it is applied similarly to both the highest and lowest rhythmic levels.

In addition, there is another symmetry within the A sections. A_1 and A_4 exhibit many structural parallels, as do A_2 and A_3. (See diagram RN3). The symmetry is brought out by the themes and transitions used, the amount of repetition, and the tonal movement. This symmetry, like others, is made more complex by the resemblance of the first two phrases of A_2 to A_1. This is reflected in the last part of A_4, where the repetition of theme a recalls that of theme d in A_{23}.



Thus the movement is a complex layer of alternations and off-balance and overlapping symmetries, each with a different axis.



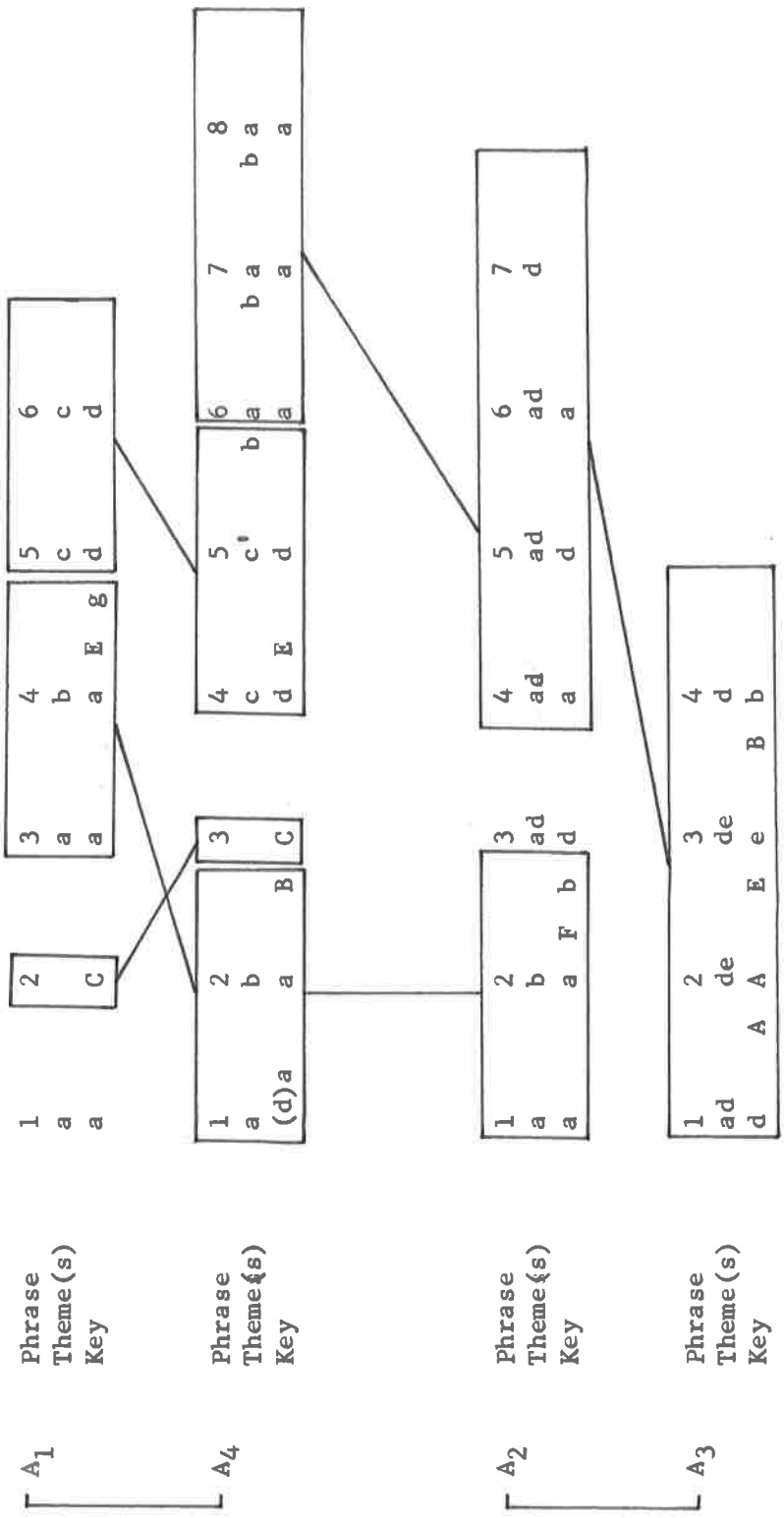

A1
A4
A2
A3
Phrase
Theme(s)
Key
1 2 3 4 5 6
a C a b c c
a a E g d d
1 2 3 4 5 6 7 8
a b C c c' b a b a a
(d)a a B d E d a a
1 2 3 4 5 6 7
a b ad ad ad d
a a F b d a d
1 2 3 4
ad de de d
d A A E e B b

Diagram RN3

If the foregoing is somewhat unclear and set forth in a confusing manner, perhaps this may be excused by the fact that a simple and linear paper purporting to be an analysis of such an immensely complex piece as Mahler's ninth symphony would be suspect. What I want to emphasize is not any one interpretation of the piece, but the processes (augmentation, diminution,  , ) that occur on many different levels, from the smallest motives to the macro-structure. These processes are sometimes linear, more often interrupted and complex, and at times different processes are brought out by focus on different parameters. I have also tried to bring out a hint of the balance between processes: the reflection of rhythmic changes in correlative pitch changes, the reflection of the structure of the whole in each part, and the careful balance and symmetry of relationships between weights and durations of sections. These are what give the work its high aesthetic value and exhibit Mahler's mastery over form.

Appendix

The accuracy of the $A_{123}BCA_4$ form depends on performance. The only deviations from the opening tempo marked by Mahler are the etwas gehalt in the C section and the piu stretto and presto at the end of A_4. The ratios $\frac{A123}{C}$ and $\frac{A4}{B}$ can theoretically be equal if C is taken at a slightly slower tempo and if there is an acceleration at the end. So far I have not found a recording that either preserves these ratios or follows the tempo indications correctly. The Bruno Walter recording (Odyssey Y2 30308) comes fairly close. The lengths in seconds of the four sections in his performance are:

A_{123}	B_{12}	C	A_4
256	131	242	159

A_{123}:C would equal A_4:B if A_4 were 139 seconds long; and Walter's primary discrepancy with regard to the tempi is that the concluding piu stretto and presto are no faster than tempo I. The tempo of B is also slightly faster than that of A, and if it could be expanded to 136 seconds, which would be the proper length at tempo I, A_4 would only have to be cut down to 144 sec.

$$A_{123}/C = 256/242 = 1.05785$$

$$A_4/B_{12} = 144/136 = 1.0588$$

The difference is less than 0.1%.

Kubelik's recording (DGG SLPM 139345/346) is even further off. He takes A very fast, observing the presto in A_4, but B is significantly slower than A, in spite of the composer's l'istesso tempo. Also C is much, much slower than the A sections, so that the timings are:

A_{123}	B_{12}	C	A_4
240	133	277	147

C is much longer than A_{123}. This is hardly justified by the direction "etwas gehalt". If the B sections were l'istesso tempo, their combined lengths would be 127 seconds. The equation would then work if C were cut down to 207 seconds, which would leave room for a considerably slower tempo than that of A. Playing C within 207 seconds would, in my opinion, be too fast for the nature of the material, but it is also my opinion that the A sections are taken too fast, to the complete obscuring of the inner lines in spite of the excellent pressing. The counterpoint is much more audible at Walter's tempo.

$$A_{123}/C = 240/207 = 1.1594$$

$$A_4/B_{12} = 147/127 = 1.1575$$

The faster the final presto is taken, the more the tempo of C can be relaxed and still exhibit this ratio.