WIND INSTRUMENT USAGES IN THE SYMPHONIES
OF GUSTAV MAHLER

by

Donald Irvin Caughill

A Thesis Submitted to the Faculty of the
SCHOOL OF MUSIC
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF MUSIC
In the Graduate College
THE UNIVERSITY OF ARIZONA

1972
STATEMENT BY AUTHOR

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: Donald J. Laughlin

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

E. W. Murphy
Associate Professor of Music

Date 5/11/52
ACKNOWLEDGMENTS

The author wishes to acknowledge the assistance given by Dr. Edward W. Murphy in the conception, development, and final completion of this thesis. The author also wishes to recognize the assistance given by his wife, Sharon, in the completion of the final manuscript.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>vi</td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>The Need for the Study</td>
<td>1</td>
</tr>
<tr>
<td>The Purpose of the Study</td>
<td>1</td>
</tr>
<tr>
<td>Works Examined</td>
<td>2</td>
</tr>
<tr>
<td>Selection of Scores from Available Editions</td>
<td>2</td>
</tr>
<tr>
<td>Notation of Pitch in the Text</td>
<td>3</td>
</tr>
<tr>
<td>2. THE WOODWIND INSTRUMENTS</td>
<td>5</td>
</tr>
<tr>
<td>Piccolo</td>
<td>5</td>
</tr>
<tr>
<td>Flute</td>
<td>8</td>
</tr>
<tr>
<td>Oboe</td>
<td>14</td>
</tr>
<tr>
<td>English Horn</td>
<td>20</td>
</tr>
<tr>
<td>E-flat Clarinet</td>
<td>22</td>
</tr>
<tr>
<td>Standard Clarinets</td>
<td>26</td>
</tr>
<tr>
<td>Bass Clarinet</td>
<td>32</td>
</tr>
<tr>
<td>Bassoon</td>
<td>34</td>
</tr>
<tr>
<td>Contrabassoon</td>
<td>37</td>
</tr>
<tr>
<td>The Woodwind Section</td>
<td>39</td>
</tr>
<tr>
<td>3. THE BRASS INSTRUMENTS</td>
<td>46</td>
</tr>
<tr>
<td>Horn</td>
<td>46</td>
</tr>
<tr>
<td>Trumpet</td>
<td>60</td>
</tr>
<tr>
<td>Trombone</td>
<td>68</td>
</tr>
<tr>
<td>Tuba</td>
<td>72</td>
</tr>
<tr>
<td>Unusual Brass Instruments</td>
<td>75</td>
</tr>
<tr>
<td>The Brass Section</td>
<td>78</td>
</tr>
<tr>
<td>4. SUMMARY AND CONCLUSIONS</td>
<td>83</td>
</tr>
<tr>
<td>Importance of Winds</td>
<td>83</td>
</tr>
<tr>
<td>Cultural Influences</td>
<td>84</td>
</tr>
<tr>
<td>Difficulty of Parts</td>
<td>85</td>
</tr>
<tr>
<td>Score Markings</td>
<td>87</td>
</tr>
<tr>
<td>Doublings</td>
<td>89</td>
</tr>
<tr>
<td>Fragmentary Orchestration</td>
<td>91</td>
</tr>
<tr>
<td>Wind Instruments Offstage</td>
<td>93</td>
</tr>
<tr>
<td>Independence of the Horn Section</td>
<td>94</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Parody</td>
<td>95</td>
</tr>
<tr>
<td>Size and Textures</td>
<td>96</td>
</tr>
<tr>
<td>APPENDIX: WINDS USED IN THE SYMPHONIES</td>
<td>100</td>
</tr>
<tr>
<td>LIST OF REFERENCES</td>
<td>104</td>
</tr>
</tbody>
</table>
ABSTRACT

Gustav Mahler had a great and lasting influence on the techniques of wind instrumentation. All of the high winds in these works received solo treatment consistently throughout, including horns and trumpets. Released from their usual duties of support and punctuation, the high brasses were called upon to express solo melodies, sometimes of strongly lyrical character, and often containing important thematic material. Similar parts for unusual brass instruments are featured in two of the symphonies.

Instruments with very high and very low ranges, like the piccolo and the tuba, were released from constant octave doublings, and also given solo lines on occasion. The E-flat clarinet was again brought into the orchestra as both a creator of parody and as an instrument which could effectively add support to the orchestra's highest registers.

Demands on the performers of these works are considerable owing to the great exposure given many of the solo passages, alterations in basic playing positions, written instructions to produce certain types of sounds, and duration of some of these symphonies. Increasing the size of each instrumental family, by the addition of both standard and supplementary members, allowed extensive doublings in tuttis as well as sufficient weight on lines consisting of a single basic timbre.

Despite the large orchestras specified, there are countless passages of thin texture in these works. Such sections provide contrast and allow the exploitation of combinations in chamber-music style.
CHAPTER 1

INTRODUCTION

Wind instrumentation showed great advances during the nineteenth century due both to demands of the music itself and to technical improvements of the instrumental mechanisms. Mahler knew well the music of that period and these symphonies show that he was not to pass these techniques on to his followers unchanged.

The Need for the Study

The need for this thesis is based on the general lack of understanding this author has encountered in existing writings which make reference to the instrumental usages found in Mahler. His contribution has been too often generalized as a summation of the nineteenth century tendency to increase the size of the orchestra without regard to his evident tendencies to thinner textures in the late works, without regard to his soloistic treatments even in large ensembles, and without regard to his increased technical requirements of all the wind players. It is hoped that this thesis will help make clear some of these ambiguities.

The Purpose of the Study

The purpose of this thesis is to examine the wind instrument writing in the symphonies of Gustav Mahler. This is to be done from the viewpoint of individual instruments and of interrelations between
various types of instruments, and to extract and comment upon any general stylistic traits which are found.

Works Examined

Some specific decisions must be made in determining exactly which works should be included among the symphonies of Gustav Mahler. The Blumine movement of the First Symphony was ultimately dropped by Mahler, himself, and consideration of it has therefore been excluded from this thesis.

The subtitle of Das Lied von der Erde reads, "Symphony for Tenor, Contralto (or Baritone), and Orchestra." Although there are certain qualities which might place it in consideration as an orchestral song cycle, the subtitle cannot be ignored, and wind instrument usages within it have been taken into full consideration.

In the incomplete Tenth Symphony, the first movement (Andante-Adagio) is the only one to have been completed in full score. Unlike the other movements, editorial changes and additions are at a minimum and, therefore, only the first movement has been included in this study.

Selection of Scores from Available Editions

Throughout his later life, Mahler was continually revising the scores of some of the symphonies. There is still strong disagreement over many points; perhaps the most notable is whether there should be two or three hammer blows in the Sixth Symphony.

In 1959, the Internationale Gustav Mahler Gesellschaft began to submit for publication Critical Editions of many of the symphonies. These are currently available for symphonies I, IV, V, VI, VII, IX, X,
and *Das Lied von der Erde*. Although references to the scores in the pages of this thesis are not always made to the Critical Editions, the revisions contained therein are fully considered in this study.

The Sixth Symphony poses a special problem. The preface to the 1968 Eulenberg Pocket Score edition, edited by Professor H. F. Redlich, indicates many inconsistencies in the Critical Edition of 1963. This author feels that Professor Redlich's work, by referring to the original version of 1906 and to later corrections of misprints and ambiguities, presents a version perhaps more in line with Mahler's intentions.

None of the available editions are completely accurate in their listings of the instruments employed in each work. The appendix to this thesis has been prepared following careful examination of each score to alleviate these inaccuracies.

**Notation of Pitch in the Text**

Several solutions to the problem of indicating the location of a pitch within specific octaves are currently in use. There is no problem when the note is written on a musical staff, but when formulating a shorthand notation for use within a text, many possibilities are available. For this study one of the systems which label the octaves above a piano's middle c in ascending numerical order will be used.

Octaves are understood to extend from any given c up to the nearest b-natural. Here, the octave which begins at the piano's middle c and extends upward for twelve semitones will be called octave number one. In notating this within the text, the c in that octave will be written as c', the a-flat in that octave as a-flat', etc.
next higher octave will be written as c''(c-two), e-flat'', a'', etc.
The notes in still higher octaves will be written with supernumeraries
one number greater for each succeeding octave, up to c''''''.

The octave below middle c (extending from the b one semitone
below middle c to the c an octave below middle c) is labeled the "small
octave," and is written as "small a," for example, or simply as a lower
case a. The next lower octave is the great octave and is written as
great A, for example, or as an upper case A. The octave below that is
sometimes called the contra octave, and notes therein are notated in a
text as CC, EE, AA, etc. The remaining notes lying below this contra
octave are sometimes called sub-contra, and are written as AAA, BBB,
extc.
CHAPTER 2

THE WOODWIND INSTRUMENTS

The classical woodwind section of woodwinds in twos had been greatly expanded during the Romantic period, both by the addition of more of the standard-sized instruments and by the introduction of recently developed larger and smaller members of each distinct group. Although Mahler followed this tendency to increased size of the section, he was as important in developing new methods of individual treatment for many of these instruments.

**Piccolo**

The piccolo, a smaller, higher-pitched version of the flute, has long been treated solely as an extension to it. Its ability to exist in the highest registers has relegated it primarily to doubling the flute or the other high woodwind instruments, or violins at the octave. Mahler did not ignore this valuable asset, but he did recognize other significant potentialities.

The most important of these new outlooks is the relative wealth of solo material given to the piccolo. *Das Lied von der Erde*, with its thinner textures and, therefore, greater opportunities for such treatment, provides excellent examples. The fourth and fifth movements use the instrument continually. In the fifth, just before cue number 7, a solo melody occurs which, although involving sixteenth notes, is of a strongly legato and lyrical character. It functions partially as an
elaboration of the voice line at that point, but retains definite inde-
pendence. Several measures later an undoubled line of more rhythmic
character occurs. Then, at cue 12, the instrument returns briefly to
the more expected doubling of the first violin at the octave. The
piccolo's usage has been determined by the requirements of the music,
not by pre-existing dictates.

A solo passage exists at the beginning of the third movement in
the same work which at first glance can only be puzzling. The piccolo
enters with the tenor voice on a legato solo line that is accompanied
only by short notes in the high strings, and is required to duplicate
the tenor line two octaves higher a 2. The piccolo part would lie well
within the best part of the flute range, and, indeed, does extend rather
low for piccolo, but the usually undesirable lack of quality in that
area may explain the instrument's presence here.

On occasion Mahler will even take the instrument down to d',
which is doubled in another part of the orchestra, and sustains it
there. A veritable study in the low register of the instrument is found
in the opening section of the fourth movement of the Third Symphony. In
alternation with two high trombones and two harps, divisi strings in
harmonics and two piccolos play minor thirds as sustained notes. Two
octaves below the high strings, and two octaves above the D pedal in the
low strings, the piccolos play c#' and e'. A similar passage occurs at
cue number 4, and then a more moving passage in thirds is played an oc-
tave below the oboes, starting on d' and f'. Later in the work, at the
end of the fifth movement, there is an example of the piccolos playing
in a more natural range under similar circumstances. Yet here too,
there is an unusual quality, for they are a \( \text{d} \) and decrescendo to "ppp."
The extension into the lower register marks a truly significant character­
istic, for the piccolo is usually stretched only upward in range by
other composers.

There is also an example of the piccolo in a cadenza-like pas-
sage. This occurs after cue 30 in the fifth movement of the Second
Symphony at Der Grosse Appell. The cadenza, which alternates with flute
and with solo brass fanfares, features the medium-low register of the
instrument, trills, fast runs, and sustained tones at pianissimo or
softer. This, combined with similar material for the flute, gives a
stronger impression of birdcalls than would be possible with either in-
strument alone.

The Second Symphony also provides good opportunities to study
the piccolos within truly thick textures. All four flute players are
required, at tuttis near the end, to change to piccolo, but division
into two of each is predominant. All the symphonies, except Nine and
Ten, require at least two piccolos on occasion. Their most unusual ap-
pearance is in orchestral or sectional tuttis, as would be expected, and
within fortissimo passages two will usually double the same line, a part
that itself is an octave displacement. However, Mahler does vary from
this general practice. The music after cue 44 in the third movement of
the Second Symphony has decreased, following an orchestral climax, to
chamber-music proportions, and two piccolos appear with two independent
solo lines. Their usage frequently depends on the surrounding texture,
but Mahler does not hesitate to treat them as melodic instruments.
Flute

It would have been impossible for Mahler to have raised the status of the flute as a solo instrument the way he did the piccolo, for the flute had been recognized as such for well over a century. His most significant contribution to flute writing, and one which has had great influence upon his followers, is his use of the instrument in its lowest octave.

Concerning this, Berlioz (1948, p. 230) states that few composers of his time know how to write for the flute effectively in that range, and that those tones are effective in serious or dreamy harmonies, particularly when combined with the low tones of clarinets and English horn. The situation had not changed much by Mahler's day. There had been occasional experiments, but applications were inconsistent; it could be associated with no particular composer as having achieved the significance of a stylistic trait. The tone in this area is weak, and requires very thin textures for it to sound. This usage would be expected more in the late symphonies, but since Mahler enjoyed the contrast of chamber-like sections in even the largest works, they are found in all.

Sometimes the flutes will move in a passage confined exclusively to the low register, and in others they will suddenly jump to one of the lowest notes as the conclusion to a figure or phrase. An example of the latter is found in measure 200 in the first movement of the Fifth Symphony. In that measure four flutes have eighth notes in unison with the first violins, but when at the beginning of the next measure the violins continue with descending broken chords, the flutes drop to
a unison on d', where they are doubling the second horn. All of this is played behind a lyrical solo trumpet melody.

An even more startling example occurs at cue 99 in the first Nachtmusik of the Seventh Symphony. Here, following a b-flat' and an a''' played fortissimo, the a is slurred into a c' played forte-piano which sustains through the entire measure. The part is played a 3. C' is the lowest note available on a flute without a special B foot; it is also the lowest note for flute that Mahler writes consistently, for there are two isolated b-naturals in Das Lied von der Erde. Such isolated tones, although sustained as chord tones, do not approach the heart of the matter.

Melodic character determines the true significance of these low tones. At measure 118 of the second movement of the Fourth Symphony the three flutes, together with two oboes and one horn, play a short little phrase as harmonization to the principal melodic line. Beginning on a d', these flutes pass downward to a c' chromatically, with all three notes slurred.

Although basically only an alternation between two pitches, the flute part at cue number 5 in the first movement of the First Symphony is truly a solo line; for other than the staccato fourths in the oboe, the few other parts sustain on single pitches. The flutes are only a 2 against bassoons and 'celli, but the part is not hidden.

At cue 13 in the third movement of the same work, three flutes in unison are combined with one bassoon on the Frere Jacques melody. They are doubled an octave lower by two clarinets and one bassoon. For comic effect, this movement makes use of the low registers of all the
winds, even flutes. Despite the doubling here, and without overcompensation in the dynamic levels, the tone quality of the flutes is heard quite distinctly. Later, at cue 18, the same is true, but less surprisingly, because the line here is undoubled. Here their quality is not only perceived within the blend, but it cuts through the simultaneous melody in strings and English horn even though the three flutes are only playing at a "p" dynamic level.

Before cue 45 in the next movement two flutes play a d' that sustains through thirteen measures. This is the highest note in the prevailing sonority (c, b-flat, f, a, d) that is sustained underneath by clarinets, tympani, and double basses. The flute is quite an unusual choice here. When the note diminishes to four "p's" only the first flute is left to carry on for three additional measures. In this passage the flute quality is confusing: the ear can interpret it as either a good blend with the other sustaining instruments, or it can pick out the flute timbre on top. The mind controls the choice.

Low writing continues right up through the Tenth Symphony. Much of the time it is used for doubling oboes, perhaps to reduce the sharpness of their tone quality, but the flute's usage in this register is far from restricted to this dependence on other basic colors.

The higher tones of the flute are exploited as well, but primarily for non-lyrical effects. The quality of these notes is shrill, and few composers will venture to write them at anything softer than forte. Mahler was one who did.

Most orchestration texts consider b-flat as the top practical limit, with excursions beyond made at the composer's risk. At cue 83 in
the Scherzo of the Sixth Symphony, flutes $a_2$ enter this pitch forte
from an $a'$ at fortissimo. The entrance is slurred, and after reaching
the $b$-flat$$, they must begin a decrescendo to pianissimo immediately.
At this low dynamic level, the pitch must be held for three additional
measures, with the only doubling being done by one-quarter of the first
violin section.

An obvious usage of these pitches for effect occurs following
cue 27 in the first movement of the Third Symphony. Two flutes play a
$b'''$ forte-pianissimo and trill to the next diatonic tone, a $c''$.$''$.
During the five measures of this sustained trill they are doubled by
violins at the unison (and an octave higher!) playing tremolos. Less
for effect, because of a distinct lyrical quality, is the descending
chromatic scale beginning on $c'{}''$ at cue 24 in the second movement of
the Fifth Symphony.

The limit of this extension is reached at cue 28 in the Adagio
of the Tenth Symphony. Again doubling violins, the flutes reach for a
note that is disregarded in most textbooks: $d'$$'$. Although piccolo is
called for elsewhere in this movement, it is not used here. Most of
these usages of the highest notes of the instrument have been not for
the primary effect of the flute tone, but rather as volume support of
the violins. When used without violin doublings, these pitches are
often very difficult due to soft dynamic levels. This is particularly
true at cue 50 in the fifth movement of the Second Symphony where a high
$c'''$ is sustained with piccolos at a "$p$" level.

Another exception to the doubling usage exists at cue 9 in the
fourth movement of Das Lied von der Erde. Although two piccolos are
available for these solo figures, the first flute must attack pianissimo a b-flat" and a c-flat". There are no doublings, and if Mahler wanted shrillness to contrast with the underlying textures, that is exactly what he got. Playing these isolated high pitches, the flute loses its characteristic quality and the sound becomes very abstract, almost electronic, in its lack of expression.

The flute is often combined with other woodwinds to double a violin line. At cue 51 in the last movement of the First Symphony, two flutes and two piccolos are in unison, "pp" and "ppp," respectively, with the first violins around g-flat". At cue ⁴⁄₂ in the same movement it is flutes and oboes in octaves which double the octaves of first and second violins in a descending scale passage.

The thin textures of Das Lied von der Erde provide good examples for study of the flute used together with voice. From cue number 3 to cue ⁴⁄₃ in the last movement, the alto is supported only by a sustained "C" in the 'celli while the flute, as the only other instrument playing, performs elaborations on the basic turn figure in a passage of strong improvisational character. A more extended and varied cadenza-like passage begins at cue 29 in the last movement of the Second Symphony, but there the line is an interlude between full orchestra and the following a capella chorus with soprano solo. The voice is in dialogue with other instruments rather than with another voice. This latter example has previously been mentioned with the piccolo; here we can note that the flute is also an integral part in imitating the sound of birds.

This depiction of birds also occurs at cue number 7 in the preceding movement. Following a passage involving the lowest flute tones
(including a sustained solo "b" in the second flute) the flutes are taken up to the medium high register for solo trills and grade notes played in conjunction with slightly different figures in the oboe and clarinets, all of which enhances the bird-like quality. Particular care in scoring is evident, for one of the flutes will have the grace notes while the other one trills, and then the parts are reversed.

Solo material abounds for the flute, but it is rarely chosen for presentation of important themes, probably due to its lack of weight. Although not truly a theme, the importance of the initial flute motive in the first movement of the Fourth Symphony cannot be minimized. In addition to setting the mood of the movement, it returns constantly throughout to give a feeling of orientation and to re-establish the basic mood after various diversions. The music here was probably written with the flute in mind, for it lies extremely well for the instrument and no other could be used as well. The sound blends perfectly with the small bells. For true thematic material one must go onward to measure 125 where flutes \( \frac{a}{4} \) state a major theme within this developmental section, accompanied only by bass clarinet and low strings more than two octaves below.

Within large tutti, when the flutes are used primarily to double high strings, even four flutes will be placed \( \frac{a}{2} \) on only two distinct parts, even to a "ppp" dynamic level. At the final chord of the fourth movement in Das Lied von der Erde, the three available flutes are placed on the three different tones of the tonic triad "pppp," but still these pitches are doubled at the unison and octave by harmonics of the harp and 'celli.
Of the new techniques of sound production appearing in the twentieth century, Mahler finds the fluttertongue suitable for occasional needs. At the very beginning of Das Lied von der Erde, flutes a 3 play a basically step-wise quarter note line using this technique. Sixteenth notes, triplets, and longer note values occur simultaneously, but surprisingly there is not a tremolo in the strings and the part is allowed to sound without confusion. A possible explanation may be found by examining the recurrence at cue number 4. When the strings do play a tremolo, the flutes follow Mahler's usual practice of doubling it in the woodwinds with a trill, but when the violins change to bounced-bow sixteenth notes as before, the flutes return to fluttertonguing. It is seen not to be an attempted duplication of tremolo, but rather a new device valuable for its own sake. It occurs again at cue 39 in the Ninth Symphony, but there it does double violin tremolos. However, the situation is far different than it was in the preceding symphony, for the flutes in this latter example are brought in for dynamic emphasis and the strings are marked to play at the bridge. Few orchestral scores prior to these had made use of flute fluttertonguing; Mahler's usage helped it attain a place as a valid orchestral technique.

Oboe

To one acquainted with his symphonies, Mahler's use of the oboe is rather startling because of certain traits which are not exploited; yet his usages are still in line with his general principles. March rhythms played softly by oboes were long recognized as equivalents of trumpets in the distance. At cue 92 in the Seventh Symphony a perfect
opportunity is presented for such a treatment, but Mahler chooses the clarinet instead. However, in a similar situation at cue number 3 in the fourth movement of the Second Symphony, he does choose the oboe.

Strauss (in Berlioz 1948, p. 176) said that the lowest and highest tones of the instrument are very suitable for humorous effects and for caricature, yet Mahler will consistently choose the E-flat clarinet or the lowest wind instruments instead. Many previous composers had relegated solo material in the oboe to the medium high registers, where pathos and longing could best be expressed, but Mahler will usually give it lyrical solo passages in the natural sounding middle register.

The sound of the oboe is suitable for many purposes. Its penetrating quality lets it sound through full accompanying sections. This tone can also be used, less obviously, to enrich strings, supplement the other woodwinds, and help blend the woodwinds to the brasses.

Solos given by Mahler to the instrument have many different characters due to range, accompaniment, speed, volume, and prominent intervals. The opening of the second movement of Das Lied von der Erde contains a long solo passage accompanied by monotonous scales in the strings and occasional wind chords. There is momentary contrapuntal activity with the clarinet, but this soon disappears. Although the passage extends to a b-flat', much of it centers around the middle part of the staff. When it does venture high, the character becomes plaintive and effectively establishes a mood for the rest of the movement. The fourth is an important interval in this melody, as it has been and will be throughout the work, irregardless of the instrument used to sound it.
A combination of range and note values makes the opening solo of the second movement in the Third Symphony sound entirely differently. Over pizzicato broken chords in the strings, the oboe plays short eighths and sixteenths in a minuet tempo. The line is marked "grazioso" and "expressivo" and when properly played cannot be considered humorous, even though the range extends downward to include c# and b. This low register can be quite raucous when played improperly or when played to achieve that specific effect, but here those notes are an integral part of the lyrical line and must be made to sound as such.

At cue number 5 in the third movement of the Third Symphony a humorous effect is desired, but Mahler depends on the parallel thirds, the oboe's middle register, and the upward leap of a sixth to achieve the desired feeling, rather than excursions into the extreme registers. This passage is one of the few of this character assigned to the oboes. At the beginning of the Trio in the Scherzo of the Seventh Symphony, there is a somewhat similar style of writing. The second and third oboes harmonize folk-like material in the first part, yet the quality is "folkish," not burlesque. The difference is achieved partially through the lines, themselves, but also because of the variance from strict parallelism. Here the accompaniments are more freely contrapuntal.

In the occasional moments when Mahler attempts to graphically portray nature, the oboe will be used prominently. At cue number 2 in the fourth movement of the Third Symphony, the solo oboe is marked to play "like a natural sound." The voice has just questioned what midnight will say, and the oboe answers with a slow melodic progression of a minor third upward, repeated twice.
The images are even more specific after cue number 2 in the preceding movement, where the imitation of birdcalls cannot be misinterpreted. A similar interpretation is possible of the passage already discussed at the beginning of the second movement in Das Lied von der Erde. Although containing more step-wise motion, the leaps of fourths as pick-ups can carry this meaning. Yet at cue 5 the same basic motive is divided between 'celli and solo horn, and the bird-like character has been changed.

This idea of fast moving figures in the oboe is rarely more noticeable than at the beginning of the sixth movement. Solo turns preceding long held notes become a characteristic feature of this movement through repetition. Although found shortly afterward in the flute, the pattern is still strongly associated with the oboe in the listener's mind. At cue number 7 the pattern is repeated as the beginning of an eleven measure lyrical solo. At cue 9 the flute repeats a slightly modified version of it as accompaniment to the alto solo, but Mahler inserts a special note to the conductor specifying that if the flutist does not have a large sound, the oboe should play this passage.

The normal sound of the oboes is changed in several ways at various places in the symphonies. Like the other winds, they must play at certain climaxes with bells in the air. One example occurs at cue 28 in the second movement of the Fifth Symphony where four flutes, three oboes, and three clarinets are all in unison on slow triplets in a duple meter, opposed to moving eighth notes in the strings and sustained tones in the low brasses. The main reason for raising the bells is an increased volume, but it is doubtless that such a change in playing
position will play havoc with an embouchure. Since this will vary with individual players, the specific change in timbre cannot be assessed. When these markings are approached with professional moderation, the desired increase in volume will be the main consideration, rather than the actual position of the instrument.

In contrast to marking the instruments to play with a natural sound, the word "shrill" is found on occasion. By pinching and emphasizing the upper partials, a player can increase the nasal quality inherent in the instrument, obtaining a sound that will have even more penetration. At cue number 2 in the first movement of the Sixth Symphony, four oboes have a fortissimo unison line over short chords played piano in the low strings and occasional loud sustained chords in the woodwinds and high strings. Although loud, these latter chords are well below the oboes in pitch, and the shrill quality desired can only be explained in terms of the character desired for the line itself, rather than for penetrating power.

Extremes in range requirements are startlingly exposed. Although the oboe can actually go higher, e''' is not a common pitch. At cue 13 in the first movement of the First Symphony the entrance must be, as marked, pianissimo, because this e''' is a solo half note stating the first half of a descending fourth, and the only accompaniment is one flute and high strings in harmonics on sustained a's. Other instances of such high pitches usually occur as the result of doublings with high woodwinds or strings.

We have already seen the oboe in its lowest register, where it was shown mainly in step-wise motion. An exception occurs at cue 42 in
the last movement of the same symphony. At a point in a lyrical, undoubled line where a b-flat is joined to a d" by the use of an obvious c"', the line jumps down to the c'. This gives the note the quality of a pick-up instead of a passing tone. This conclusion is then confirmed by the following sequences.

Because of its affinity to string tone, the oboe is used occasionally to reinforce violin lines through their climaxes. Such a use can be seen in measure 122 of the second movement of the Fourth Symphony, where the oboe joins the solo violin for only one measure while the first horn could be obscuring this violin due to its high pitches at that point.

The oboe is well suited to solos with pure or reinforced string accompaniments. At cue number 2 in the fourth movement of the Second Symphony, three bars before the alto ends her phrase, the oboe begins a counterpoint to five string voices. The instruments continue past the end of the vocal part to a cadence five measures later. A horn is used with pizzicato strings at measure 397 in the Scherzo of the Fifth Symphony; the horn is actually carrying the main melody, but since it has just been previously stated by a solo trumpet, the ear may wander to the countermelody in the oboe.

The oboe in concert with other winds in a solo contrapuntal texture can be seen at cue number 6 in the third movement of the Fourth Symphony. Joined with English horn and horn, the oboe does not predominate but rather is a truly equal voice. All three instruments are kept in their normal, comfortable ranges.
For many years composers had consistently placed oboes on higher pitches than clarinets, probably due to their relative positions on a score. This practice began to fade before Mahler wrote his symphonies because it does not use either instrument to full advantage in orchestral tuttis. Consistently throughout these scores the oboes and clarinets, when each section is internally divided, will be interlocked; that is, one type of instrument will have the highest note, a different type the next highest, and so forth.

**English Horn**

Comparison of the French and German methods of treating the English horn (in Berlioz 1948, p. 183) shows that Mahler, like Wagner, preferred a point of moderation between the two poles of thought. The French advocated its use as a discrete mediator within the tone qualities of the woodwinds section, while the Germans had a greater tendency to let its timbre be more exposed.

The characteristic tone color of the instrument is derived primarily from the lower half of its range, while the higher pitches are quite pinched and harsh. The highest part of its range greatly exaggerates this harshness, and its penetrating power increases accordingly. This aspect must be handled with care, and its ability to mix with the brasses and to intensify their sound is rarely overlooked by composers.

In Mahler's scores the English horn(s) are frequently played by doubling oboists. All require at least one English horn, except the Adagio of the Tenth Symphony where there are no supplemental members of the woodwind families except one piccolo.
In a relatively large work like the Third Symphony, Mahler tends to bring in the English horn (played by Oboe IV) as a bass part to the oboes, playing down around small b-flat and c' where an oboe might not blend well due to the change of quality. Since these parts occur during rather heavily scored passages, his attention to detail is again evident.

The same principle pervades the Sixth Symphony, where there are four oboes and one English horn, with Oboe IV doubling as English horn II. Most parts are scored only for the four oboes, with no English horn, and when the latter instrument does appear it is to obtain notes in the range previously mentioned. When the English horn appears in large tutti passages, it will occasionally double a viola or 'cello part, but it more frequently is used as a middle voice within the woodwind section. In movements of thinner texture, such as the third in this Sixth Symphony, the instrument will gain some degree of independence by receiving solo material which is usually a middle voice in a many-voiced polyphonic texture.

As is typical of the piece, Das Lied von der Erde offers opportunity to observe the role of the English horn in sparse surroundings. In the last movement, at cues 37 and 38, the quick turns which appeared originally in the oboe are transferred to this instrument, lying over a quiet and sustained accompaniment. However, even here the tessitura seems to be the only reason for the choice, since it again hovers around middle c. In contrast with the other winds, the English horn emerges as the only one to be overlooked consistently in terms of soloistic capacities. It is used almost exclusively as a filler.
E-flat Clarinet

Both Strauss' and Mahler's use of this instrument in the symphonic idiom is frequently traced to the famous distortion of the "fixed idea" in the last movement of Berlioz' *Symphonie fantastique*. In his treatise, Berlioz (1948, p. 206) refers to the penetrating tones of the instrument, yet also mentions the commonness of the timbre above e'\textsuperscript{'} and the veiled and melancholy quality in the lower register. He also makes note of its use in symphonies to parody and degrade a melody, a characteristic which Mahler seized with gusto.

Strauss, in his additional notes on the same passage (Berlioz 1948, p. 206), suggests their use in greater numbers in the orchestra because of their ability to balance a large group of strings and the massive effect of the brass, especially in contrapuntal passages. He mentions the ineffectiveness of oboes in the high register and the lack of character in the flutes at forte as primary justifications, and even refers the reader to the works of Gustav Mahler as illustration.

The origins of the instrument in Mahler's writing can also be traced to the influences of military music. E-flat clarinets had long been employed in military bands, not only in their concert programs, but in marching as well. It is inconceivable that Mahler would appropriate military tunes and rhythms without also taking one of the characteristic sound elements that make the music so distinctive, even in non-march rhythms. Yet his usage of the instrument is not primarily concerned with the military elements in his music, in fact it is frequently absent from those passages of the strongest military character, where Mahler seems content to let brass and percussion carry the message. The main
uses are those mentioned by Berlioz and Strauss: doubling in the highest registers and parody.

The first three symphonies and the Eighth use two E-flat clarinets and the remainder use one each, except the Tenth which has none. The Fifth and Sixth Symphonies call for clarinet in D. Since those parts do not descend below the range of the E-flat clarinet, the clarinet in D was probably chosen to avoid key signatures of F# and B major. For this reason both of these clarinets will be considered as identical for further discussion.

These parts are often played by doubling clarinetists. When requirements of the music do not make this possible, one or even both of these small clarinets may require non-doubling players throughout.

In the Second and Eighth Symphonies, the two players are instructed always to double in fortissimo passages. In these works the doubling of other instruments in the high registers is continual, but instances of variance do exist. Between cue numbers 6 and 7 of the Second Symphony only one E-flat clarinet is used to double the high wind and first violin parts, but the reason here is rather obvious. Two would distinctly predominate in the ensemble. In the symphonies where only one high clarinet is indicated, the usage is again mainly to double the high instrumental lines.

Mahler's self-parody was a strong feature of his works. No instrument was better suited to his needs in this respect than the E-flat clarinet. Berlioz had employed its effect only on special occasions. Mahler, too, used it on special occasions, but these instances are so numerous as to assume the quality of a stylistic trait.
To avoid the slightest possibility of misinterpretation, Mahler frequently indicated in the score that certain E-flat clarinet passages were to be played "with humor" or "with parody." Even the "Resurrection" Symphony was not immune. Near the beginning of the third movement, at cue 30, the E-flat clarinet receives a tune that had been passed around previously between the flutes, clarinets, and first violins, but with its acceptance and continuation here the part is marked to be played with humor. What had begun in a semi-serious vein has suddenly been completely turned around, and the listener is swept onto a new level. Even the "funeral march" based on Frère Jacques received this treatment.

In addition to the particular tone quality, this technique of burlesque was achieved by the addition of little rhythmic figures, sudden changes of key, and exaggerated leaps. Any instrument could do it, but none as deftly or as shrilly as the E-flat clarinet.

In its variety of usage, the Third Symphony reaches a high point in Mahler's writing for the instrument. At cue 12 in the first movement an ornamentation of the basic clarinet chords, out of tempo, and the accelerando figures at 48 and 53 provide the mocking aspect already so familiar. However, at cue 46 the entire woodwind section is engaged in a rhythmic counter-pattern to the melody in the violins, and the E-flat clarinets, although still doubling at fortissimo, are out of their more normal high registers and are functioning in the lower portion of the staff. They are even briefly removed from the common procedure for a brief pattern in thirds. Admittedly, their primary function is still one of doubling, but the music has necessitated additional reinforcement
in a relatively unusual register, and Mahler does not hesitate to write for them there.

Later in the movement (at cue number 65) the two E-flat clarinet nets are again doubling in thirds other woodwinds, notably low flutes and oboes, but here they descend to the instrument's lowest note at a pianissimo level. Similarities occur following cue number 68, but more of a doubling usage is evident.

The Fourth Symphony also contains something rather unusual. Like the other winds, instructions to play with bells in the air are not uncommon, but in measure 215 of the first movement of this work the E-flat clarinet is given this instruction while doubling other winds who are not similarly marked. However, all of these features are relatively isolated, and the emergence of the E-flat clarinet as a truly independent and melodic instrument without purely comic associations can be observed only in the later works, although the seeds of discovery are seen here.

The culmination of Mahler's writing for this instrument in solo capacity can best be seen in the Ninth Symphony. This should be expected due to the basically thinner and more exposed textures of the late works. Here it is used continually, almost as frequently as the other woodwinds; its independence is increased and it receives a fair share of solo material. It is by no means a concerto for E-flat clarinet, and the instrument still frequently doubles high points, but it is no longer limited strictly to this, nor to parody, for it receives melodies of lyrical quality and its color is blended or allowed to predominate as fits the material.
An obvious comparison between the "extra" woodwind instruments shows that the usage of the E-flat clarinet lies somewhere between the piccolo and the English horn. Although used in the early symphonies more than the piccolo as a solo instrument, the element of parody was greatly responsible. Both doubled often. Yet the piccolo gained more freedom from the section in the late compositions and had even more solo material. The English horn approached neither of these higher instruments in individuality of treatment at any time. Yet the usage of E-flat clarinet for parody and grotesqueness in these works has never been surpassed.

**Standard Clarinets**

Mahler's symphonies require three or four standard clarinets, pitched in B-flat, A, and C. Clarinets in all three keys are required in the first five works, except the Third Symphony which does not call for the instrument in C.

The use of the clarinet in C is perhaps determined in these early works by considerations of range. It seems that whenever a part approaches a sounding e'' this instrument will be indicated. Such concern for the high notes was not inappropriate at the time, but the application of new mechanical developments made the problem purely academic. Perhaps this explains the lack of the C-parts in the later scores, where, assuredly, there are many high notes. The instrument in C will occasionally venture into the low chalumeau register while awaiting an opportunity to return to the clarinet in A or B-flat. Some writers point out that they recognize a brighter quality in the instrument
of higher pitch, an effect which is most noticeable to the player who fingers a note which sounds higher than it would on either of the other instruments. But if the change in quality is noticeable to most listeners, it still does not appear to figure prominently into Mahler's use of it. Yet there appears no other obvious explanation for the use of one clarinet in C and another in B-flat simultaneously in isolated locations. One such is at cue 15 in the first movement of the First Symphony. The second clarinet has changed to B-flat during a series of rests where the first clarinet could do likewise, but it is kept in C to answer fourths in the flute.

The time had not yet arrived when even clarinets in A would be totally replaced by those in B-flat, in recognition of the great facility which had been developed by players to achieve ease of execution in formerly "impossible" keys. Yet Mahler shows some recognition of this in that he will often choose the A-clarinet only to permit the inclusion of a sounding small c# in a line; but when awkward keys do appear, his choice of instrument will result often in the least possible number of accidentals in the key signature. The Tenth Symphony is unusual for requiring only the third clarinetist to use a clarinet in A. Here it is necessary for the low c# which occurs in chords within the isolated clarinet section.

The changes between instruments are usually carefully covered by appropriate rests, but there is a singular lack of consideration at cue number 39 in the Ninth Symphony. All three clarinetists must change to B-flat instruments for four measures of chording and then return to A-clarinets within only two beats. No considerations of range necessitate
this change, and it seems impossible to explain, coming from the composer so otherwise meticulous in score markings.

The clarinet is a particularly flexible instrument in terms of range of dynamics, range of playable pitches, timbre, and technique. Throughout its range of about four and a half octaves, it can play at all levels from the softest pianissimo to a substantial fortissimo. When Mahler required all these possible dynamic shadings from all the instruments, the clarinet was already prepared. The tone color can be varied somewhat by the player, but most noticeable are the color changes inherent in the various registers. Its ability to cover fast notes approaches that of the flute.

With all this to work with, one would expect Mahler to find the instrument ideally suited to his compositional ideals, especially those dealing with variety of texture and tone quality. Yet these qualities had been discovered long before, and in addition to his focusing of attention primarily on the brasses, it is not unexpected that the instrument is treated much in the manner of his contemporaries. Significant characteristics derive from the application of his general compositional practices for the winds.

He fully exploited the quality of the chalumeau register, though mostly on unessential, transitory material. In the transition to the Wayfarer theme at cue 10 in the third movement of the First Symphony, one clarinet sustains a low e (written) for five measures while the tym­pani finishes the alternating fourths in quarter notes which have char­acterized the accompaniment throughout that section. Two pages later
there is a soloistic countermelody which moves up and away from that low and finally returns to it.

That written note is often found held through several measures as a type of pedal tone. In the fourth movement of the same work, at cue 21, it is found again, but this time in the A-clarinet where it can act as a tonic D-flat. It appears once again in the fourth movement of the Third Symphony at cue number 3, but here, before settling on the final sustained tone, it alternates with its upper neighbor. The passage is significant because the texture is extremely thin and yet four clarinets must play it "pppp." Since the instrument is capable of infinite dynamic gradations, the richness of the entire section is probably desired at that point.

Featured, undoubled passages in this register are most likely to occur during such moments of thin texture. In measure 226 in the first movement of the Fourth Symphony, two clarinets begin a fast moving sixteenth note line involving a few rather awkward leaps, but when the upper registers are approached, the line is transferred to flute.

The instrument is used occasionally for elaboration of a principal melody in another instrument. The phrase may be scale-wise or may feature the arpeggio figures so familiar from earlier periods. Truly exposed examples of this latter type are best seen in the Scherzo of the Fifth Symphony, beginning in measures 383 and 785. Both times the clarinet prepares and accompanies statements by the horns. In contrast to many earlier practices, however, the notes do not range over the lower registers but instead center around the upper-middle area.
There are few truly awkward passages for the player, but sixteenth note staccato jumps from c'' to d'', as at cue 59 in the Sixth Symphony, certainly qualify, especially undoubled. The frequent occurrence of trills between disjunct notes in the symphonies is carefully restricted to avoid the cumbersome register break of the instrument between b-flat' and b-natural'. This technique is most effective in the chalumeau register, and will almost invariably be used in conjunction with a string tremolo. By alternating between two chord tones, the distinct sound of a conjunct trill is eliminated and it blends well with the general agitation. The effect is further enhanced by rapid tonguing of repeated pitches in the horns, as at cue 37 in the Sixth Symphony. Comparison with the natural form of trill is best observed at the conclusion of the fourth movement of the Seventh Symphony, where a solo clarinet trill over thin sustained harmonies resolves, by means of a turn, into the final cadence. The effect is different because of the non-chord tones.

"Bells in the air" is a most unusual marking for clarinets in the standard literature. It is found in these symphonies in several passages of triple forte in conjunction with the other woodwinds, as at cue 12 in the beginning of the Second Symphony. However, at cue 28 in the second movement of the Fifth Symphony, only the oboes and clarinets are so marked, while the rest of the orchestra is at relatively softer dynamic levels. Since little of the actual sound of a clarinet emits from the bell, the main reason for such a marking may be psychological, for the player's benefit. Yet there is a slight difference in tonal quality. If the instrument is actually aimed directly at the listener,
the sound of the reed will not be bounced from the interior of the bore, and there will be a slight increase in harshness causing a greater penetration. The seated position of a player will make this direct line impossible, yet the player will still realize what is desired.

Other unusual score markings include those directed at obtaining a specific tone quality. "Echo tone" is found particularly in the early symphonies, where such obvious effects are more frequent. At cue 17 in the first movement of the First Symphony, two clarinets are instructed to play in such a manner. The oboe has stated a lyrical five-note figure, and the clarinets and piccolos (an octave higher) answer with basically the same pitches, but staccato, while the first violin plays a lyric variation of it. Only the clarinets are marked "echo tone," not the piccolo, because only they are capable of the particular sound usually called a sub-tone, due to the nature of the vibrating medium. The Second Symphony contains such effects of distance throughout, but mainly for brasses. At cue number 8, shortly after the beginning, the reeds are given a similar passage. Unable to alter their sound by muting or stopping, Mahler obtains the effect through orchestration. The descending scale passage is first stated pianissimo by oboes and English horn, and, just as it finishes, the three clarinets begin to repeat it "ppp" in echo tones. It is a close approximation of the later brass treatment.

At cue 92 in the Seventh Symphony there is an even more obvious imitation of the brass; in fact, the clarinets are even marked quasi-tromba. At that point the horns are playing staccato parallel thirds behind a 'cello melody and the trumpets are occupied with muted and
accented short figures. The clarinets are called upon to play soft fanfare triplets in imitation of distant trumpets.

Such passages are, however, exceptional; the clarinet's versatility is useful in many other ways. It blends well with brass and strings, particularly in the lower registers. It lacks the penetration power of the double reeds and the high range agility of the flute. As a result, in the large works it is often relegated to much doubling of inner voices or of the high voices within very large tuttis. As would be expected, this situation changes in the thin textures of the later works. It even enters into dialogues with the horn, as at the end of the first movement of the Ninth Symphony, but even more importantly, it is exploited as a solo voice, equal to any other.

Solos for the clarinet often range through several octaves, particularly in the late works. In the earlier symphonies, solo lines were more restricted to the upper-middle and high registers where the sound would be more liable to carry above the relatively fuller textures. When the number of instruments playing at any given moment was decreased overall as his style matured, the low tones of the clarinet were no longer obscured by other timbres and the melody could weave in and out of the low register, or stay there more consistently, without loss of melodic continuity.

**Bass Clarinet**

In general practice, the bass clarinet is rarely used as the bass voice of the clarinet section. Its extraordinary ability to blend with other basic tone colors has made it of great value to composers.
Strauss (in Berlioz 1948, p. 225) points out that the low tones of the bassoon are lacking in flexibility and the bass clarinet serves well as the lowest voice in combination with three bassoons.

The primary function of the bass clarinet in recent literature has been in passages where a bassoon would normally be expected, as well as as a general supplement to the orchestra. Its low register has much richness, but the high register is extremely weak and strained. One notable usage of this high register occurs at cue number 10 of the fifth movement of the Third Symphony where the instrument doubles the third clarinet and proceeds upward to a written e'.

The early symphonies of Mahler use the bass clarinet infrequently. The parts are always covered by a doubling clarinetist and the total number of measures played by the instrument is small. Only in the Sixth Symphony does the instrument begin to obtain relatively important lines throughout, but it is still mainly restricted to doubling within its effective range.

The Seventh Symphony is one instance where the part alternates between the instruments in B-flat and A. His reasons for choosing one over the other are sometimes rather obscure, for the instrument in A is used occasionally when the part does not extend to small e, written, nor to alleviate excessive accidentals in the key signature. Mahler's exacting standards are most obvious in the final movement of Das Lied von der Erde where, although the entire work has been written for bass clarinet in B-flat, the player must suddenly switch at cue 41 to the instrument in A (involving a key signature of six flats) simply in order to play two low c#'s unavailable on the former instrument. These notes are
doubled at the octave in bassoons and 'celli. The passage continues for some time afterward with notes easily playable on either instrument, and at the first opportunity the player must revert to the original instrument.

Solo writing for this instrument did not reach the high levels found in some of the other winds, but its significance on inner parts is occasionally thrown into distinct relief. A fine example of Mahler's recognition of the bass clarinet's value in the chalumeau register is found near the beginning of the Ninth Symphony at cue number 7, where fast arpeggios occur over the simplest of accompaniments. There are no striking innovations, as such, in his treatment of this instrument, but in being consistent with his general principles, Mahler made it an integral part of the orchestra, and not just the occasional carrier of a recognizable line which appears from and disappears into the orchestral tutti.

**Bassoon**

The tone quality of the bassoon, like that of the clarinet, is well suited to unobtrusive support of the strings. Its presence is often unnoticed by the listener. It also fits well with horns, and was often used, before the invention of valves, on parts that today would be given to the horns. When these two types of instruments play together, the effect is frequently that of horns with a richer overtone series.

Other standard usages of the bassoon include: additional weight on string lines without changing the overall sound quality extensively, doublings with the lower brasses to remove the edge in loud passages,
and as the normal bass voice in the woodwind ensembles. Although there are notable exceptions, most of Mahler's usages can be included in one of these general categories.

Effective use of the solo bassoon with 'celli is found in a countermelody to the Wayfarer theme following cue 10 in the third movement of the First Symphony. The bassoon is in a unison at "pp" with half the 'celli while a three-part harmonization of the theme occurs in the violins. The rest of the 'celli and the harp arpeggiate the tonic chord. The use of mutes on the first group of 'celli makes the blend even more complete. A very similar passage is found during the chromatic melody at cue 40 in the last movement, where the 'celli are again muted, and in unison with a solo bassoon.

A slightly different usage is seen earlier in the same movement at cue number 19. There, the solo bassoon is with the violas, while the 'celli move in elaborated parallel sixths above them. The doubling is carefully calculated to balance the two unequal string sections.

A similar problem of melodic weight takes place at measure 45 in the third movement of the Fourth Symphony. Over very soft, sustained strings, the melody in thirds in the violas is doubled by two bassoons in thirds. There is just enough variation in the basic string quality to give the lines proper significance. At the end of this phrase Mahler shows again his extreme care with the problem of balance. When the violas return to unison, the second bassoon drops out, and when they land on the final sustained chord, the other bassoon is eliminated allowing the pure string color to sound following the completion of the lyrical melodic material.
Bassoons with horn can be examined at measure 296 of the third movement of this same symphony. Marked "delicately" and "portamento," two bassoons and two horns in unison thirds achieve an extremely rich horn quality.

Technical difficulties for the instrument include the glissandi and disjunct trill found in the other woodwinds, as well as extremes of range. Glissandi are rare, but cue number 7 at the beginning of the Third Symphony has three in a row, doubled by low strings and brass, and covering an octave and a half.

The bassoon's top registers are awkward for most players, and lack intensity. They are most effective as isolated cries requiring very thin textures, yet Mahler also takes them to b-flat for sustained doubling in high brass chords, as in the Scherzo of the Sixth Symphony. At cue 49 it is doubled by the first horn, but at cue 67 the only other instruments that are high in pitch are two flutes and a clarinet. Although the clarinet shortly disappears, the bassoon must diminuendo to pianissimo through several measures at that b-flat.

Low dynamic levels increase the difficulty of playing both very high and very low pitches. At cue 34 in the first movement of the Third Symphony, the second bassoon must diminish to pianissimo on a C-flat: an unusual choice, considering the contrabassoon is available.

At cue 16 in the same movement of the Third Symphony, the three bassoons join the clarinets in disjunct trills. As usual, there are tremolos in the strings, which these trills seem designed to supplement, rather than vice-versa.
The opening canon of the third movement of the First Symphony shows that the bassoon is not overlooked as a solo instrument in these early symphonies, but, like the tuba, its use here is mainly for a mocking effect. The bassoon is also recognized for similar purposes in the opening of the Rondo-Finale of the Fifth. With staccato tonguing it presents the initial statement of a melody that will figure prominently throughout the movement.

In *Das Lied von der Erde* the bassoon reaches a peak of independence. Doublings of other parts are difficult to locate. Primarily functioning as an independent bass voice to the woodwinds, it also receives much serious solo material throughout the work. Usage in the Ninth and Tenth Symphonies is similar to that in *Das Lied*, but there are more instances of dependence on similar parts in other instruments in the same range.

**Contrabassoon**

As in the case of the bass clarinet, the contrabassoon is usually played by a doubling player of a higher instrument in the same family, especially in the early works. This practice is also found in *Das Lied von der Erde* and the Ninth Symphony, probably due to their generally reduced instrumentations.

In the First Symphony the instrument appears rarely, and on those occasions it merely doubles the bassoons or the double basses. In the last movement of the Second Symphony, Mahler is practically forced to use a contrabassoon, for after cue number 6 a triplet figure is brought to a conclusion by passing downward through the various
woodwinds to a FF. The line is very exposed, and although he could have found a different ending to the pattern, the fact that he did not hesitate to employ the instrument at "ppp" in these circumstances is significant. These fast scale passages, as well as those found in tuba parts, are surprisingly frequent in Mahler's scores. The instance mentioned above is unusual in that it is a solo; the most important usage is in doubling the double basses or other low instruments instead of changing to simple accent patterns.

The contrabassoon figures prominently in the opening measures of the Third Symphony. First it doubles the tuba as an octave doubling of the bottom voice of the four-part trombone passage, then it doubles the bottom of the horn choir, and finally it doubles (at the octave) the sixteenth note and trill figure of the bassoon solo at cue number 2. The ponderous and dramatic nature of the passage makes its appearance appropriate, but it is carefully limited to bass reinforcements.

A curious instrumentation is found in the third movement of the Fourth Symphony. At cue number 14, the contrabassoon doubles the 'celli while the double basses play the same line an octave higher. Despite this unusual displacement, Mahler keeps the contrabassoon on the lowest line.

Requirements for agility reach a peak between cue numbers 3 and 4 in the first movement of the Fifth Symphony. Trills, four-note grace notes, and groups of five and eight thirty-second notes prevail, yet everything is still covered in other instrumental parts.

In the Sixth Symphony, at cue 109 in the Finale, Mahler pushes the instrument down to almost the very bottom of its range. A full
orchestral tutti is proclaiming the "Fate" motive fortissimo with a decrescendo into the minor chord resolution. Although he indicates the need for a great C, written, in the double basses in other locations, here they remain on small c and only the contrabassoon extends down the octave. The same situation is found shortly after the beginning of the Seventh Symphony involving a written BB-flat. The low C is used again in the second movement of the Seventh Symphony, just before cue 92, as part of a sustained chord, where the only other note in that range is a great C sounding in the fourth horn. Shortly after, just before cue 99, the contrabassoon ascends to a written f' in the middle of a heavily doubled melodic line. This top of the range would not be written without coverage from other instruments. Throughout the symphonies, the contrabassoon works steadily in support of the bass parts, and never achieves any notable degree of independence.

The Eighth Symphony is, by no means, an exception to the above statement, but at cue number 4 in the second part the contrabassoon is found in an unusually thin texture of winds and strings at "ppp." General tendencies are evident, for throughout this work of gigantic proportions the contrabassoon is found almost everywhere.

The Woodwind Section

Flutes must be used in the higher parts of their range to be distinctly heard in a large ensemble, while the particular timbre of the oboe will penetrate throughout its range, although the lower tones will cut through to an even greater degree. The clarinet tone, being more mellow, is somewhat obscured by doubling flutes in the higher registers
and by oboes in the middle register, but this blending ability is quite useful. Although a double reed instrument, the bassoon is used primarily for supportive doublings because its range, being much lower than the oboe's, softens the double reed quality.

Standard orchestral usages have shown that in a chord scored exclusively for woodwinds, the flutes and oboes are most evident as individual voices, while the clarinets and bassoons provide body. Such use of the woodwinds as an isolated section is relatively infrequent in the literature, but in Mahler's symphonies the tendencies to the use of many passages in chamber-music style (relatively few players and undoubled lines) and to the greater separation of the sections made such scoring more usual.

In the teaching of orchestration, students today are cautioned against the placement of two dissimilar woodwinds on the same melodic line. The combination of tone qualities has a certain negative effect, and the problem of intonation is great in any group of less than professional caliber. Since acoustical phenomena dictate that the resulting sound will be significantly less than twice as loud, it is not a workable solution to problems of balance.

Mahler's basic solution was similar to that of most other recent composers: octave doublings. Yet where most of his contemporaries continued to place similar instruments on the various nearby chord tones, Mahler made much more use of unison doubling of the similar instruments, particularly within the large orchestral tuttis. The availability of woodwinds in threes, or even fours, made this a workable solution. Four flutes could now be heard on their lowest notes, despite other prominent
In earlier scores, composers had adopted a common practice of consistently placing the oboes above the clarinets within woodwind chords. Forcing the clarinet into its low registers created problems of balance which seemed insoluble at that time. By the latter half of the last century, interlocking of the multiple parts for these two types of instruments had replaced the previous practice, and the scores of Mahler are literally full of this type of interlocking. When the woodwinds are used to double lines in the string or brass sections the requirements of the music may demand something different, but when the woodwinds are orchestrated as an independent group, the chord spacing returns consistently to this practice.

Secondary members of each woodwind type are used often, but not always, in the usual manner. Within tuttis, piccolo will often double the flute or first violin line an octave higher, but as has already been shown, the independence given this instrument within thinner textures has little precedence. The usage of E-flat clarinet is similar. Although used as reinforcement for flutes in tuttis, their individual color enabled them to also venture beyond this standard usage. The contrabassoon is used more obviously and more consistently as a doubling instrument. Its basic design being that of a bassoon, but an octave lower, it would be expected, like the piccolo, to primarily double its parent instrument at the octave; however, the separation of the double basses from the 'celli, and the contrabassoon's similarity in range to
the double basses, brought this low woodwind more into conjunction with the lowest strings.

When considering the woodwind section in conjunction with the other sections, what had been faults within the family sometimes become desirable traits. The blurring of tone color when two dissimilar woodwinds play a unison melody line is an advantage when a string line needs reinforcement but not at the expense of the basic string color.

Woodwinds can be useful to the brasses in several ways. When an oboe or a clarinet doubles a trumpet melody, the brass quality is noticeably enriched. On occasion, this effect is desired, but with the melodic importance given to the brass instruments by Mahler, and with the knowledge that such a doubling can enrich, but can also subdue the basic brass quality, the melodic passages for brass in these symphonies are usually kept clear of woodwind doublings.

Within orchestral tuttis, the ranges of the high woodwinds are particularly useful for strengthening the overtones of the brasses. Because of the lighter weights of the woodwind qualities, the danger of over-emphasizing the high partials can be easily controlled. The basically neutral quality of flute tone is particularly useful for this effect.

Although all the above-mentioned characteristics are general, and may be found throughout the scores, several specific instances do much to exemplify the particular regard Mahler had for this section. Usages range from the many doublings found in fortissimo passages to the individual treatment given to each instrument in the thin textures
interspersed through the early works and in the overall thinness of the three late symphonies.

Much unison and octave doubling in the woodwinds can be seen throughout the symphonies, but perhaps most notable are the full sections in the first movement of the First Symphony and the fifth movement of the Second. At cue 159 in the Sixth Symphony a very angular melodic line in all the high instruments of the orchestra must be made to sound over a simple trumpet melody and rhythmic figures in the low woodwinds and strings. To emphasize the high line, Mahler makes use of extensive unison doublings of the first and second violins, flutes, and clarinet in D, with octave doubling by piccolo, A-clarinets, oboes, and violas. On the page these forces seem much more than is necessary or desirable, but in performance they are fully justified.

The different tone qualities of the various woodwinds make them admirably suited to Mahler's practice of dividing short fragments of a melodic phrase between several instruments. At cue 20 in the second movement of the First Symphony, the first oboe and first clarinet alternate measures of a strongly lyrical melody. Each measure continues on to the first eighth note of the next measure, which is doubled as the first note of the melody's continuation by the other instrument.

Such fragmentary appearances of a melody also appear in the woodwinds for additional tonal weight. Eight measures after cue 79 in the Sixth Symphony, two flutes are added as unison doubling for the solo oboe to continue the prominence of the melodic line when sudden loud chords appear in the horns. Thirteen measures after cue 16 in the second movement of the First Symphony, solo winds alternate melodic
doubling of the high strings. The texture is very thin, and the effect, although subtle, shows Mahler's awareness of the changing colors produced even when doubling the strings.

More in accord with common practice are those passages which contrast the two sections distinctly with no overlapping of colors. Cue 56 in the Sixth Symphony contains such an example, where woodwinds with a horn as the bass play a complete phrase without any other colors, and at the end of the phrase all the music is given over to the string section.

As a solo section, the woodwinds perform many varied tasks. The high woodwinds may sound very shrill, as at cue 47 in the Sixth Symphony. With trills and staccato sixteenth notes, they form an effective doubling for the xylophone's somewhat eerie quality. They may partake in a parody of a melody as inherently serious as the Dies Irae, found in the Second Symphony just before cue 5 of the last movement. The tune is stated by a flute, oboe, and clarinet in unison at "ppp."

At cues 15 and 16 in the third movement of the First Symphony the parody is even more obvious. The two voices in thirds are doubled in each type of woodwind, and the effect is strongly suggestive of an Austrian band. A similar Austrian effect, although more folk-like in nature, occurs in measures 120 and 259 of the first movement of the Fifth Symphony. The woodwind section receives the material in octave doublings and in thirds in the bassoons, with only occasional doubling of a low part by viola or 'cello.

The alternation of woodwind colors has much to do with the effect achieved at the beginning of the second movement of the Seventh
Symphony. Following the opening horn dialogue, contrapuntal entrances of the oboe, English horn, and clarinet lead to a fanfare-like motive in the three clarinets, which is embellished by rhythmic figurations in the other woodwinds over simple, short chords in the strings. The contrasting colors of these figures, and the gradual addition of woodwinds, build to a climax involving the whole section, and serve as a preparation for the horn melody that follows.

Mahler's use of the woodwinds in a full orchestral tutti at triple forte may be seen at cue 18 in the first movement of the Fifth Symphony. The high strings are divided and play double stops, while the brasses are divided within each group to cover each of the chord tones. However, the high woodwinds are a 3 or a 4, and are all in unison on the same pitch, while the bassoons and contrabassoon are in three separate parts. This example is not unique, but it is far more common for the high winds in these works to be a 3 or a 4, with each group of like instruments having a separate chord tone. The use of woodwinds in threes or fours allowed Mahler to maintain the integrity of a single tone color for each pitch within the chord. When all the high woodwinds are combined on a single pitch, the result is sheer volume.
CHAPTER 3

THE BRASS INSTRUMENTS

Treatment of the brass instruments in the symphonies of Gustav Mahler was even more revolutionary than that of the woodwinds. With the high brasses released from the chains of the overtone series of the natural instruments, and the establishment of the tuba as the bass voice of the brass choir, all of the brass instruments were ready to receive true melodic character and significance within the symphonic forms. Mahler gave it to them.

Horn

One can only wonder about the possible existence of Mahler's symphonies if the invention of valves for horns and trumpets had not occurred. The horn had long been recognized as the best blending instrument between all the instrumental groups. Strauss (in Berlioz 1948, p. 260) indicates its traditional usages as an occasional carrier of melody, a middle voice in the brass section or mixed ensembles, or as a bass voice to woodwinds or other partial orchestral combinations. Very few had done as much as Bruckner, Strauss, or Wagner toward making the horn a frequent and significant medium of melodic expression. Yet Mahler's horn writing surpassed them all.

The horn was never used to a greater extent than in these works, nor had its melodic content ever been so important. Bruckner had taken its expressiveness beyond existing limits, had learned how to obtain a
marvelous effect by suddenly drawing a solo horn out of a surrounding chorus of horns, and had obtained feelings for tragedy by placing the horn in low registers. Mahler, building on these practices, went further. Every register of the instrument gained a different significance.

The different sizes of the horn section indicates a part of this new significance. Moving chronologically, the works employ 9, 10, 8, 4, 6, 8, 4, 4, 4, and 4 horns, respectively. In attempting to determine a pattern, the First Symphony is most accurately represented as having seven horns, for the two additional ones appear only in the closing measures, and are labeled "Reinforcement." At the time these symphonies were being composed, Wagner's Ring and Bruckner's late symphonies had established eight horns as an acceptable symphonic norm. All of the numbers here are quite in line with what could be expected. The largest works have a large number, those with thinner textures (the Fourth, Ninth, and Tenth Symphonies, and Das Lied von der Erde) have four each, and those of medium proportions lie somewhere in the middle. The true significance lies not in the totals, but rather in the methods with which they are combined with themselves and with other instruments, and with the prominence they achieve within the symphonic textures.

The section writing is somewhat uncharacteristic in the First Symphony. Most of the sectional passages are four-part, with the additional forces used consistently for doubling purposes. However, many of the later characteristics of his style are quite evident. When four or more horns are playing, they will constitute an effective, separate unit, whether all playing a single line in unison or divided into four separate, but related, parts.
Imitative entrances, as in the third movement of the First Symphony, present obvious opportunities for a solo horn passage, but the later works will use such an element in less obvious circumstances. A perfect example of canon at the unison for four horn parts occurs after cue number 3 in the first movement of the First Symphony. There is also an imitative passage near the end of the Third Symphony, but here the horns are simply staggering entrances while doubling continuous string lines.

However, most of Mahler's writing for the horn was not contrapuntal within the section. He primarily used the instrument in solo capacities, either as an actual solo instrument, or as a section in chorales, or on a single line within a more polyphonic texture. Three-part soloistic treatment of the section is seen as early as the first movement of the First Symphony (cue 15), where they are carriers of important thematic material, although restricted to a single major triad.

Perhaps Mahler's most memorable solo theme for the section is at the beginning of the Third Symphony, where eight horns in unison state at fortissimo the first principal theme of the movement. A study of the recurrences of this theme throughout the movement shows significant changes in the character of the tune, caused somewhat by changes in orchestration pertaining to the horns. At cue 26 the theme is still recognizable, although primarily by rhythms and directions of leaps, rather than actual pitches. Four of the horns carry the main melody while the other four have changed to chordal punctuations of the harmony.

At the beginning of the development section at cue 39 the key has changed from D minor to G-flat major, and the accompaniment is
reduced to triple piano, but the melody is still presented in the horn. It has again changed. Through careful dynamic markings and indication of *portamento*, plus reduction to only a solo horn, the character has become freer and more rhapsodic, where before it was decidedly bold. At cue 55 the theme is back in D minor and is restated by eight horns, although here the ending is extended by sequence. At cue 70 both major versions of the theme are presented by the eight horns with orchestral tutti, but to compete with the fuller sound around them, three of the horns shortly drop to an octave doubling at the lower octave. The movement concludes tutti, but the ear remembers the horn.

Eight horns are not the limit on an important line. Although the orchestra is no larger at cue 14 in the last movement of the Second Symphony, ten horns blare forth at triple forte, five in a high octave (going to a written a-flat) and five in the octave below.

The important melodic material given to horns has been mentioned above concerning the Third Symphony. However, the bridging of melodies is also, on occasion, a good use for the instrument. Note particularly the use of the horn at cue 10 in the last movement of *Das Lied von der Erde*, where it momentarily takes over the melodic interest from the voice and then returns it.

The horn is also used frequently for musical recall. At measure 167 in the Rondo-Finale of the Fifth Symphony, the horn briefly states an important melodic idea from the previous *Adagietto* over an eighth note figuration in the strings. In the same work, at measure 349 in the first movement, the horn is used to anticipate a motive seen later in
the second movement. Here it is a solo while above it was a 1/4, yet both parts are allowed to sound without conflict.

In addition to sounding principal themes, it is also used for stating important motives to be used for later development. Most noticeable are the pentatonic idea in the first movement of Das Lied von der Erde and the major-minor motto stated by six horns at the first hammer blow in the Sixth Symphony.

Mahler, like many others, also found horns particularly effective for chorales, either alone or with other brasses, and for fanfares. The early movements of the First Symphony are especially rich in fanfares. The passage mentioned above at cue 15 of the first movement is a harmonized fanfare in an older style, made so by the dotted rhythms and harmonic basis on only one major chord. As here, Mahler will often write the parts for four horns, but one of them will double another part. At the closing of the second movement, a principal theme is extended by antiphonal fanfare treatment within the section. In a section of musical recall from the first movement, cue 38 of the last movement places horns polyphonically on a fanfare figure with which trumpets had been primarily associated in the earlier location. Rather unusual is the opening fanfare of the Rondo-Finale of the Seventh Symphony, where, after the initial statement by the tympani, four horns in three parts sound a fanfare of fast notes involving trills on changing quarter notes, reinforced by short rolls on the tympani.

Chorales also abound for the horns. There is a short one for three horns at cue number 2 in the first movement of the First Symphony. As usual, the passage is in parallel thirds and sixths. In the later
works Mahler tended more away from the obvious parallelisms, and would make more use of four real voices. At cue 24 in the first movement of the Sixth Symphony, there is a short passage typifying these characteristics. It is also notable here because all eight horns, playing a 2 on each part, begin at a piano dynamic level using mutes.

Within chorale passages for the entire brass section, the horns will fill inner voices, but such passages are relatively uncommon. Most often the other brasses will choralize without the horns, a notable example being the Dies Irae in the Second Symphony.

As with all the brasses, and particularly the horns, their use in the wings or above the orchestra combined with echo effects, either from placement or method of execution, is a strongly characteristic feature of Mahler's symphonies. The most notable examples occur in the last movement of the Second Symphony, where four horns are assigned to be played in the distance exclusively throughout the first part of the movement, and join the six in the orchestra later. The first appearance of the distant horns is at cue number 3, where they sound intervals of a fifth, first loud and then as their own echo. Mahler calls for the greatest possible number available. They occur again only after cue 6, where, following a written c' pick-up, they jump to g'' and then to c'''. Both passages are unison and the second is cued in the distant trumpets because of the range.

Following this they rejoin the orchestra until shortly before cue 29 when they must return to the wings and repeat, with slight modification, the initial entrance a half-tone higher. This time, however, the statement develops into a polyphony of trumpets and cadenzas by
flute and piccolo in imitation of birds at Der Grosse Appell. The effect is purely theatrical, and not surprising in view of the scope of the work, yet even on recordings this passage generates a great deal of excitement.

This idea is again used in the Fifth Symphony, although here the instruments are not separated from the orchestra. At cue 10 in the third movement, the first regular horn enters on a written c'' fortissimo and immediately decrescendos to a piano dynamic with its bell in the air. The second regular horn does exactly the same thing, on the same pitch, but three beats later. Similarly, the third and fourth horns follow identically, but two and one beats late, respectively. The effect strongly suggests echoes, but not to be outguessed, Mahler marks all four sudden fortissimo in the measure following the entrance of the fourth horn. The fortissimo is sustained in each horn, yet they fall off suddenly to rest with each succeeding measure. All this has served to prepare the way for the following *corno obligato* entrance, pianissimo and molto portamento, in the next bar. The four horns and *corno obligato* are then carefully marked dynamically in dialogues. When the solo line cadences on an a', four horns are added on that pitch "pppp," and sustain it while the soloist rests. Following a scale-wise statement by the soloist with bell in the air, the first of the regular horns repeats it exactly, but stopped. The sound is unexpected. This solo echo is repeated in measure 738 over similar string chords, but at this appearance Mahler decided to mute the answering horn instead of playing it stopped. The effect is slightly different, but the recall is obvious.
Grotesque effects are usually obtained from fortissimo stopped horns, but the use of simple grace notes can achieve the same result if the situation is right. At cue 63 in the second movement of the Sixth Symphony, the first two horns play repeated e's with lower neighbor grace notes while the three lower parts, each a play a repeated scale passage where each note is ornamented by a grace note. All feeling of possible seriousness is momentarily halted.

Similar effects are achieved when the full battery of horns interrupts a flowing passage with sharp statements. Following a long melodic passage for woodwinds and strings at measure 696 in the third movement of the Fifth Symphony, four horns enter in unison, triple forte, with bells in the air, into a prevailing triple meter with a hemiola rhythm based on two beats. The passage is a preparation for the corno obligato cadence by focusing the ear on the horn sound.

Unusual score markings abound in the horn parts. Two additional horn parts are added in the closing pages of the First Symphony for "Reinforcement," and double the two existing horn parts being played by the original seven horns until the conclusion. The lines are chorale-like, although unharmonized, and must cut through the entire orchestra.

In accordance with one of his primary characteristics, the horn parts are abundantly marked with dynamics that conflict with those of the other sections. The example mentioned immediately above is sectional, but a most interesting one occurs nine measures after cue 18 in the first movement of the Fifth Symphony, for here the conflict exists within the section itself. All four horns are on the same pitches, in octaves, but while the first two attack the sustained tones fortissimo
and stopped, and then decrescendo to pianissimo, the second two are muted and sustain the fortissimo throughout. To achieve the same effect while keeping all four playing would have required innumerable dynamic markings and extreme sensitivity from the players and conductor. The whole of the first movement of the Ninth Symphony is practically a study in this type of conflicting dynamics for the horns.

Dynamics in the horns are also used subtly for burlesquing of a more serious theme. This is most obvious at cue 23 in the Scherzo of the Third Symphony, where six horns enter triple forte on a complete parody of the nightingale motive.

Horn parts in earlier romantic symphonic music frequently call for syncopated accompaniments, and there is even a similar usage on important thematic material at cue 16 in the last movement of the First Symphony. At that point the first violins have a primary subordinate theme which is extended to thirty measures and which is accompanied throughout by two or more horns playing upbeat chord patterns.

A solo horn will also be used to set the mood of a particular section, without accompaniment, as in the second movement of this same work. The first horn establishes, with octave jumps, the total character of this typical dance accompaniment in preparation for the string theme at cue 26.

The use of horns with other instruments or instrumental sections is treated with much variety in all the works. With the string section, they can serve as either accompaniment or as equal partner. An example of the former has already been mentioned in association with syncopation, yet another fine one can be seen at cue 72 in the first movement of the
First Symphony. Within an orchestral tutti, the violins play an important theme which has been derived from the opening horn melody while, at the same time, eight horns are sounding another theme which was derived from the same source. With some doubling of the string line by other winds, both parts are heard as separate, but related, entities. A similar occurrence, but in very thin texture, may be seen at cue number 7 at the beginning of the Second Symphony. Here only the strings and two horns play. The material is developmental, and after the violins have begun their melody, the two horns enter with a countermelody in parallel thirds and sixths. There is even an obligato accompaniment for horn to a solo violin, in the second movement of the Fourth Symphony at cue 5 and again at cue 7 on the same material. After preparation by a third horn solo, the first horn enters as an ornamentation of the simultaneous solo violin melody. These usages with instruments of higher range intensify the separateness of the horns.

The fragmentation of a melody with an instrument of more similar quality and range, the 'cello, occurs at cue number 5 in the second movement of *Das Lied von der Erde*. Although not extremely evident on paper, the shift of concentration from one to the other is obvious to the ear. Yet the horn will return shortly afterwards to undeniable use as a contrasting color. Again, at the beginning of the fourth movement, it restates the interval of a fourth under solo lines in the flute and violin.

Being a favorite instrument of the Romantics, the horn is used occasionally in contexts demanding romantic treatment. Of course the obvious fanfares and horn calls spring to mind, but more abstract tone-painting is not absent. Two measures into the first *Nachtmusik* of the
Seventh Symphony, the horn has established a pastoral mood that pervades throughout, while in the second Nachtmusik, with guitar accompaniment, it will be used to maintain and further a similar mood. Mahler will even use it in more specific portraits. When the voice, in the fourth movement of the Fourth Symphony, refers to oxen at cue number 6, there is a single horn in the low register with short step-wise passages preceded by grace notes.

Yet, despite all of these interesting usages, the horn is primarily significant in Mahler's works for its treatment as a solo instrument or as a solo section. No composer had used it more. The difficulty of the parts in general is great, not because of the occasional fast, technical passages, but because of maximum exposure given to the frequent solos. A player cannot take it easy throughout a work in preparation for a difficult solo ahead: there are simply too many of them and they are scattered everywhere. The first movement of the Third Symphony is full of these exposed solo passages, but this location is not at all unique in this respect. Even single notes or short lyrical passages present difficulties, for they often involve entrances on relatively high pitches at very low volume levels and without supporting doublings. Since the works are quite long, endurance is taxed to the limit.

As a section, the horns show distinct development in individualistic treatment even as early as the First Symphony. By examining the score of just that one work, one realizes that, where in the first three movements the horn section had been used primarily in support of the other brasses in full textures, the fourth movement treats them as a
completely independent group. At that point, they are no longer with trumpets and trombones, but are frequently either in direct opposition to them or are at least the carriers of distinctly different lines. This distinctiveness is not totally relevant only to the other brasses, but also applies to both the woodwind and string sections. The horns have become a fifth independent section.

Many variations can be made on the sound emitted by a horn. Fast technical passages abound in the scores, as, for instance, in the opening of the fifth movement of Das Lied von der Erde, where in an allegro tempo the first and third horns must execute solo triplets and fast disjunct sixteenth notes with instantaneous changes from forte to piano. Other unusual technical requirements include trills at any dynamic level and the execution of widely separated notes under a slur. After cue 27 in the first movement of the Third Symphony, four horns are required to trill whole and half steps in thirds with each other at a fortissimo level, acting as the only accompaniment, besides a tambourine, to a descending figure in four trumpets. This practice did not disappear in his later works for it may be seen in a solo horn part in the first movement of Das Lied von der Erde at cue number 8, as well as at numerous other locations.

Large slurs are found almost everywhere. In a well covered part descending from fortissimo, following cue 14 of the fifth movement of the Sixth Symphony, four horns must descend from an e' to a small b-flat (written pitches). A similar part is found in the Scherzo of the Fifth Symphony, but there the part is much more exposed and occurs in an upward direction during a crescendo.
Mahler's horns must climb to the highest reaches and plunge to the depths of their pedal tones. Written high c's for the F-horn are not common, and do not occur in thin textures, but when they do occur their appearance cannot pass unnoticed, due to the quality of the horn at that pitch.

On the other hand, pedal tones are very frequent in the symphonies. They may occur as supportive parts to other sections, as the bass part in horn chorales, or as specific effects within quasi-solo material in relatively thin textures. At cue 20 in the last movement of the Third Symphony, the four principal horns drop to very low pitches, but the orchestra is engaged in a fortissimo tutti. In the third movement of the First Symphony, at cue 13, three horns are required to play, at pianissimo, the Frère Jacques melody while employing pedal tones. The second and fourth horns, at the beginning of the Scherzo in the Seventh Symphony, must play a sounding great B-flat pedal tone at "pp." This note is repeated, isolated, for several measures.

In addition to using isolated pedal tones, they also may come as a conclusion to a melodic phrase in the normal registers. Sudden jumps to these pedal tones, which are then usually sustained through several measures, may be easily seen in the Second Symphony's fifth movement, following cue number 2, where the dynamic level is "ppp" and the pitch is sounding C-natural, or in the Scherzo of the Sixth Symphony where an A must be diminished from pianissimo. Both involve jumps from at least an octave. There is a similar passage earlier in the Sixth, prior to cue 22 in the first movement, where three horns must descend to a D-natural with mutes, at "p." There is an example of an isolated pedal
tone before cue number 92 in the Seventh Symphony. The fourth horn sounds a C beneath the other three horns in the treble clef.

Probably the most effective use of pedal tones in the horn occurs in the Third Symphony. At cue number 1 in the first movement, the horns have a four-part chorale-like passage which will recur at the beginning of the fourth movement in accompaniment of the alto voice. At pianissimo, all eight horns are a 2 on each of the four parts, and move through a counterpoint involving quarter notes in each part. The sixth and eighth horns begin the passage on a written great E and descend in this passage to contra F#'s, GG's, and EE's at "ppp." The lines are lyrical and require careful blending and individual execution.

The actual sound on the instrument can be varied in several ways. The use of mutes is an obvious solution and may be seen, for example, in the pianissimo three-part horn chorale-like passage after cue number 14 in the first movement of the First Symphony. Although having previously used brass instruments offstage, Mahler chooses, in the second movement of the Seventh Symphony, to create a dialogue between two horns, in a question and answer style, by muting the second horn.

The juxtaposition of different sounds from similar instruments is seen frequently in the use of stopped and natural horns. The alternation in a single melodic line is most obvious following cue number 73 in the Seventh Symphony. Single stopped horns appear following and preceding open ones in a three-part harmony to the first violin tune. The lines are basically lyrical, and the chords are not separated from each other by rests. The mixture of stopped and unstopped horns are particularly frequent in the first movement of the Sixth Symphony. Following
cue number 14, four horns play a moving pattern while four stopped horns hold chord tones beneath them. Later in the movement, at cue number 33, four horns sustain a major triad fortissimo with diminuendo, while four other horns hold the same triad, but the first four are stopped and the latter four are open.

The use of stopped horns is particularly grotesque at the louder volume levels. When Mahler uses them for this effect, they are usually also played with bells in the air. It may be seen in the second movement of the First Symphony at cue number 5, or in the first movement of the Fifth Symphony at cue 18, for example. Both examples require six horns at either fortissimo or triple forte. The degree of difficulty that these stopped passages can attain is best seen in the third movement of the Third Symphony, just before cue 17. Here two horns are accompanying the posthorn solo together with sustained open fifths in the strings. When the second trumpet enters with a short fanfare, the first horn must diminuendo from pianissimo through a passage which includes a written c''' and a final sustained written g'' while the instrument is stopped. This, again, is extremely difficult. The demand on horn players in the symphonies of Mahler is taxing and severe, both in terms of technique and unusual manners of playing.

**Trumpet**

Like the horn, the trumpet is an important carrier of Mahler’s melodic material. The reasons are similar: great tone and volume weight enables a trumpet line to be distinguished even in the middle range during an orchestral tutti.
Berlioz (1948, p. 288) expressed displeasure at the idioms of contemporary trumpet usages. It had long been relegated to fill-in and simple rhythmic formulae, and only occasional composers possessing true style had given it any degree of independence in melodic passages. There was to be little change before the time of Mahler.

Composers were avoiding the practice of completing chords within each section in favor of providing each line with a different timbre for easier identification within the more contrapuntal textures. It can be seen that where massed brasses would formerly be necessary within full orchestral tuttis, the sound of a single trumpet is more than adequate in the thinner textures to be found at various locations throughout Mahler's symphonies. Strauss had begun to approach this usage in his treatment of the horn, but only on special occasions and without the consistent exposure found in Mahler. Nowhere in Strauss is there a passage for trumpet with the significance of the opening to Mahler's Fifth Symphony. Strauss (in Berlioz 1948, p. 296) even admits a violent aversion to using the trumpet for carrying melodies when backed only by a simple accompaniment.

The first movement of the Fifth Symphony provides one of the best examples of Mahler's treatment of this instrument in relation to techniques of symphonic treatment. The initial theme is stated by a single trumpet with varying dynamics and with no accompaniment until the crashing chord in measure 13. The basic figure returns in the solo trumpet at cue number 3, but here there is harmony to it in the horns, woodwinds, and strings. At cue number 7 the trumpet solo is of a more lyrical quality with contrapuntal lines in other instruments. This same
material returns at cue 9, but the accompaniment, though similar, is less full. The initial theme recurs at cue number 11, but in a different key, and with string and low woodwind accompaniment. Although used occasionally for other material, the trumpets are usually reserved for statements of the initial motive as it reappears throughout this movement.

Trumpets in three parts, with two high woodwind parts doubling the first part, and with opposing lines in the horns, are used also for the opening statement of a principal theme in the Rondo-Finale of the Seventh. But here, the melody is continued by horns and strings, rather than the trumpet.

Use of two trumpets in thirds and sixths with an independent countermelody can be found in the third movement of the First Symphony. At cue number 5 two oboes in thirds state the second important theme of the movement which is parodied by the E-flat clarinets at cue 6. Beneath both of these runs the steady countermelody in two trumpets, based somewhat on the oboe tune, but effectively counter to it. When that melody is given to strings at cue number 7, the trumpets retain the countermelody. Similar writing occurs at cue numbers 14 and 16 against low horns with the Frère Jacques tune and a flute with the staccato figure as well as with the whole woodwind section stating a parody of previous material.

Trumpets with solo material are not always expected to play it within only thin textures. At cue 32 in the last movement of the Third Symphony, four trumpets (two in F and two in B-flat) are instructed to
play out through a full orchestral tutti. Winds are marked piano, but strings are fortissimo.

Solos of lyrical quality in the manner of a string instrument can be found throughout the scores. One such occurs at cue 13 in the Scherzo of the Fifth Symphony. As an interlude between solos for the cornet obligato, and accompanied only by moving eighths in the first violin, the first trumpets in B-flat must execute a slurred line that includes a leap from a written c sharp to a written f sharp.

Like so many of the other wind instruments, the trumpet is also used on occasion for parody. Although not used as frequently as some of these others, it is almost as effective at those points where it does occur. For parody, muting the trumpets usually enhances the effect, but at cue 21 in the second movement of the First Symphony, Mahler chooses not to do this. The parody effect here is achieved primarily by the use of staccato notes and intervals of a third in the trumpets, and by the forte-pianos in the horns.

Within the brass section, trumpets work together with trombones, or can be treated as an integral subdivision. They are found together, and are dependent on one another, at cue 26 in the fourth movement of the First Symphony. As a sustained chordal background, four trumpets are in close position on the tonic chord, with two or three trombones immediately beneath them. There is a similar passage, but one of more thematic importance, at cue 26 in the last movement of the Third Symphony. Here, trumpets are found in three parts with one trombone closely below. The lines are independent, and are backed only by
sustained strings. Before cue 27, the second trombone enters, and the passage continues with five independent parts.

Such polyphonic parts can also occur within the trumpet section. Most notable is the cadenza-like passage beginning at cue 29 in the last movement of the Second Symphony. Playing in the distance, four trumpets play staggered entrances of fast triplets and continue with four separate parts until the appearance of the solo flute and piccolo. There is also the slower passage at cue 40 in the second movement, but there the first trumpet is carrying material of distinctly greater melodic significance, as evidenced by the fact that only it is instructed to play with the bell raised.

The trumpet is not always kept in the middle or high registers in an effort to penetrate. Eleven measures after cue 11 in the second movement of the Third Symphony, the first trumpet completes a descending sequence with alternation between small b-flat and small f (written pitches for the instrument in F). All other pitches are higher at that point, and the part is easily distinguished. In a repetition of the same passage after cue 13, sustained small f's provide a bass to the strings.

In the first movement of the Ninth Symphony, the trumpets are carefully kept from sounding until three measures after cue number 3, where there is a solo figure in the first part. This lack of trumpet sound makes the fortissimo syncopated chords by three trumpets, nine measures after cue 3, particularly effective.

Trumpets had achieved much more than simple usage at climax points and in fanfares, but the latter was not overlooked. One of the
more significant fanfares is the one where trumpets are not used to play it, but rather are held for a statement of musical recall. At cue number 3 in the last movement of the Second Symphony, a horn and then an oboe play the fanfares. At "ppp," the oboe is probably meant to imitate a distant trumpet, but as if to destroy this imitation, the trumpet enters with a short figure from the Scherzo.

At cue 29 in the same movement, we have already seen the staggered fanfare entrances of the four trumpets in the distance. They are extremely effective. Mahler is even more specific at cue 17 in the third movement of the Third Symphony, where a single muted trumpet plays, as conclusion to the first appearance of the posthorn, a short fanfare which Redlich (1955, p. 151) states is an actual Austrian army signal.

The use of brasses in the distance is a characteristic of Mahler's symphonic style in some of the larger works. At cue number 1 in the first movement of the First Symphony, three trumpets engage in a fanfare dialogue over an unchanging chord in the strings. Marked "ppp," they are to play in the distance. As previously mentioned, they also appear in the last movement of the Second Symphony, where the material is also of a fanfare nature, although blurred by multiple, staggered entrances. In addition to that appearance at cue 29, there is a much earlier one twelve measures after cue number 6, where one trumpet is marked as a possible support for the solo horn. There is no actual solo trumpet part at that point. Two trumpets in the distance appear later at cue 22 with triangle and cymbals also separated from the orchestra. As in the First Symphony, the part is of a fanfare character and is accompanied by sustained chords in the strings, but here there is movement.
in other parts as well. As all the orchestral parts begin to gain melodic character, the instruments in the wings will reappear as a counterpoint to them twice, following rests of six and eleven measures, respectively.

Brasses in the distance reappear at the end of both parts of the Eighth Symphony. At cue 91 there are four trumpets in F indicated, in addition to the four already seated in the orchestra. The first and second isolated trumpets are in unison, and the third and fourth parts double them an octave lower. Eight measures from the end, the part becomes a ½. In a footnote, Mahler indicates that this isolated first trumpet part should be taken by more than one player. At the entrance of the isolated brasses, the orchestra is building to a fortissimo tutti, while the two choruses are fortissimo throughout. The isolated brasses are undoubled elsewhere in the orchestra, and the best interpretation of "isolated" would not be to place them in the wings, where their power would be decreased, but rather in a prominent position away from the orchestra.

Mahler, as did others before him, used mutes for the trumpets on occasion. Used throughout the symphonies, they are particularly prominent in Das Lied von der Erde. Trumpets are used less in this work than any other standard orchestral instrument, and although thin textures will allow the use of a single trumpet played at low volume levels, the sound quality with a mute better fits the overall character of the work.

In the search for wide variety of tonal combinations, Mahler will occasionally indicate conflicts in trumpet muting. Following cue 38 in the Sixth Symphony, while four horns are playing stopped and four
open, two trumpets play muted and two open. Although the different horn sounds are not combined on similar lines, the trumpets are. In fact, they play many of the same pitches.

Range requirements for trumpets are moderately difficult in the symphonies. The low range extends down to small f, and rarely to e, as written pitches of trumpet in B-flat. High notes do not venture above written d'''', but when a trumpet in F plays a written b-flat''', as at five measures after cue 17 in the first part of the Eighth Symphony, it actually sounds an e-flat'''. Execution of these high pitches is a distinct problem. Nine measures after cue number 2 in the Sixth Symphony, two trumpets in B-flat, a 2, must enter on a written c#''' following a short rest. The note, despite the large jump, is a part of the melodic idea, and the placing of two instruments on the line aids security. They are not both needed for prominence of the line at that point. A sustained b'' (written) is held fortissimo by a trumpet in B-flat, without doubling, for seven measures at cue 28 in the Tenth Symphony. The texture is very thin, and the note must decrescendo at the end. The same note is held without any accompaniment in the posthorn solo at cue 16 in the third movement of the Third Symphony. Coming at the end of a long solo passage, it is a strain on the player. The finale of the Seventh Symphony makes much use of the trumpet's top register. There are many sounding c''''s for trumpets in both F and B-flat.

Stopping a trumpet has never been a common practice, but there are occasions of its use in these works. In the tenth measure after cue 21 in the last movement of the First Symphony, there is such a marking. It is a single descending triplet which acts as punctuation to the
preceding horn line. At cue 17 in the third movement of this work there is also a part for stopped trumpets. It is a sforzando-piano chord which resolves in the following measure.

Like the other brasses, trumpets are frequently called upon to play with their bells in the air. This is not always used for increased volume. At cue 40 in the third movement of the Second Symphony, Mahler would not have hesitated to give the first trumpet a different dynamic marking than the others, but instead all are marked piano, and the first is told to play with the bell up. The marking may simply have been used instead of a different dynamic, or it may be for psychological effect on the player. One of the strangest markings occurs at cue 18 in the first movement of the Fifth Symphony. Here, two trumpets join the full orchestra in a triple forte tutti, yet they are instructed to use mutes. The intention is probably to better match the sound of stopped horns, although there is no change indicated in the trombones for this purpose. These techniques of achieving orchestral blend are fully as important to orchestration as the more obvious treatment of the trumpet as a truly lyrical solo instrument. Both have had influence on the course of musical development.

**Trombone**

Berlioz (1948, p. 302) indicates a distinct aversion to using a single trombone in the orchestra. He feels that it is out of place in that it needs harmony, or at least unison, with other brasses. Like many other composers, Berlioz recognized the heroism implicit in the sound of the instrument, particularly at a forte dynamic level, and
particularly in three-part harmony within the medium range. He also states that at a slow tempo, and in the middle of its range, the trombone assumes certain religious connotations. He particularly warns against the opposite extreme of vulgar or commonplace melodies which can only destroy the effectiveness of the instrument. Fortunately, Strauss (in Berlioz 1948, p. 302) has modified these comments to some extent by indicating interesting examples in direct contradiction to Berlioz' statements. One, especially, is an excerpt of two trombones in unison opposed by a third on an entirely different melody, a device he describes as being extremely effective.

As will be seen with the tuba, one of the strangest characteristics of Mahler's writings for the instrument pertains to an aspect of absence. The Fourth Symphony contains no parts for trombone or tuba. Here Mahler has obviously sought to obtain thin textures throughout, and although the trombone can be employed in those circumstances, he chose to venture to the extreme.

In the other symphonies, the trombone is used in both manners mentioned previously. The solo material found in the first movement of the Third Symphony at cue 13 and elsewhere is not excelled anywhere else in his writings. It extends for forty-three measures at a fortissimo level over woodwind, tympani, and low string accompaniment that is basically at a pianissimo level. The line contains many sustained notes, as well as leaps and arpeggios. Its character is very free, and although the trombone is not used as frequently in the symphonies as some of the other solo brasses, this particular passage is one that cannot be forgotten.
Chorale-like writing for the trombones can best be examined in the Dies Irae of the Second Symphony. This musical idea is initially presented in the first movement and reappears in the fifth movement. It is first stated in the fifth movement by woodwinds before cue number 5, and reappears shortly afterward at cue 10 in the trombones, tuba, and contrabassoon. The two latter instruments may be disregarded here, as they represent octave doublings of the fourth trombone line. The passage lasts eight measures, is pianissimo, and the voice leading resembles a textbook illustration. A good contrast can be seen at cue 165 in the Sixth Symphony, where, over the quietest of orchestral backgrounds, the four trombones and the tuba engage in imitative entrances characterized by initial octave leaps followed by step-wise motion. Each line is totally independent, except for the obvious necessities of contrapuntal considerations.

As with the other instruments, Mahler will frequently put all of the trombones in unison, either to bring out a particular line, or to balance a line within the whole orchestral fabric. At cue number 163 in the Scherzo of the Seventh Symphony, they are on an important theme which is opposed by strong figures, fortissimo, in the woodwinds and strings. A good example of the trombone in a thin texture is seen just after the beginning of the fourth movement of the Third Symphony as an accompaniment to the alto solo. Sustained whole notes at very high pitches must be entered at pianissimo level. The part is very exposed and is not covered in any other part. In fact, the trombone is somewhat of a surprise choice here because of the pitch, dynamic level, and exposure. This passage is also notable because of the technique used of
staggering individual notes between many different instruments, something best described as "pointillism."

Other requirements of the instrument include the use of mutes in many spots throughout the Second Symphony and the recurring glissandos in the Third Symphony. Neither technique is unique in the literature, but both introduce additional elements of variety.

One of the most useful characteristics of the trombone is its ability to blend with the other brasses. The last pages of the Second Symphony show the trombones in unisons and in complete chords with the trumpets. In orchestral tuttis, Mahler will frequently have the trombone section doubling at the octave the important melodic material of the trumpets to insure its complete penetration through the rest of the orchestra. The isolated brass sections in the Eighth Symphony amply demonstrate this. At such locations, its ability to blend with the trumpets is used to achieve a unity of timbre which will carry the lines to the listener through both weight and tonal clarity. Since the horn has gained relative independence from the rest of the brass section, the trombone is used quite consistently as harmonic filler to brass chords. Its similarity of sound quality is used as it has been throughout modern history: to sound complete three or four-part chords (with a fourth trombone or tuba) as background support, as in the first movement of the First Symphony. Therefore, its blending ability can serve two dissimilar functions, and Mahler was not one to ignore either.

There are occasional polyphonic treatments within the section, but these are not nearly as frequent as in the higher brasses. An excellent example of this is one that has been mentioned previously in a
different context: cue 165 in the Sixth Symphony. Following full fortissimo triads in all the brasses that diminish to pianissimo following the change from major to minor, the tuba begins a melodic statement which is joined in counterpoint in successive measures by all four trombones separately. The only accompaniment is a roll on the tympani, which is finally joined by low woodwind chords. The passage is an interlude preceding the final short tutti chord and tympani conclusion.

The trombones are used most often as low voice fillers, frequently working with the low strings in tuttis, or with the trumpets. However, the desire to distinguish lines within full textures also gave them significant material of their own, as did Mahler's general melodic interest in the brass instruments.

**Tuba**

As an inheritor of Wagner's new techniques, and as one of the composers whose orchestration was strongly influenced by the tendencies found in Wagner's music, perhaps the most striking feature of Mahler's tuba writing is the failure to follow Wagner's example in the introduction of tubas of several different sizes. Bruckner had continued this usage to some extent, but it would be more expected of Mahler, the composer who furthered to the greatest extent the principle of large sections obtained by the addition of members of the various families with extensions of the available ranges.

Traditionally, the tuba has been used as both a doubling instrument to the double basses and as a bass part to the trombone section or the brass section in general. In the eleventh bar of the Third Symphony
there begins a solo passage for four trombones and tuba; but in line with common practices, the tuba doubles the fourth trombone an octave lower. At cue 67 in the Sixth Symphony the tuba doubles an important solo line in the double basses. Although most of the orchestra is playing, the line is an important counterpoint to other material. The quality of the line is lyric, and it shows that the tuba would have to move smoothly, even in the lowest registers. It will also be used occasionally as the bass part to a chorale in the woodwinds and low horns, as at cue 106 in the same work. Here it is doubled by the contrabassoon.

In the early symphonies, the tuba is primarily confined to doublings, but it goes beyond common practice by following moving lines completely, not just providing a single note per beat. Great agility is required. At cue number 52 in the Scherzo of the Sixth Symphony, the tuba must play, at a moderately fast tempo, groups of six sixteenth notes in descending scale patterns in conjunction with the other low instruments of the orchestra.

Lyricism for the tuba increased during the middle part of Mahler's productive period. The tuba was given passages of lyrical quality, playing slurred notes through complete phrases. Note the exceptional passage in the first movement of the Third Symphony (cue 35, for example), where, at "ppp" level, the tuba sustains notes in its low depths while only high strings and woodwinds are used in conjunction. A similar occurrence is found in the first movement of the Fifty Symphony, before cue 12, but the difference is one of importance. In a completely undoubled part, the tuba is given one of the main motives of the movement. Although the low strings and woodwinds are completing a
scale-wise passage, the tuba demands the listener's attention immedi­ately. Part of the choice of instrumental medium can be explained by a desire for effect, but this is certainly much less true here than at the solo part in imitative entrances just after the beginning of the third movement in the First Symphony, where grotesqueness is obvious.

Other typical solo passages are found throughout the middle symphonies. The close of the second movement in the Fifth has a brief bit of important thematic material. It is the tuba, with no accompani­ment. Cue 104 in the Sixth Symphony has solos of a different character: they involve leaps and staccato notes. But the Sixth contains a more important passage for the tuba in a section discussed earlier at cue 165. Here it becomes an independent contrapuntal voice in the imitative entrances with trombones. Perhaps one of the finest examples of a tuba solo occurs at cue 152 in the Seventh Symphony, where, over the thinnest of accompaniments, its line is chromatic and extremely lyrical.

Some of the tuba parts require a fast technique, but few are more difficult than the sustained low FF before cue 13 in the first movement of the First Symphony. It is "ppp" throughout its duration and Mahler indicates in the score that if the tuba player cannot play it softly enough, the note should be taken by a contrabassoon. Another un­usual technical problem occurs at cue 148 in the Seventh Symphony, where an octave glissando is required. However, this last passage is a dou­bling of the double basses, unlike the previous one, which was a solo.

An examination of the later works indicates that Mahler's over­all tendency to increase solo writing for unusual instruments throughout his productive period did not apply to the tuba. In the Ninth Symphony
each note it has is almost invariably articulated, the notes move quite slowly, and the only really sustained parts consist of a single note. Almost everything exists as a doubling function.

The only tuba part in Das Lied von der Erde occurs at cue number 12 in the fourth movement. The part lasts for six measures, and is simply a doubling at the lower octave of the third trombone. This is not unexpected, for the increased use of unusual instruments in solo capacities assumes a natural lyric quality and a high tessitura. Solos in the large works for tuba are effective because of the contrasts possible with full tutti sections, but in the late works its opposition with a flute, for example, would be totally out of place.

Solos for the tuba are generally rare in Mahler's writings, although they are more prevalent than in works by many other composers. Mahler, however, used it primarily in thick textures to double. Yet within these limitations, his demands on its agility were great, even though the parts were not extended into the top register.

Unusual Brass Instruments

In the third movement of the Third Symphony, Mahler makes use of an instrument rarely seen in orchestral literature: a posthorn in B-flat. The part is usually played today by a standard trumpet.

One of the most significant features of this posthorn part is its importance within the structural framework. Both times it appears (cue numbers 14-17 and 27-30), the change of texture and character makes these sections Trios to the surrounding Scherzo. The posthorn completely dominates both parts with its distant calls.
At the first entrance, the music is marked "very comfortably," with the dotted quarter of this compound duple somewhat slower than the quarter note in the preceding duple meter. The posthorn is marked to be played with a "free delivery," and in the manner of a posthorn. The marking probably pertains to a manner of execution consistent with the posthorn's usage in Austrian culture.

Throughout the passages there are indications to vary the rhythm from its otherwise assumed strictness, in a rather rhapsodic manner. This freedom accounts for a portion of the line's character, but even more influential is the melodic movement of the line. Following the bird-like passages in the woodwinds, this begins with the stylized broken tonic chord over sustained string chords which immediately resolve to this tonic. The separation of this Trio from the previous section is further enhanced by the change from F minor to F major. Following the broken triads, the part moves smoothly into step-wise motion in what is an elaboration and extension of the previous material. There is much emphasis on eighth note pick-ups, and the part ranges from written d' to b''. At cue number 15, there is a short interlude for high woodwinds and strings lasting eight measures. The passage between cues 15 and 16 includes a sustained trill and grace notes for the posthorn, and it holds on a solo b'' before the cadence at cue 16. Following a statement of different material by high woodwinds and strings, the posthorn returns eleven measures later with the original material and an accompaniment of two horns lasting until cue 17. Six measures before cue 17 the horns play a line in thirds (stopped) which takes over the main
interest when the first horn reaches a high written c', and the interest is then passed on to a fanfare in the second trumpet.

The Scherzo returns at cue 17 and continues to cue 27, leading into the appearance of the posthorn with material similar to that preceding cue number 14. This Trio is shorter than the first one, and the posthorn's material is adjusted accordingly. There is also a subtle change in rhythm in this new line, including hemiolas. The contrasting material is presented by first and second violins, each divided into four parts, and the return of the posthorn is again accompanied by horns, but with different lines than previously. When accompanied by horns, the posthorn is kept well above them in pitch.

The other unusual brass instrument which Mahler employs is a tenorhorn in B-flat, required in the first movement of the Seventh Symphony. The instrument, in this country, is best known as a baritone horn in B-flat, an instrument frequently found in band music but also used occasionally in the symphonic literature. The tenorhorn is actually a slight variation of the modern instrument. This unusual instrument is found nowhere else in Mahler's works.

The part is written in the G-clef, and the range extends over two octaves, from written c# to written c##'. The instrument sounds a major ninth below written pitch. Its part occurs only five times in the entire movement: three measures at the very beginning, nine measures at cue numbers 2 and 3, five measures at cue number 4, two measures following cue 23, and sixteen measures between cue numbers 43 and 45. The first and last entrances are marked to be played with a very large sound.
As would be expected, the parts are very exposed, with only rare doublings.

The early solos are part of a strong dirge-like character in the adagio introduction. Dotted rhythms and short pick-ups characterize the style throughout both accompaniment and tenorhorn solos. There is irregularity to the solo lines, with emphasis on leaps of fourths, either perfect or augmented, and frequent change of direction of the line. The short passage following cue 23 is more in the nature of a reminiscence, for although the dynamic markings and isolation of the line give it extreme prominence at that point, the idea is much less than a complete musical thought. In fact, all the tenorhorn solos are similarly set off by dynamics from the accompaniment. The short passage mentioned above recalls previous solos of the instrument, but even its first appearance seems to perhaps suggest longing after something the composer, or listener, has lost. The passages are not as rhapsodic as those of the trombone in the Third Symphony, nor as specific as those of the posthorn, but the same general quality pervades all three.

The Brass Section

The brass section, unlike the woodwind section, has an inherent ability to blend well within itself. The woodwind instruments vary so greatly in method of tone production that only the experience of years of listening has made audiences accept the compatibility of the various components of the section. While there are certain similarities in the overtone constructions, they are not nearly as closely allied as those of the brass instruments. The bores of all the brass instruments are
either conical or a combination of conical and cylindrical, and the method of tone production is identical, in principle, for each.

This overall sameness of quality has led many composers to take advantage of it in passages of chorale-like character, where the basic similarity of human voices is replaced by those of the brasses. Such a passage, involving only the low brasses, occurs at cue 10 in the last movement of the Second Symphony. As in the earlier statement by the woodwinds, this passage is a variation of the old Dies Irae melody. Scored for four trombones and a tuba, the contrabassoon is added only for proper balance of the bass line. At the beginning of the fourth movement of this same symphony, a similar chorale-like passage is written for only the high brasses: horns and trumpets. Again a bassoon has been added, initially as the only bass voice, but shortly after it serves as a doubling for the bass voice played by the fourth horn.

At cue number 27 in the second movement of the Fifth Symphony, trumpets and trombones begin a passage of similar character, although one not as lyrical as the two mentioned above. Six horns have been added by measure 471. It is typical of Mahler's overall style that throughout this passage, the three separate trumpet parts are always above the four distinct parts of the horns. The three high horns play a unison octave doubling of the highest trumpet line, while the three lower horns are used to double the three-part trombones. Being primarily chordal, this passage does not demand the usual distinctness of line found even in Mahler's tuttis, and the added weight of the low horns is probably felt necessary to balance the greater brilliance of the trumpets, playing in a higher register.
Horns are rarely used to double trumpets. When it does occur, as at measure 318 in the Scherzo of the Fifth Symphony, several trumpets in unison are doubled an octave lower by a greater number of horns. Earlier in the same work, at cue 18 in the first movement, three horns at triple forte double, an octave lower, two trumpets at that same dynamic level. As before, the other three horns are given three distinct parts which partially overlap the trombones. Within this tutti, the trumpets are again placed higher than the horns.

Horns occasionally double an important trombone motive, but never to an extent which would lessen the impact of the trombones. Before cue 32 in the third movement of the Third Symphony, six horns and three trombones play a motive involving leaps of fourths, fifths, and octaves at the unison. The accompaniment is so light that this weight would seem unnecessary, yet previous thematic statements in this symphony act as precedents to make it perfectly reasonable. The heroic quality of neither instrument is diminished.

Earlier it was pointed out that the horns, despite not infrequent contradictions, show a distinct separation from the other brass instruments throughout these symphonies, even to the point of possible consideration as a separate orchestral group. The opening pages of the Third Symphony treat horns, trumpets, and trombones quite distinctly, each pronouncing their own motives alternately. Yet while this situation was somewhat unusual for the trumpets and trombones, the horns often regain similar independence.

Alteration of the basic brass quality is achieved by muting and stopping. Long a usable technique for horns, stopping is occasionally
applied also to trumpets in these works. Although there are isolated instances of muting for trombones and tuba, these low brassed will usually remain open while the trumpets and horns can be muted and/or stopped.

Such markings will sometimes be in conflict. In measure 428 of the second movement of the Fifth Symphony, some of the horns are played stopped, the rest are open, and some of the trumpets are muted while the remainder are played open. As is usual, the trombones and tuba here are all played without color alteration.

The use of isolated trumpets and horns in the last movement of the Second Symphony has already been discussed under those respective instruments, due to the individual quality of each type of instrument in those passages. In the Eighth Symphony, at cue 91 in the first part and cue 218 in the second part, the use of four trumpets and three trombones in isolated positions is more of a sectional usage because of the absence of any similarly isolated woodwind color and the general chorale-like character of these brass parts.

At cue 91, following a few opening measures of two-part counterpoint between the trumpets and trombones, the parts settle into octave doublings of a moving line over a fortissimo orchestral tutti. Like the previous example, the one at cue 218 in the second part is also played while the brasses within the orchestra are sounding, but where before the orchestral brasses had merely been used to fill the general tutti, here they initially play an important melodic idea over sustained three-part chords in the isolated brass. When writing these three-part chords, Mahler chose in this instance to make each triad complete within each
type of instrument. The first two trumpets are doubling the highest voice. It is seen here that when a seventh chord appears in all seven instruments, the fifth of the chord is omitted, but when just the four trumpets are playing, the chord is completed and doubled an octave lower by the orchestral horns.

Within the passages for full brass section, it is notable that the trumpet specified is usually the one in F. The parts are frequently played today by transposition on a B-flat, C, or D instrument. The instrument in F is usually intended for the playing of high parts, and Mahler's choice of it helps point out the usual placement of the trumpets as the highest voices in brass chords.

The use of additional instruments of each brass type in the symphonies is primarily caused by requirements of doubling for tonal weight. Six trumpets or horns are almost never used as six independent voices, but rather as two, three, or four voices, with unison or octave doubling of the main melody. This was caused by the increased melodic importance given to the higher brasses, a conclusion partially justified by the rare supplementation of the trombones and tuba, except those used in locations away from the main body of the orchestra.
CHAPTER 4

SUMMARY AND CONCLUSIONS

Mahler's writing for the wind instruments was built on the discoveries of the past and in turn had great influence on the twentieth century. Certain developments derived from his general compositional practices while others seem to have arisen from consideration of each available instrument.

**Importance of Winds**

The importance that Mahler places on the wind instruments in general, and the brasses in particular, is of great significance. Precedence for the new prominence given to the brass instruments may be found in the scores of Wagner and Bruckner, but the greater frequency and exposure in the works of Mahler went beyond those of his predecessors. They are consistently and frequently given important thematic material, as opposed to the classical use of the brass only at high points. The horn parts in the Seventh Symphony provide an outstanding example. After the slow introduction in the first movement, the tempo at cue number 6 becomes allegro. The theme which had been anticipated in the introduction is positively stated by horns \( \frac{4}{4} \), and is again stated by horns several measures later.

At cue number 72 in the second movement, the main theme is again in the horns. This time the horns are in three parts and partake in a canon with the 'celli. In the third movement, the principal theme is in
the high strings, but in the fourth, the main thematic interest is back in a solo horn part accompanied by a strummed guitar and quiet figures in the strings and woodwinds. In the Rondo-Finale, the principal theme is again given to the horns, in association with the trumpets. Not only have the horns received significant melodic material, but they are given the important first statements of that material.

The string section is no longer the basis from which all other parts derive their music: the situation is almost reversed. Nor did they have to provide a continuous foundation for the winds. The wind instruments in Mahler's symphonies state and restate main and subordinate themes, provide transitory material, take important parts in development sections, and even dominate codas. All the winds, and particularly those in medium and high registers, became carriers of true melodic material. This created true independence of the sections so that they could be combined or separated as equal partners.

Cultural Influences

At the time of Mahler's childhood the social and political situation in Austria-Hungary had considerable influence on his musical development. As a child of the times, he received much exposure to the military bands found throughout the countryside.

Basic march rhythms, whether funereal or military, are prevalent in these scores, and by influencing the type of music which could be set to these rhythms they also made demands concerning which instruments could best be used. Naturally, the brass instruments received some, but not all, of their prominence from movements of this general character.
The folk-dance movements, on the other hand, did much to bring the wood-winds to the fore by approximating the sound quality of the town bands which originally performed this type of dance.

Fanfares are found not only in march-like movements but even as short interjections in both lyrical and grandiose movements, such as the last movement of the Second Symphony. Again of a character most natural to brasses, they are sometimes played by oboes or clarinets for spatial illusions of distance.

Military and folk influences also help to explain the rather unusual brass instruments found in these works: a posthorn in the Third Symphony and a tenorhorn in the Seventh. These wind instruments are not treated as specific effects to be used momentarily and then discarded. Although each is found in only one movement, and does not recur in later works, the parts they have are fully as important as any other.

**Difficulty of Parts**

Throughout the Romantic period, composers increasingly wrote instrumental parts which taxed the abilities of orchestral players. As the technical mechanisms of each instrument were improved, the demands took two separate directions. The ability to play fast, technical passages in all keys became a common requirement of all the winds. Mahler was no less demanding.

Yet the true difficulty of his instrumental parts is not so easily explained. Basic control of the instrument was rarely challenged so thoroughly, in terms of exposure and duration. Although the doubling of an important line elsewhere in the orchestra may lead to intonation
problems, the added security provided by additional weight and color far outweighs the former difficulty. In both the early and late works Mahler calls upon the winds often to carry principal melodic material without unison doubling. Such usages in the thin textures of the late symphonies would be expected, but they are not lacking even in the much fuller passages found in the early works.

Other difficulties may also be seen to arise from the nature of the music itself. Wind instruments at the top or bottom of their ranges result from doublings, desire for prominence, or from the exploitation of the particular sound qualities created. Flutes extend very high for octave doublings, but can also express lyrical melodies in the bottom half-octave of their range. Horns often must play high notes very softly as melodic material, or low pedal tones just as softly for harmonic foundations. Far from being simply single voices within large orchestral fabrics, the parts involving extremes of range are consistently well exposed.

Leaps within lyrical lines were relatively common for most woodwinds, but with the increasing thematic usage of the brass instruments it was only natural that they, as well, should receive passages of string-like character involving large legato leaps. Perhaps the similarity of lines found in these two greatly different sections results from the increased use of brasses to double string parts in orchestral tuttis seen during this period, perhaps not. In any case, when playing without the string section, the lines often retain the chromatic, lyrical quality found so often originally in parts for stringed instruments.
The endurance problems caused by the overall duration of each work cannot be overestimated. Although Mahler's contrasting of individual instruments and sections provides some opportunity for rest within movements, there are many passages, particularly in the larger works, where rest time is minimal. That Mahler makes great use of winds in his first movements does not preclude extensive use of them in the closing movements as well. Solo parts for winds are as frequent near the end of a work as at the beginning.

Score Markings

The great abundance of score markings in Mahler's symphonies applies to all instruments, not just the winds, yet their general characteristics can be examined and extracted by observing only the wind parts. Every page is covered with markings of dynamics, tempo, and expression.

Dynamic markings are made with extreme care. They can range from the softest possible sounds to the loudest. These extremes of volume are often used in conjunction with extremes of range for the winds, pitches at very tops or bottoms of ranges frequently being marked triple piano or triple forte. That Mahler was very careful in indicating dynamics may be seen by comparing early editions of these works to those recently released as the Critical Editions. Many of the changes involve entirely new orchestrations of selected passages, but many others deal with alterations in indicated dynamic levels. All markings were subject to revision based upon the actual sound in performance.

These scores make consistent use of different dynamics in the various parts at any given instant. This feature had only rarely been
seen previously. Proper balance was sought by Mahler, particularly in sections of reduced textures, by marking some parts louder or softer than others. This allowed the respective tonal colors of each instrument to be balanced by correspondingly different volume levels. It also allowed various parts to momentarily rise above the orchestral fabric while others declined. To achieve a true blend, a composer would never write brasses louder than woodwinds, yet this occurs ten measures after cue 32 in the last movement of the First Symphony. It is easily explained, because the brasses are stating an important theme while the woodwinds are merely sustaining a supportive chord.

However, a usage such as this would not separate Mahler appreciably from any of his contemporaries. What does, is a passage such as that twelve measures after cue 45 in the same movement. While a single flute sustains a pianissimo marking, the first oboe, which is doubling that line, crescendos twice from pianissimo to piano. Conflicting markings on parts so totally related is the real significance. Simultaneous crescendos and decrescendos will even occur. These contrapuntal dynamic markings are a truly unique feature.

Expression marks are not limited to the standard Italian musical vocabulary. Mahler will often write them in his native German, but often the meanings are expanded by relatively long verbal descriptions. Such detailed elaborations are even more noticeable in his instructions to the players for achievement of specific tonal qualities. Playing with mutes or with bells in the air is not unique to these works, but the frequency of such markings as "like a natural sound" and "in the manner of a posthorn" is. Never had a composer taken so much trouble
Doublings

In contrast to the classical practice of completing harmonies within each section, composers immediately preceding Mahler had begun to restrict doublings of melodic lines to instruments of similar color in an attempt to further separate each line from its surroundings. This new concept was to have great influence on Mahler's instrumental style.

With the new prominence given to the brass instruments, their basic tonal weight was often enough to separate melodic material from other lines or from a simple accompaniment. The scores abound with solos for single brass instruments, and when additional weight is required, two and often the whole group of horns, trumpets, or trombones will state a theme in unison. This may occur in tutti, where distinction from the rest of the ensemble is desired, or in simple homophonic passages, and even in unaccompanied solos, such as the theme stated by eight horns at the beginning of the Third Symphony.

If a countermelody occurs simultaneously, the instruments playing it will usually be of an entirely different tone color than the principal group, yet each group will be similar within itself. If a melody is supported by a simple accompaniment, the accompanying instruments are often carefully blended among themselves while still maintaining a distinct color difference from the solo instrument or instruments.

The placement of instruments of similar tone qualities on identical lines frequently results in extensive unison and octave doublings.
When the winds, in tutti, double lines in octaves, they are sometimes forced into unusual registers, producing even more distinct timbres.

The doublings at high points within movements are extensive and consistent to the point of revealing another stylistic trait. There is one instance in these scores, at measure 490 in the second movement of the Fifth Symphony, where Mahler actually marks a "Hohepunkt" in the score. Although the brasses double one another completely on a sustained major chord, the importance here is not that chord in terms of significant doubling, but rather the moving line in the bass clef. Every non-brass instrument capable of that range, except the clarinet which is held for an entrance in the next measure, is placed on that moving line. Doublings do not occur only in extended tutti at the ends of major sections. Seven measures before cue 13 in the fifth movement of the Second Symphony, the high strings play a moving, primarily scalewise passage of quick triplets, which crescendos to a fortissimo and then decrescendos to a pianissimo. Begun by unison doubling in two flutes and two oboes, the oboes drop out in the following measure only to be followed by a return of the other two oboes in the third measure. Then in the second half of that measure, two clarinets enter with the same line at pianissimo with a crescendo indicated. Great care has been taken here, because at the clarinet entrance the other instruments have already increased to a piano level. In the last quarter of that same measure, the first two oboes are again added with similar care taken about their dynamic markings.

In the fourth measure of that passage a fortissimo is reached, and two E-flat clarinets are added to the line for additional weight.
The decrescendo begins and groups of woodwinds in twos are dropped in each succeeding measure. There is some relation here to the terraced dynamics of earlier musical periods, but the speed and care of these additions and subtractions is unprecedented as a general stylistic trait used to the extent found in Mahler.

When the music enters a tutti for a high point within a movement, specifically in the earlier works, there will be doublings everywhere, from all conceivable types of instruments. Strings will divide, high and regular clarinets will join flutes, piccolos, and high strings on the upper voices; contrabassoons and tuba will double the bass voice along with double basses an octave lower. These doublings are a characteristic of Mahler's large works. But as the textures get thinner in the later works, this is no longer possible. Even the Second, Sixth, and Eighth Symphonies contain sections of reduced textures, and when this style of writing began to predominate in the late works, a blanket statement that his orchestras are out-sized seems meaningless. The recognition of it is evident in the chamber works of Schoenberg and other twentieth-century composers.

**Fragmentary Orchestration**

The compositions of Wagner show that he often preferred the distribution of a melodic line among two or more different solo instruments. One would begin the melody and carry it for several bars, whereupon another instrument would enter without break and the first instrument would drop out. Occasionally the original instrument would then return to complete the line.
In Mahler this practice is more pronounced in the works of primarily thin textures, probably because in such circumstances it is most easily audible, but it is even used in a work as large as the Sixth Symphony. It is a consistent feature throughout all of these compositions under consideration, and may rightly be considered a significant stylistic trait.

Such "pointillistic" orchestration is most evident in the first movement of the Fourth Symphony. As early as measure ten the theme that first began in the violins, and then is passed to the low strings, is further interrupted when the horn alone receives the triplet figures, and the continuation is then made by bassoon and low strings. When this phrase is repeated immediately following, the high woodwinds interject the triplet figures that are approached from the violins. Although enhanced by supplementary figures in the horns, the same thing occurs in measure 83. The process is continual throughout this movement, and is not restricted only to this single theme.

At measure 67 in the first movement of the Fifth Symphony, descending chromatic figures are passed back and forth between various groups of woodwinds. The shifts often occupy only a single beat, and the effect is furthered by indications of sudden stress at each entrance.

Another example of fragmentary orchestration is found at the beginning of the second movement of the Third Symphony. The first oboe states the principal theme of the movement over pizzicato broken chords in the strings. The melody lasts nine measures, and just as it is about to cadence on the tonic A, the second violins join for one beat and take the resolution, while the oboe rests after a sixteenth note which sounds
the dominant. Five measures later, as an extension to this melody, flute and oboe take three beats of the theme from the first clarinet. When the oboe is again ready to cadence strongly just before the double bar, it is again made to rest while three flutes sound the A as an isolated tone.

This process is most frequently used between members of the woodwind group, although the affinity of strings to woodwinds makes this possibility fairly common, as seen in the example from the Fourth Symphony. Usage involving the brass instruments is less common.

Wind Instruments Offstage

Parts for wind instruments to be played offstage are found in several of the symphonies. They are usually of a fanfare character, as at cue number 1 in the first movement of the First Symphony, but not always. Neither are they always marked at low dynamic levels to imitate the sounds of a far-off ensemble.

Appearances in the last movement of the Second Symphony have been analysed in connection with trumpet usages, but it is again notable that only brass instruments, and occasionally percussion, are placed offstage. Little effect would be achieved by removing woodwinds from the orchestra to place them similarly offstage. Mahler acknowledges this by leaving the solo flute and piccolo in their normal positions, but marking them pianissimo and triple piano at cue 29 in this last movement.

Isolated winds again appear in the closing measures of both the first and second parts of the Eighth Symphony, but here the usages are not primarily soloistic. The parts are for four trumpets and three
trombones playing block chords, and though partially undoubled, the dy-
namics are loud and the isolated position is intended for additional
projection rather than for an effect of great distance.

Mahler's position as a prominent opera conductor undoubtedly had
great influence on his scorings, and probably none as obvious as these.
Stage positioning seems directly transposed from that genre to this of
symphonic style.

**Independence of the Horn Section**

Many pages of this study have been devoted to Mahler's treatment
of the horns. His expansion of the solo capacities of the instrument is
truly significant. And yet even this development is matched by one in-
volving the section as a whole: it also gained great independence from
the rest of the brass section.

The appearance of this in the First Symphony has already been
mentioned. Where the first three movements had used the horns basically
as support of the other brasses, the fourth movement rarely shows them
in this manner. The horns became a separate orchestral section capable
of frequent contrasting to the brass, string, or woodwind sections and
no longer dependent on them, except for general musical requirements
found in all relations between distinct groups. In the late symphonies
this trait was to persist. Even in the largest tuttis the horns often
maintain separate lines. Though specific situations did not always make
this possible, the frequency of its occurrence is relatively high, de-
spite those times when chord spacings in a final cadence, or need for
weight in the orchestra's middle register, made it double other parts.
Parody

Much of the parody in Mahler's symphonies is achieved by deliberate distortion of melodic material in terms of changes in the notes themselves, but this is rarely accomplished without an accompanying change in the instrumentation. The most memorable example is the French folk song which begins the third movement of the First Symphony. Part of the satirical quality is obtained by placing the melody in minor mode, but just as important is that, as a canon, it is played by the lowest orchestral instruments. The effectiveness of the technique of low placement was recognized long before Mahler, but as with the other methods he used for self-parody, they are found so frequently and consistently throughout the scores as to become another general trait of his orchestral writing.

The importance of the E-flat clarinet to this aspect of his writing has been discussed previously in these pages in detail. The perfectness of the instrument's tonal quality for this purpose is justifiable simply by hearing it, but precedence, if required, can most easily be seen in the "fixed idea" in Berlioz' Symphonie fantastique and the burlesque of the principal theme of Strauss' Till Eulenspiegels lustige Streiche. Also useful for doubling of the flute's high registers, this instrument had never before received such consistent prominence in orchestral scores, and never had it been used to so thoroughly destroy symphonic seriousness.

As separate groups, the woodwind and brass sections often enjoy an interplay which results in deliberate parody. A theme which had been pompously stated by full brasses was easily ridiculed by similar placing
in the woodwinds. An instance which immediately comes to mind are the statements of the Dies Irae theme in the last movement of the Second Symphony, although there the woodwinds play the parody before its chorale statement by the brass instruments several pages later.

**Size and Textures**

Berlioz, Wagner, and Bruckner had used triple and even quadruple winds, and up to eight horns on occasion. Strauss, too, was fond of large sections. Yet this increase was not accepted consistently by all composers. With Mahler the use of sections expanded by additional standard instruments, as well as by larger or smaller members of the same family, became a standard feature.

One finds that two different ends were served by this increase by examining lists of wind instruments used in the symphonies. Additional doublings by identical instruments were made possible. In other sections where these were not desired, Mahler sometimes shows his search for varied orchestral colors by having the free players switch to unusual members of the instrumental families. Although used frequently for doublings at higher or lower octaves, these instruments also received soloistic treatment.

The sheer size of the wind sections in the Second and Eighth Symphonies is commonly used to represent the total significance of Mahler's contribution to orchestration. In conjunction with the use of isolated instrumental groups, multiple choruses, and greatly enlarged percussion sections, these works may justifiably be seen as a culmination of an enlarging tendency begun a century earlier and revived sporadically as in the even larger forces of Schoenberg's Gurrelieder. But
neither Mahler's own style nor his contribution to later composers are adequately served by this generalization. Even the largest works contain sections of chamber-music quality, produced by greatly reduced textures often placed in immediate juxtaposition to full tuttis. This technique was not favored by as close a contemporary as Strauss.

The large orchestras necessary for the Second and Eighth Symphonies do not solely relate to the gigantic tuttis found particularly in the finales. It had long been recognized that the pianissimo of a large section could not be equaled by a smaller group playing at an increased dynamic level. In these works full sections are often called upon to play at levels lower than forte for just this reason.

While the early symphonies can be described correctly as being for the large orchestras always attributed to Mahler, the late ones are directly in conflict with such a statement. Following the first three symphonies, Mahler chose a smaller orchestra and used much thinner textures in the Fourth. The Fifth, Seventh, and Ninth found a mid-point in numbers between those of the Fourth and those of the earlier works, although the textures in the Ninth are thinner than those in the Fifth or Seventh.

Following the extremely large forces of the Sixth and Eighth, Mahler went to the thinnest textures and smaller forces of Das Lied von der Erde and the Tenth Symphony. Far from being the perpetrator of only out-sized orchestras, Mahler showed a foresight which was to be proven shortly afterward in the chamber and small orchestra works of the early twentieth century.
Mahler was contrapuntally oriented. He would oppose melodies frequently, rather than simply presenting one with underlying harmonies. The homophony, and even the two-part counterpoint, found in the early symphonies changes noticeably to polyphony of more voices in the later works, as, for example, in the last movement of the Fifth Symphony and in the first movement of the Eighth.

Where Wagner had preferred blended sonorities, and Bruckner had tended to the block orchestrations frequently related to his knowledge of the organ, Mahler preferred unmixed tone colors and very exposed parts for the woodwinds and high brass. Strauss got away from the blurred outlines and frequent horn pedals of Wagner, but the solo wind parts never reached the exposure they did in Mahler, except in famous exceptions, such as the horn opening to Till Eulenspiegel. The economical orchestrations of Mahler have had a tremendous influence on twentieth-century composers, most notably the Viennese atonalists.

Mahler's passion for clarity can be easily seen in a study of the revisions he, himself, made on the symphonic scores. As conductor of the Vienna opera and in similar positions he was able to learn as well as any other composer what specific sounds written notes will have. He was able to test musical ideas in various ways, and chose from them the particular sound which suited him best. This practice accounts for the large number of versions of many of the works which have appeared. In the earlier works, many changes would occur during rehearsals for the initial performances, but in many instances he even continued the revisions long after the premier. Many of the changes deal with clarity, an important aspect of texture, and were achieved through experiments with
dynamics, which resulted in the identifying feature of conflicting markings on each page for the different orchestral sections, and even for individual instruments. It also led to the placement of all similar instruments on a single line for continuity by color, and to the use of solo brasses on lines of more than just fanfare character.

The textures of Mahler's symphonies cannot be accurately generalized by a statement that he was a culmination of the Romantic trend to increase the size of the orchestra. The statement is true, but does not tell the whole story. He is more properly seen as a transition from that trend to the chamber-like textures of the twentieth century.
APPENDIX

WINDS USED IN THE SYMPHONIES

SYMPHONY NO. 1

2 Piccolos (played by Flutes III and IV)
4 Flutes
4 Oboes
1 English Horn (played by Oboe III)
2 E-flat Clarinets (played by Clarinets III and IV)
4 Clarinets in B-flat, A, and C
1 Bass Clarinet in B-flat (played by Clarinet III)
3 Bassoons
1 Contrabassoon (played by Bassoon III)
9 Horns in F
4 Trumpets in F and B-flat
3 Trombones
1 Tuba

SYMPHONY NO. 2

4 Piccolos (played by Flutes III, IV, I, and II, respectively)
4 Flutes
4 Oboes
2 English Horns (played by Oboes III and IV)
2 E-flat Clarinets (E-flat Clarinet II is played by Clarinet IV)
4 Clarinets in B-flat, A, and C
1 Bass Clarinet in B-flat (played by Clarinet III)
4 Bassoons
1 Contrabassoon (played by Bassoon IV)
6 Horns in F
4 Horns in F in the distance (become Horns VII, VIII, IX, and X)
6 Trumpets in F
4 Trumpets in F in the distance (two can be played by Trumpets V and VI)
4 Trombones
1 Tuba
SYMPHONY NO. 3

2 Piccolos (played by Flutes III and IV)
4 Flutes
4 Oboes
1 English Horn (played by Oboe IV)
2 E-flat Clarinets
3 Clarinets in B-flat and A
1 Bass Clarinet in B-flat (played by Clarinet III)
4 Bassoons
1 Contrabassoon (played by Bassoon IV)
1 Posthorn in B-flat
8 Horns in F
4 Trumpets in F and B-flat
4 Trombones
1 Tuba

SYMPHONY NO. 4

2 Piccolos (played by Flutes III and IV)
4 Flutes
3 Oboes
1 English Horn (played by Oboe III)
1 E-flat Clarinet (played by Clarinet II)
3 Clarinets in B-flat, A, and C
1 Bass Clarinet in A and B-flat (played by Clarinet III)
3 Bassoons
1 Contrabassoon (played by Bassoon III)
4 Horns in F
3 Trumpets in F and B-flat

SYMPHONY NO. 5

2 Piccolos (played by Flutes III and IV)
4 Flutes
3 Oboes
1 English Horn (played by Oboe III)
1 Clarinet in D (played by Clarinet III)
3 Clarinets in B-flat, A, and C
1 Bass Clarinet in A and B-flat (played by Clarinet III)
3 Bassoons
1 Contrabassoon (played by Bassoon III)
6 Horns in F
4 Trumpets in F and B-flat
3 Trombones
1 Tuba
SYMPHONY NO. 6

2 Piccolos (Piccolo II is played by Flute IV)
4 Flutes
4 Oboes
2 English Horns (English Horn II is played by Oboe IV)
1 Clarinet in D, E-flat, and C (played by Clarinet IV)
4 Clarinets in A and B-flat
1 Bass Clarinet in A and B-flat
4 Bassoons
1 Contrabassoon
8 Horns
6 Trumpets in F and B-flat
3 Trombones
1 Bass Trombone
1 Tuba

SYMPHONY NO. 7

2 Piccolos (Piccolo II is played by Flute IV)
4 Flutes
3 Oboes
1 English Horn
1 E-flat Clarinet
3 Clarinets in A and B-flat
1 Bass Clarinet in A and B-flat
3 Bassoons
1 Contrabassoon
1 Tenorhorn in B-flat
4 Horns in F
3 Trumpets in F and B-flat
3 Trombones
1 Tuba

SYMPHONY NO. 8

2 Piccolos
4 Flutes
4 Oboes
1 English Horn
2 E-flat Clarinets
3 Clarinets in A and B-flat
1 Bass Clarinet in A and B-flat
4 Bassoons
1 Contrabassoon
8 Horns
8 Trumpets in F and B-flat
7 Trombones
1 Tuba
DAS LIED VON DER ERDE

2 Piccolos (Piccolo II is played by Flute III)
3 Flutes
3 Oboes
1 English Horn (played by Oboe III)
1 E-flat Clarinet
3 Clarinets in B-flat
1 Bass Clarinet in A and B-flat
3 Bassoons
1 Contrabassoon (played by Bassoon III)
4 Horns in F
3 Trumpets in F and B-flat
3 Trombones
1 Tuba

SYMPHONY NO. 9

1 Piccolo
4 Flutes
3 Oboes
1 English Horn
1 E-flat Clarinet
3 Clarinets in A and B-flat
1 Bass Clarinet in B-flat
4 Bassoons
1 Contrabassoon (played by Bassoon IV)
4 Horns
3 Trumpets in F
3 Trombones
1 Tuba

SYMPHONY NO. 10

1 Piccolo (played by Flute III)
3 Flutes
3 Oboes
3 Clarinets in B-flat (Clarinet III also needs a Clarinet in A)
3 Bassoons
4 Horns in F
4 Trumpets in F
3 Trombones
1 Tuba
LIST OF REFERENCES


Mahler Scores:


Symphony Number One, miniature score. New York: Edwin F. Kalmus, n. d.


