A PROPOSED MUSIC THEORY TEXTBOOK FOR INSTRUMENTAL STUDENTS OF HIGH SCHOOLS OF 250-750 ENROLLMENT, WHO HAVE HAD A LIMITED AMOUNT OF PUBLIC SCHOOL MUSIC

THESIS

Presented to the Graduate Council of the North Texas State Teachers College in Partial Fulfillment of the Requirements For the Degree of

MASTER OF MUSIC

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TABLE OF CONTENTS

LIST OF TABLES ........................................ iv

LIST OF ILLUSTRATIONS ............................... v

Chapter

I. INTRODUCTION .................................... 1

II. ANALYSIS AND STUDY OF THEORY BOOKS ....... 6

III. CONCLUSION AND RECOMMENDATIONS ........... 13

Conclusion
Recommendation

Music Notation
Time and Rhythm
The Diatonic Scale, Key Signatures, the Chromatic Scale
Minor Scales
Intervals
Acoustics
Chords
Instruments of the Orchestra and Band
Terminology

BIBLIOGRAPHY ......................................... 102
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Analysis of Theory Textbooks Showing Mean and Median Percentage of Total Space Given to Various Subjects</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>Relative Value of Notes</td>
<td>18</td>
</tr>
<tr>
<td>3.</td>
<td>Meter (Time) Signatures in Common Use</td>
<td>25</td>
</tr>
<tr>
<td>4.</td>
<td>Major Keys</td>
<td>47</td>
</tr>
<tr>
<td>5.</td>
<td>Specific Names of Intervals</td>
<td>56</td>
</tr>
</tbody>
</table>
# LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Staff</td>
<td>14</td>
</tr>
<tr>
<td>2. Treble clef</td>
<td>14</td>
</tr>
<tr>
<td>3. Bass clef</td>
<td>15</td>
</tr>
<tr>
<td>4. Grand staff</td>
<td>15</td>
</tr>
<tr>
<td>5. Ledger lines, treble clef</td>
<td>16</td>
</tr>
<tr>
<td>6. Ledger lines, bass clef</td>
<td>16</td>
</tr>
<tr>
<td>7. C clef</td>
<td>16</td>
</tr>
<tr>
<td>8. Pitch relation of clefs</td>
<td>16</td>
</tr>
<tr>
<td>9. Placement of clefs</td>
<td>17</td>
</tr>
<tr>
<td>10. Notes below third line</td>
<td>19</td>
</tr>
<tr>
<td>11. Notes above third line</td>
<td>19</td>
</tr>
<tr>
<td>12. Notes with stems</td>
<td>19</td>
</tr>
<tr>
<td>13. Flags or hooks</td>
<td>19</td>
</tr>
<tr>
<td>14. Tie</td>
<td>20</td>
</tr>
<tr>
<td>15. Slur</td>
<td>20</td>
</tr>
<tr>
<td>16. Dotted notes</td>
<td>21</td>
</tr>
<tr>
<td>17. Double dotted notes</td>
<td>21</td>
</tr>
<tr>
<td>18. Bars</td>
<td>22</td>
</tr>
<tr>
<td>19. Measures</td>
<td>22</td>
</tr>
<tr>
<td>20. Duple meter</td>
<td>22</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>21.</td>
<td>Triple meter</td>
</tr>
<tr>
<td>22.</td>
<td>Quadruple meter</td>
</tr>
<tr>
<td>23.</td>
<td>Simple and compound meter</td>
</tr>
<tr>
<td>24.</td>
<td>Duple beat</td>
</tr>
<tr>
<td>25.</td>
<td>Triple beat</td>
</tr>
<tr>
<td>26.</td>
<td>Quadruple beat</td>
</tr>
<tr>
<td>27.</td>
<td>Beams</td>
</tr>
<tr>
<td>28.</td>
<td>Beam across bar line</td>
</tr>
<tr>
<td>29.</td>
<td>Beaming of first and second, third and fourth counts</td>
</tr>
<tr>
<td>30.</td>
<td>Beaming of small subdivisions of notes</td>
</tr>
<tr>
<td>31.</td>
<td>Vocal notation</td>
</tr>
<tr>
<td>32.</td>
<td>Rhythmic subdivisions</td>
</tr>
<tr>
<td>33.</td>
<td>Rhythmic figure</td>
</tr>
<tr>
<td>34.</td>
<td>Uniform rhythm</td>
</tr>
<tr>
<td>35.</td>
<td>Regular rhythm</td>
</tr>
<tr>
<td>36.</td>
<td>Irregular rhythm</td>
</tr>
<tr>
<td>37.</td>
<td>Syncopated rhythm</td>
</tr>
<tr>
<td>38.</td>
<td>Triplet</td>
</tr>
<tr>
<td>39.</td>
<td>Triplets</td>
</tr>
<tr>
<td>40.</td>
<td>Counting rhythm</td>
</tr>
<tr>
<td>41.</td>
<td>Counting rhythm</td>
</tr>
<tr>
<td>42.</td>
<td>Whole and half-steps</td>
</tr>
<tr>
<td>43.</td>
<td>Major scale</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>44.</td>
<td>Major scale pattern</td>
</tr>
<tr>
<td>45.</td>
<td>Key signatures</td>
</tr>
<tr>
<td>46.</td>
<td>Accidentals</td>
</tr>
<tr>
<td>47.</td>
<td>Natural sign</td>
</tr>
<tr>
<td>48.</td>
<td>Double sharps and flats</td>
</tr>
<tr>
<td>49.</td>
<td>Tied double sharp</td>
</tr>
<tr>
<td>50.</td>
<td>Accidentals</td>
</tr>
<tr>
<td>51.</td>
<td>G major scale</td>
</tr>
<tr>
<td>52.</td>
<td>G major scale</td>
</tr>
<tr>
<td>53.</td>
<td>Placement of sharps on staff</td>
</tr>
<tr>
<td>54.</td>
<td>Placement of flats on staff</td>
</tr>
<tr>
<td>55.</td>
<td>Name of sharp key</td>
</tr>
<tr>
<td>56.</td>
<td>Name of flat key</td>
</tr>
<tr>
<td>57.</td>
<td>Sharp key signature</td>
</tr>
<tr>
<td>58.</td>
<td>Flat key signature</td>
</tr>
<tr>
<td>59.</td>
<td>Circle of keys</td>
</tr>
<tr>
<td>60.</td>
<td>Enharmonic tones</td>
</tr>
<tr>
<td>61.</td>
<td>Relation of enharmonic tones</td>
</tr>
<tr>
<td>62.</td>
<td>Enharmonic tones</td>
</tr>
<tr>
<td>63.</td>
<td>Enharmonic tones</td>
</tr>
<tr>
<td>64.</td>
<td>Enharmonic scales</td>
</tr>
<tr>
<td>65.</td>
<td>Degrees of the scale</td>
</tr>
<tr>
<td>66.</td>
<td>Chromatic scale</td>
</tr>
<tr>
<td>67.</td>
<td>A minor scale</td>
</tr>
</tbody>
</table>

vii
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>Relative minor scales</td>
<td>49</td>
</tr>
<tr>
<td>69</td>
<td>Harmonic minor scales</td>
<td>50</td>
</tr>
<tr>
<td>70</td>
<td>Melodic minor scales</td>
<td>51</td>
</tr>
<tr>
<td>71</td>
<td>Parallel minor scales</td>
<td>51</td>
</tr>
<tr>
<td>72</td>
<td>Harmonic interval</td>
<td>52</td>
</tr>
<tr>
<td>73</td>
<td>Melodic interval</td>
<td>52</td>
</tr>
<tr>
<td>74</td>
<td>Interval number name</td>
<td>52</td>
</tr>
<tr>
<td>75</td>
<td>Interval number names</td>
<td>52</td>
</tr>
<tr>
<td>76</td>
<td>Prime</td>
<td>53</td>
</tr>
<tr>
<td>77</td>
<td>Interval content</td>
<td>53</td>
</tr>
<tr>
<td>78</td>
<td>Intervals of a third</td>
<td>53</td>
</tr>
<tr>
<td>79</td>
<td>Thirds</td>
<td>54</td>
</tr>
<tr>
<td>80</td>
<td>Enharmonic intervals</td>
<td>54</td>
</tr>
<tr>
<td>81</td>
<td>Major and perfect intervals</td>
<td>54</td>
</tr>
<tr>
<td>82</td>
<td>Minor intervals</td>
<td>55</td>
</tr>
<tr>
<td>83</td>
<td>Diminished intervals</td>
<td>55</td>
</tr>
<tr>
<td>84</td>
<td>Augmented intervals</td>
<td>56</td>
</tr>
<tr>
<td>85</td>
<td>Specific and number names of intervals</td>
<td>57</td>
</tr>
<tr>
<td>86</td>
<td>Inversion of intervals</td>
<td>57</td>
</tr>
<tr>
<td>87</td>
<td>Inversion of intervals</td>
<td>58</td>
</tr>
<tr>
<td>88</td>
<td>Vibration</td>
<td>59</td>
</tr>
<tr>
<td>89</td>
<td>Harmonic series</td>
<td>62</td>
</tr>
<tr>
<td>90</td>
<td>Chord</td>
<td>66</td>
</tr>
<tr>
<td>91</td>
<td>Intervals of a chord</td>
<td>67</td>
</tr>
</tbody>
</table>

viii
<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>92. Primary triads</td>
<td>67</td>
</tr>
<tr>
<td>93. Secondary triads</td>
<td>68</td>
</tr>
<tr>
<td>94. Major triad</td>
<td>68</td>
</tr>
<tr>
<td>95. Minor triad</td>
<td>68</td>
</tr>
<tr>
<td>96. Diminished triad</td>
<td>68</td>
</tr>
<tr>
<td>97. Augmented triad</td>
<td>69</td>
</tr>
<tr>
<td>98. Chord in root position</td>
<td>69</td>
</tr>
<tr>
<td>99. Chord in first inversion</td>
<td>69</td>
</tr>
<tr>
<td>100. Chord in second inversion</td>
<td>70</td>
</tr>
<tr>
<td>101. Authentic cadence</td>
<td>71</td>
</tr>
<tr>
<td>102. Plagal cadence</td>
<td>71</td>
</tr>
<tr>
<td>103. Half cadence</td>
<td>71</td>
</tr>
<tr>
<td>104. Deceptive cadence</td>
<td>71</td>
</tr>
<tr>
<td>105. Seventh chord in root position</td>
<td>71</td>
</tr>
<tr>
<td>106. Seventh chord in first inversion</td>
<td>72</td>
</tr>
<tr>
<td>107. Seventh chord in second inversion</td>
<td>72</td>
</tr>
<tr>
<td>108. Seventh chord in third inversion</td>
<td>72</td>
</tr>
<tr>
<td>109. Strings of violin</td>
<td>75</td>
</tr>
<tr>
<td>110. Range of violin</td>
<td>75</td>
</tr>
<tr>
<td>111. Strings of viola</td>
<td>75</td>
</tr>
<tr>
<td>112. Range of viola</td>
<td>76</td>
</tr>
<tr>
<td>113. Strings of 'cello</td>
<td>76</td>
</tr>
<tr>
<td>114. Range of 'cello</td>
<td>76</td>
</tr>
<tr>
<td>115. Strings of four-string bass</td>
<td>77</td>
</tr>
</tbody>
</table>
Figure | Description | Page
--- | --- | ---
116. | Strings of five-string bass | 77
117. | Range of four-string bass | 77
118. | Range of five-string bass | 77
119. | Range of harp | 79
120. | Range of flute | 80
121. | Range of piccolo | 81
122. | Range of oboe | 81
123. | Range of English horn | 82
124. | Range of bassoon | 82
125. | Range of double-bassoon | 83
126. | Range of clarinets | 84
127. | Range of bass clarinet | 85
128. | Range of alto clarinet | 85
129. | Range of saxophones | 86
130. | Range of French horn | 87
131. | Range of mellophone | 88
132. | Range of trumpet | 88
133. | Range of tenor trombone | 89
134. | Range of bass trombone | 89
135. | Range of tubas | 90
136. | Range of baritone | 91
137. | Range of tympani | 92
138. | Range of chimes | 92
139. | Range of bells | 93
140. | Normal range of xylophone | 93
CHAPTER I

INTRODUCTION

Music study in the public schools of America has enjoyed a remarkable growth in the last three decades. Whereas only a few years ago the music curriculum consisted chiefly of solfeggio and a few other elemental courses, today we have many large high schools with music departments of almost conservatory rank. The program has expanded until it covers all branches of vocal, instrumental, and theoretical music. Even in smaller high schools, we find music departments offering some sort of musical opportunity to every student who desires to participate.

With the increase in instrumental and vocal music has come an increased realization on the part of the music educator that a student should have an adequate theoretical background in music if he is to become a good vocal or instrumental performer.

Problem

With the increase of courses in music theory in the high schools, it has been quite natural that a large number
of theory textbooks should be written for use in the schools. A number of fine books have been written, and undoubtedly have been used successfully in many cases. Often, however, these books, presented as general music theory books, place much emphasis on certain subjects, and in turn neglect other subjects.

From the author's experience in teaching instrumental music in the high schools, he feels that the students coming from many high school theory courses are lacking in a fundamental knowledge of theory that he should have in order properly to fill his place in a high school instrumental organization. An examination of several theory textbooks reveals that, in the opinion of the author, none of the books completely cover the subject of elemental theory. Some contain material which can best be treated in other music courses.

Entirely too many music students graduate from high school without having a knowledge of and an ability to perform simple rhythm patterns. This is perhaps the greatest weakness in the playing or singing of the average high school student. In spite of this, most theory books devote a very small amount of space to the subject of meter and rhythm.

The average player in a high school band or orchestra has very little knowledge of how the tone is produced on his instrument, how it is played, or why it sounds as it
does. He also knows very little about the other instruments of the band, except that he either likes or dislikes them. These two subjects are inadequately discussed in most theory texts. Because of limited time, it is difficult to study these subjects in the instrumental class period.

A textbook is needed to cover all of these often neglected subjects, and also cover the fundamentals discussed in practically all theory books.

Purpose

It is the author's purpose, after a thorough study of published theory books, to present a proposed textbook in music theory to meet the needs of the average high school student. It would meet the needs of the general music student, and would be of special benefit to the performer, whether vocalist or instrumentalist. No attempt has been made to plan exercises for each topic discussed, as it is felt that the teacher in each individual case is better qualified to fit his own exercises to the needs of the particular class.

The first five sections of the textbook deal with subjects considered fundamental in any study of music theory.

A section on acoustics has been included because it is felt that the instrumental student will be a better
performer if he has some understanding of the way in which the tone is produced on his instrument. The material presented is purely factual, and may appear at a glance to be too complicated for high school use. However, the teacher may present the material to the students in any way deemed advisable.

The section on chords is presented to give the students a knowledge of the construction of the most-used chords, and to assist them in analyzing and performing chord figures in the music that they play.

The book contains a section on musical instruments, to acquaint the student with other instruments. A list of terms used in music is also included.

Source and Validity of Data

The data were obtained from a study of published theory books, music encyclopedias, and dictionaries.

These books were selected as a representative group of all high school music theory books listed in the United States Catalogue of Books from 1928 to the present. They represent publications of reliable publishers, and the validity of material contained therein is dependent upon the reliability of the publishers.

Procedure

Fifteen music theory books were studied and analyzed as to subjects covered and the amount of space given to
each subject. After this was done, a proposed theory textbook was developed.

Because of the large amount of factual material which is self-explanatory, very few footnote references are given. Anyone who is interested may consult the books listed in the bibliography.
CHAPTER II

ANALYSIS AND STUDY OF THEORY BOOKS

The following fifteen published high school theory textbooks were studied and an analysis made of the subjects presented in each book:


The analysis included the number of pages devoted to each subject, and the per cent of the total number of pages devoted to each subject.

The subjects for evaluation were chosen because they were the subjects appearing most frequently in the books analyzed. Certain of the fundamental subjects are considered in practically all theory books, with varying amounts of space per subject in different books. Certain other subjects, which are vital to the instrumentalist, are discussed in some books, but all are not consistently discussed in connection with the fundamental subjects.

Also, much space is given to the subjects not considered important in a theory course for instrumentalists. The results of this analysis are shown in Table 1. The numbers in the stub of the table refer to the books listed above. Henceforth, in the discussion, these books will be known by the author's name.
TABLE 1
ANALYSIS OF THEORY TEXTBOOKS SHOWING MEAN AND MEDIAN PERCENTAGE OF TOTAL SPACE GIVEN TO VARIOUS SUBJECTS

<table>
<thead>
<tr>
<th>Book</th>
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<th>No. Pages</th>
<th>Per Cent</th>
<th>Diatonic Scales, Key Signature, Chromatic Scales</th>
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<th>Per Cent</th>
<th>Minor Scales</th>
<th>No. Pages</th>
<th>Per Cent</th>
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<tbody>
<tr>
<td>1..</td>
<td>74</td>
<td>5</td>
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<td>6.7</td>
<td>28</td>
<td>10</td>
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<td>2..</td>
<td>52</td>
<td>11</td>
<td>6</td>
<td>16</td>
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<td>2</td>
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<tr>
<td>3..</td>
<td>170</td>
<td>3</td>
<td>18</td>
<td>13</td>
<td>3</td>
<td>12</td>
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<td>32</td>
<td>5</td>
<td>15</td>
<td>4</td>
<td>12.5</td>
<td>6</td>
<td>18</td>
<td>2</td>
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<td>3</td>
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<tr>
<td>6..</td>
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<td>16</td>
<td>6</td>
<td>5.6</td>
<td>10</td>
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<td>10</td>
<td>15</td>
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<td>125</td>
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<td>8</td>
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<td>14</td>
<td>11</td>
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<td>3</td>
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<tr>
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<td>14</td>
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<td>11</td>
<td>8</td>
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<td>3.5</td>
<td>4</td>
<td>4</td>
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</tr>
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<td>12..</td>
<td>144</td>
<td>8</td>
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<td>11</td>
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<td>8</td>
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</tr>
<tr>
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<td>47</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>8</td>
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Mean.... .. 11.3 .. 8.8 .. 13.7 .. 7.0
Median.. .. 9.5 .. 8.5 .. 14.0 .. 5.6
**TABLE 1 -- Continued**

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<th>Instruments of Orchestra and Band</th>
<th>Terminology</th>
<th>Chords</th>
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<td>8.5</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Total Pages Devoted to Each Subject
The first five subjects listed, notation, meter and rhythm, diatonic and chromatic scales and key signatures, minor scales, and intervals, are the most frequently discussed, though no one subject is discussed in all the books. Bampton, which is a more advanced book, does not discuss notation nor meter and rhythm.

The space given to notation ranges from 4.5 per cent of the total pages in Holmberg to 29.0 per cent in Wrightson, with a mean of 11.3 per cent and a median of 9.5 per cent.

The space given to meter and rhythm ranges from 1.3 per cent in Holmberg to 18.0 per cent in Hunt, with a mean of 8.8 per cent and a median of 8.5 per cent.

The space devoted to diatonic and chromatic scales and key signatures ranged from 1.3 per cent in Holmberg to 30.0 per cent in Hunt, with a mean of 13.7 per cent and a median of 14.0 per cent.

The space given to minor scales ranges from 1.3 per cent in Jones-Barnard to 28.0 per cent in Bartholomew, with a mean of 7.0 per cent and a median of 5.6 per cent.

The space given to intervals ranges from 2.0 per cent in Robinson and Jones-Barnard to 12.0 per cent in Hunt and Blanke and Speck, with a mean of 7.3 per cent and a median of 7.0 per cent.
The last four subjects are not discussed in as many books as the first five subjects.

Only five books, Bampton, Jones, Maryott, Smith, and Wrightson, discuss acoustics. The space given to it ranges from 2.0 per cent in Maryott to 8.0 per cent in Jones, with a mean of 4.4 per cent and a median of 3.5 per cent.

Six books, Blancke and Speck, Holmberg, Jones, Jones-Barnard, Robinson, and Smith, discuss instruments of the orchestra and band. The space given ranges from 1.4 per cent in Smith to 30.0 per cent in Blancke and Speck, with a mean of 11.2 per cent and a median of 8.5 per cent.

Eleven books, all except Bampton, Brown, Holmberg, and Howell, give some space to music terminology. The space ranges from 1.4 per cent in Smith to 36.0 per cent in MacPherson, with a mean of 11.9 per cent and a median of 8.0 per cent.

Thirteen books, all except Blancke and Speck and Brown, discuss chords. The space given ranges from 6.0 per cent in Maryott, Smith, and Wrightson to 21.0 per cent in Bampton, with a mean of 9.7 per cent and a median of 8.0 per cent.

Only three books, Blancke and Speck, Hunt, and MacPherson, do not contain some other material. The other subjects include harmony, form, transposition, modulation, history, appreciation, ornaments, and biography. The space
given to these other subjects ranges from 7.0 per cent in Bartholomew to 68.0 per cent in Holmberg, with a mean of 34.6 per cent and a median of 33.0 per cent.

Only two books, Jones and Smith, discuss all of the subjects, but they also contain some other material.
CHAPTER III

CONCLUSION AND RECOMMENDATIONS

Conclusion

The five fundamental subjects considered in the study of high school theory books—notation; meter and rhythm; diatonic scales, key signatures, and chromatic scales; minor scales; and intervals—are discussed in practically all of the books studied. Only one book leaves any of these subjects out, and it does not discuss the first two. The other four subjects discussed are considered in various books, but only two books have all of them. However, these two books, which discuss all nine subjects, contain much material which is not considered important in a course in theory for an instrumentalist.

The study shows that there is need for a theory book covering all of the subjects listed in the study, and leaving out some material not needed in the course.

Recommendation

In the light of the above study, the author presents the following proposed textbook to be used in a high school
course in first-year music theory, for instrumental students.

Music Notation

**Staffs and clefs.**—Music is visualized for performance by the use of notes printed or written on the staff. The staff consists of five lines and four spaces.

![Fig. 1.--Staff](image)

Each pitch or musical sound is represented by a note, which is written either on a line or in a space. The first seven letters of the alphabet, A, B, C, D, E, F, and G, are used as names for the various notes.

However, a staff without a clef sign is meaningless. Notes have different sound values and different names according to the clef in which they are written. The most common clefs used are the treble, or G clef, and the bass, or F clef.

![Fig. 2.--Treble clef](image)

Note that the treble clef encircles the second line, and locates G on that line. The names of other notes are
determined in relation to it. Note that the bass clef encircles the fourth line, and locates F on that line.
The names of the other notes are determined in relation to it.

The grand staff consists of two staffs joined together with a brace. The top staff is keyed with the treble clef and the bottom staff with the bass clef.

To complete the notation, one extra line, represented here by the dotted line, is added between the two staffs, and the note on that line is called middle C, since it is halfway between the two staffs.

It is easily seen that all the pitches cannot be represented on these few lines and spaces, so extra lines, called ledger lines, can be added above and below both
staffs. The notes placed on these lines are named in the same sequence as those in the staff.

Fig. 5.--Ledger lines, treble clef.  
Fig. 6.--Ledger lines, bass clef.

Although the average high school student is primarily concerned with the two clefs already discussed, he should know that there are five other clefs.

Four of these use the C clef, illustrated below. The line set off by the two hooks becomes middle C.

Fig. 7.--C clef

The other uses the F clef, already discussed.

The five lines used in each clef are taken from the grand staff, and the exact pitch of each is shown in the following diagram. The continuous lines show the lines used by a particular clef, while the dotted lines show the lines not used by that clef.

Fig. 8.--Pitch relation of clefs
The placement of the various clefs on the five-line staff is as follows:

![Fig. 9.—Placement of clefs]

These clefs are used to facilitate the reading of music using a minimum of ledger lines. The alto clef is used by violas and sometimes trombones. The tenor clef is sometimes used by cellos, bassoons, and trombones.

Value of notes.—In order to locate each pitch on the staff and to determine the length it is to be held, we use characters called notes. To indicate silence, we use rests. Not all notes or rests have the same time value. A rest has the same time value as the note of the same name.

A note has either one, two, or three parts: (1) Head, (2) Stem, and (3) Flag or Hook.

A whole-note (○) is a head.
A whole-rest (⅛) is a small bar below the fourth line.
A half-note (▁) is a head and stem.
A half-rest (½) is a small bar above the third line.
A quarter-note (▅) is a head and stem.
A quarter-rest (¼ or ☛) is a small waved line across the three middle lines, or a stem with a hook on the right side. The waved line is more commonly used.
An eighth note \( (\cdot) \) is a head and stem with one flag.
An eighth rest \( (\gamma) \) is a stem with one hook on the left side.
A sixteenth note \( (\checkmark) \) is a head and stem with two flags.
A sixteenth rest \( (\gamma) \) is a stem with two hooks.
A thirty-second note \( (\checkmark) \) is a head and stem with three flags.
A thirty-second rest \( (\gamma) \) is a stem with three hooks.
A sixty-fourth note \( (\checkmark) \) is a head and stem with four flags.
A sixty-fourth rest \( (\gamma) \) is a stem with four hooks.
Whole-notes and half-notes have open heads. The heads of the others are filled in.
Whole-notes receive twice the value of half-notes, half-notes twice the value of quarter-notes, etc. The relative value of all notes is shown in the following table:

**TABLE 2**

<table>
<thead>
<tr>
<th>RELATIVE VALUE OF NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 ( \cdot )</td>
</tr>
<tr>
<td>8 ( \cdot )</td>
</tr>
<tr>
<td>8 ( \cdot )</td>
</tr>
<tr>
<td>8 ( \cdot )</td>
</tr>
</tbody>
</table>
When there is one melody on a staff, the notes below the third line have their stems at the right of the head, pointing upward.

![Fig. 10.--Notes below third line](image)

Notes above the third line have their stems at the left of the head, pointing downward.

![Fig. 11.--Notes above third line](image)

When notes are on the third line, stems may point either way, according to the position of the preceding and following notes.

![Fig. 12.--Notes with stems](image)

Flags or hooks are always on the right of the stems.

![Fig. 13.--Flags or hooks](image)
The tie or bind.--When two notes on the same line or space are adjacent to each other and connected by this symbol (---) or (---), we have what is known as the tie or bind.

Fig. 14.--Tie

The tie means that the note is to be sounded once and then held for the combined values of the two notes.

Slur or legato sign.--When two or more notes on different lines or spaces are joined by a curve, we have the slur or legato sign.

Fig. 15.--Slur

This means that the notes are to be performed smoothly one after another. Only the first note is tongued when played on wind instruments.

Staccato.--Staccato means not connected, separated, detached, short and crisp. Ordinarily a note marked staccato receives approximately one-half the value it would receive otherwise. Staccato is indicated by a dot under or over a note, thus: ☞. Non-legato is a combination of legato and staccato, neither long nor short, but each
tone slightly separated. It is indicated thus: \( \dot{\text{.}} \).

The dot.--A dot placed after a note adds to the note one-half of its normal time value.

\[
\begin{align*}
\text{Dotted, becomes:} & \\
\text{or } & \\
\end{align*}
\]

Fig. 16.--Dotted notes

A note is increased three-quarters its value by two dots (double dot).

\[
\begin{align*}
\text{or } & \\
\end{align*}
\]

Fig. 17.--Double dotted notes

Bars and measures.--A bar is a vertical line drawn through a staff. Bars are used to divide music into measures and to indicate the principal accent, which normally comes immediately after the bar. An accent in music is an emphasis or stress on certain tones.

A double-bar consists of two vertical lines through the staff, the second usually being heavier than the first. A double-bar indicates the end of a phrase, movement, or composition.
A measure is the content between two bars.

**Fig. 19.--Measures**

**Time and Rhythm**

**Meter.**—Music is measured by meter, or time.

Meter in music is the regular grouping of time units into measures.

Fundamentally, there are only two kinds of meter: Duple (two beats to the measure) and Triple (three beats to the measure). However, some schools recognize Quadruple meter (four beats to the measure) as being a distinct meter, and it will be so treated here. All other meters are combinations of these three meters.

Duple meter consists of a strong or stressed beat followed by a weak or relaxed beat.

```
|  /  |  /  |  /  |  /  |  /  |
```

**Fig. 20.--Duple meter**
Triple meter consists of a strong beat followed by two weak beats.

\[
\begin{array}{cccc}
\text{I} & \text{I} & \text{I} & \text{I} \\
\end{array}
\]

Fig. 21.--Triple meter

Quadruple meter consists of a strong beat followed by three weak beats, with a secondary accent on the third beat.

\[
\begin{array}{cccc}
\text{I} & \text{I} & \text{I} & \text{I} \\
\end{array}
\]

Fig. 22.--Quadruple meter

We noted in the preceding chapter that an accent is an emphasis or stress on certain tones. We also noted that a measure is the space between two bars.

There are two types of time units: simple, having one pulsation to each beat; and compound, having three pulsations to each beat. A time unit is the unit assigned to each beat of a measure.

The meter and the time unit are designated by two numbers placed one above the other at the beginning of a composition, for example: \(\frac{3}{4}\). This is commonly called the time signature. The time signature is found by multiplying the meter times the unit.
In duple simple meter with a quarter-note time unit, the signature will be $2 \times \frac{1}{4}$ or $\frac{2}{4}$. The signature for triple meter will be $3 \times \frac{1}{2}$ or $\frac{3}{4}$, or for quadruple, $4 \times \frac{1}{4}$ or $\frac{4}{4}$.

In compound meters with dotted quarter-note unit (value $3/8$ or three-eighths note), the corresponding signatures will be $2 \times \frac{3}{8}$ or $\frac{6}{8}$ for duple, $3 \times \frac{3}{8}$ or $\frac{9}{8}$ for triple, and $4 \times \frac{3}{8}$ or $\frac{12}{8}$ for quadruple. With notes other than quarter-notes as time units, the time signatures will be figured accordingly.

The letter C is sometimes placed on the staff to indicate $\frac{4}{4}$ time. It is not, however, an abbreviation of the word "common," as is often stated. In early music, triple meter was considered "perfect" and was represented by a circle. Quadruple meter was considered imperfect and the circle was broken, thus: C. From this we get the "common time" signature.

Table 3 summarizes the meter signatures in common use.

The examples on page 26 show each simple meter compared with its related compound meter.

At this point the student should learn how to direct, or beat time with his hand and arm, at least the three simple meters, namely, $2$, $3$, and $4$.

Duple is simply beating straight down on the first beat and up on the second beat of the measure.
# Table 3

## Meter (Time) Signatures in Common Use

<table>
<thead>
<tr>
<th></th>
<th>Simple</th>
<th></th>
<th>Compound</th>
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</thead>
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<tr>
<td></td>
<td>Unit</td>
<td>Signature</td>
<td>Unit</td>
</tr>
<tr>
<td><strong>Duple</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2(\times)1/2</td>
<td>2/2</td>
<td>2(\times)3/4</td>
</tr>
<tr>
<td></td>
<td>2(\times)1/4</td>
<td>2/4</td>
<td>2(\times)3/8</td>
</tr>
<tr>
<td></td>
<td>2(\times)1/8</td>
<td>2/8</td>
<td>(2(\times)3/16)</td>
</tr>
<tr>
<td><strong>Triple</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3(\times)1/2</td>
<td>3/2</td>
<td>3(\times)3/4</td>
</tr>
<tr>
<td></td>
<td>3(\times)1/4</td>
<td>3/4</td>
<td>3(\times)3/8</td>
</tr>
<tr>
<td></td>
<td>3(\times)1/8</td>
<td>3/8</td>
<td>(3(\times)3/16)</td>
</tr>
<tr>
<td><strong>Quadruple</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4(\times)1/2</td>
<td>4/2</td>
<td>4(\times)3/4</td>
</tr>
<tr>
<td></td>
<td>4(\times)1/4</td>
<td>4/4</td>
<td>4(\times)3/8</td>
</tr>
<tr>
<td></td>
<td>4(\times)1/8</td>
<td>4/8</td>
<td>(4(\times)3/16)</td>
</tr>
</tbody>
</table>

---

Simple

Duple Meter

Compound

Triple Meter

Quadruple Meter

Fig. 23.--Simple and compound meter
Triple is "down-out-up."

Quadruple is "down-in-out-up."

The student should practice beating these three meters until he can beat them without having to worry about his hands.

In addition to meters of two, three, and four beats to the measure, there are others which are occasionally used. However, they are all combinations of the three meters mentioned above. Five pulse meter is a combination of duple and triple meters. Whether the duple or triple part of the measure comes first is designated by numbers immediately after the time signature, thus: 5/4 (2.3) or 5/4 (3.2); by phrase marks, thus: 5/4\(^\text{f}^\text{f}^\text{f}^\text{f}^\text{f}\);
by beams\textsuperscript{2} joining the notes, thus: $5/8 \cdot \cdot \cdot \cdot \cdot \cdot \cdot$; or by dotted bar lines, thus: $5.4 \cdot \cdot \cdot \cdot \cdot \cdot \cdot$.

Seven pulse meter is a combination of triple and quadruple meter.

\textsuperscript{2}When there are rhythmic subdivisions in instrumental music, the metric pulses are made more recognizable by beams, or lines joining the stems of notes.

3/4 \begin{music}
\begin{notation}
\\\Dm\Dm\Dm
\end{notation}
\end{music}

Fig. 27.---Beams

Beams do not cross the bar line unless they are used to show a rhythmic figure.

\begin{music}
\begin{notation}
\\\Dm\Dm\Dm
\end{notation}
\end{music}

Fig. 28.---Beam across bar line

When the rhythmic subdivision of quadruple meter is in two, the first two or last two pulses may be beamed together, but never the second and third.

\begin{music}
\begin{notation}
\\\Dm\Dm\Dm
\end{notation}
\end{music}

Fig. 29.---Beaming of first and second, third and fourth counts.

Smaller subdivisions should be beamed separately for each pulse. Beams are rarely used in vocal music.

\begin{music}
\begin{notation}
\\\Dm\Dm\Dm
\end{notation}
\end{music} \quad \begin{music}
\begin{notation}
\\\Dm\Dm\Dm
\end{notation}
\end{music}

Fig. 30.---Beaming of small subdivisions of notes. \quad \text{Fig. 31.---Vocal notation.
Rhythm.--Rhythm is the distribution, or arrangement of notes within the measure. Meter gives music its unity, whereas rhythm gives it variety.

The time or rhythmic unit is the kind of note value designated for each metric pulse. In 4/4 time, the quarter-note is the rhythmic unit; in 2/2, the half-note, etc.

Rhythmic subdivisions are made by dividing the rhythmic unit into smaller notes.

The following are only a few of the rhythmic subdivisions that can be made from a quarter-note rhythmic unit:

\[
\begin{align*}
\frac{4}{4} & : \quad \begin{array}{c}
\text{Fig. 32.--Rhythmic subdivisions}
\end{array}
\end{align*}
\]

A rhythmic figure is the grouping of notes into a pattern that occurs throughout a composition.

\[
\begin{align*}
\frac{2}{4} & : \quad \begin{array}{c}
\text{Beethoven, 5th. Symphony}
\end{array}
\end{align*}
\]

\[
\begin{align*}
\frac{3}{4} & : \quad \begin{array}{c}
\text{Fig. 33.--Rhythmic figure}
\end{array}
\end{align*}
\]
Just as there are different types of meters, there are different types of rhythms.

A uniform rhythm is one in which notes of the same value are employed throughout a phrase.

![Doxology](image)

Fig. 34.--Uniform rhythm

A regular rhythm is one in which the longer notes are on the accented pulse of the meter.

![Blue Bells of Scotland](image)

Fig. 35.--Regular rhythm

An irregular rhythm is one in which the shorter notes are on the accented pulse.

![Haydn](image)

Fig. 36.--Irregular rhythm

A syncopated rhythm is one in which the longer notes occupy the unaccented part of the pulse.

![Beethoven](image)

Fig. 37.--Syncopated rhythm
A triplet is a group of three notes played in the time ordinarily used by two of the same kind of notes, thus:

\[
\begin{array}{c}
\frac{2}{4} \quad \frac{3}{4}
\end{array}
\]

Fig. 38.--Triplet

The three eighth notes in the triplet, marked \( \frac{3}{3} \) or \( \frac{3}{3} \), received the same time value as the two eighth notes in the measure above.

Triplets of any note value may be used.

\[
\begin{array}{c}
\frac{0}{3} \quad \frac{0}{3} \quad \frac{0}{3}
\end{array}
\]

Fig. 39.--Triplets

This rhythmic figure, \( \frac{1}{3} \), would be played as a triplet, with the quarter receiving the value of the first two eighth notes in an eighth note triplet.

When the composer wishes to use two notes where three would be used ordinarily, he uses a doublet, written thus: \( \frac{1}{3} \).

Likewise, groups of 4, 5, 7, 9, etc., notes may be used, thus: \( \frac{4}{4} \), etc.

The first measure of a composition may start on any beat or part of a beat. When it starts on any beat except
the first beat, the notes before the first bar are commonly known as "pick-up notes." The last measure of any such composition usually is incomplete by the value of the notes in the first part measure.

Performance of rhythms.--Because of its complexity, rhythm presents one of the most outstanding difficulties in the correct performance of music. There have been several methods of time counting introduced, but the author has obtained far better results in actual teaching with the following method than with any other used. It may seem strange at first, but it is more definite than most systems.

The whole idea is to say each note aloud exactly as it would be played or sung, meanwhile beating time with the hand. For example, instead of counting a whole note in 4/4 time "one-two-three-four," count "one" and hold the note four counts, meanwhile beating time.

The other points of this method can be noted best from the following examples. Remember that in order to secure the best results, the student must beat time at all times while counting.

Fig. 40.--Counting rhythm
By reducing it to its lowest note, and counting it in this method, a difficult rhythm may easily be understood. For example, the following rhythm may be accurately analyzed thus:

![Fig. 41.--Counting rhythm](image)

By reducing the second beat of the first measure to four sixteenth notes, we can see the proper place for the two sixteenth notes. According to this system four sixteenth notes are counted 1-2-3-4. Actually, the first note of the group, an eighth note, is the equivalent of two tied sixteenth notes, thus: \( \left( \begin{array}{c} \frac{3}{4} \\ \frac{1}{4} \end{array} \right) \). Counted in four counts, the second count is silent, or part of the first count, and we can see the proper mathematical relation of the notes.

Reduced to four sixteenth notes, the figure in the second measure, \( \left( \begin{array}{c} \frac{3}{4} \\ \frac{1}{4} \end{array} \right) \), becomes three tied sixteenth notes, the equivalent of the dotted eighth, and one more sixteenth, thus: \( \left( \begin{array}{c} \frac{3}{4} \\ \frac{1}{4} \end{array} \right) \). Counted in four counts, the second and third counts are silent, or part of the first count, and we can see the exact value of the notes. If the student has trouble with this figure at first, he should count 1-2-3-4, with the 1 and 4 emphasized, since that is
where the dotted eighth and sixteenth actually come. Then the 2 and 3 can be left out, thus:  

Much time should be spent in work on all types of rhythms.

The Diatonic Scale, Key Signatures, the Chromatic Scale

It was noted in the first chapter that we arbitrarily use the first seven letters of the alphabet as the names of our notes. By using just these seven notes we have a feeling of a certain tonality, or that one tone is the key note, or most important note of that group. Of these seven notes it is generally recognized that C is the most important, and should come first. By arranging the other notes in alphabetical order after C, and repeating the A and B after G, there is a feeling for the C major scale.

Whole steps and half-steps.--Before introducing the subject of diatonic scales, we first must have some understanding of the elements used to construct a scale.

The smallest usable unit of measuring the distance between two tones (commonly called an interval) is the half-step, also known as half-tone, or semi-tone. The next largest unit is the whole step, or whole tone. These two units constitute the larger part of the intervals that are employed in the music now in use.
The difference in the half-step and the whole step is often hard to explain to young students, and any visual or aural device that can be employed by the teacher to make this point clear is satisfactory. By simple mathematics, the average student will understand that the half-step is just half as large as the whole step. A diagram such as this may be used to show the proper relation:

![Diagram showing the relation between a whole step and a half-step](image)

Fig. 42.--Whole and half-steps.

(Throughout the remainder of this book whole steps will be marked thus — , and half-steps thus √ .)

Also the teacher may give the students an auditory realization of their relation by playing whole steps on the piano, then playing the two half-steps contained in the whole step.

If a piano keyboard is available, the relation of the white and black keys will be of much assistance.

**Diatonic major scale.**--Starting on C, and using just the natural notes, C, D, E, F, G, A, B, C, or the white keys on the piano, we have the scale of C major. All the intervals are either whole steps or half-steps, and this kind of scale is then known as a diatonic scale. The notes
of the scale are known as degrees of the scale; for instance, the first note of any scale is the first degree, the fifth note is the fifth degree, etc.

From this scale we can construct a pattern for major scales, since all major scales have the same number of notes, and the whole steps and half-steps always occur in the same order. Note that in the above scale between B and C, and E and F, we find natural half-steps, or half-steps formed without the use of accidentals (sharps or flats). This fact will be of great importance in the further study of scales.

The following is the major scale pattern:

```
    1 2 3 4 5 6 7
```

Accidentals.--To avoid monotony in our music, there are many different scales and keys. In our major system
alone, there are fifteen different scales, including C major. However, it will be noted later on that some of these scales are the same in sound, but are written differently.

In order to signify what key our music is written in, a system of accidentals, called sharps (#) and flats (b), is used.

A sharp placed in front of a note signifies that the note is to be played or sung one-half step higher.

A flat placed in front of a note signifies that the note is to be played or sung one-half step lower.

Since each note in our notation system, A, B, C, D, E, F, and G, can be sharped (raised) or flatted (lowered), there are then seven sharps and seven flats.

**Key signatures.**—There are several keys besides C major, each of which involves the use of from one to seven accidentals. It would be rather confusing in some keys to place a sharp or flat beside each note that was to be sharped or flatted in a composition, so a system of key signatures has been devised. A key signature is the total of the sharps or flats used in the scale of any given key.

The key signature is placed at the beginning of the composition and at the beginning of each staff. Thus, a note sharped in the key signature will be sharped every time it appears in the composition, unless some further treatment is made of it.
It is understood that the F in the above example is to be raised a half-step, or played as "F sharp" each time it appears.

However, the composer may wish to alter some single note in the composition, and does not wish to change the key signature. To do this, he may introduce other sharps or flats, which will be foreign to (i.e., not in the) key signature. These sharps or flats are commonly known as accidentals.

The composer may also wish to nullify one of the sharps or flats in the key signature, or one that has appeared previously in the same measure. To do this he places in front of the note this sign (♮), commonly known as a natural sign, meaning that the sharp or flat is to be ignored.
In addition to sharps, flats, and natural signs, we have two more accidentals, which are used less frequently. They are the double sharp (×) and the double flat (bb). As the name implies, one of these signs placed in front of a note signifies that it is to be raised or lowered an additional half-step, or two half-steps in all.

An accidental affects only the notes in the measure in which it appears. A note changed by an accidental automatically returns to the key in the next measure. The only exception is in the case of a note that is tied to a note in the next measure.
Some composers and publishers mark the return to key in the next measure, to remind the performer.

![Figure 50. --Accidentals](image)

Played the same

Other major scales.--Remembering our major scale pattern, let us review, and at the same time introduce, a new key. A scale can be built beginning on any note, so we will take G as a starting point.

![Figure 51. --G major scale](image)

B-C is a natural half-step, and as B-C forms the interval between 3 and 4, which is supposed to be a half-step, everything is all right so far. When we come to E-F, we find a problem. E-F forms a half-step, but according to our pattern, the interval between 6 and 7, occupied by E and F in this case, must be a whole step. By figuring our whole steps, we see that E is the correct note to have on the sixth degree, so we cannot change it, so something must be done to F. Since a sharp raises a note one half-step, we can sharp the F, and form a whole step between E and F#. This will then form a half-step between F# and G, the seventh and eighth degrees of our scale.
Rewritten with the key signature in its proper place, the scale of G major would appear thus:

![G major scale](image)

Fig. 52.--G major scale

This process could be carried out for any major scale, and should be done a few times until the student understands the major scale pattern and how it applies to all major scales. For rapid derivation of scale notation, however, this process is too cumbersome and slow.

By learning the order in which sharps and flats are added, and one or two simple rules, we can easily find out the sharps or flats that each key has.

Beginning at the left of the staff, the sharps are added in the following order: F, C, G, D, A, E, B.

They are placed on the staff thus:

![Placement of sharps on staff](image)

Fig. 53.--Placement of sharps on staff

Beginning at the left of the staff, the flats are added in the following order: B, E, A, D, G, C, F. Note that this is the exact reverse of the order of sharps.

They are placed on the staff thus:
Thus a key containing four sharps will always have as a signature F#, C#, G#, and D#. A key containing three flats will always have as a signature Bb, Eb, and Ab.

There are various methods and rules for finding the name of the key, but for the instrumentalist the following are short and rather easy to understand.

Rule. To find the name of the key when a sharp signature is given, go one half-step above the last sharp (the one on the right).

Rule. To find the name of the key when a flat signature is given, the next to the last flat (the second from the right) is always the keynote or starting point of its scale.
There is one key that at a first glance does not seem to follow this rule, and it is much easier to memorize it than to try to explain it according to the rule.

E major has a signature of one flat, Bb.

When we have given the name of the key and wish to find the key signature, the inverse of the above rules will hold true.

Rule. To find the signature when the name of the key in sharps is given, go one half-step below the name of the key to find the last sharp.

Key of A major

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{sharp_key_signature}
\caption{Sharp key signature}
\end{figure}

Rule. To find the signature when the name of the key in flats is given, go one flat to the right of the name of the key, in the order of flats, to find the last flat.

Key of Db

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{flat_key_signature}
\caption{Flat key signature}
\end{figure}

The circle of keys.--The various keys may be arranged on a circle, in order of the number of accidentals. Starting with the key of C, which has no sharps or flats, at the top, the sharp keys are placed reading around to the right,
and the flat keys are placed reading around to the left.

![Circle of keys diagram]

**Fig. 59.--Circle of keys**

It will be noted later that of the six keys at the bottom of the circle, there are three pairs of keys that have the same pitch.

**Enharmonic tones.**—Before taking up the study of the chromatic scale, we wish to consider the subject of enharmonic tones.

Enharmonic tones are those which are written differently but sound the same.

![Enharmonic tones example]

**Fig. 60.--Enharmonic tones**
By means of the following diagram we can see how these two notes will sound the same. We have already found that from G to A is a whole step. Therefore, there will be two half-steps between G and A. Let the lines of the following diagram represent the notes.

\[ \text{Fig. 61.--Relation of enharmonic tones} \]

We see by sharping G (raising it a half-step), we arrive at the note in the middle, G#. By flatting (lowering it a half-step), we arrive at the same note, which this time is called Ab. Thus we see that the two are the same tone, though written differently.

In certain instances, we can produce enharmonics by altering only one note. Take for example, E and F, which are only one half-step apart.

\[ \text{Fig. 62.--Enharmonic tones} \]

We can also have enharmonic tones written as far apart as two whole steps.
Enharmonic scales.--We have already seen that we have enharmonic intervals, two notes with the same sound, but written differently. We also have entire scales which are enharmonic with other scales, note for note.

Note that the first degree of F# major is the enharmonic of the first degree of Gb major, the second degrees are enharmonic, etc.

The other two pairs of enharmonic major scales are C# major and Db major, and Cb major and B major.

Major key signatures.--The following table will assist students in checking their results in finding key signatures:
TABLE 4
MAJOR KEYS

<table>
<thead>
<tr>
<th>Number of Sharps</th>
<th>Sharps</th>
<th>Name of Key</th>
<th>Number of Flats</th>
<th>Flats</th>
<th>Name of Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>1...</td>
<td>F</td>
<td>G</td>
<td>1</td>
<td>B</td>
<td>F</td>
</tr>
<tr>
<td>2...</td>
<td>FC</td>
<td>D</td>
<td>2</td>
<td>BE</td>
<td>Bb</td>
</tr>
<tr>
<td>3...</td>
<td>FCG</td>
<td>A</td>
<td>3</td>
<td>BEA</td>
<td>Eb</td>
</tr>
<tr>
<td>4...</td>
<td>FCGD</td>
<td>B</td>
<td>4</td>
<td>BEAD</td>
<td>Ab</td>
</tr>
<tr>
<td>5...</td>
<td>FCGDA</td>
<td>C#</td>
<td>5</td>
<td>BEADG</td>
<td>Db</td>
</tr>
<tr>
<td>6...</td>
<td>FCGDAE</td>
<td>F#</td>
<td>6</td>
<td>BEADGC</td>
<td>Gb</td>
</tr>
<tr>
<td>7...</td>
<td>FCGDAEB</td>
<td>C#</td>
<td>7</td>
<td>BEADGCF</td>
<td>Cb</td>
</tr>
</tbody>
</table>

Note that only two major sharp keys have a sharp after the letter name -- F# and C#.

Note that all major flat keys except F have a flat after the letter name -- Bb, etc.

This will assist in determining whether a key is in sharps or flats.

Names of degrees of scales.—Each note in a scale represents a degree of the scale. The names of the various degrees of the diatonic scale are as follows:

![Numbers of Degrees](image)

Fig. 65.—Degrees of the scale
The chromatic scale.--Heretofore we have concerned our study with one type of scale, the diatonic, which is made up of whole steps and half-steps.

The next type of scale we shall study is the chromatic scale, which proceeds entirely by half-steps.

It is written from any given note to the next note of the same name, or one octave, with intervening sharps ascending and flats descending.

Thus we see that there is one half-step between each two notes.

Minor Scales

Diatonic minor.--There are several forms of minor scales, and the one to be studied first is the one most closely related to the diatonic major scale. It is known as the diatonic minor scale, and is also called the pure, ancient, normal, natural, or primitive minor.

Each minor scale is closely related to some major scale, and we speak of it as the relative minor of a certain major key.
The relative minor will always have the same key signature as its relative major. There are two methods of finding the relative minor of a given major scale.

1. Build a scale with the same signature, starting on the sixth degree of the major scale.

The sixth degree of C major, which has no sharps or flats, is A.

Designating the whole and half-steps, we find that the pattern for the diatonic minor scale is different from the diatonic major scale. Here the half-steps are between the second and third degrees and the fifth and sixth degrees.

2. To find the tonic (first degree) of the relative minor, count down, an interval of a minor third, or one and one-half-steps from the tonic of the major. By counting down the half-step first, and then the whole step, there will be no danger of getting the wrong starting note.
Although the diatonic minor scale is most closely related to its relative major scale, it is seldom used as the basis of composition.

There are several forms of the minor scale, including the harmonic minor, melodic minor, Hungarian minor, major-minor, and others, but we will confine our study to the harmonic minor and the melodic minor. Both of these scales will have the same tonic as the diatonic minor.

**Harmonic minor.**--The harmonic minor scale has the same form ascending and descending.

**Rule.** To form the harmonic minor, raise the seventh degree of the diatonic minor one half-step.

![Harmonic minor scales](image)

Note that in the harmonic minor scale pattern we have half-steps between the second and third, fifth and sixth, and seventh and eighth degrees. Between the sixth and seventh degrees, we have a new interval, an interval of a step and a half.

**Melodic minor.**--In the melodic minor the descending form differs from the ascending.
Rule. To form the melodic minor scale, raise the sixth and seventh degrees of the diatonic minor one half-step ascending, and lower them descending; i.e., return to the key signature.

Fig. 70.--Melodic minor scales

Note that ascending there are half-steps between the second and third degrees and seventh and eighth degrees, which is like the major scale except for the placing of the first half-step. We also have four consecutive whole steps, which helps to distinguish this scale from other forms.

Parallel minor.--A minor scale starting on the same note as a major scale, is known as a parallel, or tonic, minor scale.

Fig. 71.--Parallel minor scales
The parallel minor always has three more flats or three fewer sharps than its parallel major.

**Intervals**

An interval is the distance between two given pitches. If the two pitches are sounded simultaneously or written perpendicularly, the interval is a harmonic interval. If the two tones are sounded separately or written horizontally, the interval is a melodic interval.

![Fig. 72.--Harmonic interval.](image)

![Fig. 73.--Melodic interval.](image)

Each interval has two names, a number, or general name (third, sixth, etc.), and a specific name (major, minor, etc.).

**Number names.**—The number name of an interval is found by calling the first tone one and then counting by staff degrees or note name until the other tone is reached. Both notes are counted.

![Fig. 74.--Interval number name.](image)

![Fig. 75.--Interval number names.](image)
When two notes on the same line or in the same space are played or sung simultaneously, we have an interval called a prime (first), or unison.

Fig. 76.—Prime

The specific name of an interval is found by determining the number of half-steps, whole steps, or one and one-half steps it contains. In this case, both notes are not counted.

Fig. 77.—Interval content

This interval of a third contains two whole steps, so it is called a major third.

Accidentals do not alter the number name, but do affect the specific name, unless both notes are treated the same.

Fig. 78.—Intervals of a third

Each of these intervals is a third, but each will not have the same specific name.
Fig. 79.--Thirds

Since both notes are flatted, the interval is still a major third.

Intervals can be computed from the top note downward as well as from the bottom note upward.

The name of an interval may be changed without changing the sound of it, thus:

Fig. 80.--Enharmonic intervals

Specific names.Using the major scale as our unit of measure, we find that there are five principal types of intervals: major, minor, perfect, diminished, and augmented.

Major and perfect intervals can be thought of as scale intervals, because they occur in a major scale from the tonic upwards to each succeeding note in the scale.

Fig. 81.--Major and perfect intervals

At this stage, it is hard to make perfectly clear why some intervals are called "perfect" and others "major."
For the present it is enough to say that perfect intervals, when inverted, or "turned upside down," remain perfect; whereas major intervals, when inverted, become minor.

Of the intervals of the major scale, primes, fourths, fifths, and octaves are perfect; while seconds, thirds, sixths, and sevenths are major.

Minor intervals.--A major interval made smaller by one half-step becomes a minor interval.

![Minor intervals diagram]

Fig. 82.--Minor intervals

Diminished intervals.--A minor or perfect interval made smaller by one half-step becomes a diminished interval.

![Diminished intervals diagram]

Fig. 83.--Diminished intervals

It is impossible to build a diminished second, as a minor second made smaller by one half-step would become a unison in sound. Likewise, a prime cannot be diminished.

Augmented intervals.--A major or perfect interval made larger by one half-step becomes an augmented interval.
Fig. 84. -- Augmented intervals

Not every interval can contain all five types. The following table will show the possibilities of each interval.

**TABLE 5**

**SPECIFIC NAMES OF INTERVALS**

<table>
<thead>
<tr>
<th>Specific Name</th>
<th>Prime</th>
<th>2nd.</th>
<th>3rd.</th>
<th>4th.</th>
<th>5th.</th>
<th>6th.</th>
<th>7th.</th>
<th>Octave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major....</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Minor....</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Augmented</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diminished.</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

Note that perfect intervals cannot be either major or minor; they can only be augmented or diminished.

From this, all of the intervals in the key of C major can be constructed, as shown in the following figure.

Intervals may be made smaller in two ways: by lowering the top tone or raising the lower tone.
Inversion of intervals.---To invert an interval literally means to turn it upside down. This is done by raising the bottom note one octave or lowering the top note one octave.

When inverted:

Perfect intervals remain perfect.
Major intervals become minor.
Minor intervals become major.
Augmented intervals become diminished. (Exception: augmented octave becomes an augmented prime.)
Diminished intervals become augmented.

Furthermore:

A prime becomes an octave.

A second becomes a seventh.

A third becomes a sixth.

A fourth becomes a fifth.

A fifth becomes a fourth.

A sixth becomes a third.

A seventh becomes a second.

An octave becomes a prime.

Note that in each case the sum of the number names of an interval and its inversion is always nine. Thus a rapid way to determine the number name of the inversion of an interval is to subtract the number of the given interval from nine, thus: the inversion of a second is \((9 - 2 = 7)\) a seventh.

Note again that the perfect intervals, primes, fourths, fifths, and octaves remain perfect intervals when inverted.

Fig. 87.—Inversion of intervals
Acoustics

Acoustics is the science which treats of sound. Sound is a sensation made on the organs of hearing by vibrations of the air. There can be no sound without air, and the air is generally set in motion by the collision of two bodies, and the vibration of one or both of them. This can be easily illustrated with a tightly stretched string.

If a string is plucked in the middle, it begins to swing to and fro. A complete swing to one side, then the other and back to the starting point, is a vibration, as illustrated in the following diagram:

![Fig. 88.--Vibration](attachment:image)

In addition to this simple movement, strings and other substances have more complex vibrations which will be explained later. If these vibrations are too slow they are not heard, but when they occur as rapidly as sixteen times a second, a tone is heard. This corresponds to the lowest notes on a large pipe organ. The human ear can hear sound up to about 38,000 vibrations a second. If the vibrations are regular, a musical tone is heard. If they are irregular, only a noise is produced.
The lowest C on a piano is about thirty-two vibrations, middle C is about 260, and the highest C is about 4,160.

Sound travels faster in warm, damp weather than in cold, clear air; but the speed in a moderate temperature is about 1,100 feet per second. All kinds of sound travel at the same speed.

The vibrations of strings are subject to four laws which are called the "Canons of the stretched string." All of these, except the one relating to tension, apply to some degree to other vibrating substances, therefore they are most important points to memorize, if the student would comprehend the construction of different musical instruments. These laws relate to the length, thickness, tension, and density of the string.

First Canon. The longer a string the slower its vibrations, in inverse proportion to the length. That is, if a string of twenty feet should have fifty vibrations per second, the same string, under the same conditions, but shortened to ten feet, would have one hundred vibrations in the same time, sounding an octave higher than the note first produced, since twice the number of vibrations will produce the octave above a given note, and half the number the octave below. The above rule applies also to the length of organ pipes.

Second Canon. The thicker a string the slower its vibrations in inverse proportion to the thickness. That is, a string of a certain diameter will vibrate twice as slowly as one of half its diameter, all other conditions being equal.

Third Canon. The tighter a string is drawn, the more rapid will be its vibrations, in a proportion of four to one. Thus, if a string with a twenty-five pound weight at the end of it had fifty vibrations per second, by changing the weight to one hundred pounds we would attain one hundred vibrations per second, twice the original number.

Fourth Canon. The greater the specific gravity of the substance of which the string is composed, the slower its vibrations. Thus two strings of wire, the one made of platinum, the other of iron, but in all other conditions alike, will not vibrate at the same rate since platinum is nearly three times as heavy as
iron. One quarter the weight of a given string will double the number of its vibrations, if other things (tension, length, etc.) remain equal.

All of the above rules are applied in the stringing of a piano, for while the upper wires are short, thin, tightly drawn, and of steel only, the lower ones are long, thick, rather loosely drawn, and coiled around with copper or wrought iron, both of which substances have a greater specific gravity than steel. In stringing the violin, the last three canons are regarded, and thickness, tension, and density (the last produced by coiling the G string) give the requisite proportion of vibrations.  

Overtones.--We have already noted that audible sound begins at sixteen vibrations and ceases at about 38,000 vibrations, or a total of eleven octaves and a minor third. In practical music, however, we use only about seven octaves.

The vibrations of a string by itself are so small that it is necessary to reinforce them, just as a reflector is used to reinforce a light. In the case of musical instruments, the reflector is a sounding-board. It is the amplified and reflected vibrations of the sounding-board which make the tone audible to the ear.

Vibrations differ in rapidity, extent, and shape. Difference in rapidity would affect the pitch, difference in extent, or size, would affect the volume and power of the tone; and difference in shape would affect the quality of tone. Just as a large ocean wave has smaller waves on it, so a vibrating object has smaller vibrations along with

1L. C. Elson, Theory of Music, pp. 9-11.
its chief or fundamental vibration. These are called overtones. Overtones subdivide in a regular order, and produce a series of fainter, higher tones, which sound simultaneously with the fundamental tone. Overtones are present in every musical tone, and it is the number and proportionate strength which distinguish tones of the same pitch and power from each other, such as the difference in the tone of the clarinet and flute. We do not hear just fundamental tones. A tone with few overtones is dull, hollow, and monotonous, while one with many overtones is bright, penetrating, and sharp.

When the fundamental note, C, for example, is struck, the fundamental vibration starts. At the same time, the string starts vibrating in two equal parts, each part twice as fast as the full vibration, called ventral segments, producing the C an octave higher. Another series of vibrations has also started, dividing the string into three ventral segments, and produces the next G. Another series divides the string in four parts, and produces the next C. This continues almost indefinitely, and produces "the harmonic series," or "the chord of nature."

Fig. 89.--Harmonic series
The first C is the fundamental and the others are its overtones. The seventh overtone is flatter than our Bb, and the eleventh is about halfway between E and F#.  

Most of the overtones in the harmonic series can be heard on the piano by depressing a desired note without sounding it, then striking the fundamental and its lower octave together as loudly as possible and releasing it immediately. The note depressed will be heard vibrating very softly.

The tempered scale.--It has already been noted that some of the overtones do not exactly correspond to any of the notes in our scale. Although we use a fixed succession of tones as a basis for our music, no one has ever been able to give a satisfactory reason for doing so. It is merely a man-made, arbitrary affair, and does not come completely from a natural law. One of the chief reasons for its adoption was in order to permit modulation, or changing of keys, on keyboard instruments. Thus "the tempered scale," as it is called, was devised, with twelve half-tones, practically equally distant.

The deviations of our intervals, as founded on the tempered scale system, from the true intervals as given by natural laws of proportion, are chiefly as follows, reckoning upward from the key-note:

---


3Elson, op. cit., p. 21.
The perfect fifth is only one-fiftieth of a semitone flat.

The perfect fourth is one-fiftieth of a semitone sharp.

These are so near to the true pitch that it would require the keenest musical ear to perceive the aberration at all. Those most perceptibly out of tune are:

- The major third, one-seventh of a semitone sharp.
- The minor third, one-sixth of a semitone flat.
- The major sixth, one-sixth of a semitone sharp.
- The minor sixth, one-seventh of a semitone flat.
- The minor seventh, one-eighth of a semitone flat.
- The major seventh, one-eighth of a semitone sharp.

Taking the fourth, fifth, and sixth overtones, we find the tonic major chord, or triad of the given key. Adding to this the seventh overtone, which is a minor third above the sixth overtone, we have a four-note chord, known as the dominant seventh. This chord has a strong feeling of movement, and has become a very important chord in modulation from one key to another.

**Classification of vibrations.**—Vibrations may be classified under the following six types:

**First.** The vibrations of strings; these differ in quality according to the manner in which the string is set in motion, i.e., by striking, as in the piano; by plucking, as with harp or guitar; and by friction, as with instruments of the violin family.

**Second.** The vibrations of reeds. A reed, in musical instruments, is a thin tongue of wood or metal, against which a current of air is directed; the reed, swaying rapidly to and fro, breaks this current into intermittent puffs, which form the tone. Reed vibrations generally produce many overtones, and therefore a rather thin and penetrating quality of sound. Cabinet-organs, oboes, clarinets, bassoons, etc., are examples of reed vibrations.

Ibid., p. 23.
Third. The vibrations of elastic membranes, generally organs of the human body, set in motion by a current of air. The lips of a player of horn, trumpet, cornet, trombone, etc., and the vocal chords in the human throat, are examples of this kind of vibration, which is of the same general character as reed vibration.

Fourth. The vibrations of elastic membranes set in motion by a blow. These move the air in the same manner as a sounding-board would do. Drums give examples of such vibrations, and although most drums do not produce a strictly musical sound, the kettle-drums give as musical a tone as almost any percussive instrument of their pitch.

Fifth. The vibrations of solid substances of elastic material. These are almost always set in motion by percussion. Bells, tuning-forks, etc., are examples of this class of vibrations.

Sixth. The vibrations of the air upon itself in a confined space -- generally a tube. Although the air which gives the sound-vibrations is generally set in motion by some vibrating substance, yet the assistance of the latter is not always necessary.

If we force a column of air with some degree of rapidity into or across a tube in such a manner that instead of passing directly through the tube it will cause a flutter of air at one end, we at once produce a tone directly from the air itself, without the necessity of any other vibrating body, for the tube will at once select the sound-waves which suit its length, or synchronize with it. The wind whistling in a chasm or cave is a natural example of this, while flutes, organ (diapason) pipes, etc., show in what manner man has applied the principle. In the flute, the breath of the player is blown at a certain angle and with a certain power or no tone will result, but in the organ-pipe this angle or deflection which causes the alternate expansion and contraction of the air necessary to produce sound-waves, is caused by a plug or sharp edge (similar to that which the boy places at one end of his whistle) at the mouth. It remains only to add that the pitch of open pipes depends chiefly on their length. The width of pipes affects the quality of the tone. In wide pipes the harmonics are not prominent, and therefore these have hollow tones; narrow pipes have prominent harmonics, and therefore bright and penetrating tones. The same pipe can produce more than one tone; if the rapidity of the vibrations be increased, other tones ensue. In a cylindrical pipe or tube only every alternate overtone is strong, which
gives a rather mellow quality to the tone. Flutes and clarinets are made upon this principle. In a conical pipe all the overtones are clearly present up to a reasonable height, which causes the penetrating quality heard in the tones of the oboe and bassoon.

Chords

The study of harmony for more advanced high school music students is now recognized as being important to complete the high school music program. However, it generally is recognized as a separate course, with either one or two years of study given to it. It is not the author's purpose to present here the actual study of harmonization of a given bass or melody, but to give the student a basic knowledge of chords, especially triads, and chord progression.

Chords.---A chord is a combination of tones, arranged one above the other in thirds, and sounded simultaneously. A simple chord may consist of three, four, five, six, or seven tones, all of which must be a member of the diatonic major or minor scale being used. When other tones are used, the chord becomes chromatic or altered.

\[ \text{Fig. 90.--Chord} \]

\[ \text{5Ibid.}, \text{pp. 29-32}. \]
The lowest tone of a chord is called the root of that chord. In the above chord, C is the root. The root can be any degree of the scale.

The tones are numbered according to their distance from the root.

![Fig. 91.--Intervals of a chord]

**Triads.**—A triad is a chord made up of three notes, the root, the third above the root, and the fifth above the root.

In both major and minor keys, the most important triads are those built on the tonic, or first degree of the scale, sub-dominant, or fourth degree, and dominant, or fifth degree. The octave is considered the same note as the tonic. They are called primary triads, and contain all the degrees of the scale.

![Fig. 92.--Primary triads]

The secondary triads are those on the supertonic (second degree), mediant (third degree), sub-mediant (sixth degree) and leading tone (seventh degree). They also contain all the degrees of the scale.
There are four kinds of triads: major, minor, diminished, and augmented.

Major triads are composed of a root, a major third, and a perfect fifth.

A minor triad is composed of a root, minor third, and a perfect fifth.

A diminished triad is composed of a root, a minor third, and a diminished fifth. The triad on the seventh degree of any diatonic scale is always diminished.
An augmented triad is composed of a root, a major third, and an augmented fifth.

Fig. 97.--Augmented triad

Most music is usually written in four parts, or for four voices, soprano, alto, tenor, and bass; and for this reason one member of the triad must be doubled, or used in the chord again. The root is usually doubled, but the third and fifth can be doubled.

All triads have two possible inversions. In root position, or with the root of the chord in the bass, the chord is sometimes called the "5 chord," since the top note is a fifth from the bass note.

Fig. 98.--Chord in root position

The first inversion, or "6 chord," is made by raising the root one octave. The soprano note is then a sixth from the bass note.

Fig. 99.--Chord in first inversion
The second inversion, or 6/4 chord, is made by raising the root and third one octave. The soprano is then a sixth from the bass note and the alto note is a fourth from the bottom note.

Fig. 100.--Chord in second inversion

**Chord progression.**--Chord progression consists of moving from one chord to another. There are certain fundamental rules that usually govern the correct progression of chords, but they are subject to the desires of the composer and the type of music.

**Cadences.**--A cadence in music is a place of rest or repose at the end of a musical thought. There is a cadence of some kind at the end of a phrase (four measures) and at the end of a period (eight measures). The cadence note is usually of longer duration than the preceding notes.

An authentic (also called perfect or complete) cadence is the chord progression V-I.

A plagal cadence is IV-I. This is also called the "Amen cadence," as it is used at the end of hymns.

A half cadence if I-V, II-V, or IV-V.

A deceptive or false cadence is the V followed by any chord, usually VI.
The authentic gives the most feeling of finality. Half cadences represent only temporary pauses. The deceptive cadence leaves the impression of an interrupted cadence.

Fig. 101.--Authentic cadence  Fig. 102.--Plagal cadence

Fig. 103.--Half cadence  Fig. 104.--Deceptive cadence.

Seventh chords.--A seventh chord is formed by adding a minor third to a triad. It is so-called because the interval from the root to the soprano note is a seventh. The most common seventh chord is the dominant seventh, or $V_7$ chord.

Fig. 105.--Seventh chord in root position
There are three inversions of the seventh chord.

The first inversion is called the 6/5 because the two top notes are a fifth and sixth, respectively, from the bottom.

![Fig. 106.] - Seventh chord in first inversion

The second inversion is called the 4/3 chord, because the third and second notes of the chord are a fourth and a third above the bass, respectively.

![Fig. 107.] - Seventh chord in second inversion

The third inversion is called the 4/2 chord, because the third and second notes of the chord are a fourth and a second above the bass, respectively.

![Fig. 108.] - Seventh chord in third inversion

Instruments of the Orchestra and Band

The modern orchestra and band are products of a long period of evolution and development, from the simplest instruments of early man to the fine instruments and great
musical organizations of today. However, it is not the purpose to present here a course in music history. Space will permit the presentation of only a few important facts regarding each instrument. For further study, other books, dealing especially with instruments, should be consulted. Also, there are many rarely used instruments that will not be discussed here.

A symphony orchestra is made up of four principal families of instruments, namely, strings, woodwinds, brass, and percussion. A band is made up of woodwinds, brass, saxophone, percussion, and occasionally a string instrument. Saxophones are sometimes considered a separate family and sometimes as members of the woodwind family.

The following standard instrumentation is recommended by the National Music Educators Association for high school bands and orchestras:

**Standard Instrumentation for Symphonic Band**

5 flutes (one or two interchangeable with piccolo).
2 Eb clarinets. (Two Eb clarinets may be replaced by two additional C or Eb flutes, or one Eb clarinet and one or more C or Eb flutes.)
24 or more Bb clarinets.
2 alto clarinets.
2 bass clarinets.
2 or more oboes. (One doubling English horn when called for in score.)
2 or more bassoons.
5 saxophones. (Soprano, alto, or two altos, tenor, baritone, and bass. Large bands may double this number.)
4 or more Bb cornets.
2 or more Bb trumpets.
2 Fluegelhorns.
4 to 8 French horns.
4 to 6 trombones.
2 to 4 baritones.
2 Eb tubas.
4 BBb tubas.
2 string basses.
1 harp (if available and called for in score).
1 timpani.
3 other percussion.

Total 75 or more players.

Standard Instrumentation for Symphony Orchestra
16 to 20 first violins.
14 to 18 second violins.
10 to 12 violas.
8 to 10 cellos.
8 basses.
2 or 3 flutes (one doubling piccolo when called for).
2 or 3 oboes (one doubling English horn when called for).
2 to 4 clarinets (2 firsts and 2 seconds). One player on each part in solo passages, or one player may double on bass clarinet.
2 to 3 bassoons (1 first and 2 seconds. One may double contra-bassoon).
4 to 6 French horns.
2 to 4 trumpets (2 firsts and 2 seconds, one on each part for solo passages).
3 trombones.
1 tuba (preferably CC or BBb).
4 percussion players (1 tympani, 3 drums).
1 or 2 harps, when called for in score.

Total 79 or more players.¹

The string section is made up of the violin family and the harp. No important changes have been made in construction of the instruments of the violin family since the seventeenth century.

Violin.—The violin is the most important instrument in the orchestra, because it carries the bulk of the melody.

¹National School Band Association, School Music Competition—Festivals, p. 12.
It is the smallest of the string family, and its tone is the most brilliant and penetrating. It has four strings, tuned in intervals of fifths.

Fig. 109.--Strings of violin

Written and sounds non-transposing instrument

Fig. 110.--Range of violin

The violin section is divided into first and second violins, the seconds usually playing harmony parts or counter-melodies.

Viola.--The viola is similar in construction to the violin, but is a little larger, and as a result, it has a less brilliant tone than the violin. It is rich and full and rather somber. Most music for the viola is written in the alto clef, although the treble clef is used occasionally for very high notes.

It has four strings, A, D, G, C, tuned in fifths.

Fig. 111.--Strings of viola
The music played by the violas usually corresponds to the tenor part in choral music. However, they are sometimes used for solo passages.

*Violoncello.*--In common usage, this instrument is called the 'cello. The 'cello is more than twice the size of the violin and has a great variety of tone color. It is held between the knees of the seated performer, with the crook over the left shoulder. Although the bass clef is most used, some of the 'cello music is written in the tenor and treble clefs.

It has four strings, A, D, G, C, tuned in fifths.
The 'cello is the bass member of the string choir, but because of its wide tonal variety, it is used extensively as a solo instrument.

**Double-bass.**—The double-bass, also called contrabass, string bass, and bass viol, is used to augment the 'cello in playing bass parts, and because of its heavy, coarse tone, is seldom used as a solo instrument.

Most double-basses have four strings, G, D, A, E, but some are built with five strings, G, D, A, E, C. They are both tuned in fourths, except for the third between the E and C on the five-string bass.

1. ![Strings of four-string bass](image1)
2. ![Strings of five-string bass](image2)

**Fig. 115.**—Strings of four-string bass. **Fig. 116.**—Strings of five-string bass.

1. **Written** ![Written](image3) **Sounds** ![Sounds](image4)

**Fig. 117.**—Range of four-string bass

2. **Written** ![Written](image5) **Sounds** ![Sounds](image6)

**Fig. 118.**—Range of five-string bass

The double-bass is a transposing instrument, in that it sounds one octave lower than written.
Often the double-bass and occasionally the 'cello are now used in large concert bands.

**Bow.**--All members of the violin family are played with a bow, which took its original form and name from the archer's bow. The bows correspond in size to the instrument upon which each plays.

By using different methods of tone production, the instruments of this family can produce many tonal effects:

- **Harmonics** -- by placing the finger on the string very lightly, bowing as usual, producing a thin, whistling tone which is one of the overtones of the string.

- **Pizzicato** -- by plucking the strings, producing a sharp staccato.

- **Ponticello** -- by bowing close to the bridge, producing a buzzing effect.

- **Tremolo** -- by bowing as fast as possible, producing a trembling or rolling effect.

- **Col'legno** -- by using the wood of the bow instead of the hair, producing a percussion effect.

- **Muted** -- by placing a mute on the bridge, producing a softer, veiled tone.

These instruments can produce double-stops, or two tones at the same time, chords, arpeggios, trills, and other effects.

**Harp.**--The harp is a large triangle-shaped instrument with either forty-six or forty-seven gut strings. It is
tuned to the key of Cb, but with the use of pedals, can be played in any key.

![Non-transposing](image)

Fig. 119.--Range of harp

Its music is written on the grand staff, using both bass and treble clefs. It is used primarily for special effects, and plays arpeggios, chords, glissandos, and harmonics.

A harp is used in a complete symphony, and is used occasionally in a concert band.

The woodwind family consists of flute, piccolo, oboe, English horn, bassoon, double bassoon, clarinets in Bb, A, and Eb, alto clarinet in Eb, and bass clarinet in Bb. There are other instruments in this family, but they are rarely used in this country.

One of the difficulties encountered by the student in music of some of the wind instruments is that it is written according to the way it is produced on the instrument, and not according to actual pitch. Many wind instruments are "transposing instruments," that is, they actually sound higher or lower than the note written on their music. For example, a Bb clarinet sounds a whole tone lower than the
notation, thus its music must be written a whole step higher than actual pitch.

When a clarinet in Bb plays we hear .

When a clarinet in Eb plays we hear .

The "concert pitch" is the actual sound of an instrument. Thus, when a Bb clarinet plays C, he is actually sounding Bb concert.

Flute.--The flute is a slender tube-like instrument, made of wood or metal, with a series of keys and holes, covered by the fingers or by pads manipulated by keys. The Boehm system of fingering is used. The tone is produced by blowing over a hole near one end of the flute. The flute has wide technical and tonal possibilities.

Written and sounds Non-transposing

Fig. 120.--Range of flute

The two higher octaves are produced by added pressure of the breath and slight changes in fingering.

Flutes play an important part in bands as well as in orchestras.

Piccolo.--The piccolo is in reality a small flute, as it is constructed the same and is played in the same manner. The chief difference is in the tonal quality, which is very
shrill on the piccolo. The music sounds an octave higher than written.

The piccolo in C is used in the orchestra, usually played by the third flute player, while the Db piccolo is usually used in bands. The piccolo plays an important part in military music.

Oboe. --The oboe is a slender conical instrument, usually made of wood, although metal oboes have recently appeared. The Conservatory system of fingering is used almost universally. The tone is produced through a "double-reed," or two thin pieces of cane properly shaped and tied together, which is placed in the player's mouth. A nasal, somber tone is produced.

The oboe is important both in band and orchestra work.

English horn. --The English horn is not a horn at all, but is an instrument very similar to the oboe. It is a
little longer than the oboe, has a crooked pipe on which the double-reed is placed, and has a globular bell. It is tuned a fifth lower than the oboe. Its tone is nasal, and is sad and mysterious, and for this reason the instrument makes a fine solo instrument for special effects.

Fig. 123.—Range of English horn

Bassoon.—The bassoon, another double-reed instrument, made of wood, is much larger than the English horn. It doubles back on itself, and has a curved mouthpiece to hold the reed. It has a very wide variety of tonal effects. It is used in solo passages as well as in accompaniment and harmony parts, and is often used to express humor or grotesqueness. The bassoon is rapidly becoming more important in the concert band. Its music is written in both the bass and tenor clefs.

Fig. 124.—Range of bassoon

Double-bassoon.—The double-bassoon, or contra-bassoon, is simply what its name implies -- a large bassoon. Its
tubing is about sixteen feet long, and is made in four sections so that it can be put in a case. It is used to enforce the bass part of the symphony, and occasionally one is found in a concert band. Its tone is rather pale and mournful.

\[ \text{Written} \quad \begin{array}{c} \text{\underline{\text{\textbullet}}} \\ \text{\underline{\text{\textbullet}}} \end{array} \quad \text{Sounds} \quad \begin{array}{c} \text{\underline{\text{\textbullet}}} \\ \text{\underline{\text{\textbullet}}} \end{array} \quad \text{Transposing} \]

**Fig. 125.—Range of double-bassoon**

**Clarinets.—**There are several kinds of clarinets manufactured, but here we shall concern ourselves only with the Bb, A, and Eb clarinets. Of these three, the Bb is by far the most widely used. Much symphonic music is written for clarinet in A, but most players use a Bb clarinet and transpose the music. All three clarinets are similar in construction, fingering, and method of tone production, the only difference being in size. The A clarinet is the largest of the three, and the Eb the smallest. The tone is produced by blowing through a mouthpiece equipped with a single cane reed. These three clarinets are cylindrical, with a conical-shaped bell.

The clarinet has three distinct registers, or sections of its range, each with a definite tone quality. The low register is dark and gloomy. The middle register is clear and vocal-like, while the high register is piercing and
shrill. The Bb clarinet in the band corresponds to the violin section of the orchestra. The A clarinet is used to some extent in the orchestra, but not in the band, while the Eb clarinet is rarely heard in the orchestra, but is used in the band.

**Bb clarinet**

*Written*  

![Written notation for Bb clarinet](image)

*Sounds*  

![Sounds notation for Bb clarinet](image)

*Transposing*

---

**A clarinet**

*Written*  

![Written notation for A clarinet](image)

*Sounds*  

![Sounds notation for A clarinet](image)

*Transposing*

---

**Eb clarinet**

*Written*  

![Written notation for Eb clarinet](image)

*Sounds*  

![Sounds notation for Eb clarinet](image)

*Transposing*

---

**Fig. 126.--Range of clarinets**

**Bass clarinet in Eb.**—The bass clarinet is longer than the other clarinets, and has a curved pipe for the mouthpiece, and a curved metal bell. It has a deep organ-like tone. Two systems of notation are used for the bass
clarinet, the French notation in the treble clef and the German notation in the bass clef. The French notation is used almost exclusively in this country.

\[
\begin{array}{cc}
\text{French system} & \text{German system} \\
\text{Written} & \text{Written} \\
\text{Sounds} & \text{Transposing}
\end{array}
\]

Fig. 127.—Range of bass clarinet

The bass clarinet is more important in the orchestra, but is now becoming more prominent in the band.

\textbf{Alto clarinet in Eb}.—The present alto clarinet is practically the same instrument as the old basset-horn. It is similar to the bass clarinet, except it is smaller. It has a mellow, somber tone, and is used primarily in the band, where it occupies a place relatively similar to the viola in the orchestra.

\[
\begin{array}{cc}
\text{Written} & \text{Sounds} \\
\text{Transposing}
\end{array}
\]

Fig. 128.—Range of alto clarinet

\textbf{Saxophone}.—The saxophone is a cross between a woodwind instrument and a brass instrument, and it has never been
fully decided to which family it belongs. It is played with a single-reed mouthpiece, while the body of the instrument is brass. It has a rather reedy tone quality and blends well with both families. This fact makes it an important member of the band, as it serves as a connecting link between the two. It is not as yet a regular member of the symphony orchestra.

The four most important members of the saxophone family are Eb Alto, Bb Tenor, Eb Baritone, and Bb Bass.

Fig. 129.--Range of saxophones

Other saxophones are the Bb soprano, Eb soprano, F mezzo-soprano, C tenor, and Eb contra-bass.
The brass family consists of the French horn, mellophone, trumpet in Bb, cornet in Bb, tenor trombone, bass trombone, tuba, Sousaphone, and baritone.

All are played by blowing upon a cupped mouthpiece, causing the air to vibrate by producing a buzzing effect with the lips. The harmonic series can be produced on brass instruments by changing the position of the lips. The other notes are produced with the aid of valves, usually three in number, or in the case of the trombones, the slides. The flared opening at the end of a wind instrument is called the "bell."

French horn.--The French horn is made of about sixteen feet of tubing, curved in a circular form. It is built in F, but development of added slides and keys makes possible the playing of it in other keys. It is the only brass instrument with a conical-shaped mouthpiece. Because of its distinctive plaintive, piercing tone quality, it is widely used as a solo instrument in both band and orchestra. It is considered the most difficult of all brass instruments to play.

![Fig. 130.---Range of French horn](image)

Written \(\text{\includegraphics{image}}\) Sounds \(\text{\includegraphics{image}}\) Transposing

Mellophone in Eb.--The mellophone is somewhat similar to the French horn, but has less tubing, is played with a
cupped mouthpiece, and fingered like the trumpet. It is not used in orchestras, but is often used in bands as a substitute for French horns. The Eb alto and upright alto are also used for this purpose. The present tendency is to use French horns when at all possible. The mellophone has a weak, indistinct tone.

Written Sounds Transposing

Fig. 131.—Range of mellophone

Trumpet in Eb.—The trumpet is used in the orchestra and band primarily for fanfares, and similar effects. Its tone is brilliant and penetrating. Much symphonic music is written for trumpet in A, and there are A trumpets built, but most players use a Bb trumpet and transpose the music.

Written Sounds Transposing

Fig. 132.—Range of trumpet

Cornet in Eb.—The cornet is similar to the trumpet, but is a little shorter. It is not used extensively in orchestras, but occupies an important place in bands. Because of its full, rich, mellow tone, it lends itself to
melodic solo passages. The tendency in bands is to use two cornets for each trumpet, with separate music for each, and to use one or two flugelhorns, a large bore cornet, to complete the trumpet family. The range of the cornet is the same as that of the trumpet, and the same is true of the flugelhorn.

Trombone (Tenor Trombone).—Various tones are produced on a trombone with the aid of a slide which is moved in and out. The trombone can produce either a sharp, blasting tone, or a sweet, mellow tone. It is important in both band and orchestra work.

Formerly in the band it was used primarily to play harmony or augment the bass, but is now recognized as a solo instrument.

Written and sounds

Fig. 133.—Range of tenor trombone

Bass trombone.—The bass trombone is like the tenor trombone except that it is built so that it can play lower. Its chief purpose is to augment the bass.

Written and sounds

Fig. 134.—Range of bass trombone
Tubas.—There are many varieties of tubas, but they are all much alike. They are the bass part of the brass section, and are very heavy and ponderous. The ones used chiefly are the BBb (double B flat) and Eb. The BBb is the most important and is found in both bands and orchestras. The Eb tuba, which is smaller than the BBb, is used in bands. The BBb is constructed with both three and four valves.

3-valve BBb

4-valve BBb

Written and sounds

Written and sounds

Non-transposing

Fig. 135.—Range of tubas

Sousaphone.—The Sousaphone is in reality a large BBb tuba, with the tubing and bell so arranged that the bell faces the front. It was developed at the insistence of the late John Philip Sousa, and bears his name. It is used exclusively in bands.
Baritone.--The baritone is built similar to the tuba, but is much smaller. It has a rich, mellow tone and blends well with other instruments of the band. It is not used in the orchestra, and its place in the band corresponds to that of the 'cello in the orchestra. Music for the baritone is written in either the bass or treble clef. When written in the treble clef, the instrument is considered a transposing instrument in B♭. The pitch is the same in both cases. The euphonium is a large bored baritone. The double-bell euphonium has two bells, one small one, and four or five valves.

The percussion instruments are used chiefly to reinforce the rhythm of the music of bands and orchestras and for special effects. They are divided into two groups, those with definite pitch, and those with indefinite pitch. Those of definite pitch are the tympani, or kettle-drum, chimes, bell, and xylophone. Those of indefinite pitch are the bass drum, snare drum, tenor or street drum, tambourine, castanets, gong, cymbals, and triangle. All percussion instruments except perhaps the tenor drum, are
used in both the band and orchestra. The tenor drum, or street drum, is used in bands and for parade work.

**Tympani.**--A set of tympani, or kettle-drums, consists of two large copper kettles, over which are stretched skins, which are called "heads." The tone is produced by striking the heads with soft-headed sticks. The modern pedal tympani can be tuned almost instantly.

![Written and sounds](image)

Large drum          Small drum

Non-transposing

Fig. 137.--Range of tympani

**Chimes.**--Chimes consist of a number of metal tubes of different lengths, hung from a frame. The tone is produced by striking them at the top with a mallet.

![Written and sounds](image)

Non-transposing

Fig. 138.--Range of chimes

**Bells.**--Bells are short bars of metal, tuned chromatically. They are played with hard-headed mallets.
Xylophone.—The xylophone is made up of various lengths of hard wood suspended over proportionately varied lengths of metal tubes, which serve as amplifiers. They are struck with hard-headed mallets, and have wide technical possibilities. The marimba and vibraphone or vibraharp are modifications of the xylophone, differing chiefly in tonal quality. The sizes range from two and one-half to four and one-half octaves. The following is the normal range:

Drums.—The bass, snare, and tenor drums are similar in that they consist of wooden shells (the snare shell is often made of metal), with skin heads on both sides. The bass drum is struck with a soft-headed stick, while the two others are played with wooden sticks. The snare and tenor drum have several gut or wire strings, called snares, stretched across the under head.
Music for all percussion instruments of indefinite pitch is written in the bass clef.

**Cymbals.**—Cymbals are two large thin brass discs, varying in diameter from twelve to twenty inches, which are struck together, or one may be struck with a soft-headed stick for crash effects.

The following instruments are used only for special effects.

**Tambourine.**—The tambourine is a wood rim with small metal discs in it, covered with a skin head on one side. It is either shaken or struck with the hand.

**Castanets.**—Castanets are two small wooden discs which are struck together.

**Gong.**—The gong is a large brass disc, suspended from a frame, and struck with a mallet.

**Triangle.**—The triangle is a triangular-shaped metal bar, open at one corner, struck with a metal bar.

**Terminology**

Space will not permit anything like a complete list of terms used in music. Only the most commonly used terms will be presented here.

**Terms indicating tempo, or rate of speed.**

Grave........Solemn, the slowest tempo.
Lento........Very slow.
Largo........Large or broad.
Adagio.......Slowly, leisurely.
Andante.......Moderately slow.
Andantino.....Slightly faster than Andante.
Moderato.....Moderate tempo.
Allegretto...Bright and cheerful.
Allegro.......Lively, brisk.
Vivace.......Quick.
Presto.......Very quick.
Prestissimo..As fast as possible.
Tempo di Marcia..A march tempo.

Modification of tempo.
Accelerando..Gradually faster.
Allargando...Decrease tempo and increase volume.
Ritardando }
Ritenuto } \ldots Gradually slower.
Rallentando

Meno mosso......Less fast.
Piu lento.......Less fast.
Piu allegro }
Piu mosso \ldots Increase the tempo at once.
Un poco animato

Affretando }
Stringendo } \ldots Increase the tempo and volume.

A tempo...........Return to the tempo at the first of the movement.
Tempo Primo......Return to first tempo indicated.
L'istesso tempo..The same tempo.
Tenuto..........Hold on, sustain.
Ad libitum ...At pleasure.
A piacere ...

Assisting terms.

Assai...........Very.
Con.............With.
Ma non tanto...But not too much.
Meno..........Less.
Moto..........Motion.
Piu............A little.
Quasi..........In the style of.
Sempre........Always.
Senza.........Without.
Subito.........Suddenly.
Tres............Very.

Dynamics, or relative degrees of volume.

Pianississimo -- ppp....As softly as possible.
Pianissimo -- pp........Very softly.
Piano -- p............Softly.
Mezzo-piano -- mp......Moderately soft.
Mezzo-forte -- mf.....Moderately loud.
Forte -- f.............Loudly.
Fortissimo -- ff.......Very loudly.
Fortississimo -- fff...As loudly as possible.

Change of dynamics.
Crescendo........A gradual increase in power.
Decrescendo }........A gradual decrease in power.
Diminuendo }
Morendo }
Smorzando }
 Fortepiano -- fp...Loudly then immediately softly.
Sforzando -- sf }
Fortando -- fz }
 Sforzato -- sfz }
Rinforzando -- rinf. }
Rinforzato -- rfz. }

Style or expression.
Cantabile........Like a song.
Con amore..........With tenderness.
Con bravura........With boldness.
Con celerita........With rapidity.
Con espressione...With expression.
Con forza.........With force.
Con grazia........With grace.
Con passione......With passion.
Con sentimento....With sentiment.
Delicato..........Delicately.
Dolce..............Sweetly.
Doloroso........Sorrowfully.
Energico........With energy.
Expressivo.......Expressively.
Fuoca...............With fire and passion.
Grandioso........Grandly.
Grazioso..........Gracefully.
Giojoso..........Joyfully.
Humeroso.........Humorously.
Lacrimoso.........Sorrowfully.
Legato...........Smoothly.
Leggero...........Lightly.
Maestoso..........Majestically.
Marziali..........Martially.
Mezza voce......With half voice.
Misterioso........Mysteriously.
Parlando..........Well accented; applied to a melody.
Pastorale........In a simple, unaffected style.
Pomposo........Pompously.
Risoluto..........Resolutely.
Scherzando.......Jokingly.
Semplice.........Simply.
Sempre Marcatissimo.Always well marked.
Solenne..........Solemnly.
Sotto voce.......In subdued voice.
Spiritoso........With spirit.
Strepitoso........Precipitously.
Tranquillo........Tranquilly.
Tristamento........Sadly.
Staccato............In a detached style.

**Metronome marks.**—The metronome is a device invented by Maelzel in about 1815. It has a moving upright pendulum, on which is placed a movable weight which can set at a given figure to determine the number of beats per minute. The marking, "M. M. (Maelzel's Metronome) \( \text{=} \) 82" would mean that the instrument was to be set at 82, and a quarter note would be given the duration of time between each click of the pendulum.

**Abbreviations.**

Acc............Accelerando.
Ad. lib.......Ad libitum.
All'ott   }  
8   }  ...Play octave higher or lower.  
8va.   }  
8va. bass
Al seg.......Al segno, return to the sign.
A t...........A tempo.
C.a..........Coll'arco, with the bow.
Cad...........Cadenza.
D. C...........Da Capo, from the beginning.
D. S.   }  ...Dal Segno, from the sign.
Dal. S.  }
Decresc........Decrescendo.
Dim..................Diminuendo.
Div..................Divisi, divide the parts.
Dol..............Dolce.
f..................Forte.
ff.................Fortissimo.
fff...............Fortississimo.
fine.............The end.
fp................Forte piano.
G. P..............Grand pause.
Leg..............Legato.
mf..............Mezzo-forte.
M. M...............Maelzel's Metronome.
mp..............Mezzo-piano.
Mod............Moderato.
Op...............Opus.
Ott.  }
Ova.  }..........Octave.
Sva.  }
P............Piano.
pp.............Pianissimo.
ppp...........Pianississimo.
T. P...........Tempo primo.
Va...............Viola.
Var............Variation.
Vo.
Vcello.
Vllo.
Viv.
Vl.

Violoncello.
Vivace.
Violin.

Signs and symbols:

- dot over a note -- staccato.
- line over a note -- play broadly.
- crescendo.
- decrescendo.
- crescendo, then decrescendo.
- Rinforzando.
- Sforzando.
- up bow.
- down bow.
- Segno (sign).
- Coda sign (proceed from here to coda).
- treble clef.
- bass clef.
- dot.
- double dot.
- appogiatura, grace note (always accented).
- acciaccatura, grace note (never accented).
- repeat.
- pause, hold, fermata.
- arpeggio.
BIBLIOGRAPHY


School Music Competition-Festivals, Chicago, National School Band Association, 1939.


