1957

Manual of clarinet techniques supplementary to the basic necessary skills

Jane Roene Forvilly

The University of Montana

Let us know how access to this document benefits you.
Follow this and additional works at: https://scholarworks.umt.edu/etd

Recommended Citation
Forvilly, Jane Roene, "Manual of clarinet techniques supplementary to the basic necessary skills" (1957). Graduate Student Theses, Dissertations, & Professional Papers. 2920.
https://scholarworks.umt.edu/etd/2920

This Thesis is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
A MANUAL OF CLARINET TECHNIQUES
SUPPLEMENTARY TO THE BASIC
NECESSARY SKILLS

by

JANE VALENTINE FORVILLY

Bachelor of Music., Montana State University, 1954

Presented in partial fulfillment of the
requirements for the degree of:
Master of Music in Music Education

MONTANA STATE UNIVERSITY
1957

Approved by:

[Signatures]
Chairman, Board of Examiners

Dean, Graduate School

Date
PREFACE

This manual is presented as an aid to the instrumental teacher. In it are concepts and technical approaches to clarinet playing and teaching that are not generally introduced in basic method books. The text is a compilation of the philosophies and technics of many clarinet teachers selected from the mass of such material on the basis of personal teaching and playing experience.

The author recognizes that many controversial aspects of the subject may arise in a paper of this type. The intention is not to dispute or promulgate any of the schools of thought. They become secondary issues in the belief that the final objective of a majority of instrumental instructors is to achieve a musical performance. This material was selected as being a legitimate means and appropriate to that end. It is not, in all cases, complete. The element that often means the difference between the development of a musical organization and one that "just plays" is the technical capacity and the instrumental ability of the students.

The director's responsibility is to find a means of analysing, isolating and correcting any such deficiencies.

It is hoped that herein the instrumental director may become acquainted with ideas that will fit into his own
philosophy and pattern of clarinet teaching or that will stimulate independent thinking and subsequent critical evaluation of his present methods. The aim is to realize a desired result in the most logical and efficient manner.

The writer acknowledges with appreciation her indebtedness to Charles Osborne, instructor of woodwinds at Montana State University, for his suggestions and generous loan of materials and to J. Justin Gray, graduate advisor and instructor of woodwinds at Montana State University, for his thoughtful criticisms and recommendations.

JrvF.
TABLE OF CONTENTS

CHAPTER          | PAGE
I.  INTRODUCTION | 1
   The Problem   | 1
   Delimitations | 1
   Definition of Terms Used | 2
   Procedure     | 2
II. HISTORY OF THE CLARINET IN DIGEST | 3
III. THE CLARINET: SELECTION AND CARE | 8
   Selecting the Clarinet | 9
   Care of the Clarinet  | 13
       Assembling the instrument | 13
       Care habits       | 15
   Chronic Repair Problems | 18
       Detecting leaks      | 19
       Checking the bridge lever | 20
       Reseating pads      | 21
       Bending keys        | 22
       Corking keys        | 23
       Recorking tenons.   | 23
       Freeing "sticky" keys | 25
   Inspecting the clarinet | 26
<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV. THE REED: SELECTION AND CARE</td>
<td>28</td>
</tr>
<tr>
<td>Selection</td>
<td>29</td>
</tr>
<tr>
<td>Color</td>
<td>30</td>
</tr>
<tr>
<td>Hardness</td>
<td>32</td>
</tr>
<tr>
<td>Vamp</td>
<td>32</td>
</tr>
<tr>
<td>Tip and sides</td>
<td>34</td>
</tr>
<tr>
<td>Grain</td>
<td>37</td>
</tr>
<tr>
<td>Strength</td>
<td>37</td>
</tr>
<tr>
<td>Care of the Reed</td>
<td>39</td>
</tr>
<tr>
<td>Repair of the Reed</td>
<td>41</td>
</tr>
<tr>
<td>Soft reeds</td>
<td>42</td>
</tr>
<tr>
<td>Tip of the reed</td>
<td>44</td>
</tr>
<tr>
<td>Strong reeds</td>
<td>45</td>
</tr>
<tr>
<td>Trimming for specific problems</td>
<td>46</td>
</tr>
<tr>
<td>V. THE MOUTHPIECE: SELECTION AND CARE</td>
<td>48</td>
</tr>
<tr>
<td>Materials</td>
<td>48</td>
</tr>
<tr>
<td>Description of Mouthpiece Parts</td>
<td>51</td>
</tr>
<tr>
<td>Facing</td>
<td>51</td>
</tr>
<tr>
<td>Resistance curve</td>
<td>51</td>
</tr>
<tr>
<td>Tip opening</td>
<td>51</td>
</tr>
<tr>
<td>Table</td>
<td>51</td>
</tr>
<tr>
<td>Bore</td>
<td>52</td>
</tr>
<tr>
<td>Tone chamber</td>
<td>52</td>
</tr>
</tbody>
</table>
CHAPTER  

Tip rail ...................................... 52  
Baffle ........................................... 52  
Mouthpiece Characteristics ............... 52  
Selecting Mouthpieces ...................... 57  
Care of the Mouthpiece ...................... 59  

VI. BREATH SUPPORT. .............................. 61  

VII. THE EMBOUCHURE. .............................. 67  
   Description and History of Embouchure Styles. 67  
   Common Embouchure Errors ..................... 69  
   Construction of a Proper Single-Lip Embouchure. 70  
      Angle of the clarinet ......................... 71  
      Upper teeth and size of bite .................. 73  
      Lower jaw and the lips ....................... 73  
      The cheeks .................................. 78  
      The throat .................................. 80  

VIII. EQUALIZATION OF THE REGISTERS .......... 81  
   The Problem .................................. 81  
   The "Break" ................................. 83  
   The High Register ........................... 84  
   The Throat Tone Problem .................... 85  

IX. TUNING AND INTONATION ..................... 87  
   Tuning the Clarinet ......................... 87  
   Reasons for Poor Intonation ............... 89
X. MECHANICAL SKILLS ................................ 94
  Finger-Hand Position and Action ............ 95
  Fingering Patterns ................................99
  The right-hand-down rule .................... 103
  Fingering Chart ................................ 104
  Trill Chart ..................................... 115

XI. ARTICULATION .......................................122
  The Attack ....................................... 122
  Placement of the tongue ...................... 122
  Steps in starting the tone ....................125
  Weakest aspect of the attack ................ 125
  Dynamics and the attack ..................... 127
  The Release ..................................... 128
  Developing action of the tongue .......... 130
  Staccato ........................................ 131
  Greatest danger in tonguing ............... 132
  Legato Style .................................... 133
  Double and Triple Tonguing .................. 135

XII. SUMMARY ............................................138

BIBLIOGRAPHY ........................................... 140
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Two-Keyed Clarinet</td>
<td>4</td>
</tr>
<tr>
<td>2. The Clarinet of Denner</td>
<td>5</td>
</tr>
<tr>
<td>3. The Five-Keyed Clarinet</td>
<td>5</td>
</tr>
<tr>
<td>4. Sample Beginning Passage</td>
<td>8</td>
</tr>
<tr>
<td>5. Pictoral Comparison of Pad Styles</td>
<td>11</td>
</tr>
<tr>
<td>6. Proper Assembly of the Middle Joint</td>
<td>14</td>
</tr>
<tr>
<td>7. &quot;Feeler&quot; for Detecting Pad Leaks</td>
<td>20</td>
</tr>
<tr>
<td>8. Cut of the Lap-Joint of the Tenon Cork</td>
<td>24</td>
</tr>
<tr>
<td>9. Parts of the Clarinet Reed</td>
<td>31</td>
</tr>
<tr>
<td>10. Vibrating and Resisting Parts of the Clarinet Reed</td>
<td>32</td>
</tr>
<tr>
<td>11. The &quot;Backbone&quot; of the Reed</td>
<td>33</td>
</tr>
<tr>
<td>12. Checking the Tip for Fineness and Evenness</td>
<td>34</td>
</tr>
<tr>
<td>13. The Sides of the Reed Tip</td>
<td>35</td>
</tr>
<tr>
<td>14. Checking for Equal Resilience on the Sides of the Reed</td>
<td>36</td>
</tr>
<tr>
<td>15. Places Where a Reed May be Uneven</td>
<td>42</td>
</tr>
<tr>
<td>16. Shaping the Tip of the Reed</td>
<td>44</td>
</tr>
<tr>
<td>17. Trimming Areas</td>
<td>47</td>
</tr>
<tr>
<td>18. Parts of the Mouthpiece</td>
<td>50</td>
</tr>
<tr>
<td>19. Various Resistance Curves</td>
<td>53</td>
</tr>
<tr>
<td>FIGURE</td>
<td>PAGE</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>20. Exercise for Checking Intonation of Mouthpiece</td>
<td>58</td>
</tr>
<tr>
<td>21. Effect of Clarinet Angle on Length of &quot;Free&quot; Vibrating Reed</td>
<td>72</td>
</tr>
<tr>
<td>22. The Lower Lip Showing Part of &quot;Red&quot; Exposed</td>
<td>75</td>
</tr>
<tr>
<td>23. Graphic Representation of the Clarinet Embouchure</td>
<td>77</td>
</tr>
<tr>
<td>24. The Proper Embouchure</td>
<td>79</td>
</tr>
<tr>
<td>25. Alternate Resonance Fingerings</td>
<td>86</td>
</tr>
<tr>
<td>26. Proper Hand and Finger Position</td>
<td>98</td>
</tr>
<tr>
<td>27. The Basic Fingering System</td>
<td>100</td>
</tr>
<tr>
<td>28. The Chromatic Scale</td>
<td>101</td>
</tr>
<tr>
<td>29. Little Finger Patterns</td>
<td>102</td>
</tr>
<tr>
<td>30. Exercise for the Attack</td>
<td>127</td>
</tr>
<tr>
<td>31. Exercise for the Development of a Light Tongue</td>
<td>130</td>
</tr>
<tr>
<td>32. The Legato Style</td>
<td>134</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

THE PROBLEM

The importance of a capable clarinet section to a good band is self-evident. First, there are generally more players in the soprano clarinet section than any other single section and second, the clarinet is generally prominent in the modern band repertoire. Thus there is little camouflage for the band whose clarinet section is inadequately trained. In addition the problems met by all instrumental students and teachers are aggravated by the character of the clarinet.

Assistance in the selection and care of instrument, mouthpiece, reeds; correct tonal and technical concepts; and proper fingering procedures are a few of the fundamentals necessary for satisfactory progress.

DELIMITATIONS

This discussion has been expressed in terms of the soprano clarinet in B♭ (seventeen key, six ring model) because it is the fundamental and most numerous member of the clarinet choir.

While other "schools" of embouchure are illustrated, the "single-lip" embouchure is the method here advocated.

- 1 -
It is one of the easiest "correct" embouchures to teach and this writer feels it is the only practical one in the school situation where the clarinetist must sometimes march while playing.

**DEFINITION OF TERMS USED**

Definitions of terms peculiar to the subject are given in the body of the text in conjunction with the individual aspects with which they may be associated.

Reference to pitch names is always to the pitch as the clarinetist reads it, not to the concert pitch. Octaves are identified as middle C, C'; third space C, C''; et cetera.

**PROCEDURE**

Ten major areas of clarinet skills and knowledge are covered in as many chapters. Generally, the discussion of any specific problem is restricted to its respective chapter; however, it should be understood that many facets of performing skill must be interwoven to achieve mastery of a specific phase of playing. For example, precise articulation is unattainable unless proper breath support, embouchure and finger technic are applied coincidentally with the action of the tongue.

The aspiration of this paper is to present in a logical manner selected teaching philosophies and devices of prominent clarinetists which have been evaluated with the school clarinetist in mind.
CHAPTER II

HISTORY OF THE CLARINET IN DIGEST

The word "clarinetto" is a diminutive of "clarion," the clarin trumpet (Clarino Blasen) of the seventeenth and eighteenth centuries. The "clarinetto" of this period, because of its sound, was associated particularly with the upper register of the trumpet.

Instruments allying single reeds with a cylindrical bore may be traced back to the early Egyptian civilization and indeed the clarinet may have begun there. The single reed was in the most primitive form a flexible tongue cut from the side of a hollow reed-pipe so that one end could vibrate freely while the other was attached to the body of the pipe. Vibration was facilitated by thinning either the free end or the hinged end of the "reed."

The single reed was found in a variety of instruments, including the bag-pipe. "There is evidence that throughout the Middle Ages and beyond them well into the seventeenth century the single reed was confined to the music-making of the peasants. There is no evidence whatever that it was ever adopted for more serious purposes."¹ An instrument combining the features of a single reed and a cylindrical

bore was used in Europe in the late seventeenth and eighteenth centuries and was commonly called the "chalumeau."

Doppelmayr wrote in 1730 of a clarinet invented by Johann Christoph Denner (1655-1707), a German flute maker. All later references to the clarinet were based on this work. Presumably Denner invented the clarinet by improving the chalumeau, giving it a separate mouthpiece, adding a bell, and making the harmonics available by means of a "speaker" key. This most vital discovery was that the opening of a vent hole near the upper end of the tube caused the scale of fundamentals to sound a twelfth higher. In essence, the "clarinet" (clarion) was added to the existing "chalumeau" register.

---

This earliest instrument was a two-keyed instrument with eight finger holes which enabled a whole scale from f to b'. Figure 1 on page 4 shows two views of such an instrument.

![Figure 2: The Clarinet of Denner](image1)

![Figure 3: The Five-Keyed Clarinet](image2)

The instrument in Figure 2 is the type of two-keyed instrument that bore the Denner trade-mark. There were, of course, no tone holes for semitones. These were obtained by cross-fingering.

The early tone must have been far from soothing. J. Mattheson's reference to "chalumeaux with their howling

---

3Rendall, op. cit., Plate I.
symphony" in Neu-eröffnete Orchestre and Walther's statement that "the clarinet sounded from afar like a trumpet" testify to the stridency of the tone.\(^4\)

The five-keyed clarinet (Figure 3, page 5) to which Mozart gave status by composing the clarinet concerto, was apparently invented about 1750 and had become standard by the end of the century. The material was generally boxwood with an ebony mouthpiece, though there were some instruments of ivory elegantly fitted with silver mechanisms. In either form there is no doubt that these instruments were woefully out of tune.

The greatest growth of the key system took place in the first half of the nineteenth century. The most influential of the experimenters of this period was Ivan Muller (1786-1854) who developed the thirteen-keyed system and was regarded by some as the second inventor of the instrument.\(^5\)

From about 1840 the brass keys were replaced with silver keys, cupped keys superseded flat keys and the reed was no longer tied on but was held in place by metal ligatures. Also about this time it became customary to play with the reed next to the lower lip instead of the upper. This practice sacrificed some of the upper range but improved the remainder of the range.

\(^4\)Ibid., p. 70.  \(^5\)Carse, op. cit., p. 160.
Prominent among the experimenters with the thirteen and fourteen keyed clarinets was Albert, a manufacturer whose name is associated with the best known key system before the adoption of the Boehm system.

The so-called Boehm clarinet was devised by Klose in association with Buffet, a Paris instrument maker. The new instrument was based on elements borrowed from the Boehm flute mechanism. The gains were greater command of notes by use of duplicating levers for the right and left hand, acoustically better situated note-holes for better intonation, facilities for almost every trill and new conveniences for slurring from note to note. Although the patent was applied for in 1844, the "Boehm" clarinet was not generally adopted until after 1900. Today its use is almost universal.

Many Continental players were reluctant to accept the new instrument. A typical comment quoted from Altenburg's The Clarinet in Harry Voxman, trans., "Care of the Clarinet," Woodwind, III (January, 1951), p. 9.: "The least of its defects (Boehm) is that frequently the complex mechanism prevents the hermetic closing of the keys which is indispensable for the production of the low notes and the sonority is decidedly changed." The greatest stimulant to acceptance was its adoption by the French Army.
CHAPTER III

THE CLARINET: SELECTION AND CARE

The finest teaching methods will not be rewarded if the student is hindered by faulty equipment. A student may, unknowingly, confuse the mechanical failings of an instrument with his own inability to learn and drop out of the instrumental program. "It's good enough for a beginner" is a woefully false guide.

Consider the challenge the student accepts when he starts to learn a new instrument. While playing a simple passage such as illustrated in Figure 4 he is expected to:

1. associate note names with finger patterns;
2. maintain the value of rhythm patterns;
3. interpret and apply a key signature and time signature;
4. control the tongue and lips to start and sustain each tone;
5. consciously regulate the breathing;
6. place his fingers on the right keys to produce the right pitches.

\[ \text{FIGURE 4} \]
SAMPLE BEGINNING PASSAGE
It is the teacher's responsibility to the student to help him select an instrument and to check the instrument periodically. The next chapters are dedicated to the selection and maintainence of the tools with which the student works--the instrument, the mouthpiece, and the reed.

SELECTING THE CLARINET

Instrument manufacturers produce clarinets of many different materials: ebonite, laminated wood, metal, rubber and Grenadilla wood. The best clarinets are made of Grenadilla wood from Mozambique and Madagascar. The cost of these superior instruments and their sensitive nature sometimes restrict them from the young student, therefore, other clarinets should be considered.

The principle drawback to metal clarinets is the unusual balance of the instrument which causes the clarinet to roll or wobble in the hands. The mechanisms on metal clarinets seem to have a tendency to fall out of adjustment more readily than the other models probably because the rods and levers must be so high off the instrument. The intonation of a metal clarinet is affected more noticeably by temperature changes or long periods of rest. The prime asset is that they are as close to indestructable as a clarinet might be and they are relatively unaffected by nature's elements when it is necessary to play out of doors.
The interior bore of a metal clarinet should be smooth and unobstructed by bits of solder or projecting ends of tone holes.

Rubber clarinets are good in that the body of such instruments is not affected by moisture. However, in cold weather rubber clarinets become so brittle that they break like glass and conversely, in hot weather they become so limp that the mechanism is pulled out of place.

The most satisfactory "student class" clarinets seem to be those of plastic compounds going under different manufacturers' trade names. Intonation of these instruments is generally superior to the metal clarinets; they possess favorable tone quality, are sturdy and are moderately priced.

Students and parents should be encouraged to buy the "best" instrument possible. If the school purchases most of the instruments, problems of intonation, balance and blend can be greatly improved by using matched instruments. This is especially true if the mouthpieces are similar.⁷

The following points should be carefully considered when choosing an instrument. They are listed with the assumption that the desire is to select the best instrument possible.

⁷See Chapter V, "The Mouthpiece: Selection and Care."
1. The clarinet should be carefully inspected for cracks. When a clarinet is not in use the wood dries and any cracks pull together and are difficult to detect. Good wood is covered with lengthwise pores that are not ordinarily over one-half inch long. One must beware of extra long pores.

2. Power forged keys of nickel-silver have a spring in them and may be adjusted more easily than rolled or cast keys. Cast keys have a tendency to be brittle.

3. Keys with French style pad pockets are superior to the button style pad pockets used on some less expensive instruments. The button style is less apt to allow proper seating of the pad. (Figure 5).

---

---

For this same reason it is a good plan to mark cracks with chalk or pencil when shipping the instrument to a repairman for pinning.

Randall Spicer, "Problems in Developing the Clarinet Section," *Music Notes* (March, 1955), (Mimeographed.)
4. The best instruments have lock posts--posts with locking screws which prevent their turning and forcing rods out of line.

5. The tone holes should be cut from the clarinet itself and not from inserts set in after the body has been turned out.

6. The finer clarinets have flare cut tone holes. The bottom of the tone hole (interior of the instrument) is cut in a flare shape.\(^\text{10}\)

7. Mechanical defects which should be checked are:
   a. rattling of keys and joints;
   b. rings not fitting flush with the tone holes;
   c. second space A opening too far;
   d. holes clogged with dirt, especially the register tone hole;
   e. worn tenon corks which allow the clarinet to wobble;
   f. one and one fingering for B\(^b\) out of adjustment. (This is valuable in chordal passages.)

8. The prospective buyer should play the instrument. Thus, he can check intonation of all octaves, the clarity of third line B\(^b\), strength of low C\(^#\), and evenness of tone quality in all registers. High G, A, and B should not be sharp.

\(^{10}\text{Ibid.}\)
Poor response and squeaks can often be traced to poorly adjusted clarinet mechanism.

Final selection of a clarinet, of course, should be based on a trial playing period. In addition to good intonation and tone quality the clarinet should move easily between registers and should respond equally well in all the registers, the chalumeau, (low), the clarion (second), and the altissimo (high).

CARE OF THE CLARINET

With good care, a clarinet will remain in excellent condition for years. Carelessness can ruin an instrument in a brief period of time.

Assembling the instrument. The most frequent failings of a clarinet are not caused by some flagrant act such as sitting on it, or dropping it but are the consequence of simply putting it together.

The paramount spot of misalignment is the bridge lever connecting the upper and lower joints of the clarinet. When in proper adjustment, the rings on the lower joint, held down, will also close the rings of the upper joint with no play between the two. The bridge lever that controls this action is often forced out of line when the instrument is assembled. When connecting the two main joints, the rings of the upper
(left hand) joint should be closed, thereby lifting the top lever; the rings of the lower (right hand) joint should be left open. Thus the two parts of the connection will be separated.

FIGURE 6

PROPER ASSEMBLY OF THE MIDDLE JOINT
The clarinet should not be held in any way that there would be danger of squeezing down on the rods. The lower joint is especially vulnerable in this respect.

Accidents may be prevented by working only with the immediate two joints to be joined. For example, when assembling the middle joint, the player does not grasp the clarinet by the barrel joint and the bell section.

The tenon corks must be well greased so that the joints may be twisted together without danger of stripping the cork. The joints are twisted, not wobbled, together.

**Care Habits.** A frequent mistreatment of the clarinet is the failure to wipe the excess moisture out of the instrument after each playing session. A swab is roughly as important to the clarinet player as his toothbrush. Carelessness in this respect not only endangers the wood but the pads as well. Moisture running into the tone holes and being in contact with pads causes them to harden and consequently not to seat properly resulting in fuzzy tones and squeaks. "Gurgles" or "bubbles" in the tone are most frequently found in the C# - G# key and are caused by this.

Sanitation demands that the instrument be cleaned regularly. The reed must be removed from the mouthpiece; the excess saliva wiped from the reed and the mouthpiece. It is not advisable to replace the reed and store it on the mouthpiece.
To completely remove moisture from the instrument the barrel joint must be separated from the mouthpiece. Failure to do this is a major cause of cracks in the wood. The moisture, if left in the joints, is more readily absorbed by the open end of the pores causing the inside bore to swell. New instrument cases are generally blocked so that the barrel and mouthpiece must be separated. If a case is not so divided it should be reblocked or a new case obtained for wood instruments.

A chamois swab or swab of old cloth pulled through the clarinet is superior to a wool-wire swab.\textsuperscript{11} It has greater absorbency and there is less danger of scratching the bore and damaging the instrument, especially the mouthpiece. The use of a silk swab after initial cleaning with a chamois will help keep the bore smooth and polished.

Periodically extra precautions should be taken to preserve the quality of an instrument.

Pivots should be oiled once every four or five months with good grade key oil. Avoid using too much oil. About the right amount may be had by dipping the end of a toothpick or screwdriver and applying a drop to the pivot.

The instrument body (if wood) should be treated with bore oil from time to time. The outside may be oiled about

\textsuperscript{11}Some teachers suggest that the swab be pulled from the small to the large end of each section, thus collecting more moisture and lessening the danger of catching the register tube.
every six months (more frequently if the instrument is new). However, oiling the wood too much is also dangerous. Under ordinary circumstances once a year is often enough for clarinets three years old or more. The bore needs oiling more often than the exterior. Just the smallest amount is sufficient. It need not moisten the wood surface--just put a film or sheen on the grain. Care must be taken not to get oil on pads or moving parts of the mechanism. As a precautionary measure, small squares of paper may be set under the pads when the wood is being oiled.

Extreme seasonal changes present additional problems. During the autumn marching season the possibility of cracking is heightened. The instrument must not be submitted to extreme temperature changes, nor should a very cold clarinet be blown as this makes too great a difference between interior and exterior temperatures. Likewise, the clarinet must not be assembled when it is cold--the case should be opened allowing the instrument to adjust to room temperature.

In summer an effort should be made to compensate for differences in humidity. In an area where the humidity is unusually high, the excessive moisture is apt to cause stickey keys. The instrument must be carefully swabbed. A piece of camphor placed in the case will help absorb the moisture.

In areas that are unusually dry, a humidifier placed in the case will supply some moisture. A moistened rag,
apple or orange peel may be used as a working substitute. This is also a good practice for instruments that are not used for long periods of time.

The direct rays of the sun must be avoided. The principle danger here is warpage of the rubber mouthpiece.

Extra care should be taken to keep tenons greased as they will expand in hot weather. If the corks are allowed to dry out they will wear down. Consequently, with the corks contracted they will not provide a secure fit between the joints.

The essential thing, of course, is that students learn to regard the clarinet for what it is, a delicate, complicated instrument inclined to a sensitive temperament.

CHRONIC REPAIR PROBLEMS

A certain number of "accidents" to clarinets will occur so frequently that the instrumental director will have to be prepared to make the necessary repairs himself. The troubles covered in this section are those which will be confronted most often and for which a minimum of time, material and tools will be needed.¹²

¹²In connection with instrument repair, students should understand that a crack in the wood is not cause for undue alarm. A competent repairman can effect a totally satisfactory closure of the crack by either of two methods, pinning or setting a flush band around the body of the clarinet.
Detecting Leaks. A clarinet cannot work its best if it is not absolutely air-tight. Leaking tone holes are the cause of squeaks and hard blowing instruments. The better the "cover" of the pads, the better the clarinet will play.

The simplest way of locating an air leak is to seal the end of the joint with a cork or the palm of the hand, cover the holes and blow in the other end of the section. Air will escape wherever the leak may be. The advantage of using a cork to seal the end is that the other hand is then free to see if pressing the already closed holes will stop the leakage. For this test to be effective however, the air must be forced into the instrument and the holes must be covered only lightly as in playing.

Blowing into the section in this manner may simply indicate that a leak is present but not locate the trouble. If the leak is not easily located, smoke may be blown into the instrument. A wisp of smoke indicates the leak. When using smoke one must be sure that all nicotine is wiped off pads and tone hole seat after the test as it will become sticky and cause the pads to stick.

Perhaps the best method of locating pad leaks is by the use of paper "feelers." These can be made by gluing narrow strips of tissue paper or cellophane to the end of match sticks. (Figure 7)
The "feeler" is inserted between the tone hole and the pad while the pad is open. The key is very lightly closed and the "feeler" gently pulled out. By repeating this process all around the pad differences in tension can be noted.

FIGURE 7
"FEELER" FOR DETECTING PAD LEAKS

Where the "feeler" drags, the pad is closing. Where there is little or no tension there is liable to be a leak.

None of these tests are of any value if the pads are pressed down tightly. They should be closed with a light touch—just enough to complete the stroke of the key.

Checking the Bridge Lever. The bridge between the upper and lower sections of the clarinet body is the source of frequent trouble. Closing the rings of the lower section must completely close the ring and pad of the upper section. The connection may be checked in the following manner:
Hold down the first finger of the right hand, then tap the small pad which lies between the first and second holes of the upper segment with the left hand. If there is give to the pad or if the right hand feels vibration something is wrong. Repeat the test, holding down the rings of the left hand with the second finger and then with the third finger.

To correct any discrepancies it may be necessary to bend either of the bridge levers, to bend a pad or ring in line with the others or to fit new cork to the connecting levers.

**Reseating Pads.** If the pad does not seat properly, a quick but temporary solution may be to wet the pad and recrese it by pressing down hard on the pad cup.

Frequently, it is possible to reseat a pad or adjust one that is not "closing" by heating the pad cup. The pad, of course, must still be in good condition. Heat the cup just enough to soften the old cement. An alcohol lamp is better than a match flame because both hands are free to work with the instrument, there is less danger of burning the pad and the flame is cleaner. While the cup is hot, seat the pad by pressing it a little harder than usual against the tone hole. (Be sure to protect the finger with a cloth. If a match flame was used, the carbon should be removed while the metal is still warm.) Hold the pad in this position until it has a chance to set.
If replacing pads, those of skin should be used on all fine clarinets. Puncture the pad with a small pin just under the rim of the pad cup so that it will not swell up when the air becomes warm. A pad of the proper diameter and thickness should be selected. One either too thick or too thin will close on the edge of the tone hole first rather than covering the entire hole at the same time.

All the old cement must be removed from the pad cup. The repairman then heats and applies a few drops of cement to the cup. Usually three is sufficient although the amount may have to be varied to adjust the height of the pad. The pad may then be set in with a pad slick, the smooth rounded end of a nail file, or a similar tool.

Stick shellac is the best adhesive material. The white French type is preferred for use with skin pads.

**Bending Keys.** Often the necessary bending can be done with the strength of the fingers alone. If any amount of force is necessary or if the area being adjusted is rather inaccessible the key should be removed before any bending is attempted. The important thing is to be sure that the bending will occur only where it needs to bend. If the outer edge of a ring is to be bent down a small block of wood placed under the ring, between the circle of the ring and the rod, may help confine the work. Extreme care cannot be emphasized too much.
To bend a key carelessly may twist a post or bend a rod, constituting serious trouble.

Whenever pliers are used they should be covered with cloth, cardboard or some other material that will protect the key from becoming marred or dented.

**Corking Keys.** When bumper corks must be replaced, the proper thickness of the cork should be noted before starting the work. First, the surface of the key or rod must be thoroughly cleaned. The cork may fall off if the surface is not clean enough.

Then, the part of the key to receive the cork is heated just enough to allow the adhesive (stick shellac is easiest to control) to melt. After the cement is on the key, the cork, a *rectangular* piece of the proper thickness and sufficiently large to cover the area, is pressed on the key.

Considerable time may be saved if the key is pressed against a damp cloth or paper pad to cool. When the cement is set, the cork may be trimmed with a very sharp knife. The edge of the key is used as a cutting guide. After the cutting, the cork is sanded with fine sandpaper.

**Recorking Tenons.** Worn tenon corks may be made temporarily serviceable by evenly winding thread over the cork and applying a generous amount of cork grease.

If the cork is to be replaced, all of the old cork and glue must first be removed from the tenon joint. Cut a strip
of cork just long enough to go around the joint and leave enough material for a three-sixteenths of an inch lap-joint. (Figure 8) Hammering the cork will soften it and prevent its cracking when it is bent around the tenon. If the strip is cut from a sheet of cork the grain should be length-wise of the strip.

![Figure 8](image.png)

**FIGURE 8**

**CUT OF THE LAP-JOINT OF THE TENON CORK**

Drops of shellac or glue are applied alternatingly along the edge of either side of the tenon area to receive the cork. The repairman wraps the cork tightly around the joint; covers the lap-joint with hot shellac. Twine wound evenly over the cork will hold the cork in place. Having the twine tied to a secure object will make the work much easier and faster.

If circumstances allow, this job should be done by a reliable repair man. Correctly done, it requires the application of heat to the body of the instrument. (For that reason it may be wise to use cork glue in this operation.)
Instrument repairmen would have the equipment to keep the instrument from being affected by the heating process.

**Freeing "Sticky" Keys.** Failure of keys to spring back into place after being released may be the result of "gummy" pads, weak springs or dirty mechanism.

If the cause is a "gummy" or "sticky" pad, the pad surface may be effectively cleaned by a cloth dampened with alcohol. Talcum powder is sometimes sprinkled on the pad but this is not as satisfactory a solution as cleaning the pad. The talcum, combined with the moisture in the instrument, may form a "flour-paste."

A spring that is too weak to affect the return of a key to its released position may be restored to usefulness by carefully bending it in the opposite direction of the desired "pull." A small instrument screw driver with a "push-pull" slot or a crochet needle is convenient for this job.

If dirty mechanism is the cause of the trouble usually all that is necessary is that the controlling rod be pulled part way from the rod tube, wiped clean, receive a small amount of clean key oil and be replaced.

Much frustration, and oftentimes, despair, may be avoided if a small wooden block in which holes are drilled is kept to receive screws as they are removed from the clarinet. The holes may be arranged in any convenient manner.
Inspecting the Clarinet. All instruments should be checked periodically. The following items should receive attention in the examination of clarinets.

1. cleanliness
   a. mouthpiece, especially
   b. an excess of dirt around the mechanism or "grease" on the rods probably indicates that the instrument should be dismantled and thoroughly cleaned by an instrument repairman.

2. cracks in the wood
   a. Cracks which show an inclination to expand should be pinned.

3. joints
   a. no "wobble" of joints
   b. greased for easy assembly

4. body rings
   a. The absence of tight rings around the body at the joints is a principle cause of wood cracks. As a temporary repair the ring may be forced on over paper or cheesecloth.

5. leaks in either segment of the clarinet
   a. all pads must completely "cover"

6. pads
   a. not hard or torn
   b. securely in pad cup
7. springs
   a. in place
   b. sufficient tension
8. keys
   a. not bent or jumbled—especially the side
      trill keys and the little finger keys
9. screws and rods
   a. not working out of place
10. action of cross-fingerings used by little fingers
11. alignment of rings across the bridge lever
12. condition of the mouthpiece
   a. neither warped or chipped
CHAPTER IV

THE REED: SELECTION AND CARE

As the principle source of woodwind tone, a good reed is as important to the conscientious player as are the instrument and mouthpiece on which he plays. Even the finest instrument and mouthpiece will not play well unless they are accompanied by a good reed that matches the mouthpiece and the player. Further, an excellent reed may compensate for some of the failings of a not-altogether-perfect mouthpiece.

Tone is the cardinal aim in the selection of reeds. The cane of Southern France is the favored reed material. It is almost unfortunate that the woodwind player must rely on cane for satisfactory reeds. No two respond exactly the same and even individual reeds seemingly behave according to whim, sometimes changing radically in the first hours of alternate playing and drying.

The recent war gave fillip to the quest for a substitute material and plastic reeds have since been sold. However, plastic reeds lack responsiveness and control, especially in the high register, and they cannot match the tone color of a really good cane reed.

\[13\] California cane is being used with increasing success by some American commercial reed manufacturers.
There are unverified reports of early use of ivory, of bone, of whalebone, of lance and of other woods and later of ebonite as a substitute for the cane reed. That these assertions have found their way into print reflects the efforts of the player to escape the vacillating behavior of the cane reed.

However, patience and care in the selection and use of reeds will allow for the inherent complications and still produce good results.

**SELECTION**

Encouraging students to buy reeds by the box or at least several at a time so that they may keep four or five good reeds ready to play will greatly help improve the clarinet section.

While the rank beginner may use any reed that will produce a sound with a reasonable amount of air pressure, as he advances he becomes more discriminating until a relatively small percentage of the reeds purchased are truly satisfactory. One of the teacher's most perplexing problems is to convince parents of clarinet students that reeds must be thrown away as useless or worn out and at the same time teach the student that reeds must not be accepted or rejected on first trial and that they can be adjusted to become

---

working specimens. Consider that "the average professional player probably uses 500 reeds per year."¹⁵

The best, and only true, test of a reed is trial which of course, is generally impossible where the director is purchasing reeds for the school. The mouthpiece affects reed selection—a close lay requires a stiffer reed than does a more open one. Lips, teeth, formation of the mouth and throat and development of the muscles comprising the embouchure also influence individual selection. There is no guiding rule in choosing a reed, however, certain characteristics are apt to represent a good reed.

The illustration in Figure 9, page 31, will serve as an identifying guide for the discussion of reeds.

**Color.** Reeds run in color from light yellow to brown. A reed that is straw-colored or golden yellow on the stock and only slightly yellow on the vamp is generally good cane. Reeds with a pronounced greenish cast are best avoided. Brown streaks or stains in the stock do not impair reed performance and are regarded by some players as an indication of a properly ripened reed. However, brown streaks in the cut portion of the reed should be avoided.

FIGURE 9

PARTS OF THE CLARINET REED
Hardness. A hard substance is desirable—one that will not leave an impression when the thumbnail is pressed on the flat side of the reed near the heel. If the mark left is deep, the reed is soft.

Vamp. The reed has two principle areas: the vibrating parts and the resisting parts as shown in Figure 10. These areas must be reasonably balanced to expect a good reed.

---

The vamp or cut must be thin at the tip and gradually grow thicker and stronger toward the shoulder. This graduation reaches and produces the resisting part and heart of the reed. When held up to the light a well defined contour or shadow should be seen in the vamp at the point of resistance. If this area is not heavy enough the reed will lack needed strength. The shadow should resemble an inverted "U" or "V" and should be centered in the reed. (Figure 11)

![Figure 11](image)

**FIGURE 11**

THE "BACKBONE" OF THE REED

The sides should taper evenly from the shoulder to the tip of the reed.
**Tip and Sides.** The shape at the tip of the reed must conform to the tip of the mouthpiece. Nonconformity means that the reed will probably respond poorly with a buzzy or harsh tone.

An important item to consider in selecting reeds is that there be equal resilience and thickness across the tip. This may be checked by gently rolling the tip from side to side on the back of the hand or by holding the reed in the left hand and feeling the tip with the right thumbnail for evenness. (Figure 12) In this way the reed can also be checked for possible hidden split or chipped spots which usually cause squeaking.

**FIGURE 12**

CHECKING THE TIP FOR FINENESS AND EVENNESS
There should also be equal resilience on either side of the reed. This area (represented by the shaded spots in Figure 13) may be checked by holding the reed up to a strong light. A more effective test is illustrated in Figure 14 on page 36.

FIGURE 13

THE SIDES OF THE REED TIP

The last one-quarter to three-eights inch of the tip should be quite thin in relation to the remainder of the reed to preserve reed resonance. However, one must avoid reeds that show too pronounced a flatness at the tip. They do not produce the best tone and are usually short-lived.¹⁷

A balanced reed is more than a convenience. An uneven one will not respond and may be the cause of irritating, unnerving, squawks.

¹⁷G. Leblanc Co., The Selection of Reeds and Mouthpieces, A pamphlet (Kenosha; Wisconsin, G. Leblanc Co., 1951)
FIGURE 14
CHECKING FOR EQUAL RESILIENCE ON THE SIDES OF THE REED
Grain. The grain should be fine, straight and with fibres of uniform size. Heavy fibres need not detract from the quality of the reed if they are equally spaced across the reed.

Strength. Although the gradings of the reed manufacturers are not uniform or totally accurate they generally are suprisingly close considering that the reed is a product of nature and, they are the best guide in beginning the search for reeds.

Different players and teachers recommend different strength reeds with equal conviction. A reed that is too soft is unsatisfactory as it will choke up when pressure is increased for a heavier dynamic level, resulting in squeaks. On the other hand, a reed too heavy or strong will cause bunching of the lower lip and excessive "biting", especially in the upper register with the same consequences. In either case, the tone will be undesirable and hard, if not impossible, to control.

This writer feels the best reed is one which responds freely but which has enough "edge" or resistance for the player to control the tone and forces the student to use a certain amount of support. This reed would usually fall in the commercial gradings of 1 to $2\frac{1}{2}$ if used with a medium lay mouthpiece. For a beginning student the strength would probably be a 1; the strength increasing SLIGHTLY as the student's
embouchure develops. The teacher must vigorously put down any idea that a strong reed indicates a "strong" embouchure. If the director recommends a stronger reed it must be done in such a way that the student cannot interpret it as giving credence to that belief. A well developed embouchure is capable of handling a more sensitive reed. Also, the mouthpiece greatly influences the strength of the reed, some, causing the reed to feel "stiff", others causing the reed to feel "limp."

The strength of a reed cannot be determined with the first trial as most reeds change appreciably during the first series of playing and drying. A new reed is best played no longer than a few minutes the first time it is used.\textsuperscript{18} Then let it "rest" for a few days before using it again. When several good reeds are selected, play them in rotation.

To begin with, the reed should be placed even with the tip of the mouthpiece. Then, the response of an individual reed may be greatly enhanced by moving it slightly up or down, right or left. A reed that has a tendency to be light may respond better if it is moved down on the mouthpiece so that a little of the tip rail on the mouthpiece shows above the tip of the reed. Conversely, if a reed seems a trifle sluggish, move the reed so that a little of it shows over the tip of the mouthpiece. These movements are not great--no more than one sixty-fourth of an inch either way.

\textsuperscript{18}Bonade, \textit{op. cit.}, p. 14.
CARE OF THE REED

Before playing, the reed must be thoroughly moistened with saliva. The reed should be held in the mouth long enough to overcome the warped "ripples" in the end of the reed. A reed will not respond properly until these ripples are removed as it cannot seal against the tip of the mouthpiece. Also blowing against a dry reed may cause splits to appear in the fine tip of the reed.

Many players massage the vamp of the reed with the thumb. This seals the porous ends of the fibres which run lengthwise of the reed and thus prevents the reed from absorbing as much moisture and ultimately prolonging the playing life of the reed. This practice also hastens the process of flattening the warped tip. A word of caution: This must be done with the vamp resting against the flat table of the mouthpiece. If it is done with the reed in place under the ligature, the reed will tend to curve forward with the curve of the lay. This would slow tonguing response and cause a thinner tone.

With the reed in place, the excess moisture is drawn out of the mouthpiece from behind the reed with the breath. At first students are reluctant to do this and it requires some coaxing, but with the beginning student especially, the combination mouthpiece and reed is a strange object, and like a lolli-pop, the mouth tries to dissolve it.
After each session the reed should be thoroughly wiped off to prolong the life of the reed and for sanitary reasons. Do not store reeds where the cannot reach them. Unless ventilated, they will remain water soaked and the resiliency of the reed fibres will not be restored. Also in the interest of resiliency they should not be left in the hot sun or near artificial heat as they will become too dry and brittle.

A very satisfactory reed case may be fashioned from a piece of plate glass and elastic or rubber bands. Warpage is discouraged by fastening reeds against this flat surface after each use.

Much reed grief may be avoided by proper use of the ligature. A bad ligature will spoil a good reed on a good mouthpiece by not holding it properly and preventing it from vibrating freely. The sides of the reed should not be pinched against the mouthpiece by the ligature. The pressure of the ligature should be in the center, leaving the edges free to vibrate.

Free vibration will be complimented by placing the ligature about a quarter of an inch below the line indicated on most mouthpieces. Tighten only the lower screw leaving the upper screw just tight enough to secure the reed.

Many reeds may be saved by teaching young students to slip the reed behind a loose ligature rather than putting the ligature over the reed.
REPAIR OF THE REED

In the final test of reeds, that of trial on an instrument, the principle factor is that the reeds selected by healthy. They need not immediately satisfy the taste of the individual player as to strength but should feel healthy and vigorous.

A well built reed will be relatively easy to fix—a poor reed will be difficult if not impossible to fix. With a little practice and patience many old reeds or new ones that might otherwise be discarded can be adjusted by the player to meet his own specifications.

As was stressed in the discussion on reed selection, a very important element is that the reed be even or balanced. Figure 15, page 42, points out different places where a reed may be uneven. The balance between these points is difficult to achieve but is the art in fixing a reed properly.

A reed will not play well if:
1. one side is thicker than the other;
2. the tip is too thin or too strong;
3. the lower edges are too heavy or unequal;
4. the center does not sufficiently resist lip pressure.

\[19\text{Ibid.}, \ p. \ 5.\]
Soft Reeds. The tip of the reed is a spring that bends or vibrates over the break in the mouthpiece lay under the pressure of the breath and which must bend back to its original position against that pressure. The speed of these vibrations is approximately 146 per second for low E on the B♭ clarinet and about 1900 per second at the other extremity of the range, C on the sixth space above the staff. To do its job well, it must be delicately adjusted.

An excessively soft reed, or one which has too fine a tip, is to be identified with a light, thin, reedy, twangy, or nasal tone. A reed that is too soft speaks so freely that

FIGURE 15
PLACES WHERE A REED MAY BE UNEVEN

1 - tip
2 - corners
3 - middle edges
4 - lower edges
5 - sides of resisting points

---

20 Willaman, op. cit., p. 42.
it choking up and stops vibration when breath pressure is increased. The student will have difficulty with the upper register and may be plagued with squeaks.

The remedy is to trim the tip of the reed. This may be accomplished in several different ways. The tip may be cut with scissors using a pattern cut from a tin can lid as a guide. Two quarters or fifty-cent pieces may hold the reed tightly between them with just the area to be trimmed exposed. This exposed tip area is burned off. The result is generally unsatisfactory because the soft organic material of the reeds burns more readily than do the fibres and the result is a ragged edge. By far the most satisfactory method of trimming a reed tip is to use a reed clipper. When purchasing a reed clipper, one must be sure that it will not leave the corners of the reed too sharp.

The size of the cutting should be very small. Clip only a hair’s breadth at a time. Try the reed after each clipping.

When a reed is unevenly built the lip pressure must necessarily be heavier on the strong side of the reed. This makes the weaker side vibrate too rapidly. The reed will sound too soft. The strong side is scraped to match the weaker side thus equalizing the lip pressure across the reed. The reed will vibrate more equally and will seem stronger. If the reed becomes too soft it should be clipped slightly with
a reed clipper until the desired strength is obtained. In this operation, and in all reed repair, the reed must be tried after each bit of work and progressed on the basis of comparison.

**Tip of the Reed.** The tip of the reed should match the tip of the mouthpiece. In the same manner, the corners of the tip of the reed should not be too sharp. Square corners on a reed may produce a buzz in the tone.

A sandpaper file or emery board such as is used to trim fingernails, is used to shape the tip of the reed. File, with light strokes, in the upper direction of the reed.

**FIGURE 16**

SHAPING THE TIP OF THE REED
Strong Reeds. Reeds which are too strong, blowing hard and making notes in the low and middle range difficult, are scraped to lessen resistance to the breath pressure.

The best way to scrape a reed is to use Dutch rush, plants which when dry are like small round files, about as large as icecream straws, because the rush scrapes off a very small amount of reed at a time, it is small enough that you may see the exact spot you want to thin and because it will not dig a hole in the cane or cut ridges around the trimmed section. In lieu of Dutch rush, knife or sissor blades, razors, or sandpaper may be used to scrape a reed. Because the razor blade is so flexible and sharp it must be used with extreme care so that cuts are not made on the surface of the reed. A blade works best on a wet reed while sandpaper is best when the reed is dry. All trimming should be done with the reed against a flat surface.

Naturally in something as nebulous as reed fixing, an individual art cultivated largely by trial and error and with a variable product, there is much disagreement as to procedure. The principle debate is whether to trim or not to trim the "heart" of the reed.

Willaman says:

The spring must be scraped thinner to weaken it until it will vibrate with comfort . . . The part of the spring that governs the ease of bending is located almost entirely
in the region extending 1/4 inch each way from the break in the curve of the lay.\textsuperscript{21}

This method would scrape the area of the center rib or the heart of the reed.

On the other hand, Bonade asserts that this is precisely the area that must not be scraped.

Whenever scraping is done--remember that the center is never touched.\textsuperscript{22}

It seems reasonable that except as a means of last resort this portion of the original shape of the reed could be preserved.

Still another method is to retain the whole of the original cut of the reed by working on the back, flat surface of the reed with '00' (very fine) sandpaper.\textsuperscript{23}

Trimming for Specific Problems. With experimentation a reed may be treated for more specific maladies than "too strong" or "too weak."

The following is an incorporated list of suggestions taken from articles by Bonade\textsuperscript{24} and Rufener.\textsuperscript{25} The areas are identified in Figure 17.

\begin{thebibliography}{9}
\bibitem{21} Ibid., p. 45.
\bibitem{22} Bonade, \textit{op. cit.}, p. 8.
\bibitem{24} Bonade, \textit{op. cit.}.
\bibitem{25} Rufener, \textit{op. cit.}.
\end{thebibliography}
Trim Area:

1 - A reed which is sharp in the lower register;
1 - or which does not respond well but sounds good while playing forte, and heavy when playing soft is probably too strong at the tip.

2, 3 - A reed which lacks brilliance, with poor staccato in the 'break' may be trimmed in area 2 and 3.

4, 5 - A reed which lacks brilliance and on which the middle register is dull may be scraped in these areas.

6, 7 - A reed that is too brilliant;
6, 7 - shows poor response in the lower register;
6, 7 - and which has poor staccato throughout the range, may be trimmed in area 6 and 7 near the shoulder.

When a reed sounds good but a little too heavy probably the lower edges are too strong or uneven.
When a reed whistles or squeaks, one side is too strong at the middle NEAR the center. Cracks in the tip of the reed may also be the cause of squeaks.
CHAPTER V

THE MOUTHPIECE: SELECTION AND CARE

Perhaps the most important single part of the clarinet is the mouthpiece. Its importance to good tone and free response cannot be overemphasized. "Surveys have shown that as high as 80% of the clarinet mouthpieces in use in our school bands are faulty."\(^{26}\) Mouthpiece selection is a subject given to much conjecture, experimentation and fad-ism. This problem alone could support a comprehensive discourse. However the purpose of this chapter is to acquaint the director or student with general mouthpiece characteristics and their influence on the performance of the mouthpiece.

MATERIALS

Currently the most popular materials for mouthpiece manufacture are plastic, crystal, molded rubber and hard rubber rod. The preferred material is rubber rod because it is relatively more stable and it is possible to control its dimensions in the manufacture to a greater extent.

Plastic is used in the cheapest mouthpieces but is unsatisfactory because of the ease with which the mouthpiece

can warp. Any material with this high coefficient of expansion causing the dimensions to change excessively is apt to result in embouchure difficulties and tone distortion. Continued warping of course, will render the mouthpiece useless.

Crystal, a high grade glass, is stable and affected the least of the above materials by temperature and is more permanent from the standpoint of freedom from warping. However, it is very delicate and susceptible to chipping and breaking. Some clarinetists also feel that these mouthpieces have a "tendency to blow stuffy."27

Some molded rubber mouthpieces (less expensive than the rod rubber) are manufactured with special care and are quite satisfactory. Still, comparison of the two rubber materials would indicate that rod rubber is the best material primarily because of the accuracy in manufacture and stability in use.

Rubber rod is formed under intense pressure and might be compared to the forging of metal, while molded rubber would be comparable to cast metal which never has the strength and the density of forged metal.28

---

27Spicer, op. cit.

FIGURE 18
PARTS OF THE MOUTHPIECE
DESCRIPTION OF MOUTHPIECE PARTS

The following are the parts of the mouthpiece. (See Figure 18, page 50.) Knowledge of them will facilitate this discussion and other inquiries about mouthpieces. They are standard terms.

FACING. The first consideration is the facing. The facing is the entire area against which the reed rests. It consists of the curve or opening formed on the side rails of the mouthpiece. Thus, the facing includes the flat part (table) that touches the reed, the resistance curve and the tip opening. A synonymous term, "Lay", may be used to designate the resistance curve and the tip opening.

RESISTANCE CURVE. The resistance curve extends from the tip of the mouthpiece to the place where the reed and mouthpiece meet.

TIP OPENING. The tip opening is the space between the tip of the mouthpiece and the tip of the reed.

TABLE. The table is the flat portion of the mouthpiece against which the reed is held by the ligature. The table must be perfectly flat to assure that the reed will seal properly. Exposure to heat or prolonged use will warp the table or cause little "ripples" to appear. To work effectively the table must be ABSOLUTELY flat.
Bore. The bore is the inside portion of the mouthpiece at the tenon end joining the instrument. Its dimensions must match the dimensions of the instrument bore.

Tone Chamber. The tone chamber is the upper portion of the inside dimensions of the mouthpiece. Its proportions will greatly affect tone quality.

Tip Rail. The tip rail is the ridge at the tip of the mouthpiece against which the reed will vibrate. It must be neither too thick or too thin.

Baffle. The baffle is the section of the mouthpiece wall just inside the tip rail.

MOUTHPIECE CHARACTERISTICS

A poor facing will affect intonation, limit the response and influence the tone quality of the clarinet. In addition, a poor facing will make the fitting of reeds difficult. There are three types of mouthpiece facings; long, short, and medium.

A long (German) facing favors the low notes and thus makes the high ones more difficult to get. Because this mouthpiece is hard to control the embouchure is apt to tire

sooner. The pitch tends to be wild and it requires a larger air stream.

The other extreme, the short opening, reverses the responsibilities of the player. The lip is given more rest but more control must come from the breath support. A short staccato is a risky business on this facing. The sole advantage of the short facing is that high notes are easy to reach.

A compromise between the two, a medium (French) facing, is best for most people. It makes available both extremities of the range, can be controlled with the least effort and opens up reed selection.

Another facet of the facing, the curve, has an effect on both the sound and the player. The four principle types of mouthpiece curves are illustrated in Figure 19.30

---

The "curve" in illustration "A" (not a curve at all but a combination of flat areas) will present a reedy sound with the average reed. Also the player will have difficulty developing a good embouchure with this mouthpiece.

Type "B" will allow the reed to vibrate nicely from 'y' to 'w' but it cannot vibrate with ease, especially pianissimo, beyond this point. This makes necessary a reed with an extremely flexible tip in comparison to the body of the reed. Such disproportion in the reed will encourage squeaks or chirps on staccato passages. The mouthpiece will have too much resistance.

The curve at 'x' in type "C" allows the reed to start vibrating instantly but it is halted when it hits the flat section between 'x' and 'y'. For the best results the reed should be able to continue vibrating on around a constant curve. Because this curve has disappeared the reed slaps at the tip rail and has an edgy or "buzzy" tone.

The best is a plain, even but gradual, curve as shown in type "D." This produces the right amount of resistance and allows the player to sustain long passages with a minimum of fatigue. This curve produces clarity of tone and evenness of scale throughout the range of the instrument.

The baffle has much to do with the tone quality. A low baffle (concave or hollow and curved) will produce a "dark" tone. If too deep however, the tone will become
"stuffy" and "tubby" and will project very poorly. For the majority of players it creates too much resistance and makes the reed feel stiff and hard to blow. A high (convex) baffle is usually characterized by a pronounced edginess of sound. Although the projection is good, the tone is likely to be nasal.

A compromise between these two, a baffle neither too high nor too low, is suited to the majority of players. The tone quality is desirable and it makes possible a good sound and attack in all registers. 31

The tip-openings are generally classified as open, close and medium. The open tip indicates a greater distance between the tip rail and the tip of the reed. In cases where the lower lip is extremely thick or heavy this opening may be necessary. For the average player the wide opening requires excess lip pressure. Other disadvantages are that it is harder to fit with reeds as they must be very soft and will wear out faster, that low notes are harder to produce and that it has poor projection of tone.

The close tip with little distance between the reed and the tip rail is ideal for the mature player that wants a mouthpiece with delicate attack and finesse. The close opening puts the immature player at a disadvantage however because it requires a stiffer reed, with a tendency to chirp and it lacks volume.

31 Ibid., Part III, Woodwind, IV No. 8 (April, 1952)
Again, moderation between the two extremes seems to be best for all-around work. The response is good and the player has control over volume.  

A thickness of one-thirty-second of an inch at the tip rail is recommended. A thin tip rail is fine for the players specializing in staccato but has a rather thin tone and has a tendency to chirp or squeak. The reed should strike the full width of the tip rail. For the tip of the reed to undershoot the tip of the mouthpiece may have the same effect as a thin tip rail. The thick tip rail will be fine for pianissimo playing but will respond sluggishly.

Generally, we may list common mouthpiece troubles with the possible sources of the difficulty.

Mouthpiece squeaks:
- Tip rail too thin, chipped or with a "bump" or "dip"...
- Warped facing...
- Curve too flat ..
- A convex curve on the baffle near tip rail...

Blows hard or stuffy:
- Tip rail too wide...
- Long concave curve on baffle...
- "Break" (where reed leaves mouthpiece) too near tip...

---

32 Ibid., Part IV, Woodwind, IV No. 9 (May, 1952)
33 McCathren, loc. cit.
Blows rough:
  Lay too long or too open or both...
Entire curve of lay too flat...
Concave curve in the baffle...
Makes instrument sharp:
This is due to improper manufacture of the tone chamber. The chamber may be too small or too short and lack the proper taper.

SELECTING MOUTHPIECES

A mouthpiece cannot fairly be accepted or rejected until it has been played several days with a variety of reeds. When playing on the mouthpiece alone it should be possible to produce the concert C'', two ledger lines above the staff. Because the throat register uses a relatively short length of the clarinet tube it will reflect intonation discrepancies of the mouthpiece to the greatest extent. Intonation of the throat tones may be checked by playing slow octaves through the throat register. (Figure 20) This is also a good method of determining if the mouthpiece matches the instrument.  

This great variety of distinctive features in part indicates the efforts of manufacturers to make available to players mouthpieces which will suit their individual needs

34Ibid.
and embouchure. It is unlikely that dance men and symphony
or legitimately schooled clarinetists will seek the same tone
characteristics. School directors however, will probably
discover that the intonation, balance and blend of their
clarinet sections can be greatly improved by using matched
mouthpieces.

![FIGURE 20](image)

EXERCISE FOR CHECKING INTONATION
OF MOUTHPIECE

A statement supporting use by the entire section of the
"French" lay (medium length and tip opening) by Don McCathren:

The fallacy that each performer must have a mouth­
piece which is tailored for his own personal physical
characteristics was exploded by the clarinet section
of the famous Garde Republicaine Band of Paris which
toured our country in 1953-54. In this great band,
where each clarinetist is an accomplished artist, the
great majority of players used the same mouthpiece
with the same identical facings. The muscles which
make up the embouchure are actually quite flexible
and are readily adopted to a good standard facing.35

---

35Ibid.
The following is a similar endorsement by George Waln.

I think there is a great deal to be said for the plan of using the same type and facing on a mouthpiece for the entire clarinet section in your band. There can be a threefold advantage from such a plan:
1) greater likeness of tone quality and blending;
2) better tuning;
3) greater ease in the selection of reeds.36

Individuals may not be able to obtain good results with a standard mouthpiece because of physical characteristics. The difference may be a marked receding or protruding chin.

New "student-grade" instruments often come equipped with mouthpieces that are unappropriate to student use or the standard embouchure, the lay being too long and open. Some frequently recommended mouthpieces are:

Woodwind: B6, B7, K9 or G7
VanDoren: No. 2 or No. 2RV
Selmer: S or HS
Penzel Mueller: No. 3
Bonade: 7 1/2

CARE OF THE MOUTHPIECE

The mouthpiece should be swabbed after each playing session with a soft cloth or chamois. A small accumulation of dirt in the tone chamber can change its blowing qualities. The mouthpiece should be washed frequently (this cannot be stressed too emphatically) in luke warm water and castile soap.

36George E. Waln, "Are You Intonation Conscious?" Instrumentalist, X No. 6 (February, 1956), p. 34.
Avoid hot water, acids or chemicals as they are liable to loosen the cork, discolor or warp the mouthpiece.

When the mouthpiece is replaced in the case, the ligature should not be tightened but should fit loosely. A cap will help protect the facing and the tip of the mouthpiece.

Warpage will be the result of leaving the mouthpiece exposed to unusual heat such as a radiator or the sunshine.

A director should carefully consider the mouthpieces being used by his students. Any number of "bugs": intonation, squeaks, inferior tone quality, lack of response and poor embouchure may be traced back to the mouthpiece.
CHAPTER VI

BREATH SUPPORT

Full-bodied, resonant tone, intonation, and precise articulation; those facets of clarinet playing that represent the difference between a musical performance and an unmusical one are ultimately founded in the support of the breath. The most mature embouchure is negated to uselessness without adequate breath support behind it for the production of the tone. The breath is the tone; the embouchure regulates the quality.

As a means to an end the posture must be erect, but relaxed. Slovenly posture very nearly makes correct breathing impossible. Also, in order to preserve the stability of the embouchure, as well as the linear qualities of the music, the breath must be taken (snatched, as it were) from the corners of the mouth without removing the clarinet from the mouth.

Breathing is a natural phenomenon but unfortunately it is exceptional students that do not set about to alter the normal procedure when they start to blow an instrument. These same students probably breath very comfortably when they are sleeping or whenever they are not consciously working at it. Nevertheless when a big breath is required, they associate this effort with an expanding chest and lifting shoulders.
The breath must be taken "down deep" rather than high in the chest. It must be diaphragmatic breathing and employ the dear capacity of the lungs.

The diaphragm is a muscular membrane just below the ribs that separates our internal organs from the lungs. Ordinarily it is dome shaped but in deep breathing it flattens out with each intake of air. Its strength and the proper volume of air will allow the student simply to release the air or "breathe" into the instrument. For a student to try to project a tone using only breath swallowed in the throat or upper lungs and not coming from the diaphragm is as unreasonable as to attempt a basketball pass using only the hand and wrist, ignoring the available strength of the arms and body.

If the breathing resources are being utilized fully there should be a feeling of expansion around the lower ribs and especially in front, just above the belt. Students sometimes breath as if the lungs were hung up-side-down, that is, larger at the top than they are at the bottom. The opposite is true. What should happen is that they spread the rib cage, drop the floor (the diaphragm), and fill that space with the expanded lungs.

To help the students consciously to experience this breathing the director may suggest they place their doubled
fist over the diaphragm and feel the expansion. The deep
breath may be thought of as breathing from the stomach. The
effect of a sudden gasp, not unlike a startled or frightened
exclamation, will be felt in the diaphragm. If when at home,
the students will lie on the floor and breathe deeply they
will probably feel the proper expansion. As another means of
illustrating this concept of breathing the students may sit
with their feet flat on the floor, knees close together, the
chin in the palms of the hands and reaching out with their
elbows on their knees as far as they can. While in this
doubled up position the students gasp suddenly. The only
place that they can breathe, if they gasp suddenly, is from
the bottom of their lungs.

Having obtained the "breath" the next step is to con­
trol it. Students do not use enough air pressure to produce
a beautiful tone. Abato says, "One should have the feeling
of blowing against a wall." This feeling of resistance or
pressure is a combination of air deep in the lungs and the
focus of that air by the tongue and the throat into the
mouthpiece. It is insufficient and misleading to tell the
students to "blow-harder." If the air is not focused and
under pressure the tone will spread and cause the pitch to
flatten.

37Vincent J. Abato, "How to Develop a Good Clarinet
The tone is not controlled by how much air is used but rather how it is used. The effect of creating pressure in the air stream may be demonstrated by blowing against the palm of the hand. First, one blows lightly, with the lips loose. The second time, one uses the same amount of air but puts it under pressure by forcing it through a small opening in the lips. The effect will be felt on the hand. The difference between the strength of the air stream when it is not under pressure and when it is is like the difference in strength of water from a garden hose—once with the nozzle on spray and again with the water forced into a concentrated stream.

The tongue is the principle means of putting this pressure or resistance into the air column. It serves a dual purpose; the middle portion maintains a constant pressure on the air stream while the flexible blade concentrates and directs the air toward the tip of the reed and into the mouthpiece. When the lungs are full, the tongue against the tip of the reed seals off the air stream. This creates a degree of back pressure so that when the tongue, acting as a damper, is moved, the air is projected from the lungs, steadily but without forcing.

---

38 Napoleon Cerminara, *First Principles of Clarinet Tone Production*, a pamphlet (Kenosha, Wisconsin: G. Leblanc Company) 1950.
The air stream sets into vibration the reed which in turn causes the motion of the air column on the clarinet which produces the sound. A steady air stream is necessary. Dips and sags in the air stream will result in corresponding "dips" and "sags" in the tone. For this reason the diaphragm should be kept firm and not allowed to "cave in." A certain amount of air should be kept in reserve. One should never have the feeling of exhaling completely.

A more mature tone will result if the concept of blowing faster and faster is kept in mind.

Influence of good breath support on the tone may be illustrated by comparing two playings of a note in the chalumeau register. The first time the tone may be played without any special preparation. Then play a high note that requires good breath support. Following this, play the low note again using the same pressure as was needed for the high note.

The student may work on the development of breath support by practicing exercises with slurs, especially from the chalumeau register into the clarion register. Another exercise that will demand proper breath support is to start playing with a full dynamic and diminuendo on a sustained note. It takes more breath and a firmer embouchure to maintain a soft tone with fine quality. This exercise will teach
the student to draw out his tone into a fine pianissimo without the appearance of "fuzz" and a "mushy" feeling.

The development of fine breath support is the key to all other aspects of clarinet playing. If breath support, the combination of full lungs and a concentrated air stream, is neglected the consequences will be sagging pitch, undesirable tone quality, indistinct articulation and inadequate phrasing.
CHAPTER VII

THE EMBOUCHURE

There is much confusion among clarinetists, especially at the advanced performing level, as to which of the two prevalent embouchure styles is superior, the single-lip embouchure or the double-lip embouchure. With proper application the two styles are almost equally desirable.

Some writers claim that the double-lip embouchure provides a more uniform and elastic ring around the mouthpiece. The single-lip embouchure is criticized as producing a slightly less mellow sound. Conversely, the double-lip style of playing is criticized as being too flute-like in tone quality.

DESCRIPTION AND HISTORY OF EMBOUCHURE STYLES

The double-lip embouchure, the "French" method, is used at the National Conservatory in Paris and at the Royal Conservatory. Both the upper and lower teeth are covered by the lips to keep the upper teeth from touching the mouthpiece and the lower teeth from touching the reed.

The national "names" assigned the various styles of embouchure no longer indicate geographic limitations but serve only as a convenient means of identification.
This is the oldest embouchure, going back to the primitive Chalumeau which was played with the reed on the upper lip. When Denner created the clarinet, players simply transferred the Chalumeau embouchure. In 1831 the double-lip embouchure with the reed resting on the lower lip was introduced at the Paris Conservatoire by Frederic Berr, a teacher there. Clarinetists accustomed to playing with the reed on the upper lip naturally continued covering the upper teeth even though the mouthpiece was now turned over. Clarinetists throughout Europe followed this tradition.  

A small group of Italian clarinetists have preserved the older style. There are still some who play with the reed on the upper lip.

A combination between the single-lip and the double-lip embouchure described as the "upper teeth and lower lip method" is apparently used by a very few players. In the "German" embouchure the lower lip supports the mouthpiece but never covers the lower teeth. It is placed against the reed outside and beyond the line of the teeth. The upper teeth rest firmly on the mouthpiece. This embouchure requires tremendous strength and a great deal of practice to maintain.

---


The single-lip embouchure has only the lower teeth covered with the lip to provide a cushion for the reed while the upper teeth rest directly on the mouthpiece.

This method originated in Germany in the middle nineteenth century. The greatest exponent of the style was Carl Baermann, a virtuoso clarinetist and the author of method books still used and frequently recommended by clarinet teachers. The advantages of the single-lip embouchure were greater player endurance and better dynamic facility.

For the school music director the ease of teaching single-lip has made the double-lip style somewhat suspect. The vast majority of school clarinetists use the single-lip embouchure. It presents a sturdier scaffolding for the embouchure, the muscles may be developed with greater ease and less consideration of physical characteristics such as sharpness and length of upper teeth is necessary. In addition, it is capable of producing a big, beautiful tone.

COMMON EMBOUCHURE ERRORS

The clarinet embouchure, the formation of the lips, teeth and tongue on the mouthpiece and reed, is an unnatural position and cannot be acquired by accident. The most important embouchure lesson is the first one when the entire pattern is new and must be learned. Establishing correct habits is easier than changing poor habits of embouchure.
If correct habits are established in the beginning the student will find the development of tone production, articulation and mechanical dexterity relatively simple, progressive steps in their technique.

Frequently observed embouchure errors are:

1. bunching the muscles of the lower lip and chin and attempting to control the reed by biting, especially in the upper register;
2. pulling the corners of the mouth back as in a hard smile, causing a "pinched" tone;
3. rolling the lip too far over the teeth;
4. allowing the cheek muscles to be loose and "puffy";
5. neglecting to rest the mouthpiece firmly against the upper teeth;
6. holding the instrument at an incorrect angle causing the lower lip to rest too close to the tip of the reed thus producing a "pinched" tone.

The foundation from which these problems must be resolved is the way in which the instrument is put in the mouth.

CONSTRUCTION OF A PROPER SINGLE-LIP EMBOUCHURE

The following discussion does not necessarily take up the various aspects of the embouchure in the order of their importance. Rather, it is commenced with the things that are
most obvious, visually, and proceeds to the least tangible, the formation of the throat.

**Angle of the clarinet.** Generally, the clarinet should be held at a 30° to 45° angle from the body. This position will direct the air stream at the reed instead of directly down into the mouthpiece. Experiment by raising and lowering the clarinet as a tone is sustained. The differences in quality at various angles will be very noticeable. Of course, the head must remain straight and not "see-saw" with the instrument.

Often the clarinet is held too high and the head too low. This causes the mouthpiece to enter the mouth with the upper teeth opposite the lower jaw. A comparison of the two illustrations in Figure 21 will show that when the pressure of the lower lip is opposite the upper teeth a shorter portion of the reed is left free to vibrate than when the instrument is in correct position. In addition, the incorrect position will require a stronger reed. When the head is up and the clarinet down more reed is placed in the mouth. In this position the lower jaw is farther down onto the heart of the reed and allows for use of a softer reed with greater vibration and liveliness of sound.
FIGURE 21
EFFECT OF CLARINET ANGLE ON LENGTH
OF "FREE" VIBRATING REED
Upper Teeth and Size of Bite. The amount of mouthpiece put in the mouth will vary with individuals but will probably be from three-eights to one-half inch. That is, so that the upper teeth come in contact with the top of the mouthpiece about that distance from the tip.

Often, even though this bite is taken, the amount of "free" reed in the mouth is very small. Instructing the student to move his lower jaw outward and downward on the reed will greatly improve the tone.

If the teeth are too close to the tip of the mouthpiece the tone may be small and pinched, although sweet. If squawks are frequent the student may try putting the upper teeth slightly nearer the tip of the mouthpiece.

The support of the instrument against the upper teeth is very important and should be stressed. This is not to imply that the upper teeth should be allowed to "bite" into the mouthpiece but simply that the thumb of the right hand should hold the clarinet firmly against the upper teeth so that it cannot wobble in the mouth.

The lip should fit snugly against the upper teeth so that no air can get between the two.

The Lower Jaw and the Lips. The lower jaw is perhaps the paramount element in proper embouchure. To discuss the respective roles of the lips and the lower jaw is difficult
because in application they cannot be separated. Each depends upon the other. The smooth, pointed chin is the corner-stone of good embouchure.

The reed is not supported by the lower jaw. The support must come from the pucker of the muscles in the lips.

A good embouchure may be likened to a flexible ring, cushioning and supporting the mouthpiece and reed in the manner of an elastic band. Simply, the embouchure must hold the mouthpiece as a rubber band would, from all sides; not as a pliers, with pressure on top and bottom.

The most difficult problem is to acquire a firm, pointed chin with the reed resting on the red of the lower lip. A basic idea of the fundamental embouchure may be had by blowing a thin, intense stream of air at the palm of the hand.

The lower lip is stretched over the lower teeth but only slightly over them so that about half of the reed lip will remain exposed. (Figure 22) The lip must be tight against the teeth to avoid an air pocket between the lower teeth and the lip, and only slightly over to avoid interference with the reed vibration. The reed cannot vibrate freely on a loose, flabby lip.

---

\[42\] Cerminara, op. cit.
The chin or lower jaw must be pointed slightly forward and down as a means of keeping too much lower lip from under the reed. A device used by Mr. Keith Stein of Michigan State to correct the lower jaw is to have the student place the thumb in the mouth, form the embouchure and suck in. The idea of pressure from all around the mouthpiece as well as the pointed chin may be gained.

Palmer suggest that as much of the lower lip as possible be placed in the mouth. (This is without the instrument.) Then the upper teeth are closed down tightly on the lip and the lower lip is slowly withdrawn until the upper
teeth are biting against a small remaining portion of the red part of the lip.\textsuperscript{43}

A muffled tone is often due to the player having too much lip drawn over the lower teeth. Too large a fold of lip then lies against the reed and interferes with the vibration. Players with full lips should be particularly careful not to cover their teeth with more than half of the lower lip.

The lower lip should come in contact with the reed approximately where the lay begins. That is, where the curve of the mouthpiece facing begins to separate from the reed.

Edwin C. Kruth suggest the following technique in helping the student develop a proper concept of embouchure.

Place the mouthpiece and reed in the student's mouth with the portion of the thumb between the first joint and tip under the reed directly against the student's lower jaw just below the lips. This will assist the student in keeping the lower jaw flat and pointed. By this technique the instructor may also check the pressure of the mouthpiece against the upper teeth, which is exerted by the student's right thumb against the thumb rest, and the pressure against the reed by the lower jaw.\textsuperscript{44}

The direction of this quotation is not immediately clear.

The contention here is that the reed is controlled by a combination of muscular support (around the reed) and a slight

\textsuperscript{43}Harold G. Palmer, \textit{Teaching Techniques of the Woodwinds}, (New York: Belwin Inc., 1952)

forward pressure of the jaw and that the mouthpiece is not secured by the "biting" action of the embouchure.

The important aspects of embouchure are illustrated in Figure 23. Note particularly that the lips contract with a uniform elastic pressure—the corners of the mouth should not spread apart. Spreading the corners of the mouth would mean that the pressure against the mouthpiece would have to come from the teeth or jaw either of which would prevent the reed from vibrating freely.

![Figure 23](image_url)

**FIGURE 23**

GRAPHIC REPRESENTATION OF THE CLARINET EMBouchURE

The diagram also emphasizes that the chin is flat and pointed. The muscular support to the mouthpiece is applied equally from all sides of the mouthpiece.
The mental pronunciation of two vowels may help build a concept of embouchure. Setting the mouth to form a hard "ee" will point the chin and draw the lower lip tightly over the lower teeth. With the chin retaining that position, the vowel is changed to "oo" as in 'food.' This will press the corners of the mouth toward each other. A feeling of tightening and lifting the muscles of the cheeks may also help obtain the feel of the embouchure.

In addition to allowing more freedom to the reed, this aspect of the embouchure will eliminate air leakage around the sides of the mouthpiece and will promote a balanced register from the bottom to the top.

The use of a mirror in practice sessions will greatly help the student mold a proper embouchure. The aim is that the student soon begins to associate quality of sound with proper embouchure.

The Cheeks. The cheeks should never be permitted to "puff" out. They should be held as if you were inhaling despite the fact that you are blowing out. A feeling of "lift" in these muscles will help the formation of the embouchure.

If the cheeks are "puffed" out, the embouchure has been distorted. Proper control of the lip muscles is impossible if the cheeks are distorted.
FIGURE 24

THE PROPER EMBOUCHURE

UPPER TEETH APPROXIMATELY 1/2 TO 3/8 INCH FROM THE TIP OF THE MOUTHPIECE

UPPER LIP FLAT AGAINST TEETH

DIRECTION OF SUPPORT WITH JAW - JAW SLIGHTLY FORWARD AND DOWN IN DIRECTION OF ARROW -

ONE-HALF OF RED PART OF LOWER LIP OVER TEETH
The Throat. A relaxed and open throat is essential in all wind instrument playing. The silent pronunciation of the sounds 'long o' as in 'old' or the sound 'yaw' may help open the throat chamber. Clarinet players can relax the throat by playing low E. This gives a feeling of how the throat should be.

Figure 24, page 79, reviews some of the physical features of proper embouchure. An even more essential aspect of course, is that the students know what they are seeking and have the opportunity to hear fine clarinet tone quality either through demonstrations or the medium of recordings.

Excellent ensemble albums are sponsored by either the Leblanc or Selmer Instrument Manufacturing Companies. Some suggested clarinet artists and the labels for which they record are:

Reginald Kell, DECCA
Sidney Forrest, LYRICHORD
Rudolpf Jettel, VOX
Benny Goodman, (The Copland Concerto) COLUMBIA
Gervase DePeyer, LONDON
Jos D'Handt, MUSICAL MASTERPIECES SOCIETY
Richard Schonhofen, EPIC
Simeon Bellison, CLASSIC EDITIONS
Alois Heine, PERIOD
Franz Hammerla, URANIA
CHAPTER VIII

EQUALIZATION OF THE REGISTERS

THE PROBLEM

The teacher should approach any attempt to equalize the clarinet registers with a great deal of caution. Whatever changes that may be necessary to assist a continuous and homogeneous sound from one end of the range to the other are so subtle, if the instrument is in good condition and proper embouchure and breath support are used, as to practically defy description.

The principle rule for equalization of the registers is that the player does not employ excessive lip pressure in any register of the clarinet. Squeaks or mistakes are often made by trying to compensate for a problem. Examples of these errors are: excessive changes in the embouchure or breath support, tightening the throat, alteration of the tongue movement, grasping the instrument tighter, or a combination of any of these things.

Abato states, "It (the embouchure) must be flexible and capable of adjusting quickly to the various registers of the clarinet." The pliable embouchure is necessary to achieve good intonation and uniform tone quality throughout
the entire range. The clarinetist should have the feeling of lifting the muscles for high notes and dropping them for low ones. "One should have the feeling of ascending and descending with the embouchure muscles."^44

Conversely, Spicer claims that "the same embouchure and same breath control is needed for every note on the instrument."^45

The actual situation is most clearly described by Wagner.

Lips and facial muscles do not change appreciably in playing different notes on the clarinet; however, one may have to make slight adjustments to compensate for different wind pressures and different registers of the instrument.^46

Skipping from low to high notes, or vice-versa, may be facilitated by mentally saying "tah" for the low notes and "tee" for the high notes. The tongue fixed as if saying "tah" brings down the floor of the mouth making a large rounded cavity accommodating a low tone. The formation "tee" raises the tongue causing a smaller cavity and gives air added speed and force needed for high notes. These changes are very slight.


^45Randal Spicer, "Problems in Developing the Clarinet Section," Music Notes, (March, 1955), ( Mimeographed.)

The areas of the clarinet range often difficult for students are the high notes and the "break" (the span from the throat tones which use only a short tube to B' and C'' for which the entire tube must be filled with air). The essence of the problem is not that a great deal more breath pressure or embouchure tension is needed for these higher notes than for the remainder of the instrument, but that not enough breath support or embouchure has been used for the easy notes.

THE "BREAK"

Students sense difficulty in moving from open G to C''. In order to try to correct the difficulty they grasp the instrument harder, causing the instrument to move in the mouth. This creates a disturbance in the embouchure and contributes toward a "break" in the flow of sound. At the same time they allow the breath support to sag until C feels secure and then increase it again. Simultaneously, they "reach" (bite) for C with the embouchure also contributing to a "break." If the breath support and embouchure is adequate (especially the breath support) the transition will be relatively smooth and the student will not feel as greatly the need to compensate for the change. The open G must be blown as if it were B', with the entire horn to fill, as far as breath support goes. A STEADY stream of air is essential.
For smooth connection the "right-hand-down" rule should be applied in moving over the break. (See Chapter X, Mechanical Skills.)

The clarion register should be played before the "break" is attempted by the student. This may be done by playing low A; depressing the register key and producing E. The same procedure may be followed on neighboring notes. The very low tone, F to C'' and E to B' are used last. By learning the clarion register first the "break" can be introduced by descending motion (C-B-A) as it should be, instead of ascending (A-B-C). This will eliminate much of the resistance associated with the "break."

THE HIGH REGISTER

"Biting" the mouthpiece is frequently the result of too much emphasis on high notes in the first lessons, reeds of incorrect strength or a poor mouthpiece.

The beginning student should be kept in the low register until the embouchure is of sufficient strength to handle the high notes. The "feel" of the embouchure should be fully developed so that it can remain virtually the same throughout the range of the instrument. To enter the upper range too soon will encourage the substitution of "bite" for embouchure strength. This may ultimately destroy the embouchure and cause the other registers to suffer also.
An important function of scale playing, according to Tenney, is that of stretching the corners of the mouth slightly wider apart as the higher register is approached (about $G\,$). Many students "bite" the mouthpiece harder in order to play in this register. Gradual stretching will do to give proper control and will help eliminate the undesirable "crying" in the upper register.\(^{47}\)

THE THROAT TONE PROBLEM

Factors contributing to the effectiveness of the throat tone register are the position of the left hand and knowledge of alternate, resonance fingerings. The tone quality of $A$ and $B^b$ in the throat register is frequently dull and breathy. The player may experiment by adding one or more fingers in the left hand and/or the right hand as illustrated in Figure 25 when playing $A$ or $B^b$. The best combination for each student will have to be determined experimentally. Naturally, these additions are for slow passages where the throat tones are conspicuous.

Use of the side $B^b$ should be encouraged as this fingering produces a more resonant tone than the ordinary fingering.

The effectiveness of these resonance fingerings will vary from instrument to instrument, however, "right-hand-down" is generally good on all clarinets.

FIGURE 25

ALTERNATE RESONANCE FINGERINGS
CHAPTER IX

TUNING AND INTONATION

A musical performance cannot be divorced from good intonation. The essence of correct tuning is that the player knows what he wants and is able mentally to hear the pitch desired before the sound starts. It is well for the director, in tuning an ensemble, to remember that the great majority of individuals can hear correct pitch only in relation to interval. An isolated pitch is not an adequate tuning device. Band intonation will benefit greatly if, in the time dedicated to tuning, intervals, both melodic and harmonic, are played in addition to unisons. This lessens ear fatigue that results from repeatedly sounding one note and denies credence to the idea that "my C is in tune; the whole instrument must be right."

TUNING THE CLARINET

The prevalent practice of tuning only to C" or Concert B♭ is not satisfactory for clarinets, especially with young players. That C, by the character of the instrument, has a predilection to sharp. The throat tones will sound very sharp (using a shorter amount of the tube) even though the C may sound correct played enmasse.

- 87 -
Fine clarinets are manufactured to tune at A -440 at a room temperature of 68° to 72°. Some student clarinets are manufactured at a sharper pitch to compensate for the weak embouchure of the beginning player. These instruments will cause a good deal of trouble for ensemble intonation and in the development of the clarinet student. If the player does not need a firm embouchure to play in tune, it is more difficult to get him to develop the firm embouchure needed for a beautiful tone. Metal clarinets are often pitched considerably above A -440 to allow them to come up to standard when the instrument is very cold. As the instrument warms, the pitch deviates to a still greater degree.

The tuning procedure for good instruments is to tune carefully to open G' by pulling the barrel joint the appropriate amount. "Do not pull the mouthpiece for this causes more distortion than pulling the barrel joint." When the instrument has warmed to room temperature, C'' (third space) is sounded. Usually it will be in tune. If it is sharp the barrel joint should not be pulled any more because the throat tones will thereby be pulled flat, especially when playing loudly.

49Ibid.
Rather, the middle joint should be pulled a little. The third line B natural may be tuned, if sharp, by pulling the bell joint of the instrument. However, if it is necessary to lengthen the instrument excessively a new barrel joint of correct length should be obtained.

The remainder of the task is for the individual player to listen and favor the pitches in relation to the whole. If the player cannot determine whether very close pitches are sharp or flat he may develop the ability to recognize pitch color. Sharp pitch may be described as bright, harsh, shrill or strident; flat pitch as dull, empty, thick or sluggish. This device is especially useful with young players.

REASONS FOR POOR INTONATION

Conditions other than faulty tuning of the instrument may contribute to poor intonation.

1. Faulty tuning of the instrument--

2. Poor embouchure and breath support--

The importance to good intonation of proper fundamental embouchure and breath support training cannot be over emphasized.

It is a fallacy to think one will lower a sharp note by easing the breath support. One can favor down on a note with his embouchure only by exerting solid breath support. Experiment by playing B natural softly (first ledger line below the staff) and try
lowering the pitch without the aid of solid breath support. I doubt if it can be done. The reed will stop vibrating.\textsuperscript{51}

The breath support must be constant. It is the tone; the embouchure; the pitch.

3. The effect of temperature on intonation--
A cold instrument sounds flatter than a warm instrument. One member of the group will warm his instrument while another will not.\textsuperscript{52}

4. The natural tendencies of the instrument--
The clarinet, by its construction, tends to be sharp at the bottom and flat at the top of the range. The greatest inherent intonation discrepancy is caused by the "one-speaker-hole" malady. This is because the single octave key must serve several different tones. The result is a warped second register, generally flat from C'' to A''\textsuperscript{53}.

\textsuperscript{51}George E. Waln, "Are You Intonation Conscious?," \textit{Instrumentalist}, X No. 6 (February, 1956), p. 34.

\textsuperscript{52}Temperature affects the velocity of sound; waves travel faster in warm air than in cold air.

5. Pitch changes within the dynamic range--

These changes are especially acute for the young players without fully developed embouchure. When played loudly the clarinet will tend to go flat. When the dynamic level is soft the pitch may go sharp. This is probably because at 'forte' the player feels the reed begin to choke and automatically loosens the embouchure slightly. Also, at a loud dynamic there is a false sense of security as regards the tone. A firm embouchure does not seem as necessary. When playing 'piano' it is much easier to pinch the mouthpiece and thus close down the volume than to control the larger muscles of the breathing apparatus that should manage the diminuendo. The result is sharp pitch. The cause in either case is improper control of the embouchure.

To maintain the correct pitch of any sustained note, it is absolutely necessary for the lips to keep the same tension around the mouthpiece as the tone increases or decreases in volume. Any tightening or relaxing of them will result in a change of intonation. 54

This, of course, puts the responsibility on proper breath support.

Abato suggests that as a means of avoiding this common fault of playing flat in 'forte' passages and sharp in soft passages that embouchure flexibility and dynamics be

54Tenney, loc. cit.
parallel. The clarinetist starts the air slowly through the instrument with a loose embouchure. Then he increases the air pressure and embouchure proportionally. As the tone increases in volume, the embouchure increases in firmness. As the tone diminishes, the embouchure is loosened.\textsuperscript{55}

Both of the last two items (4 and 5) are aggravated in ensemble because the natural inclination of the flute is the opposite.

6. The influence of dissimilar instruments, mouthpieces and reeds--
The effect of different instruments and mouthpieces on intonation is discussed in their respective chapters. Generally soft reeds will tend to be flat while hard reeds are inclined to be sharp.

7. Poor fingering choice--
Alternate, tonal, fingerings are available on the clarinet which greatly affect the pitch of notes. (See Chapter X and the Fingering Chart.)

No amount of preparation or "fiddling" can completely lick the intonation problem. The final and only ultimate solution is for the student to learn to listen and favor the pitch with his embouchure or by means of alternate fingerings.

Most of the faulty intonation by a player, whether alone or in a group, comes from his lack of listening. He

\textsuperscript{55} Abato, \textit{loc. cit.}
must hear the pitch level and then do something about it by favoring his own pitch up or down. He can do this with the aid of the embouchure, the breath and the throat.\textsuperscript{56}

As a means of teaching this, students may be asked to favor notes OUT of pitch. This will emphasize the control the embouchure, breath and throat have over pitch and draw attention to the "beats" that identify notes out of pitch.

The writer feels that this suggestion to "favor" the pitch must be offered with qualifications. The clarinetists in question must be relatively mature in embouchure and breath support. The clarinet section is frequently the despair of band audiences because of its poor intonation. In the majority of cases the answer is ABSOLUTELY NOT the ability to "favor" notes--it is to develop proper fundamental concepts of breath support and embouchure.

\textsuperscript{56}George E. Waln, "Careful Listening Means Better Intonation," \textit{Instrumentalist} IX No. 7 (March, 1955) p. 53.
CHAPTER X

MECHANICAL SKILLS

The key to dexterity is relaxation—the attitude of the clarinetist, both mental and physical. Tenseness generally stems from a tendency to grip the instrument or from improper position.

Students will usually discover in learning to relax that if they concern themselves with the general, the specific will take care of itself. The entire body must be relaxed. This is not to intimate slouching. Posture must be erect so the muscles for breathing are free to function. The muscles must be relaxed so that the arms swing freely from the shoulders and the elbows are free from the body. The wrists may be relaxed so that the hands would droop if the arms were raised. The wrists should not be bent (proper hand position will automatically take care of the wrists.) If wrists and forearms are relaxed, the fingers will follow suit.

In a program to improve the clarinet section some of the easiest and fastest improvement is realized if the director determines that all members are holding the instrument properly. Clarinet position has great influence on tone quality, flexibility and control. Generally, the tendency
among students is to hold the clarinet too high and the head too low. When the clarinet is held properly the angle with the body will be 30° to 45°. (See Chapter VII, page 71). Directors should discourage the habits of drooping the head forward or to either side.

FINGER-HAND POSITION AND ACTION

The first point of approach to the development of technique is the position of hands and fingers. This correct hand position involves primarily the placement of hands in a way to allow individual freedom of each finger. To achieve this, the fingers should be curved so that the balls of the fingers rest on the tone holes. Some beginning students will try to use the same finger action they learned on piano, or try to stuff the tone holes with the tips of the fingers. The desired curve is about the same as results when a tennis or baseball is held in the hand.

Holding fingers straight causes tenseness and overshooting of tone holes which may result in squeaks. Also the rounded finger has much more strength and control than one with flat joints.

Precise technic on an instrument with fingers whose joints are collapsed is just as unlikely as trying to write penmanship examples on a blackboard with a twelve inch piece of chalk. 57

The curvature of the right hand depends upon what area of the thumb the thumb rest touches. For the normally proportioned hand the best place is just below the nail base and partly on the joint. Some students have an inclination to slide too much of the thumb under the clarinet. This necessarily will result in either straight or unduly cramped fingers.

For the beginner, the ring and small finger of the right hand may need a conscious effort to be rounded.

The left hand is slightly more difficult to control because it is a free agent, offering less support to the instrument. The key to good left-hand position is the index finger. The first knuckle operates the "A" key--the second knuckle operates the "G#" key. The hand remains poised in this position so that the action required to produce A or G# is no more than a "rolling" of the hand. The index finger need not be lifted from its place above the first open tone hole.

Both the left and right hand should be diagonally across and downward on the clarinet. In this position the joints of the little fingers will be only slightly bent when playing the little finger keys, B and C.

Also deserving special consideration is the position of the left thumb. The object is to cover the thumb hole
and depress the register or speaker key simultaneously. The thumb should be at an oblique angle with the instrument, across the thumb hole, close enough to roll on to the tip of the register key. The actual motion is made only by bending the first joint of the thumb. Thus, there should be no hand or wrist movement. The transverse angle of the thumb will also help maintain correct position of the fingers.

Most difficulties of players are centered around the fingers momentarily not in use. They may curl up and point toward the floor, (especially true of the little fingers), crowd up against the fingers actually in use or stiffen and point up and away from the instrument.

The fingers should never be allowed to leave their positions over the keys. It is appropriate for the fingers to remain above the holes about a half inch away although movement of an inch is not excessive. Close finger action should not be unduly stressed however. An attempt to restrict the motion of the fingers will also restrict the speed. The essential is that the fingers are kept where "their work is."

The movement of each individual finger should be only from the first (hand) knuckle joint and should be made rapidly as possible.

A main difficulty is developing even action of the fingers. Playing with tensed muscles will cause the fingers
to momentarily jump out of control. This can be overcome by slow practice.

Some teachers encourage their students to exercise the individual fingers, as in a trill pattern, while they are resting their lip during practice periods. Also, if the action of the fingers is as rapid and precise as desired, a scale-like echo will be heard from an empty clarinet as the fingers are snapped down, starting at open F and going down to G below the staff.

A review of the general points to watch for in hand position is presented in Figure 26 on page 99.

FINGERING PATTERNS

The basic fingering system of the clarinet is based on the acoustical principles involved in the construction of the instrument. In the bottom or chalumeau register, extending from E to B♭, the whole of the air column in the instrument vibrates in one piece. In the second or clarion register, which extends from B' to C''', the opening of the register key creates a node in the air column causing it to vibrate in three segments. This faster vibration causes a partial to speak, the pitch of which is nine and a half full steps, or the interval of a twelfth, above the fundamental. The high altissimo register repeats the same fingering pattern again except that the first finger of the left hand is raised.
1. Oblique left thumb--
2. Right thumb not too far under the clarinet--
3. Fingers arched slightly--
4. Index finger, left hand, touching A and G#--
5. Little fingers almost straight--
6. Index finger, right hand, diagonal; available to the side trill keys--
7. Tone holes covered with balls of fingers--
8. Both hands slightly diagonal--
This causes the air column to vibrate in five segments with a corresponding jump in the pitch. (Figure 27)

FIGURE 27
THE BASIC FINGERING SYSTEM

There is of course, more than one way to produce most of the notes in the clarinet tessitura. This was, principally, the reason for the eventual acceptance of the Boehm over the Albert or Muller system. Generally these fingerings may be divided into two categories; technical fingerings and tonal fingerings. Where the choice is available, technical fingerings are used in passages when the object is rapid execution. Tonal fingerings have the best tone quality and intonation and are used where those characteristics are more to be desired than facility.

Some of these technical fingerings are encountered in the chromatic scale. Figure 28, page 101, illustrates some of the fingerings used here that may be different than the fundamental fingerings presented in beginning methods. These
patterns allow for the most rapid and fluent execution of the chromatic passage.

FIGURE 28
THE CHROMATIC SCALE

The most important fingerings to be mastered are those of the little fingers. The fingers must never be glided or slid from key to key unless absolutely necessary. Therefore as a general rule, in scale passages of one, two, or three sharps, play E and its twelfth, B, on the left side of the instrument and F# and its twelfth, C#, on the right side in the same keys. Scale passages of four to seven sharps are fingered on the opposite side of the clarinet.
For the school musician, the most frequent application of the little finger cross-fingerings occurs in the key of B♭ Major or wherever the pattern C♭ (third space) to E♭ (fourth space) or its inversion occurs. Here the C must be played with the left hand. E♭ has no alternate fingering.

In a little-finger chromatic passage (a and a prime, Figure 28, page 101) the pattern is left, right, left.

Wherever possible, it is a good practice to play B on both sides, especially in the B to C sequence.

Other examples are shown in Figure 29.

Forked fingerings (b and b prime, Figure 28, p. 101) are valuable in chromatic passages. Their use eliminates the necessity of switching from finger to finger.
The use of side alternate fingerings chromatically (c and d, Figure 28, p. 101) will enable faster action and will logically use the strongest part of the hand instead of the weakest.

Of the tonal fingerings the one to which special attention should be drawn is the throat B♭, third line. The usual fingering creates a note which is fuzzy and indefinite. The cause of this weakness is the placement and dimensions of the register tone hole. In very slow passages the B♭ can and should be played with the A key and the second from top side trill key.

All of the throat tones, G, A♭, and B♭, may be cleared by leaving the fingers of the right hand down.

The Right Hand Down Rule: In passing from a tone that uses the right hand fingers to any of the throat tones or vice versa keep the right hand down while playing the throat tones. In addition to improving the pitch and quality of the throat tones, leaving the right hand down will make the "break" easier for the student.

In the following Fingering Chart an attempt is made to present all of the generally known fingerings for the clarinet. Wherever possible, the most practical fingering from the standpoint of tone quality, intonation and frequent use is presented first. Alternate fingerings follow. It should be understood that the advisability of some of the alternate fingerings will vary from clarinet to clarinet.
FINGERING CHART

a.- b. -- identical in pitch and quality

- 104 -
a. -- poor quality
b. -- best sonority
c. -- may also close right hand
a. -- especially for a soft attack
a. -- flat

b. -- slightly sharper than preceding fingering

c. -- flat
a. -- poor
b. -- use edge of ring, very fine
c. -- very flat on some instruments
d. -- little sharp
e. -- good for rapid scale passages, little flat
a. -- inclined to be sharp

b. -- hard to control

c. -- flat

d. -- or half cover the first hole

e. -- flat
CHAPTER XI

ARTICULATION

Complete mastery of the technical aspects of clarinet playing will be limited by the command of articulation skills. Again, the essential fundamental to the development of facile tonguing ability is proper breath support. All aspects of articulation depend upon a full, steady air stream.

THE ATTACK

Placement of the tongue. A variety of styles of tonguing is in use. One of the more unusual methods is to anchor the tip of the tongue against the gum line of the lower teeth and raise the body of the tongue so that contact is made with the reed at a point approximately one-half inch from the tip of the reed.

By another method, one touches the tips of both the reed and the mouthpiece with the UNDERSIDE of the tip of the tongue. This permits a great deal of nimbleness and rapidity of action but is a method quite difficult to learn.

A frequently used method of tonguing places the tongue against the area of the reed about one-eighth inch from the extreme tip of the reed. The point of contact, made by curving the tip of the tongue downwards, is about one-fourth
inch from the tip of the tongue. "Although it is possible,
by using this indirect stroke to obtain an adequate staccato,
one is apt to discover that the tongue lacks the flexibility
of the former method [he is referring to a method to be men­tioned later in this paper], and is inclined to become heavy,
hindering free response of tone." 58

The remainder of this discussion is based on the
assumption that the tonguing method used would place the
tip, or near tip, of the tongue on or near the tip of the
reed. With this method, or its modifications already enumer­ated, the attack, reduced to its simpliest terms, is the same
as ejecting some foreign article from the mouth off the tip
of the tongue, or the pronounciation of the syllable "tah."

The "French Method" of tonguing favors starting the
note by attacking with the tip of the tongue. The theory
for this method is that a more sensitive response can be
achieved by the tongue's point of contact at the exact vibra­ting point of the reed. In this method the tip of the tongue
projects into the air column exactly at the tip of the reed,
in contact with both the reed and the mouthpiece tips. A
rapid staccato is attainable by this method because of the
light stroke of the tongue.

58Wallace R. Tenney, "The Impeccable Staccato,"
Woodwind, VII No. 1 (September, 1954) p. 4.
A modification of this method that can produce equally satisfactory results will place the tip of the tongue under the tip of the reed from one-sixteenth to three sixteenths of an inch.

Rapidly repeat out loud the syllables "ti-ti-ti." For the average person the top side of the tongue at almost its tip touches the roof of the mouth. The clarinetist's reed substitutes for the roof of the mouth. The top of the tongue at the tip touches the reed either at the tip or a slight distance down from the tip. The point of contact should be kept as close to the tip of the reed as possible.

The sensation of tonguing the inside lip may help to describe the action. Actually the tongue touches the reed lightly.

Care should be taken that the tongue is not allowed to lie under the reed where it will "slap" the reed at a distance of one-quarter to one-half inch from the tip of the reed. This causes a "putt-putt" effect when playing in a series. Also, the pitch will flatten with each stroke and release of the tongue giving a scooped sound. When the tongue projects too far down on the reed, as in the situation described here, there is danger of the throat becoming a tonguing mechanism and altering with each stroke of the tongue.
Steps in Starting the Tone. The initial attack of the tone involves three primary movements. They must be observed until they become automatized and are part of the overall technique.

1. Place the tip of the tongue on or near the tip of the reed.
2. Build up the air pressure.
3. Release the tone by drawing back the tongue from the reed.

The first two steps are very nearly simultaneous. As the instrument is drawn to the mouth the breath is taken so that by the time the embouchure is formed the clarinetist is prepared to start the tone. The first action, that of placing the tongue on the reed, momentarily deflects or bends the tip of the reed in toward the mouthpiece opening. Thus it serves as a valve, closing off the air column from the reed.

The recoil of the tongue back from the reed releases the air column which sets and maintains the vibration of the reed. In the recoil, the tongue need not draw back any further than one-sixteenth to one thirty-second of an inch from the tip of the reed.

Weakest Aspect of the Attack. The most neglected phase of proper attack is the second step, that of building
up the breath pressure. The breath is being forced into the mouth before the tone starts. One blows against the reed but the breath is momentarily prevented from entering the mouthpiece by the action of the tongue against the reed. The presence of this wind resistance will make possible a full-bodied tone of good quality from the beginning of the attack and not a tone that will grow as the breath pressure catches up to it.

An analogy can be drawn between the proper function of the tongue in the attack and the action of turning on the ordinary water tap. When the tap, a valve at the end of the pipe, is opened, water immediately comes out. This is because water pressure is constantly present in the pipe. One does not have to wait for the water to come from the reservoir or from the main line in the street, it is already there directly behind the valve.

In the same manner, when the tongue (the valve) is released from the reed, the air column should be there to immediately start the vibration of the reed.

This same sequence may be seen in a mechanical power concept. In driving, when the car stops at an intersection, the ignition remains on, the motor running. To start, the clutch pedal is released and forward motion begins.
In tonguing, the power is a steady continuous stream of air into the instrument which enables the reed to vibrate freely when the tongue (the clutch) is released.

The above steps may be represented in practice of the example in Figure 30.

**FIGURE 30**
EXERCISE FOR THE ATTACK

Count 1: Breathe, set the embouchure and set the tip of the tongue on the reed.

Count 2: Blow. Guide the air column to the mouthpiece with the back of the tongue.

Count 3: Let the tongue draw back. A sharp tonguing noise is not necessary.

**Dynamics and the Attack.** Whether the attack is to be pianissimo or sforsando the action of the tongue will be virtually the same—touching the reed rather lightly. The pressure of the tongue need not be any stronger in loud passages than in soft passages; nor does it need to be more
rigid or heavy. The degree of loudness is controlled by the breath and not the tongue. The opposite of this is a very common mistake. The result is that the tongue loses its flexibility and the desired speed becomes unattainable.

Equally important is the maintenance of good tone production while tonguing. Striking the tongue hard against the reed will cause a harsh and unpleasant sound.

It will be of help to the clarinetist to create a mental image of the succeeding note note before commencing the attack. This, of course, is a good practice in all playing.

The attack is the key, not only to good tone production, but to all articulation as well. Proficiency in the attack is directly preparatory to the study of detached notes and staccato.59

THE RELEASE

There are three acceptable and frequently used ways of stopping the tone:

1. Stop blowing; the breath pressure release
2. Inhaling
3. Stop with the tongue

The choice among these depends upon the characteristics needed for the interpretation of the music.

The breath release, often used to round out phrases, is accomplished by releasing or relaxing the breath pressure. In doing this, the throat is kept open and the muscular support of the diaphragm is constant. It is very important that the diaphragmatic support of the air column not be interrupted. Simply, you stop blowing but the embouchure and throat remain unaltered.

An even volume of the tone throughout a note may be maintained by inhaling for the release (sometimes called breath staccato). The release is a sudden inhalation of air. Pictorially, this release counteracts the tendency to decrescendo when the tone is stopped and allows the tone to sound \( \text{\textit{---}} \) and not \( \text{\textit{----}} \) as is often the case. This release is extremely effective, especially in ensemble, when a clean, but unaccented, release is desired. This should be the most frequently used method of stopping the tone.

In the tongue release, the tone is stopped by the action of the tongue returning to the end of the reed to stop its vibration. A simple syllabic representation is "tut." Ordinarily this release will only be used where a stopped staccato is desired, or when a sequence of extremely rapid tongued notes is wanted. Thus, as in singing where the final consonant sometimes indicates the beginning of the next word, the end of one note becomes the beginning of the next.
A fourth method releases the tone by closing off the wind flow with the throat. Although this release is very precise and is used by accomplished clarinetists, this writer would hesitate to recommend the glottis release to immature students because of the throat consciousness involved.

**Developing Action of the Tongue.** The essential prerequisite to the development of a fast tongue is the development of a light tongue. Think of the action of the tongue only as a momentary interruption of a sustained tone. This will have the legato effect of "who-doo-doo-doo" but it will present the distinct advantage of making the tongue strike the reed lightly and naturally. The tongue must never stop the tone.

Slow practice of exercises similar to that in Figure 31 will help develop a fluent tongue. Use the syllable "lah". This syllable is preferred over "dah" because "dah" is quite explosive whereas "lah" is more fluent and light.

![FIGURE 31](image)

**FIGURE 31**

**EXERCISE FOR THE DEVELOPMENT OF A LIGHT TONGUE**
After beginning the exercise, the breath pressure remains the same. It must not be allowed to sag for any of the tonguing action. Keep the tone at the same dynamic level, disturbing it as little as possible with the action of the tongue.

This is a legato tongue but the exercise demonstrates the most important factor, that of keeping the breath support constant.

To develop speed, practice tonguing sustained notes in a progressively rapid pattern. Start with half notes; move to quarter notes, triplets and sixteenth notes with no discernable change in tempo. The object is that the tongue action be light and free. The embouchure, throat and breath support should remain as if whole notes were being played.

Changing the syllable to "tee" will produce a brighter attack.

STACCATO

Staccato is the abrupt or sudden release of a tone, not the harshness of attack on the tone. Staccato is simply an extension of the previously mentioned tonguing skills. The most important factor is still the lightness of the tongue stroke. The tongue should remain flexible and at no time should it become stiff or tense and "poke" at the reed. It need do no more than scarcely touch the tip of the reed.
As described in the section on the "release", the "stopped staccato" prevents the breath from entering the mouthpiece by the return of the tongue to the reed. Without the instrument in the mouth, the action could be simulated in the following manner. Make a small hole with the lips and then block that opening with the tongue. Blow, draw the tongue back and force an intense stream of air through the hole. While still blowing, place the tip of the tongue back in the hole. During the "gaps of silence" in staccato playing, air pressure is still forced into the mouth right behind the tongue. Care must be taken to keep the air column from being stopped by the throat. The tongue touches the reed to stop its vibration. The stopped staccato is used when the effect desired is brilliant, sharp or bitey.

In passages where the clarinet line alternately changes from high to low the tendency is to strike the upper notes harder than the lower ones. The stroke of the tongue must be identical for both high and low notes. The embouchure must not be altered--ie. preceptively tightened for high notes and loosened for the low.

**Greatest Danger in Tonguing.** Seemingly, the most frequent error among young students in relation to tonguing and unfortunately one of the most difficult to correct is the practice of tonguing not with the tongue, but with the throat.
Instead of the air flow being stopped with the tongue, it is stopped by the closure of the throat. (Tonguing here means the attack.)

At the beginning of the tonguing instruction the teacher should constantly check for and emphasize the emission of a steady stream of air.

A contributing factor to this difficulty may be that there is not sufficient "lift" to the embouchure and that the instrument is entering the mouth at too perpendicular an angle. If the cheek muscles are not "lifted", the throat cavity will be too flat to allow the tongue to arch sufficiently to touch the tip of the reed. Pulling the clarinet down to an appropriately close angle to the body will also help. It puts the reed in a position easy to touch with the tongue. If the tongue has room to work properly and if the reed is in a position that the air column may follow the path of least resistance the need for tonguing with the throat as a "detour" is eliminated.

**LEGATO STYLE**

The essence of legato playing is to move smoothly and with as much continuity as possible from one tone to the next. The object is to make an almost absolute connection between the two notes.
There are three important tangible or physical factors in the legato style: the breath, the fingers and the embouchure. The real significance of the three is that they must be coordinated.

The fingers should work in the style of the music—smooth and legato. But their action must be positive. It is obvious that they must be poised above the proper keys.

The breath must be continuous with a feeling of expansion from one tone to the next. This expansion happens, not between the notes, but on the note. One tone grows to meet the next tone, very subtly, even in diminuendo. (Figure 32)

FIGURE 32
THE LEGATO STYLE

This guarantees a full phrase and in addition leads the ear to anticipate the following tone.

The most important factor of legato playing is a non-physical one, the ability to sing or think in terms of singing, on the instrument.
DOUBBLE AND TRIPLE TONGUING

Although double tonguing is rarely used even by professional performers and certainly not by the school clarinetist, it is an interesting facet of the over-all clarinet technique and for that reason is included here.

As a practice in America, double tonguing on the clarinet is less than fifteen years old. Previously the skill had been left to the flute and brass instruments in feeling that the technique was more intrinsic to the nature of those instruments than to the reeds.

However some very old texts mention double tonguing for reed instruments. One was a work by Joechim Quantz (1697-1773), a flutist and composer; and another discussion was found in an oboe method by Hotteterre (1707).^60

The most common method of clarinet double-tonguing differs very little from the method used by flute and brass players. Before starting work on the technique, it should be understood that the limitations are greater for the reed instruments than for the above mentioned instruments.

When mastered, the double-tongue staccato is excellent for rapid scales, arpeggios, and repeated notes. It is best employed at a speed over M-126 (metronomic indication) in

---

^60Ralph Lorr, "Double Tonguing for Reed Instrumentalists," Woodwind, V No. 2 (October, 1952), p. 5
sixteenth notes. It may by necessary to alter the established embouchure a little and reeds must be free speaking and light.

The sounds are detached from one another by alternately touching the reed with the tongue (to stop the air stream) and interrupting the air stream with the throat. A "tu" sound represents the action of the tongue and pronouncing a "ku" sound (or any close variant such as "koo" or "gu") produces the throat action.

Players originally learn to start the tone by removing the tongue from the reed. In double tonguing they must attack with the throat. A clean attack without use of the tongue is essential

Lorr recommends the following procedure in learning this type of double tongue. First, the throat attack should be learned--"ku." It is best to start by attacking the open throat notes, progressing from half notes to quarter notes. When the throat attack is mastered, the tongue stroke is added between each "ku." The player should start again on the slow pattern, "tu-ku" and progress to simple scales.

This may be expanded to triple tonguing by adding a syllable to the pattern: "tu-ti-ku" or "tuc-tee-kuh."

6lop. cit.
Christman has developed a different species of double tonguing for the clarinet called "rebound staccato" which he admits is not easy to develop but which is, he claims, generally more successful and better suited to the nature of the instrument than the tongue-throat method. 62

This style is performed entirely by the forward part of the tongue, the tip and part of the tongue just behind the tip. No part of it is done with the throat.

Syllables used to describe the method are "te-de" or "te-re," consonants which alternate easily with one another. At fast tempos the second syllable becomes a rebound of the first stroke. As in other phases on tonguing, the sounds are not actually pronounced but are psychological props in putting the idea across.

The sound of staccato is exactly that of single tongue only with far greater speed potential and unlimited powers of endurance. 63

This tonguing pattern may already be used unconsciously on dotted eighth--sixteenth figures. The principle difficulty of this system is to get the notes even and coordinate the action of the tongue with the fingers.


63 Ibid., p. 76.
CHAPTER XII

SUMMARY

One of the best ways to improve a band is to improve the clarinet section--improvement that represents emphasis on proper fundamentals and progressive skills and clarinet knowledge.

The instrument should be in good condition with pads that "cover" and properly adjusted mechanics. It must be accompanied by a carefully selected mouthpiece and reed. For the average clarinetist a "French" lay mouthpiece with medium length curve and tip opening will make possible the greatest dynamic and tonal variances and comfortable response in all of the clarinet ranges.

The foundation to all physical phases of clarinet playing is proper breath support. Therein is the key to intonation, equalization of the registers, tone production, articulation and a sustained melodic line. This breath support is a combination of deep, diaphragmatic breathing and the concentration of that breath into a steady stream focused into the mouthpiece.

The breath is the tone; the embouchure the quality. The principle characteristics of correct embouchure, a firm pointed, but not rigid, chin and equal pressure of the lips

- 138 -
from all sides of the mouthpiece, encourage good intonation, fine tone quality and fluent articulation.

Incorrect position will restrict the development of technical proficiency. The facility of the clarinetist will be greatly advanced if he is familiar with the tonal and the technical fingerings.

Rapid or precise articulation depends primarily upon the support given the tone by the breath. The tongue must be light and act only as a momentary interruption of a sustained tone.

The clarinet is not an "easy" instrument to learn. However with the correct integration of the many phases of clarinet skill it may be one of the most versatile of the wind instruments, displaying flexible tone color, a wide dynamic range and a great technical capability.
BIBLIOGRAPHY

A. BOOKS AND BROCHURES

The author was first prize winner at Paris Conservatory and former solo clarinetist with the Philadelphia and Cleveland Symphony. He is a well known teacher and author of articles about the clarinet.


Mr. Cerminara was clarinetist with the New York Philharmonic Symphony Orchestra at the time of the publication of these articles.


The author is a concert performer and clinician and also first saxophone with the American Broadcasting Co.

Mr. Gibson is assistant professor of music at the North Texas State College.


Mr. McCathren is currently Director of the Educational Services of the G. Leblanc Corporation and has been a clarinet instructor at the University of Indiana.


Mr. Spicer, a popular clinician and adjudicator, is director of the instrumental program at Washington State College, Pullman, Washington.


Mr. Kruth is Assistant Professor of Music at San Francisco State College where he is instructor of clarinet, director of the college wind program and conductor of the Symphonic Band.


Mr. Vagner is an Associate Professor of Woodwind Instruments at the University of Oregon and has appeared professionally with the Pro Arte Quartet under Rudolph Kolisch.


Mr. Zwick holds the License de Concert of the Ecole Normale, Paris and is now first clarinetist with the Utah Symphony Orchestra. He has been a scholarship student of Bellison and Bonade.
C. PERIODICALS


Mr. Abato is one of the best known of this nation's clarinet artists. In addition to orchestral and recording work he is currently instructor of clarinet at the Julliard School of Music in New York.


Mr. Cioffi is principal clarinetist with the Boston Symphony Orchestra.


Mr. Kaplan is a frequent contributor to articles on the clarinet and currently is regular editor of the "Clarinet Corner." He is also the first clarinetist of the Tri-City (Davenport) Symphony Orchestra.

_______. "The Throat Tone Problem," Bandwagon, IV (Fall, 1956), 8.

_______. "Tone Production," The Clarinet, No. 16 (Fall, 1954) 9-12.


Rufener, R. E. "Selection and Care of Reeds," *Instrumentalist*, II (March-April, 1948), 16-17.


Mr. Tenney is a well known performer and teacher from Oakland, California.


Waln, George E. "Are You Intonation Conscious?," Instrumentalist, X (February, 1956), 34-36.
Mr. Waln, a well-known clinician, adjudicator and author of articles about the clarinet, is instructor of clarinet at Oberlin College, Ohio.

______. "The Clarinets Column," School Musician, XV (April, 1944), 19; XVI (December, 1944); XVI (January, 1945); XVI (March, 1945), 30-31.


______. "What I Heard at the 1938 Clarinet Contests," School Musician, X (September, 1938), 13 plus.

Warmelin, Clarence. "Warmelin School of Woodwinds," School Musician, X (October, 1938), 41.