Tongue Arch:  
The Missing Link in Brass Instrument Pedagogy and Performance  
by Steven Winick

Performance Factors

Teachers and performers of brass instruments are engaged daily in solving problems of tone production, such as tone quality, pitch accuracy, flexibility, range and endurance. There are numerous and often conflicting methodologies and pedagogical practices related to these problems which create much confusion, both for brass instructors and students.

Nearly all of the factors which influence tone production on brass instruments can be reduced to three basic groups: (1) breath support, (2) tongue arch, and (3) lip firmness (listed in order of internal to external relationship to the body). This tripartite organization is helpful because it facilitates the concentration on factors which have manageable and easily understood proportions and characteristics. This is true even for beginning students.

Historical Perspective

A brief review of the history of brass performance practice from the baroque era to the present reveals a major reason for the mystery surrounding the use of tongue arch. Baroque trumpeters and horn players who performed in the clarino register made much use of the diatonic scale, beginning with the eighth partial of the harmonic series. Since the valved and keyed brass instruments had not yet been invented, pitch changes in this register were accomplished primarily by a well-controlled tongue arch and a highly developed embouchure. Instruction in trumpet performance technique was carefully regulated by the guild system.

As valved and keyed instruments came into general use in the 1800’s, instruments were built in increasingly shorter lengths and the emphasis in technique shifted from control of the tongue arch to finger dexterity. Within the last 30 years, brass instruments have evolved into still shorter forms—witness the piccolo trumpet and the descant horn now widely in use. Thus, for the past 150 years, brass players have not been nearly as aware of the function of the tongue arch as they were during the baroque era.

Pedagogical Practices

In examining empirical methodology, one usually finds that aspects of tongue arch, level or position are not included or considered. Some brass teachers are reluctant to advocate the use of the tongue arch.

First, some players/teachers recognize its operation but are fearful that arching to an “eeh” syllable (as in teeth) will cause tightness or constriction in the throat. In producing a tone, the abdominal muscles indirectly exert pressure on the air contained in the lungs, forcing it through the oral cavity, the lips and into the instrument. Just before entering the mouth this air may be stopped partially or completely by the glottis. This glottal resistance is often mistakenly confused with or used instead of the arched “eeh” tongue level to obtain notes in the higher register.

An indispensable discussion of glottis resistance is offered by Philip Farkas in The Art of Brass Playing:

To experience this glottis action, simply whisper a long held “oh,” loud enough to be heard ten or fifteen feet away. If the glottis were kept wide-open instead of partially closed, the “oh” would remain quite silent, and the air, with an equal amount of diaphragm pressure, would burst out in a big, silent ball...

Farkas describes two exercises for developing conscious control of the glottis, thus gaining for the player an increased ability to maintain an open throat.

Second, some “natural” players/teachers utilize a tongue arch movement so refined and internalized that they are unaware of its operation. These people typically deny its use, generally stating that everything is played with a completely open “ah” or “ooh” syllable (as in father; tool) which does not change for the high register.

Finally, many players/teachers would rather not analyze the playing mechanism unnecessarily, especially if all is going well. Teachers in this category tend to assign students particular exercises to correct various problems without much explanation, if any is given at all. This approach is perhaps the most subtle and desirable way to solve certain types of performance problems—if positive results are obtained. However, it often takes much longer for improvement to occur—weeks and months—rather than days, as is usually the case with a clear, simple explanation of tongue arch. The same exercises may be practiced with a new understanding and increased effectiveness if the tongue arch is explained and demonstrated properly.

Research by Hall noted that the tongue may or may not have some effect on the size of the pharyngeal opening located at the base of the tongue. De Young’s research concluded that the tongue arch did not necessarily effect a closing off of the pharynx. In fact, with several subjects, there was a simultaneous opening of the pharynx as the tongue arched for the high register of the trombone.

A reading of these and similar sources will help one to understand that the use of the tongue arch does not necessarily cause constriction of the throat, pharynx or glottis. A helpful analogy is one of a garden hose, flattened or focused at the tip (= the tongue arch) rather than crimped some distance from the tip (= constriction of the throat).

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It is interesting to compare the various presentations of the use of tongue arch as contained in the trumpet pedagogical literature. A survey of vowel theories by Hall categorizes the widely differing points of view into four groups: (1) that view point which advocates the method of using the "oosh" tongue position at all times, (2) that which advocates a single syllable but prefers another one, such as "eeh," (3) that which advocates changing vowel formations as the pitch changes, using "ah" for lower pitches and "eeh" for higher pitches, and (4) that which holds that each person should choose his own vowel, or that the tongue positions should change according to the tone quality desired.⁵

Some pedagogical methods which advocate tongue arch do so in a confusing, oversimplified or illogical manner. Claude Gordon's Systematic Approach to Daily Practice for Trumpet advocates lowering and raising the tongue using the syllables "ah—eeh," but illustrates this employing the interval of only a third.⁶

Harry Freistadt's introduction to Max Schlossberg's Daily Drills and Technical Studies for Trumpet states that:

Schlossberg’s method for developing a good attack was to divide the range of the trumpet into low, middle and high sections, assigning the syllable "Tu" to the low register, "Tu" to the middle and "Ti" and "Tee" to the high.⁷

Yet, the only drills in the book which include syllables (p. 4), although for the mouthpiece alone, cause confusion because of the illogical use of both "tu" and "te" for "ee" as well as the use of the extreme syllables "ta—ee" for notes in the middle register.

Herbert I. Clarke's Characteristic Studies for the Cornet is one of the few method books which makes an attempt at illustrating a more gradual, refined change of tongue level.⁸

Clarke uses the syllables "tu," "ta" and "te" but uses "tu" for the low register, not the middle register as presented in Schlossberg's Daily Drills.

Lowell Little's Embouchure Builder uses "ah" for all registers, favoring an "open" sound. The tongue is flicked momentarily to an "ee" position for a change of harmonic and then is returned to the "ah" syllable.

Brass students seem to be especially confused by the use of syllables such as "tu" or "tue" and "toh" which are really formed by the lips in addition to the tongue arch. Obviously, when one plays a brass instrument, one cannot hold the lips in the position called for by these syllables. The syllable which is actually utilized while playing is the "internal" syllable made without the help...
of the lips. Thus, “tu” or “too” is pronounced internally as “teh” (as in ten); “teh” as “tah.”

Refining the Use of Tongue Arch

Often the significant syllable “ih” (as in tin) is omitted from the series of tongue positions being taught or described in pedagogical literature. If only two or three syllables are used, the practice of arching the tongue tends to fall under criticism. One pedagogue argues that the practice of arching the tongue might “easily be overdone, causing a decrease rather than increase in air pressure behind the embouchure.”10 This is usually caused by substituting a glottal restriction of the airstream for the needed control and refinement obtained through the proper use of the tongue arch, especially the “ih” and “eh” tongue positions.

It is far easier to observe the function of one’s lip and breath support musculature than it is to observe one’s tongue level. The lips are easily seen and felt as they are used. The breath support muscles are large and relatively easy to sense as they work. However, movements of the tongue are internal and usually very small, thus difficult to feel or sense. Most players are unaware of these movements.

Recent videofluorographic research studies by Amstutz, Briggs, De Young, Gibson, Hall, Haynie, Isley and Meidt provide ample evidence of the use of tongue arch in brass performance.11 In recent correspondence with Professor John Haynie of North Texas State University concerning his research in this area, he informed me that he had observed some 75-80 trumpet players through the fluoroscopic process. [I observed] Maurice André... later and he arched his tongue in the middle (which, incidentally, I also do). It was noted that the tongue arch would seek the exact amount of elevation necessary for each tone played. Also, it was observed that our tongue would not only go to an exact place for each tone, but also there would be a hesitation at that exact place for a fraction of a second. In other words, the tongue did not stay in a perfectly smooth motion.

Arching the middle of the tongue was most commonly observed among the better players in our studies; however, I have serious doubts if one can change the way he arches the tongue. Unless one could actually see what he does while practicing he will only be guessing about how his tongue works.

Many of our subjects would swear that they did not arch their tongue, but they all did. Some had been taught not to arch the tongue, but they all did in some way.12

Keith Johnson warns that “the motions, adjustments, and alterations necessary to successful high playing are so intricate and delicate that attempts to manipulate the involved musculature by conscious control (feeling) will almost always result in overdone activity.”13 In order not to overdo this manipulative activity I have utilized a method of sensitizing brass performers to obtain a more effective use of the tongue arch.

The performer may begin by developing a more refined, precise series of syllables than the traditional “ah—eoh” or “ah—ooh—eoh.” It is helpful to expand this series, first to four levels by establishing a syllabary of “ah—eh—ih—eh.” To feel this operating, whistle a one octave, major or minor arpeggio, paying particular attention to the internal motion of the tongue. To obtain an enhanced sense of the amount and direction of tongue motion which occurs as the tongue assumes these four syllables, repeat the syllables while placing an index finger on the center, dorsal portion of the tongue.

Example 6

<table>
<thead>
<tr>
<th>SYLLABLE</th>
<th>REGISTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;EEH&quot; as in TEETH</td>
<td>p</td>
</tr>
<tr>
<td>&quot;IH&quot; as in TIN</td>
<td>d</td>
</tr>
<tr>
<td>&quot;EH&quot; as in TEN</td>
<td>j</td>
</tr>
<tr>
<td>&quot;AH&quot; as in FATHER</td>
<td>d</td>
</tr>
</tbody>
</table>

In similar fashion, whistle a major scale and sense the refinement of the tongue arch to eight separate levels. Next, whistle a chromatic scale and sense the further, delicate refinement to twelve tongue levels. Realizing that while playing a brass instrument, the tongue approximates these same positions in the mouth, one readily understands that there are as many different tongue levels as there are notes on the instrument.

Balancing Performance Factors

It is extremely important for a performer to utilize the three basic factors (breath support, tongue arch and lip firmness) in proper amounts or proportions for the particular pitch and dynamic being played.
If there is (1) a lack of proper breath support, perhaps because the throat is too constricted or the abdominal muscles are not operating correctly to expel the air, (2) an inappropriate degree of tongue arch is used for a particular register (see Example 8), (3) there is a weakness or misalignment of the embouchure, or (4) there is an imbalance in a combination of the above factors, the performer will usually compensate by substituting excess mouthpiece pressure. This, of course, detrimentally effects tone quality and endurance.

If such performance problems arise, it is important for each of the three factors (breath support, tongue arch, lip firmness) to be isolated, examined, and then synchronized in the proper proportions by the performer. However, the final goal should be for the control of these performance factors to be internalized so that it becomes subservient to musical considerations. The adage “paralysis by analysis” should be well heeded. One should strive to maintain a balance between “analytical” and “natural” performance, or, put another way, “analytical practice” should lead to successful “natural performance.”

The final emphasis should not be on tongue arch, or any other isolated factor, but upon expressing to the utmost the artistic and aesthetic content found in the music.

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Notes
5 Hall, “A Radiographic... Study,” pp. 6-8.
7 Max Schlossberg, Daily Drills and Technical Studies for Trumpet (New York: M. Baron, Co., 1941), p. 6i.
O Christmas Brass,
O Christmas Brass
by Alvin L. Lowrey
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12 Letter from John J. Haynie, Professor of Music and Coordinator of Brass, School of Music, North Texas State University, Denton, TX, Feb. 16, 1983.

Jazz Improvisation in the Trumpet Studio
by James Ketch
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Transcription Sources
Baker, David, The Jazz Styles of Miles Davis, (Giants of Jazz Series), Studio P/R (see address above) 1980.

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