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1. The Embouchure's Function

The word *embouchure* is derived from the French word, *bouche*, meaning mouth. The mouthpiece of a brass instrument is also referred to in French as an *embouchure*. However, we shall consider only the English usage of the word, as it pertains to the mouth. A good definition of the brass player's *embouchure* might be this: The mouth, lip, chin and cheek muscles, tensed and shaped in a precise and cooperative manner, and then blown through for the purpose of setting the air-column into vibration when these lips are placed upon the mouthpiece of a brass instrument. This sounds like a relatively simple definition and a condition which should not be difficult to achieve physically. But consider what this arrangement of various muscles must accomplish. First, they will have to vary their tension and conformation sufficiently to obtain a range of three or four octaves, approximately 36 to 48 different notes. Not only must these notes be well-in-tune, but they must also have good tone quality. Along with these basic requirements the embouchure is expected to have the flexibility to jump from one range of the instrument to the other lightly and quickly. But this is not all! The embouchure is required, in conjunction with the breath, to do all these things at various dynamic levels, ranging from an extremely soft *pianissimo* to a loud *fortissimo*. Consider that these relatively small muscles must accomplish all this with the strength and endurance to continue for several hours a day and you begin to gain new respect for what appeared at first to be a simple arrangement of muscles. Although the complete embouchure is complex, it is only a composite of many individually simple muscular functions. And when these are understood and applied, perhaps very gradually at a time, they can be accomplished successfully, resulting in an excellent embouchure.

For the brass player the lips perform the same function as the woodwind player's reed. The lips are the source of vibration which is projected through the instrument. The vibration has a direct bearing on the note produced, it may be said. One of the embouchure's functions is the ability to change the tension of the lips from the highest to the lowest. The vibration from the breath is being varied.

extent, determines the pitch of the note, it is the function of the air-stream to vary the amount of volume from loud to soft. Later, however, we will see that these two functions are interrelated and must be used in conjunction with each other. We will also find that the tone quality is a direct result of the more or less successful combining of these two functions.

Another function of the lips which, strangely enough, is often overlooked by brass players; is our need to "attach" ourselves to the instrument so that the air-column is hermetically sealed or completely air-tight at the point of contact between the lips and mouthpiece. In this respect, the lips are not only as the coupler, but must also be of built-in "washer". Too often one can hear a brass player while he is playing and hear the sizzling sound of escaping air. This is due to the unsuccessful use of the lips for the purpose of sealing the lips to the instrument. As we shall see later, the embouchure correctly in all respects is a matter of sealing the lips perfectly.

Now let us investigate the lips, teeth and facial attitude. The embouchure is a matter of imagination. We will be discussing this in a later chapter.



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CROSS-SECTION, LEFT PROFILE

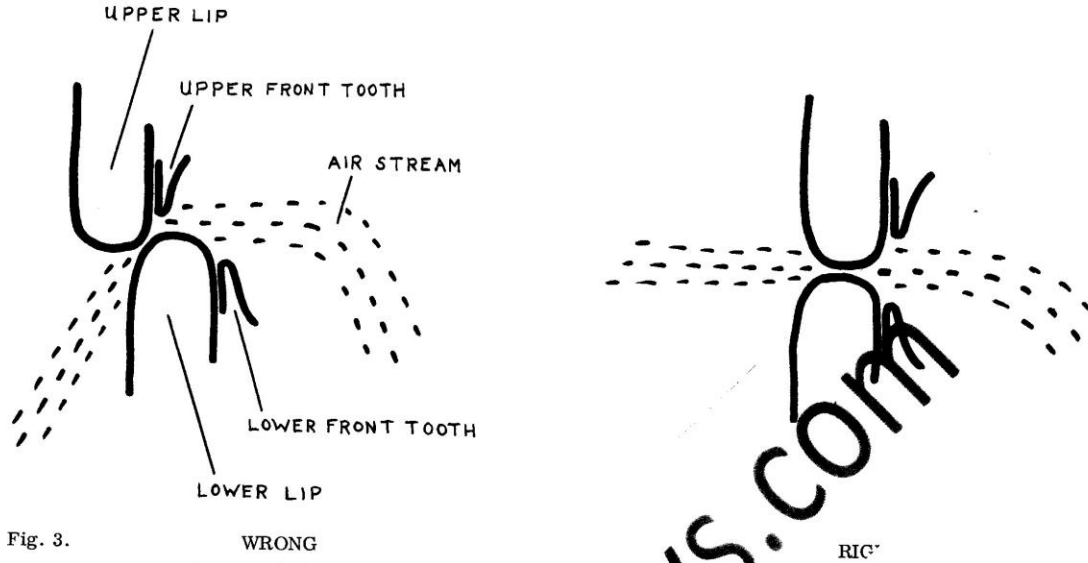


Fig. 3. **WRONG**
Lower jaw re-
ceded. Lower front
teeth not as far
forward as upper
front teeth.

RIGHT
Lower jaw thrust
forward as far as
upper front teeth.

this jaw thrust is first used. Most players who have unthinkingly learned to play with a receding lower jaw have also learned to compensate for this position by tilting the mouthpiece and instrument downward, to somewhat the same angle at which the clarinet is held. This is done instinctively to equalize the pressure on the upper and lower lips, which, of course, are not in good alignment because of the receding jaw. Therefore, when the jaw is thrust forward as recommended, *the angle of the instrument must be changed* so that the mouthpiece assumes a fairly horizontal position. The exact of this "horizontal improvement" must be considered so that the mouthpiece pressure is *actly* and *evenly* distributed on both lips.

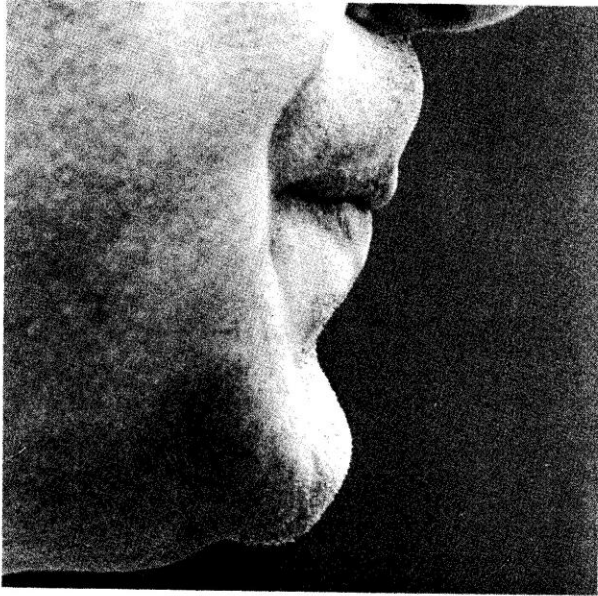
When this jaw thrust and the correct mouthpiece angle to the correct position is successfully accomplished, and many players will be partially corrected. The receding mouthpiece often causes the lips to slide upward toward the upper lip. Mouthpiece pressure is increased. This is a most common mistake. It is a more upper lip matter. Mouthpiece range. matter. soi+

and the player can help clarify the diagram "wrong" is a' for

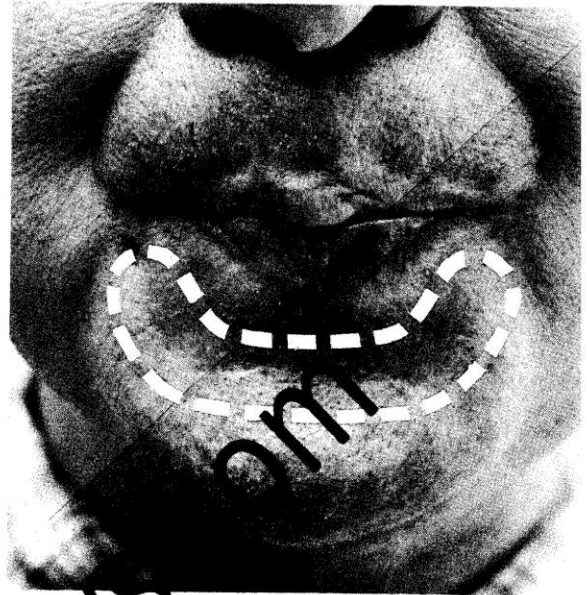


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A



B



C



D

Fig. 14. Illustration A shows profile view of chin arched down correctly. Illustration B shows how horizontal wrinkle must be stretched out of existence. Dotted line outlines typical "U" shaped valley found so often in good players. Illustration C shows correct arching of chin, with no evidence of horizontal wrinkle. Illustration D shows how properly arched-down chin smooths flesh inside mouthpiece, allowing free vibration of edges of aperture.

2. Photographic Studies of Virtuoso Players

On the following six pages are photographs of members of the Chicago Symphony Orchestra's brass section. Many of the world's greatest conductors have praised this group as an aggregation of some of the finest brass players to be found in the world. These men are from many parts of the country and have studied with many different teachers. Therefore, the similarities in the way they play result because certain fundamental rules of brass playing are observed by successful players, regardless of where or with whom they have studied. To illustrate this fact, I have chosen to photograph this particular group, not only because each player is an artist of the highest caliber, but also because it is a long established group, and not one that I could be suspected of assembling for the purpose of demonstrating my own pet theories. Regardless of the instrument played, we can observe many important similarities among these fine artists.

- 1.) The similar mouthpiece placement for players of the same instrument
- 2.) The arched-down chins.
- 3.) The slight thrust of the lower jaws.
- 4.) The similar angle at which all the instruments are held.
- 5.) The avoidance of stretched lips.
- 6.) The slight pucker, as evidenced by the small vertical wr
- 7.) The evidence of taut cheek muscles, which are "try" of the puckered lips.
- 8.) Finally, that important basic appearance of gr
player's face."

In the course of this book, as various ideas refer to these photographs and see if they group of *virtuoso* professional players.

The embouchure techniques reveal very jealously guarded secrets, and these techniques by posing for p the public, is a tribute to their The really great teachers student by divulging these fa

Therefore, it is with Chicago Symphony Or important part of this



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Adolph Herseth




Rudolph Nahan

5. The Lip Aperture

Without doubt, the ultimate object of all the muscular development, mouthpiece positioning, jaw setting, lip moistening, etc., is to form an aperture between the lips, of the right size, shape and firmness. This small opening between the lips, in the final analysis, takes complete command over the air-column's vibration and is therefore the determining factor in the brass instrumentalist's playing ability. All the previous embouchure rules, suggestions and exercises discussed in this book have been aimed directly at this object of forming the most perfect lip aperture possible. Therefore, a thorough discussion of its shape and size, and of the lip density, will not only clarify the exact objective of all the components making up the embouchure, but will show how each of these components can cooperate in attaining this goal.

The open end of the oboe reed so closely duplicates the size, shape, and function of the brass player's embouchure aperture that it is ideal for comparison purposes. Have you ever really looked at an oboe reed? If not, make a point of doing so. Exactly like the brass player's embouchure aperture, the oboe reed must have three inherent conditions in order to perform successfully: it must be the right shape; it must be the right size; and it must be made of the right material. Let us discuss these conditions and their similarity to the lip opening.

What Shape Lip Aperture?

The reed is carefully constructed of two pieces of cane which are arched against each other at the opening at the end of the reed has a very and carefully planned shape, thus:  If the opening is too highly arched, the air does not vibrate. Or if the opening is too flat, the air does not vibrate and blows it completely shut. We have all occasionally scrutinized the end of a reed, pinching it, either side to side or up and down. He is vital to the cause when it is in its greatest degree of vibration. It is up completely.

We have seen the embouchure. It, like the reed, is br

sound choked or tight and may even fail to commence at all during a *pianissimo* attack, at which time the air-column is simply too weak to create vibration in the tight and narrow horizontal slot which opposes it.

In contrast, as with the arched-too-open oboe reed, we find the brass player who holds his lip aperture too round and open. This is a much rarer fault than the tight, flat opening, but equally incorrect. Such a player usually has a dark, "hoot" tone—airy and without a ringing quality. In his case the opening is not resisting the air-column's vibration and some of the air is getting through the too-large arched lip aperture without "rubbing". This player will often have *pianissimo* attacks simply because the tiny air-column cannot vibrate in the too-large opening without "leaking" at the edges, so to speak, resulting in a weak sound ever!

Notice that either type of lip aperture is a most common of its problem. Any embouchure should be made to allow air through it. The student should pay more attention to the shape of the lip aperture completely when he is a student.

How do we know if we are using the right lip aperture? It should be



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6. Articulation

If we were to consider the tone of a brass instrument as a sort of semi-fluid building material like wet cement or clay, we might then say that it is the *tongue* which forms or molds this plastic material into building blocks or bricks. Just as any type of building can be constructed if one has sufficient sizes and shapes of bricks at his disposal, so can any musical idea be expressed if one has at his disposal notes of various lengths, pitches, and volumes.

We have only two ways to begin or articulate a note: by slurring to it from a previous note, or by starting it with an "attack" of the tongue. In two respects the tonguing of a note is the more important consideration because: 1.) The first note of a series *must* be started with the tongue; 2.) reiteration of the same note *must* be accomplished by tonguing. Even though slurring is a most important fundamental of brass playing, there are only two basic types of slur, smooth and forceful, whereas there are many types of tonguing. Therefore, let us discuss first this more complex articulation.

The Function of the Lips in Tonguing

Actually a note can be started without the help of the tongue. It can be started the same way one starts a first note while whistling—with just a gentle push of air, a sort of "ha" attack. The only trouble with such an attack is that the player cannot be quite sure just when the lips will "catch" on this air stream and start vibrating. Such uncertainty, of course, is unthinkable for the split-second timing required in the performance of music. Therefore wind instrument players resort to various types of attacks to assure the production of the tone *exactly* when needed. So it is important for us to realize that the fundamental reason we apply the tongue is to *start the lips vibrating at the exact moment they should*. Yet how often when a student makes an attack, we hear the sound of escape a second before the note "takes." The student would remember that the purpose of the attack is to "trigger" the vibration. The realization would result in a clear attack.

The fact that the vibration in a note is not the most reason for its clarity, *blame, not*

that they will vibrate exactly in sympathy with the pitch of the instrument of that moment, no amount of careful tonguing will produce clear attacks. Only the lips can influence the pitch. The tongue simply determines the starting moment of the vibration, whose pitch the *lips must have already predetermined*. True, badly focused lips can be made to start vibrating by exploding them with a *sforzando* attack, but it is just this necessity to hammer the attack which leads the unwary player to believe that there is something wrong with his tonguing. So before considering the various names of tonguing let us first make sure that faulty attacks are not caused by the lips, as they are in so many players. The test is made by simply repeating a note, tonguing it several times in succession. The notes will seem to become clearer and lighter with each initial attack, but simply means that the lips and the instinct begin to cooperate in "zeroing in" on the exact moment of the same production of pitch. On the *first* note, it too would be clearly. Obviously, it is the ability to focus the lips early before the first

One of the first things an older German player would tell you is that the frequency of attacks is not the most important factor of our art.



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7. Mouthpiece Pressure

Sooner or later every brass player asks himself, or *should* ask himself, "Do I use too much mouthpiece pressure?" If the answer is "yes", the next question must be, "How do I get rid of this undesirable pressure?" If we understand *why* we feel the need, at times, for undue pressure, perhaps the answer to this last question will be found more easily.

Common Pressure Problems

No one ever complains of mouthpiece pressure increasing as he descends into the low register. He may actually use too much pressure in the middle register, but it is usually only when he starts ascending into the high register that the pressure becomes intense enough to cause concern. Therefore, we can consider mouthpiece pressure a problem associated with the high register. A high note requires an extremely small aperture between the lips. This aperture can be achieved correctly only with an embouchure which is used correctly and which is in top physical condition as a result of sufficient practice. Note that an incorrectly formed embouchure will not produce easy high notes with *any* amount of practice, nor will a correctly formed embouchure produce easy high notes with *insufficient* practice. This is because these necessarily tiny apertures must not only be correct as to shape and size, but must also be resilient and vibratory. Flabby muscles will not permit easy high notes on even the most correctly formed embouchure. There is, *unfortunately*, one simple way of overcoming both the lack of the small aperture and the flabby muscles. This is through the use of mouthpiece pressure. It is such an easy thing to apply more of this pressure as we go higher than all beginners use it instinctively and professionals resort to it in emergency. It is extremely detrimental to good brass playing. The regular use of excessive pressure results in poor tone and sluggishness. It also shortens the player's endurance and shortens his playing year.

Through another of our visualizations how to achieve a small aperture of fresh, spongy pieces of plastic slowly practice

be observed to gradually get smaller as the doughnut itself is flattened. But, at the same time, this pressure also compresses the "flesh" of the doughnut into something much firmer than its original spongy consistency. In just this same way, mouthpiece pressure diminishes the size of the opening in the lips, while simultaneously compressing the soft flesh into something resembling strong, firm muscle. Unfortunately, the poor lips suffer the same abuse as did the crushed doughnut, and, of course, human lips cannot take this punishment indefinitely.

The understanding of why we are all occasionally tempted to use undue mouthpiece pressure with the knowledge that it is only temporarily helpful to obtain high notes will make us prepared to resist this temptation. This is which we can correctly aid the high notes without resorting to undue pressure. This method that I have always referred to as "due pressure." This method is because some small amount is always present, and should be a comfortable hermetically sealed pressure which is around on a security. This is what it will be for



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