

Neisler, Joe – Improve Your Brass Section with the Arnold Jacobs-CSO Approach

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This discussion of relaxed, efficient, artistic brass playing will feature magazine and website quotes by Arnold Jacobs and the legendary Chicago Symphony Orchestra brass.

Sound

Charles Vernon, bass trombone of the CSO, wrote in a 1993 Instrumentalist magazine article, “Pursuing a Focused Trombone Sound,” “In some practice sessions I will play only four or five notes for 40 minutes; it might be an exercise of dotted half notes followed by three or four beats of rest. I think about the greatest sound I can produce and how close I came to that sound. The thinking comes during the rests; the moment I pick up the trombone and blow air though it, the image in my mind is of singing and I forget about the trombone. I never pay any attention to what I’m doing because I am completely immersed in the sound in my head. It is as though my brain is floating on the sound. Only during the rests do I think about how close that sound was to the one in my head.” In a 2007 Instrumentalist magazine article, “On Top of the World: An Interview with Chris Martin,” the principal trumpet of the CSO stated, “Most players do not spend enough time each week working on producing the most beautiful possible sound. It doesn’t matter how many notes you play if the tone is poor. A good sound is every player’s best asset.”

BREATHING

Jay Friedman, CSO principal trombone has a great website for articles, <http://www.jayfriedman.net/home> At http://jayfriedman.net/articles/long_tones , he wrote

concerning breathing, "Think of a large beach ball filled to maximum capacity. If the plug is removed the air escapes in a sudden rush because of the pressure inside and the elasticity of the ball. The ball is made of a material that will easily expand when filled. It is not necessary for the outside of the ball to be contracted by squeezing it. The elasticity and the pressure inside is more than enough to expel the air in a steady, even manner. That's the same idea a brass player needs to produce a long tone. The lungs are filled to capacity, the embouchure seals at the moment of exit, the tongue recedes and the pressure behind the embouchure propels the air forward passed the lips, causing them to vibrate as it passes. No other action is required from the rest of the body. Just as the ball needed no squeeze from the outside to release the air, the embouchure needs no push from the torso to release the air. The best way to practice long tones, and by best I mean produce the most beautiful sound, is to begin each note with a belllike start in order to relax as quickly as possible. The bell-like shape of the note will start the air fast enough where no pushing is necessary from the body. The relaxation after the start of the note will allow for maximum resonance. In a sense the torso becomes the concert hall: if the diaphragm and abdominal muscles are engaged and tight, the concert hall will sound small and dead. If the diaphragm and abdominal muscles are relaxed the concert hall will sound spacious and reverberant. You should feel like you are spitting the air a long distance. Then the only other action required is keeping the embouchure perfectly still by having a perfect seal against the mouthpiece. This way all physical action is accomplished from the chin up, which is the only way to get optimum resonance. Your only responsibility once the air is instantly dispatched is to make

sure the air is released in an even manner from the lungs naturally deflating without an ounce of pushing from the body. This will result in a long even diminuendo and the best sound you can produce.”

At http://www.jayfriedman.net/articles/no_guts___good , Friedman writes, “If most of your

muscles are flexed while playing, you are replicating an anechoic chamber.

As more muscles are

put into a relaxed mode you are dialing up more reverberation. When all muscles are relaxed

except those of the embouchure, you are producing an acoustic, which is the equivalent of halls

such as the Musikverein in Vienna, or the Concertgebouw in Amsterdam, two of the most

reverberant concert halls in the world. This acoustic produces what is known as a "ringing" sound

and that is the secret to a great sound, strong in fundamental, and as a result, producing many

overtones. Picture this; an Olympic athlete is getting ready to perform in their event. Do they

stand there and try to get their muscles as tight as possible? No, they shake out their arms and

legs and try to get all the tension they can out of them, because relaxed muscles mean flexibility

and speed, something which is needed to play an instrument. Many years ago they tested a

brass player playing a fortissimo passage, and found it to be one of the most energy consuming

tasks of all. We must start to consign the "firm foundation in the lower torso" idea to the dustbin

of history with other widely accepted, and later discredited theories. While I developed a

fondness for practicing in an anechoic chamber, that doesn't mean I want to perform in one. So,

dial down the tension in your torso, and dial up the reverberation time in your body's concert

hall. If you can get some reverb time in your practice room, imagine what you can do in a

reasonably resonant acoustic. As I said many times before, all the work should be done from the

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chin up, and at the beginning of the note. Another thing to remember is why we take a full

breath for every passage whether that passage requires it or not. When almost all air is expelled

when playing, the only way to empty the lungs completely is to engage some muscles in the

torso. While we try to avoid this as much as possible, there are many times when there is no

alternative. When possible it is far better to take in more air than needed, to avoid using the last

liter of air, and avoid the need to push out the last of that air with the muscles of the torso.

Believe it or not, the muscles of the rib cage are much more efficient in expelling air when

needed than the diaphragm, and does much less damage to the sound. It is possible to learn to

use more of the chest muscles and less of the diaphragm to sustain the end of a long tone,

something again which has been widely misunderstood.”

http://www.jayfriedman.net/articles/how_s_the_air_up_there discusses the keys to playing in

the high register. “Everybody wants a good high register but the question is, how to get it? First

of all, let's make one thing clear; high register is mostly air and less importantly, body. A simple

but frequently overlooked fact is that it takes more air to vibrate taut lips than relaxed lips. Since

we need to have firm corners in order to produce high notes, we must increase airflow to make

those lips vibrate. I have heard many people actually decrease airflow when going up because of

the fear that the embouchure will not hold the amount of air needed to produce that note. This

becomes a self-fulfilling prophecy. Since not enough air was blown across the embouchure to

vibrate the lips the pitch wasn't produced and fear determined the result. Imagine a weight pressing down on your embouchure when playing a high note, trying to push you off of that note. Since you have already set your embouchure to produce that frequency, the only thing you have to keep that weight from pushing you off that note is the air stream. Think of the air stream as a bridge between notes. It is your job to keep the bridge strong and stable, in order to hold the traffic above on a smooth and steady plane. The mental image of a steady air stream will keep the corners firm and still so that the air has a smooth, firm and level surface to travel across. Learn to articulate on a constant air stream as if the air was in the slur mode, whether tonguing or slurring. It should feel like the notes are riding on top of the air stream. You should set your embouchure once for every passage and then rely on the air to drive up to a higher register. The partials being closer together in the high register allows you to glissando with the air stream without it being heard. I like to think of my embouchure like an elevator. I sent it up to the right floor and then I have to blow the doors open, whether soft or loud. I set my corners so that the air can be blown across a level surface. The crucial thing is to have a fanatically steady air stream as if you were playing one long note and the intrusion of the tongue to articulate had no effect on the steadiness of the air stream." Ask your wind students to inhale equal 3rds of air until they are full of air. Ask them to evaluate how they feel after inhaling each 3rd of their Vital Capacity. A large, full inhalation, which inflates to the upper 3rd of capacity, may feel unnatural and very full. It is and that's ok. Inhaling to the top 1/3 of air capacity allows us to play with optimum efficiency and success. The less air you

inhale, the more your body will substitute unnecessary and inefficient muscle tension for airflow. This is the cause of most physical playing problems. Without enough air (fuel), many players contract or tighten their torso and abdominal muscles, which automatically constricts the throat and airflow and ruins the sound. Wind players should always inhale enough air to inflate to the upper 3rd of your vital capacity of air. With that much air we can relax our body and natural deflate instead of tightening abdominal muscles, which restrict the throat and limit airflow. As we inhale a large amount of air, we should relax our body and allow our body to move as a result of inhalation and inflation. Don't move to breathe, breathe and let your body move. In his Brass Players Cookbook article, "Some Observations on Respiration," Dale Clevenger, former solo horn of the Chicago Symphony writes, "Pretend you were diving under water in order to swim quite a distance, the breath you would take would not be a small, "half-hearted" one. You would not be concerned in the least about how much your thoracic (chest) cavity moves. The comfort level of this extreme breathing movement is very different from the "normal" daily breathing, which is a reflex activity. The physical sensation of a deep breath may seem at first uncomfortable and unnatural ... it is, and this is okay. Under the stress of a lesson, rehearsal, audition or concert, all brass players occasionally forget to inhale enough air for optimum relaxation, efficiency and sound." Charles Vernon, bass trombone of the CSO, wrote in a 1993 Instrumentalist magazine article, "Pursuing a Focused Trombone Sound," "Just as Jake [Arnold Jacobs] did with me, I ask students to make a breathing bag by taking a tube [toilet paper tubes work great] and taping [or rubber band] a plastic bag on the end to form a bellows. At a tempo of $\text{♩} = 60$ students should fill

the bag with air over four beats, then empty the bag over four beats by inhaling. Keep the beat steady and fill the bag over three beats, then two beats and one beat. The goal is to get the same full breath in shorter amounts of time.” In a 2007 *Instrumentalist* magazine article, “On Top of the World: An Interview with Chris Martin,” the principal trumpet of the CSO states, “While growing up I liked using breathing bags and still use them today. Every other day, before I even start buzzing, I will perform breathing drills borrowed from Jacobs studies.”

Arnold Jacobs, legendary brass pedagogue and former tubist of the Chicago Symphony Orchestra, wrote in his 1991 *Instrumentalist* magazine article, “Wind and Song,” “We can’t substitute the pressure of air for wind. The phenomenon of wind is air on the outside of the lips, not the air inside the body ... psychologically you should think of blowing from the mouth.” Keep breathing instructions simple; “blow from the mouth like emptying the water key.” In his 1992 *Instrumentalist* magazine article, “Mind Over Metal”, Jacobs wrote that brass players develop automatic habits [good and bad] based on the instrument. “You [the teacher] can communicate to the student, but he cannot communicate to his tissues because the signals are based on old habits. Maximum efficiency comes from upsetting the student and introducing strangeness. Change is accomplished very rapidly by introducing strangeness or unusual conditions.” The use of breathing devices, away from the instrument, is an extremely efficient way to improve breathing efficiency and music making for wind instrumentalists. Performing breathing exercises with a Breathing Bag and the Breath Builder, mouthpiece buzzing on an Inspiron [Inspirx®] Incentive Spirometer, singing the music perfectly in-tune, whistling the music perfectly in-tune

and mouthpiece buzzing or rim buzzing on an embouchure visualizer/cut-away mouthpiece rim

are excellent ways to introduce strangeness and help students improve quickly. The following

YouTube videos provide Arnold Jacobs' instruction for the use of the breathing exercises, the breathing bag and breath builder.

Arnold Jacobs Breathing Bag video

<https://www.youtube.com/watch?v=JyA0jCw15Y4> Arnold

Jacobs Breath Builder video

<https://www.youtube.com/watch?v=ipCTYuFMr2k> Jacobs Breathing

Exercises <https://www.youtube.com/watch?v=KrNmbaRql0Y> Breathing Part 1

<https://www.youtube.com/watch?v=aW-WFAvqiT0>

Breathing Part 2 https://www.youtube.com/watch?v=vnoq_U008I8

Wind and Song https://www.youtube.com/watch?v=SQJBgzgn_3o

Dynamics

At http://jayfriedman.net/articles/long_tones CSO principal trombone Jay Friedman writes

"Everyone can move air fast when playing the louder dynamics, (although most people even then

don't move it fast enough) but as soon as the dynamic is reduced the air will automatically slow

down, causing the sound to change, lose focus and projection. The way to think about the sound

in the softer dynamics is to imagine a forte dynamic that has been moved a distance away. In

other words it is the same sound, same clarity, same intensity and focus, just farther away. The

only way to achieve this is to not slow down the air stream when playing soft. Less air will be

used at the softer dynamics but it must move at the same speed to get the same sound as in the

louder dynamics. This can be done by narrowing the aperture of the embouchure so that the air

stream is concentrated into a smaller area causing it to move faster. Think of long tones as

ringing a big bell and then a small bell. The small bell never rings slower; in fact it appears to

ring quicker, and that's the feeling we need to keep in mind when changing dynamics from loud to soft."

EMBOUCHURE

An important key to efficient, easy brass technique is to learn to move the lips

only inside the mouthpiece, not at the sides of the mouth or corners. Rim buzzing on a Cutaway

Mouthpiece, Embouchure Visualizer, Mouthpiece Visualizer or valve slide pull ring, and practicing

loud non-tongued SFFZ huffs, long tones, scales, arpeggios and flexibility lip slurs help develop

the efficient, strong embouchure necessary for a beautiful sound in all registers. Mouthpiece

buzzing on a cutaway mouthpiece rim/embouchure visualizer with recordings is another great

way to improve your articulation, sound and preparation.

Firm Corners

At <http://www.jayfriedman.net/articles/corners> , Friedman writes, "If you want to spit air a long

way you automatically firm the corners. I use the spitball test. Make a spitball and have someone

spit it as far as they can. Watch the angle it travels. If it comes out low they need more corners.

Most players need more corners to produce a sound that is lively and resonant with sufficient

"core." Of course, the sound is the thing that judges the correct embouchure. The old idea of

"spit some air into the horn" still is the best one because of the simplicity of concept. If a student

can spit air without tightening the diaphragm, they will get a good sound.

Thrust is achieved by

building pressure behind sealed lips at the moment of departure. The torso will move but not

tighten to start the air. I think of the lips like a rubber band that stretches and relaxes as the

range changes. The more it stretches, the more airflow is needed, and the more mouthpiece

pressure is needed. Physics says that for every action there is an equal and opposite reaction, hence the need for the "stability" of the mouthpiece to keep the embouchure still as more air and more tension in the corners need more stability from the mouthpiece. Producing sound on a trombone requires three things that must be in near perfect balance: firm corners, sufficient airflow and sufficient mouthpiece stability or seal. Firm corners mean that every note should be thought of on a shelf. The embouchure should be thought of as a forklift, delivering air to each level of the different levels of each shelf. We don't want any shelves that are not level and which sound can slide off. The embouchure and mouthpiece seal provide the necessary firmness to lift the sound to the highest shelves. One important caution, I am firmly against free buzzing because without the mouthpiece to "lean against" the torso will tighten and the sound will constrict because SOMETHING must take up the reaction to the air flow forward and if it's not the mouthpiece it will be the gut and THAT WRECKS THE SOUND."

Mouthpiece Pressure and Developing a Fine Sound

The May 1992 Instrumentalist article "Concentrate on Sound" by Dale Clevenger states, "On the subject of pressure, I am not a non-pressure player because I don't believe non-pressure gets the sound. I have never had a student who did it successfully. They are basket cases if they try to play this way because they cannot produce a fine sound. More often I say to them [students] "Relax your face just a little. Put the mouthpiece up just a little bit firmer. Let the air come through slightly more relaxed lips, rather than tense lips." A Scientific Characterization of Trumpet Mouthpiece Forces by James Ford includes Arnold Jacobs' statement, "Some mouthpiece force against the lips is important to ensure a proper seal around the vibrating portion of the lips.

If too much force is applied, tissue can be damaged. When a player holds the mouthpiece on the lips too long, swelling develops.” At the website http://www.jayfriedman.net/articles/early_bird_gets_the_note, Jay Friedman, principal trombone of the Chicago Symphony Orchestra, states, “I want to stress the basic principal of producing sound: a critical balance between the 3 components of tone; enough firmness in the corners of the embouchure, enough air flow to vibrate the lips, and enough seal or stability of the mouthpiece against the embouchure, OK, pressure. When these 3 things are in the correct balance no other muscle activity is needed or desired. How much pressure is enough? Hold your arm out and focus on how still you can keep your hand. Hard huh? Now lean your outstretched hand against a wall with just enough pressure to keep it absolutely still. That's the way you keep notes steady. Also, there are basically two kinds of mouthpiece pressure, which are useable in playing. The first is when playing loud and high, bringing the mouthpiece closer to the face by a combination of the arm bringing the horn closer to the face and bringing the embouchure closer to the mouthpiece. Then there is another more subtle way to use pressure to stabilize the embouchure for holding long notes at a soft dynamic. That is by visualizing the horn as an unmovable object (like the wall) and leaning the embouchure against it to keep it completely still, therefore requiring only the monitoring of the air stream to hold a note perfectly steady. You should feel like you are spitting the air a long distance. Then the only other action required is keeping the embouchure perfectly still by having a perfect seal against the mouthpiece.” Jay Friedman’s article at http://www.jayfriedman.net/articles/recipe_for_success states “I'm

going to go out on a limb and put forth a theory that will ruffle some feathers in many quarters.

Namely, I think the average player doesn't use enough mouthpiece pressure to balance the airflow and stabilize the embouchure during loud or high register playing. I believe a large factor in the production of the dreaded double buzz, is the buzzing of lip surface outside the rim of the mouthpiece, or even on the rim itself. Professional players have no problem using the necessary amount of mouthpiece stability to balance a strong airflow. The trouble starts when people want to use the no pressure system when playing loud and/or high. The embouchure is not held stable enough to hold that much airflow and lip tension and notes cannot be sustained in an even and resonant manner. When you think about it the mouthpiece is shaped like it is to isolate the center of the embouchure so that part can vibrate. The rim is there so that only the lips inside the rim can vibrate, not those outside. The rim is also there so the lips inside can vibrate more because they are isolated, and the lips outside can stretch and relax providing the right length of vibration just as a string is shortened or lengthened to produce different overtones on a violin.

This is not to say using more mouthpiece pressure is automatically a good thing. If you have a slow, weak air stream, this will be a very bad thing to do. Using the right amount of mouthpiece pressure in a certain register and dynamic allows more vibration of the lips inside the rim while keeping the embouchure still and stable, a must for producing a steady resonant tone, providing there is also a suitable amount of air flow to balance it. The most important thing as a suitable amount of mouthpiece pressure allows you to do is play with a completely relaxed body, which is absolutely essential in producing a great sound. If the embouchure is not stable enough, some

other part of the body will take over that function and the sound will be constricted and dead, as if someone rang a bell and then grabbed it with both hands to keep it from ringing.”

Margaret Tung’s 2009 Ohio State University DMA document, DALE CLEVENGER: PERFORMER

AND TEACHER, provides great insight and photos of former CSO solo horn Dale Clevenger’s

unique teaching aspects of Synchronization and Pursing. “The following is Clevenger’s list of

steps that occur when the production of sound begins:

1. Press the mouthpiece in on relaxed lips. The function of pressing in the mouthpiece is merely

to isolate the lips, the flexible flesh, inside the mouthpiece. The pressure should be enough on

the lips so that the mouthpiece can be felt on the teeth. He advises that one can either breathe

and then press in, or press in and then breathe, adding, however, “more and more I am pressing

first, and then breathing because often when you breathe, you firm your lips.” For these reasons,

it is recommended that before any other actions take place, players isolate relaxed lips with the

mouthpiece by pressing in the mouthpiece for optimal sound. This isolation of the flesh inside the

mouthpiece allows the air to move freely.

2. Breathe in. While breathing, it is crucial to keep the lips relaxed both inside and outside the

mouthpiece in order to avoid tension while playing. Clevenger’s students can confirm how often

he has said, “Do not stretch your lips when you breathe!” If the lips are stretched or tense while

breathing, the probability of their returning to a relaxed state to produce sound in such a short

period of time is not likely. [Lower the jaw to inhale, not through the corners.]

3. Strengthen the lips around the mouthpiece, particularly the corners, in order to counter

balance the pressure of the mouthpiece from step 1. With the relaxed isolated lip inside the

mouthpiece, the embouchure is ready to form its foundation around the mouthpiece. Clevenger explained the process in more detail: I never talk about too much pressure; somebody may play with too much pressure, but they are usually not counter balancing and playing with enough facial isometrics or facial muscles. You can use too much of either, or too little of either, and not get the desired results. So we are constantly going through a process called trial and error with beautiful tone as the primary criteria. For therapy, start a note in the middle range without tongue or articulation by blowing air through the mouthpiece and horn and letting the embouchure form until sound is attained. The goal is to “use your muscles until you get a sound.” Clevenger stresses that the “primary criteria for doing this right is the sound. If there is not enough or too much pressure, it won’t sound right.”

Mouthpiece Pressure Exercise

The following exercise can also be used to help students understand the importance of forward, contracted and firm mouth corners. Place the mouthpiece on relaxed lips with no embouchure setting, press in gently adding moderate mouthpiece pressure (only about 3% more than zero pressure), just enough to feel it on your teeth, like you would if you touched your finger to your lip. As you blow air, press the mouthpiece in gently on RELAXED lips and strengthen the lips around the mouthpiece, particularly in the corners, in order to counterbalance the pressure of the mouthpiece. Blowing air through relaxed lips, press in gently and firm the mouth corners, slightly contracting the mouth corners inward, to counterbalance the mouthpiece pressure. As you blow air, press in gently on RELAXED lips using only enough corner contraction to begin the “buzz” and avoid leaking corners or puffing the cheeks.

VOWEL

Another important element of a good tone is the proper use of vowel. The legendary brass teacher Arnold Jacobs observed that we first learn to use the tongue through language and diction, using consonants and vowels. We can only communicate with the tongue muscle and find efficiency, ease and beautiful articulation via listening and the use of vowels. Say the vowel "OH" and "AAWH" and breathe in and out using those vowels. These vowels open the throat, lower the tongue and jaw and will help produce a warm, lovely tone with a centered pitch. Say "AH" and "EE" and breathe in and out using those vowels. These vowels raise the tongue and jaw, make the oral cavity smaller, push the tongue forward and cause players to sound thin, bright and sharp. The primary difference between the vowels EE, AH, OH, OOH and AAWH is the back of the tongue, which controls the oral cavity, pitch and tone. Remember, a lovely, warm tone is always our first and foremost goal. Using vowels to communicate with the tongue, and touch the tongue tip behind the bottom of the upper teeth (but not between the teeth), say a repeated series of "thOOH-tOOH-thOOH" and for low register say "thAAWH-thAAWH.thAAWH." Listen to recordings of artists playing all articulations and concentrate on imagining and mentally hearing a beautiful sound, clarity and response while you play. Your body will figure out how to make a beautiful, clear, articulated sound if you imagine it correctly and experiment a bit with where the tip of the tongue touches when you articulate.

Articulation Clarity and Ease: Tongue at the Bottom of the Top Teeth

In Margaret Tung's 2009 DMA document DALE CLEVENGER:

PERFORMER AND TEACHER, Dale

Clevenger, recently retired solo horn of the Chicago Symphony Orchestra teaches, "the cleanest

and clearest articulation is produced when the tongue meets the [back of the] bottom of the

upper teeth.” Low brass teachers commonly teach tonguing at the bottom of the top teeth, but many high brass teachers suggest tonguing at the gum line or higher on the back of the upper teeth. As a former user of gum line tonguing I can tell you that using “thOOH” to touch the tongue tip to the back of the bottom of the upper teeth is more successful for many reasons. In a June 1991 Instrumentalist magazine article, “Arnold Jacobs Master Class,” Mr. Jacobs wrote, “Simple thoughts initiate physical responses.” He taught that we learn to use the tongue as a child via language. The simplest and quickest way to help students to adopt this more efficient and clear articulation, tonguing at the bottom of the upper teeth, is to ask them to articulate using “thOOH.” Using thOOH to touch the tongue tip behind the bottom of the upper teeth (but not between the teeth) will produce a clearer “pop” on the beginning of tongued notes, a warmer sound and lower pitch center due to the larger oral cavity and improved response due to more and thicker air causing the lips to vibrate. Say “thOOH, thOOH, thOOH,” and for low register, “thAAWH. thAAWH, thAAWH.” This helps enlarge the oral cavity and lower the tip of the tongue to touch the back of the bottom of the upper teeth. Position the tip of the tongue behind the bottom of the top teeth to articulate. These vowels open the throat, enlarge the oral cavity, lower the tongue and jaw and will help produce a warm, big, lovely tone with a centered pitch. Many low brass players tongue at the bottom of the top teeth and it is common pedagogy. Many high brass students tongue and are often taught to articulate at the gum-line where it meets the back of the upper teeth. A little experimentation using “thOOH” to lower the tongue and open the oral cavity will prove that tonguing at the back of the bottom of the upper teeth produces the

cleanest, clearest response and articulation, especially on low and soft notes. It also warms and darkens the sound and lowers the pitch to the correct pitch center and tone instead of consistently running a bit sharp and bright. Play repeated notes with Spotify "Cello Drones" or a Tuner Drone Pitch. Tongue where you normally articulate while listening to a drone pitch and then compare that sound, response and pitch to tonguing with the "thOO" vowel, behind the bottom of the upper teeth. Make certain the tip of the tongue touches behind the bottom of the top teeth, not between the teeth. Tonguing between the teeth will block the air and generally produces slow tonguing and poor, late response, especially in soft passages. If you or a student tends to tongue between the teeth, curl the tip of the tongue upward like the front of a snow ski and this will help avoid this common articulation flaw. Avoid using "Twah" which moves the entire tongue and lower jaw. This causes "chewing" and unmusical swells and pitch variance on each note. Don't stop notes with your tongue as in "TuT." If the beginning of the note is fuzzy or unclear, most likely the tongue is making contact too high on the back of the upper teeth or even on the roof of the mouth, which may interfere with the flow of air. Clarity and easy response is important for all brass musicians, but even more so for horn players because the horn bell points away from the audience and the hand is in the bell, creating obstacles for articulation clarity. All brass players should strive for the sound to be beautiful, clear, clean and articulated for the last row. Conductors rarely comment that a passage is too clean, clear and on time. Always blow fast enough to produce a good ringing sound, even on very short notes. The use of UU, OO, dOO, thOOH, tOH, thAAWH and tAAWH vowels pull the tongue down and back to enlarge the oral

cavity and encourage contracted mouth corners, which reduce corner motion and are vital to good tone and technique. Minimum corner motion is important to developing a consistently beautiful tone, easy technique and good intonation in all registers. Playing with the vowels TAH, and TEE are common mistakes, which produce poor response, a bright tone and sharpness. To find the best sound, students should mouthpiece buzz and play a long middle register pitch with a drone pitch and experiment with different vowels, while raising and lowering the jaw. Repeat mouthpiece buzzing and playing a long low register pitch and experiment with different vowels, while raising and lowering the jaw. "EE" restricts the airflow and relaxes the corners causing poor response and weak buzzing. OH and OO vowels improve response and buzz. We should use the vowel thAAWH in the low register, from middle c downward, to slow the air, open the jaw and enlarge the oral cavity. Pitch bending exercises, using "thAAWH," chewing the jaw up and down while playing long notes and Rochut etudes while comparing pitch to Spotify Cello Drones can help open up a sharp, nasal, pinched sounding low register. Great practice advice from Bud Herseth, the legendary former solo trumpet of the Chicago Symphony Orchestra for 50+ years, is available at <http://brassmusiconline.com/Articles/practise.advice-from-bud-herseth/> . He repeatedly suggests, "never practice, always perform" to help us keep the music first in our personal, individual rehearsals. Another must read is The Answers from Chris Martin. Principal Trumpet of the Chicago Symphony Orchestra answers 16 questions about music and brass playing: warmup, practice, stamina, range, tonguing, and auditions. The key to brass playing beauty, ease and efficiency is that Musical Product Dictates Technique.

Former CSO second trumpet, Vincent Cichowicz wrote in his 1996 Instrumentalist magazine article, "Teaching the Concepts of Trumpet Playing," "Without a musical image in your mind, the difficulties of performing on an instrument are magnified greatly. Many of us assume that students have a good musical image, but I am amazed at how often this basic element is either absent or fades into the background. Everyone is concerned about respiration, embouchure, and tonguing as separate entities, but it is the musical imagery that pulls this together. If the musical thought you want to convey is clear in your mind the result will be reflected in the appropriate application of the techniques required to achieve your goal. I always put this concern at the top of the list." Arnold Jacobs wrote, "We have to find the signals in the brain that cause the body to function with ease, the way it should. All brass players should develop the ability to hear music in their heads before playing. The lips act as vocal chords, but we have to furnish the message for them."