THE NORTHWESTERN UNIVERSITY LECTURES

GIVEN BY ARNOLD JACOBS

SUMMER OF 1987

Given to me by Luther Dedrickson app late 1990's.

AS TRANSCRIBED AND EDITED INTO NARRATIVE FORM BY LUIS LOUBRIEL.

This paper will present some of the principles and ideas Mr. Arnold Jacobs talked about in his Northwestern University Lectures. These lectures were (in some years) part of the Northwestern University Summer Class Curriculum. The main subject of the lectures was the use of respiration as applied to brass (wind, vocal) performance practice (thus the emphasis on the function of the respiratory system during the lectures).

This paper will be written in chronological order (according to the 1987 lecture) and divided according to subject matter. For example, under "high playing" I will write the information Mr. Jacobs gave on this subject. Sections written in Italics or quotation marks are direct quotations (verbatim) of Mr. Jacobs.

THE LECTURES:

IMITATION:

Imitation is a powerful tool for learning. In learning through imitation you can use your sense of sight, touch, hearing, etc. to imitate something or someone else. (This way you will tell your brain how to proceed to play music). This is indeed an attitude which has the dominance on the art form of music not of physical function of music. For example, you could use your breath (as applied to brass playing) to perfection and be a horrible player (musically speaking). The use of breath is nothing more than the use of fuel (like gasoline to a car); it is not music, it is just part of music.

Imitation is especially important to a young person learning a musical instrument. That young person should be aware of the musicality expected from them. They should also have a great sound to imitate because "if there is a great sound in their brain and a horrible sound coming out of the horn, it will not be long before that sound becomes better - by trial and error and by the agitation of tissue which leads to hypertrophy." In other words, eventually what comes out of the horn will match what is in the brain. "Your major should not be listening (or paying attention) to what comes out of the horn but rather your major should be the conception of sound in your brain."

SENSORY AND MOTOR SYSTEMS:

Certain attitudes need to be in place to learn to play brass instruments. First we must realize that most of our life is devoted to learning (through you senses) but in brass playing we impart information (music) through motor systems (motor activity). In other words, "you gather information thorough your sensory programs and you impart information through your motor systems". (It is

important to know that sensory nerves are a one-way street going inward and motor nerves are a one-way street going outward).

In our art form there is an imbalance. When we play and instrument we should be playing for somebody else (imparting information outward) and not playing for ourselves (listening to ourselves just like an audience member would). When performing we should create in our head - we can also imitate Adolph Herseth until what comes out of the horn matches what is in your head.

"Conceive what you want to sound like. What you actually sound like is not nearly as important as what you want to sound like."

"Don't blow and listen to what comes out of the horn hoping that some miracle will happen. You must give your brain examples of great artistry. You flood the brain with beautiful sounds and so as soon as you see a note on the page you will hear the sound of that note with all of the pitch and sound qualities you want." For brass instruments this is important because you have to send a perfect partial into the instrument (so you get the full spectrum of sound and dynamics out of your playing efforts). This study can be very frustrating partly because it requires high levels of mental efforts (approach). This mental effort is important because brass instruments are stupid pieces of brass (they cannot give you the pitches like a piano would) so we must put "perfect notes" into them.

The study of solfege (single line studies) is a good training process (challenge) to improve "pitch- recall". You must challenge the brain by studying pitch and rhythm away from the instrument. Remember that "challenge precedes development" so you cannot have improvement without challenge.

Don't put the areas of the brain which deal with pitch recall to work to take care of tissue. Just order a product and get out of the way.

If you go blank in the head you might miss notes - Sing in the brain.

The horn reflects your thoughts.

MUSICAL DEVELOPMENT:

The development of musical abilities (by a method of orderly changes) takes time. Go from the elementary to the advance. Children do not think of the time that it takes to develop. On the other hand, adults think of the time it takes to develop and rarely have the patience to stay with it. Adults must understand what is involved and come to realize that development takes time.

It is important that you always work with your brain as a musician. It so happens that as you develop you get so interested in other things (such as anatomy and equipment - these are important things but they are peripherals) and you forget to work with the brain. Also, avoid setting rules for physical function because there are always slight variations in neuro-muscular patterns so players will come to create different embouchures as time goes by (so if you play only by "feel" you will drive yourself crazy due to all of the physical changes involved).

Don't teach embouchure as the ability - teach music as the ability.

You must stabilize musical results - do not try to stabilize tissue function.

Condition of the saliva, acoustics, physical energy will vary tremendously but always try to stabilize your sound.

Players have to be flexible on how they adapt to the instrument because of all of the variations involved.

You have to work with the student's mind. This is because in most cases playing problems are not in the muscle tissue but in the student's brain. In other words, the student's psychology has to be altered. You can do this by altering the stimulus in the brain (you want to alter the response pattern in the tissue - the priority is not altering the tissue but the message in the brain to the tissue).

Be open-minded on how you think when you play so you are able to change.

BODY TYPES:

Your body type will affect the air capacity you have. For example, Will Scarlett (former co-principal trumpet with the Chicago Symphony) was 5'7" in height but had a 6.7 litters of air capacity. (In general, people who have long torsos and short legs will have a larger air capacity in their lungs). So we must realize that there is a large difference in the potentials people have for air capacity. Nevertheless, everyone is capable to play beautiful music regardless of their air capacity (Mr. Jacobs had at the peak of his physical form about 3.5 litters of air capacity and still he managed to have a successful career as a tuba player).

Players who have small lung capacities need to make sub-phrases out of a long musical phrase. In other words, the players will need to breathe more often. "Rules are meant to be broken - so many rules have to be broken with wisdom" (in the area of music).

A tuba will need to breathe more than a trumpet - waste the air because it's free.

Don't follow too many rules. For example, the rule that says "do not let the audience see you breathe" is wrong because you need to expand to fill-up correctly (fully).

To use your lung capacity you have to breathe in full movements (full length of muscle movement). In respiration we must fill-up from 35% (TLC - total lung capacity) to about 80% TLC and that constitutes an enormous change in your body - "from much smaller to much larger".

PHYSIOLOGY OF BREATHING:

We have about 659 muscles in the body and 654 of those work in antagonistic pairs. In other words, they have a great potential for shortening to exert great power (the same muscles have the potential for stiffness).

The abdominal muscles are expiratory in nature - they will come in to "push in". When they "push in" the diaphragm will be pushed up (it will move the diaphragm up). The main function of the diaphragm is inspiratory in nature (when it comes down it lowers the air pressure in the lungs and it will also increase the abdominal pressure).

Like a bellows, the abdominal muscles go up and push the air out (the intercostal muscles are also involved in blowing out). However, the abdominal muscles are also involved in two other functions in the body. In other words, the same muscles are used for three different actions in the human body: 1 - Pelvic pressures (child birth, defecation, etc.), 2- Combat (tensing up the abdominal wall to protect the vital organs in case of an attack), 3 - blowing out (brass instruments, birthday cakes, etc.). The latter are listed in order of importance from the standpoint of survival on this planet.

The human structure is designed to survive in this planet not to play brass instruments.

It is like we have three separate blueprints (1- pelvic pressures, 2- combat, 3- respiration-bellows activity). They are all part of life and quite necessary. However, when we try to blow out large quantities of air while being in "pelvic pressure" or "combat" modes it becomes

very difficult to do (because the respiratory muscles are being used to push down and not to push up). This mis-application of activity - from blowing to pushing - is what the "old school" of brass playing (ca. 1920's-1970's) taught. This kind of mis-application is similar to sneezing (it measures about three pounds of inner aural pressure whereas in trumpet playing we work in ounces of inner aural pressure).

As we have seen there is a tremendous potential of stiffness (instead of function) in the respiratory system so we have to make sure we order the right product. In other words. the three blueprints in the body can get triggered by your thoughts and the wrong thought will trigger the wrong blueprint. We have to make sure we order the right effort for playing (in the case of inhalation it is suction at the tip of the mouth).

Even players who play with pelvic pressures can make music. Miles Davis is the greatest example.

Always go for a strong tone not a strong body.

As said earlier, we can tap into any of the three biological blueprints without realizing it (it comes from the confusion of levels in your mind; your mind wonders into the wrong place and it gets in trouble). However, you can train your body to stay relaxed (to let go of the pressures) by the study of "relaxation pressures". These exercises are simple: take the air in (long breath) in elastic movements and blow out in an elastic movement.

Simple answers are the best.

PARALYSIS BY ANALYSIS:

Do not concentrate in the wrong aspect of your playing as you perform because you will not improve. You have to take music

performance and work with its challenges in terms of music making - get away from the analysis on how to make this or that note. Our mental concentration should be on the storytelling aspect of playing (it is like wearing different hats - at one time you are the performing storyteller at another time you are a teacher or a scientist, etc.).

Avoid getting too much into the mechanics of tone production while playing your instrument. Do indeed get into the study of tone but from a musical standpoint (how beautiful a trumpet tone can be). There is always some awareness of your tone as it comes out of the bell of your instruments but it should be about 10% of your mental efforts (90% of your mental efforts should be towards the mental image of the sound you want).

The easiest way to learn the storytelling aspect of music performing is by the imitation of a great artist (such as Adolph Herseth). Also you can study acting because it correlates as a form of extroversion to music performing; in acting you portray another person and in that process there are physiological changes which you use to influence (impact) the outside environment. (This is what is meant by "influencing the outside environment through the use of psychomotor activity).

Always avoid using self-analysis while playing (if you want to analyze your playing you can record yourself play and listen to the recording later).

The microphone is your audience.

When you practice you should play like painter paints on a canvas.; painting from your head (mental images) to the paper. This is more difficult to do than it appears because intelligent people (especially adults) have to know what is going on (as they play). This habit will surely get them into playing problems. To get an "intelligent player" out of the habit of analyzing is simple - you get them to start a new habit based on the imitation of a great player (do not try to fight the

old habit of analyzing because this way you will be stressing the old habit just like as you diet if you think "I can't eat food" you will be stressing the image of food and you will probably get hungry).

Music is indeed a stressful occupation in terms of the psychology involved in performance. The psychological process of performance is simple - the horn reflects your thoughts by treating your lips like vocal chords (so if you miss a note it most likely was not in your brain "like a light bulb going off in your head"). This is way it is so important to sing the note first in your head before you play it in the instrument.

Pick and choose your habits - choose the good ones and pick out the bad ones.

REGIONAL BREATHING:

Regional breathing happens when someone breathes (inhales) only using part of the lung (e.g. if you bend down you will be collapsing the lower part of your lungs and as a result you will "regional breathe" with the upper part of your lungs). Incidentally, some overweight people will have their diaphragm go up (because of the extra pounds bellow) making the lungs shorter. "The extra pounds will cost you about .75 litter of air capacity". Mr. Jacobs (after his heart attack hospitalization lost about 40 pounds and gained one litter of air capacity).

Avoid specializing in regional breathing. You must always exercise the whole system of respiration (you can excessive the system of respiration by using a "test lung" - also called a "breathing bag" - or by using a "breathing tube"). Exercising the whole system of respiration is also helpful for improving your general health; "in nature you should have movement in the abdominal region - you will feel better".

There are two ways you can use to improve the smooth working of your breathing system. First, you can load the muscles with work - by vigorous inhalations - and once they are fatigue they will let go and they will not be able to go into isometric contractions. Another way is by using "Ventilin" (a spray used to open-up your respiratory vents). This spray will help you take the air out of your lungs beautifully (sometime pollutants in the air will irritate your lungs and make you have symptoms of asthma; this is called subliminal asthma. Ventilin will help you in this case).

When you start to learn to do complete breathing remember that it does not have to be done correctly right away. Whenever you learn a new skill you always start from the crude to the refined (in other words, out of crudity you develop skill - let things develop things properly. Sometimes in the lesson you get an understanding of what is going on but then you have to go home and develop further. Practicing complete breathing (away from the instrument) will take a couple of years (so you develop the necessary reflexes).

When you move an object you move it with your whole hand not with one finger; the same with breathing. Not regional breathing but full breathing.

Think of your "bellows system" as a machine.

It is better to have great movements of air based on weakness and not strength. Look for lack of "strength" in the respiratory region.

In teaching you take two shades of gray (where things are difficult to recognize) and you make them in to black and white (where things are easy to recognize). When learning a new skill you must overdo not underdo.

EXPANSION INSTEAD OF BREATH:

The way you give the order to your body to breathe is very important because sometimes a player will order expansion instead of air. You must always tell the truth to your body - order wind (this means that at the moment you take a breath you must order suction of air from the tip of your mouth).

The psychology of wind is at the tip of your mouth.

The greatest intake happens at first (in the first second) and after that point you will still get into your lungs but in a downward curve (in other words, at a slower rate).

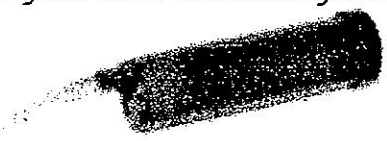
You must order a yawn not body enlargement.

Your body can lie like crazy.

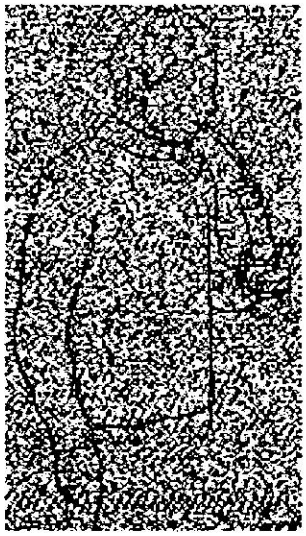
TENSION IN THE ABDOMINAL WALL:

When you take a breath the air will go into the lungs (via the bronchial trees) following a trajectory based on what part of your anatomy is expanding (it is not like water which fills up from bottom to top. This is also why it is so important to sit tall as you breathe and play). However, if your abdominal wall gets hard the ribs will be to stiff to move up to create a vacuum (the vacuum is necessary to lower the air pressure in the lungs so the air in the atmosphere, outside the lungs, can rush in to the lungs) and not much air will be able to get into the lugs.

To alleviate this problem you can exercise your breathing with the



"breath builder".



To use it try to keep the "ping pong" ball up as you blow out and in. You will notice that the tension in your abdominal wall will stop but you will still be able to move large volumes of air in and out of your lungs. (This is what is meant by the expression "use of minimal motors"; it is when you achieve an action using only the necessary muscles).

After all it said and done, many players still manage to create beautiful music while breathing "incorrectly" (with abdominal tensions); all the embouchure needs is thick air.

There are no shortcuts but there are more efficient ways to train and play.

Do the breathing training away from the trumpet - it will go faster.

With "breathing machines" you can make things more objective.

When you deal with anatomy you must also deal with psychology because anatomy is a machine system and what controls it has to do with your mind.

AIR USAGE AND THE USE OF THE BREATHING BAG:

The use of the breathing bag allows a visual illusion that helps players take larger amounts of air. (One of the ways to use the breathing bag is to fill it up with your own breath, cover the end spout of the bag so the air stays inside the bag, empty your lungs out, and inhale the air inside the bag; then you can repeat the inhalation-exhalation process many time without suffering from). If the player takes a full breath with the breathing bag and he plays the trumpet immediately afterwards the player's sound (and general technique) will improve. (Part of this phenomenon is the visual aspect involved in the filling in and out of the breathing bag - when breathing if we could only see the air as it rushes into our mouth we would breathe with more ease). The improvement in sound and technique is due to the availability of more wind at a lower pressure (helping ease some of the tensions the player might have).

The whole process of breathing in and out (with or without the breathing bag) is natural. When you think about it, human beings have been breathing since "day one" and as result we have developed (evolved) an efficient breathing system. In other words, it knows what to do very well without our interference.

Breathing is a natural act; not an intellectual act. If Arnold Jacob's were to play by his knowledge of air he probably could not have played a note. Instead, he played by his knowledge of music while ordering air as a product. (He knew the musculatures of the human body very well but he also knew how the music was supposed to sound like).

We must keep thing simple things simple. The human body is, perhaps, the most complex "machine system" on earth. However, complex machines have simple controls (like a car). In the human body the simple controls are in our brain so you can be free to cope with life outside of us - not inside us. To deal with the life inside you can study Yoga (among other disciplines) so you can influence your internal body by using concentration or your emotions.

Breathing also has simple controls (remember the three blue prints mentioned earlier): 1- Pelvic Pressures (where the musculatures are fighting each other and as a result your lips will not get the "thick air" they need), 2- Combat (your abdominal wall goes into an isometric position to protect your internal organs in case of an attack), 3- Blowing (the best one to use for great trumpet playing).
Your brain is already "wired" so when you order one of these blueprints (or products) your body will react by performing the actions involved in that particular blueprint. (The benefit of knowing all of this information is that you will be able to protect yourself from the "pitfalls" of our profession).

Of the three blueprints one is usable for great trumpet playing. You can use the other two blueprints but you will be working too hard.

Taking air depends on what you are going to do with it. For example, flutes have a higher flow rate than oboes. Take enough air so you can waste it; we always play by song and wind.

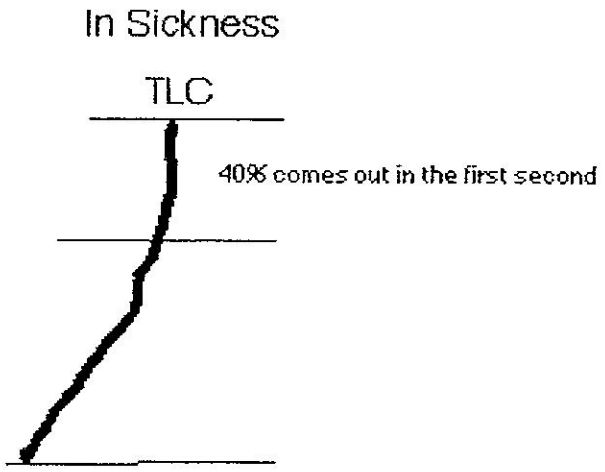
The musical message is the most important element for performers. You cannot wait for the musical message to come out of the horn all by itself; you have to put it into the horn. You have to conceive a message in your head (using your emotions and musicianship) to communicate to an audience. You have to create a pattern in which you order a product so you create a stimulus for your muscles to follow. This is what playing is all about. You cannot bypass that process by trying to control directly the various musculatures involved in playing. You have to instead order a product in music, get out of the way so the regions of the brain which deal with the control of muscle fibers can function. (Arnold Jacobs had many health problems and he would get back to the horn with negative thinking and weakness. Everything felt different when he played again but he

would start to work based on musical thoughts - the storyteller of sounds and emotions).

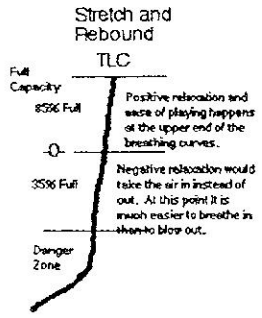
Play by music not by feel.

BREATHING CURVES:

When breathing equipment was used in the past it was quite mechanic (no computers) so you would measure quantity and time. Modern machines measure using computer systems.



You want to play your instrument using "relaxation pressures" (positive and negative) which happen when you take a breath - at this point there is a stretching and because of the elastic nature of the lungs (and intercostal muscles when relaxed) the air will blow easily (almost by itself) using minimal motors. (This action compares to filling up a balloon with air and realizing the air out once the balloon is full).



You want to stay playing with the positive pressures because in the negative pressures there are problems (mainly muscle tensions in the upper body). Some players reach this point and do not get out of it because they keep taking shallow breaths. As you stay playing in the negative pressures you will have to play with more muscle activity in the intercostal and abdominal region (trying to push the air out of the lungs). Also at this point pressures are increasing in the lungs and the little airways going through the trachea. In other words, while one pressure (the one produced with the muscle activity of the muscles) in trying to help you play the other pressure (the one being raised inside your lungs) is harming your playing. You will be fighting yourself and in that process the capillary beds in the lungs start to fill up with blood making them heavier and harder to move. (Also in capillary beds fill up in your lips making them harder to buzz and as a result inner aural pressures increase creating more tensions).

Don't get too low before re-breathing.

NEURAL INHIBITION:

If you are playing with abdominal tensions you have to visualize a "big bubble" (like the ones used to write the script in cartoon strips) and imagine that bubble in filled with air. Your job is to suck all that air in; at this point the brain will dis-activate the internal pressures by using "neural inhibition" (it takes the inhibition out of the muscle). You just have to give the order of air suction. If the order is not given properly (by not using your imagination) you will keep trying to breathe while having a tight-opposing pair of muscles.

Seek weakness in the contraction of your muscles. To achieve this you must work with the positive curves of breathing; this will help you avoid isometric firmness in the abdominal muscles (if your abdominal muscles firm up you will take a great deal of your air capacity out).

Ribs go upward when you breathe. Involved in this movement there is a potential for isometrics. In the isometrics the ribs will go down and in (the ribs are connected to the abdominal -pelvic region- so when there is need for muscle pressure in this area the ribs will go down and in). If the isometrics are involved playing a brass instrument will become "hard to do" but in done correctly brass playing is "easy to do" (Arnold Jacobs still played at a first class level at age seventy-two with chronic sicknesses).

Trumpet players need to make sure to stay away from the isometrics and instead work their respiratory system as a bellows. The main reason for the latter is because we want the pressure to be against the resistance of the lips and not anywhere else. We want to push the air out with the correct efforts. (When you have pelvic pressures you might be fooled into believing that you are playing with pressure against the lip).

A good exercise helpful for transferring the air pressure to the tip of the lip (where it is needed) is to blow (as if you were blowing a candle). Then put your index finger in your lips (as to seal the lip aperture) and as you keep your blowing efforts remove the finger from your lips.

For lead trumpet playing you will blow like a Dickens but the blowing has to be against the lips.

Whenever there is a problem at the basic level of blowing you have to deal with it based on the psychology of playing - go to the control panel in the brain and forget about the machinery system - blow in

and out (just like yawning and blowing). For loud playing you blow more (fast) and for soft playing you blow less (slow air). The amplitude of breath will increase with speed.

Lips do not have to cooperate with the air passing through them. To avoid this you have to make your playing the study of sound and not the study of air.

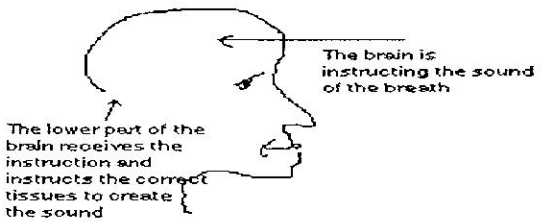
You can blow without buzzing but it is impossible to buzz without blowing.

The lips can resist the air; you can blow against your lips and they do not have to vibrate. You have to make them vibrate by thinking of each note as you play; note by note and one note at the time. It is all in the brain; it is a can of worms if we talk about all of the details and the limitations involved in the physical functions.

The psychology of breathing is always based on suction with minimal motors; the sound of a volume of air without real opposition (which applies for the air going in and the air going out).

HABITS:

Do not try to unlearn anything (that is any habit that has reached the automatic stage because it means that it has already been accepted by the brain as a conditioned reflex). If you try to unlearn the conditioned reflex (habit) you are going to make it surface (it is already in the filing cabinets in the brain; it is stored and put away). You have to instead bypass the old habit by starting a new habit (by starting a new habit you will be starting a new "bio-computer program in your brain).



The process involved is described in the drawing to the left. First you have to think of the sound of the breath you want then you have to ge out of the way to let the lower parts of the brain instruct the correct tissues to breathe. (When doing breathing exercises you can use body language - move your hand towards your lips as you breathe in and away from your lips as you blow out - because it will anchor the brain a bit more).

THE CONTROLS IN THE BRAIN:

If we play by ordering products (trumpet sounds) we will find that our playing becomes effortless. The main reason for this phenomenon lies in the great set of controls in that we have in our brain (if we simply order a product the necessary actions will be executed by the lower levels of the brain - cerebellum). This is why it is so important to go by the study of the product (trumpet sounds) and not by the study of the mechanics involved.

However, for the "chain of commands" to work effortlessly we have to get out of the way. In other words, think of how you want to sound like and avoid thinking on how you are going to do it (this would be like an actor trying to act and write the script at the same time). You have to have a great deal of thought on what you are trying to accomplish musically and not on how you are going to accomplish it mechanically. The "thinking" part of your brain is simply not competent enough to order the actual "machine systems" in your body directly. The thinking part of your brain is indeed competent in ordering what it wants and letting the lower parts of the brain do the handling of specific "machine systems" for it.

Don't try to fix or destroy old habit because you are simply reinforcing them by concentrating on them.

THE STUDY OF MOTIVATION:

You have to learn how to think like a child when it comes to communicating to your body. Think like an adult to order a musical product but get out of the way to let the lower parts of the brain do their job. When you stabilize the product you will also stabilize the tissue.

Arnold Jacobs went to the Curtis Institute of Music (Philadelphia) where he studied with Dan Telli (an Italian immigrant) who did not speak much English but was a marvelous player. Jacobs learned lots about phrasing in music from but not how to do them.

We all are products of the life we have lived so far. For example, Jacob's was a singer, a tubist, a trombonist, Dixieland bass player and trumpet played. He had varied approach to the production of sound. However, he also found similarities to the production of sound in all of the instruments he played. He found that to produce a musical sound you need 1- motor function, 2- source of vibration, and 3- a resonance chamber.

The lack of musical imagination in the musical endeavors is the number one problem in most cases (students). With these students you find that their brains are crowed out by how to play their instrument that you find that they cannot play music. One should learn first how to play music and through it you learn how to play the instrument.

With this subject in mind, it should be mentioned that there are people who warm up for one hour before they play any musical tunes. By the time the hour is up their brains are already tired. It would be wiser to take a few moments to get used to the instrument and then take a few musical challenges (easy cornet solos, folk tunes, etc.). For example, take a soprano solo and put all of the emotions into it from the very start.

PSEUDO-FUNCTIONS:

Watch out for pseudo-functions in your body. You have 659 muscles in your body and 656 of them work in antagonistic pairs (they will fight each other at the drop of a hat).

Strength or weakness in mysiology depends on how many muscle fibers are contracted (in a specific muscle group). The muscle fiber will contract to whatever degree it can; what is strength is the number of fibers that will contract.

In the cases of "maniacal strength" there is a burst of electrical energy in the brain so it will fire most of the neurons and as a result the muscle systems will contract to levels beyond usual levels. You have protection against this built into the brain to avoid breaking bones and tearing ligaments.

Through hyperthrophy (enlargement of muscle fibers will happen so they have easy contracting power). Once you have reached a state of hyperthrophy you will need very little warm up time. Atrophy is the opposite of hyperthrophy.

Trough fear on stage (etc.) we experience over applications of muscular activity. A great athlete, for example, has ease of play because his/her brain has gotten rid of the over-applications.

When starting to learn a new skill you will have over-applications but a efficiency sets in the over applications go away.

Remind yourself how easily it can be done. What was difficult to play in 1982 in 1983 might be easier (because hyperhtrophy and efficiency have increased).

Get to a point in which working for results is dominant; It is the only way to gain efficiency.

Working hard is a big illusion because you can work hard and not get any results. (Jacob's gives the example of running upstairs and screaming something to his wife; because his abdominal muscles were relaxed his voice was loud. You do not need all that strength down there. From 40 points of efforts go down to 4 points of effort; that is all you need).

Do no put all of the study of human biology into music. The study of breath is simple; study how to blow out matches, birthday cakes etc. than apply that to music. You have to motivate wind this way.

Air pressure is always present in "wind". Wind is a product in itself (with wind you already have expiratory function without the engagement of the inspiratory functions. On the other hand, with air pressure you have two functions: expiratory and inspiratory at the same time).

The psychology of wind is always outside the body.

Eighty-five percent of brass playing is in the study of song and ten or fifteen percent can be in the study of wind.

FLUTE PLAYING:

In flute playing the resistance is so low that you have to have some retention in you muscles. However, always bring it down to zero and breathe again; always ordering wind.

The childlike simplicity is so beautiful in the thought system when it communicates to the body.

Jacob's says that there are many things in the acoustics of the flute that he would like to investigate (like the angle of the mouthpiece

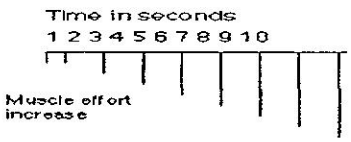
and how it affects the decibel meter. He gives the example of flutist William Kincaid with a silvery tone that was as loud as a trumpet).

THE SPIRITUAL ASPECTS:

Arnold Jacobs said, "I don't know about the spiritual aspects. In other words, I can't make statements. There are many things I don't know - whatever design - in other words the good lord - whatever has designed us has given us tremendous mind and body relationships. When this body if wonderful - you go through life expecting health as a norm. You can think of the machines we make, there is always something going wrong, but think about the body and how it rebuilds and protects itself. There are many brain potentials we don't get into. Start working on what you want to do with your body and don't get into the way of the chain of commands. Develop by ordering a product".

PLAYING EFFORT:

The resistance has to be at the lip's end not at the throat or tongue. The latter will bring ease to your playing. However, ease of playing does not mean that there is no effort in playing the trumpet. As you play a long tone the muscle effort increases (that is if you hold the long tone with a great tone all the way through).



The ease of playing happens at the beginning because you are full of air. You do not think about it because you are thinking about a beautiful tone all the way through. As you overcome the challenge of playing with a beautiful tone all the way through you, as a result, will be varying the function of the body subconsciously.

GETTING RID OF PELVIC PRESSURES:

How do you get rid of pelvic pressures? First of all, get your mind away from the problem because "when you confront a problem head on your playing will go down the hill". (Partly because by paying attention to the problem as you are playing you will be reinforcing the problem and not the solution).

Find which portion of the instrument you play with greater ease. It may be the lower register during lyrical passages. In that case, try to get into the music and teach the "love song" as dominant. Lyricism in brass playing is extremely important; it is like fine tuning the engine of an automobile where you get to the greater use of your fuel supply (air).

Your goal is basic tone production with a beautiful lyricism in the tone; "distance with less effort". You will last longer in one breath playing this way.

When you get into the extremes of brass playing, you will see that there are many pushes and changes in the embouchure and in the airways. However, you can always introduce vibrato until you find a great tone.

Remember to always use large breathing with a great melodic quality to your playing. Imitate a great player in the "bel canto" style in the beginning stages of your practice day; you will have a better playing day as a result.

CONDITIONED REFLEXES:

Experienced players have conditioned reflexes (which are as valid as natural reflexes). If you want to alter any conditioned reflex you have to do it by altering the stimuli (perhaps you can buzz the mouthpiece, or playing simple melodies while jumping on one leg) as a musician.

Many positive changes happen when a brass musician is challenged with playing tunes on the mouthpiece. If more changes are required then you can introduce "knee bends" while playing the mouthpiece because when the big muscles of the legs are used, the brain will take the effort away from the small muscles (which were malfunctioning in the first place) to protect the big muscles (of the legs). For example, when doing the Zarathustra trumpet call doing a knee bend.

To avoid further technical complications, Jacob's recommended to 1- take a large breath so you stay away from the negative pressures 2- play the mouthpiece in the middle register (do not involve the high register yet) 3- play with lots of "show business" in mind and 4- do not set rules to the embouchure but set rules to how the music has to sound.

DO NOT FIX WHAT IS WRONG:

Do not fix what is wrong but instead substitute what is wrong with another function. Use the "back door" approach using skills away from the instrument (like blowing candles) and then transfer those skills to music. For example, if you have problems with your high range you should establish success in the lower range and then transfer it to the top range. Having musical success is important because later you will put that success where there is no success. Your goal is to sound like a great Steinway where all the notes sound gorgeous.

Bad sounds can be made into good sounds. A $25 can be made into a $500 note.

APPROACH TO TEACHING:

The teaching approach should always be based on the particular student. "I can't be a mind reader but I try to get as close as possible by using intuition. I try to think - in the art of teaching you just can't have a message that you are going to impart in order for him/her to

receive it. In order to do that you have to understand the student. You have to be able to think like they do based on their background. I spent a life-time studying this... by talking to the student I establish a two-way communication not a one-way. Then you get their mind off the problem... It is hard to change the mind of a professional musician. Because they are under pressure they might resist but somewhere along the line you can establish function and transfer that to where there were problems; this way you sneak into it".

GENERAL TEACHING AIDS:

Where there is no musical success things might feel differently but it must sound as good as the low notes. You can always buzz in the low register and remember that sensation of buzz has to be present at the tip of your lip as you play the higher register (avoid having a sense of pressure at the tip of the lip while playing the high register). Working this way you will right away get the student back in to the art form.

Just the enthusiasm to play is not enough you have to have every note in your head.

AVOID OVER TEACHING:

Guide a person to play music; the tools we use are supplemental but playing music is first. The psychology of learning through language instruction is limited. For that reason, you have to use external cues (like gauges). For example, instead of teaching throat manipulation you can get the student to put the focus of the air at the tip of the mouth using a visual gauge (substitute a region where you do not have much control to a region where you have great control- the tip of the mouth).

At all times you have to use legitimacy in the read out of the wind. In other words, always use an external visual cue to aid the student (complex and expensive gauges can be substituted by single pieces of

paper, straws, candles, etc.). Also you have to know how to use the external cues; they are just read out machines, which read out change in wind pressure. (By using visual cues you will be adding to whatever breathing exercise you are doing. It is much easier to control quantities of air if you can see the air moving something outside of yourself. Jacobs said to always remember what you saw and not what you felt because if you recall what you felt you will soon relive the same negative situation but if you recall what you saw you will recall all of the positive changes that came with it).

FORMING HABITS:

It takes time to form a habit. A habit is a neurological pathway, which is formed very much like forming a pathway through a field of grass; it takes many repetitions (walk through) to form the pathway.

To form a habit, then, it takes repetition and re-motivation (the exception to the rule is when someone experiences a dramatic event; such as having a truck almost hit you. In this case the emotional charge is so high that it only takes one repetition to form a habit, triggered in this case every time you hear the blasting of a truck-horn, for life). That is way you cannot let go right away when you start a new habit. You have to repeat it many time for it to become permanent (besides, the old habit will still be there waiting for the first sign of stress to spring forth. However, through disuse the old habit will fade away).

The psychology of what we are doing is much more important than the physiology of what we are doing.

To play well you don't have to do everything well right away but you have to be a great musician at all times.

IMITATION:

It does not matter who you imitate. What matter is that you always take charge of the musical message in your head. You must allow other players (players you admire) influence your playing in terms of phrasing and sound (if you admire their sound).

Bad sounds can be made into good sound.

By imitating other players you can become very versatile in terms of sound. However, always strive for clarity of tone and allow yourself to be wrong; take some chances.

DEALING WITH PAIN IN PERFORMANCE:

When playing with pain (stomach ache, head ache, etc.) you can still have motor activity in the lip and be able to perform; you just have to go to the stage and issue musical statements. Do not think of missing notes because you will be going quite far to miss them.

TEACHING HOW TO TAKE MORE AIR:

There are various options to help a student take more air. You can use tools, visualization, musical challenges, etc. The question now is which one will fit the student's psychology; you have to talk to the student and investigate.

By using the tactile sense you have the student touch his/her abdominal region, feel the movement in the region to establish a range of motion. If the student feels stiffness in this region provide them with resistance at the tip of the lip. This way the muscles, instead of fighting each other, will start to work together against the resistance at the tip of the lip (this works well because you can control resistance at the tip of the lip but it is more difficult to control it at the back of your mouth or any point bellow). You are always striving to work towards the use of minimal motors; how easy can you work with something.

The tactile sense can also be used to teach the student about the wind outside his/her body because "if you just talk to the student about an efficient breath you might not reach the student but if you have the student feel the breath the student will learn much faster".

Have the student do a full bellows movement. Have them put their hands in their belly and tell them to push in as they play. This way they will start a program proper air support.

Put resistance at the tip of the lip and you'll see your throat relaxing.

As soon as you add the sense of sight you stop feeling and start cooperating with the visual gauges.

THE USE OF IMAGINATION:

The use of imagination is a strong tool to getting the body to react to whatever you are trying to accomplish. When playing, always imagine a great sound (even if you are sounding rotten at the moment). Imitate a player better than yourself.

Conceive the vibration of the lip the same way you can feel the vibration of the lips when you buzz in the visualizer (this way the buzzing of the lips will become the challenge). Keep buzzing in all dynamics; keep using air as a fuel and buzz as a little engine.

When you play softer there will be less vibration but the quality of your tone must continue into the pianissimo level. This way of playing is called "bello pianissimo" (it is a thinner piano which sounds beautifully - it is a small surface which vibrates minimally). To achieve this kind of playing you can start playing a note full volume and decrescendo keeping the same quality of sound (just like turning the volume down in your stereo). The bello pianissimo is like putting

a small reed into you instrument. Also you cam carry the bello pianissimo to all registers of your instrument.

Both, bello pianissimo and regular pianissimo are good and useful under different circumstances.

The use of your imagination is also important in rehearsals because you have to be able to transfer into musical sounds whatever the conductor is asking you to do (you must transfer the spoken word into images a great sound). In other words, the critique of something wrong in your playing has to be transferred to musical thoughts not into the mechanics of playing.

THE EMBOUCHURE:

The embouchure starts where the lip vibrates. It always starts at the center of the lip and it moves outward to the peripheries. Other parts of your embouchure, such as the chin, are not as important in the beginning stages of development (the mentalis muscle is involved in brass playing by pulling the lip down or up. Avoid putting too much emphasis on this right away at the cost of leaving music out of the picture).

ABOUT SHALLOW BREATHERS:

Shallow breathers will have trouble playing by the end of the phrase. If the second breath they take is poor as well the will really be in trouble because at this point reflexes in their body are going to be activated and will start to tense up (or start to close) the throat. As a result their chest will become tense and everything will go in a downward spiral from that point on.

Shallow breathers will also have playing problems as they age because with aging there is a decrease of breathing abilities (Same muscular activity with less result. However, if your breathing habits

are form correctly you will get around that problem). As a result, shallow breathers usually quit the profession by age 45-55.

You develop correct breathing habits in the practice room and not in the job. If you work the study of taking large breaths in an orderly fashion you will age gracefully as a player.

If there is pressurization of the breath before the release then you have more air pressure inside which at the moment of attack will result in a hard attack or a missed note.

To inhale you have to have less pressure internally (in your lungs) than externally (in the atmosphere). Point zero is where the inside and outside pressures are balanced. At this time all the airways are opened.

To avoid pressurization you should do the following: 1- take as much air as you can and start counting aloud - 1, 2, 3, 4, etc. You will notice that there is no internal pressure as you count, it is very natural. Also you will notice that the body regulates itself beautifully, in between the numbers, as you count. (The opposite of this is using inner-aural pressure).

Very powerful air comes from the zero pressure factor.

As you learn to control you breath you learn to control the breathing apparatus - not the other way around.

If you use antagonistic movements in your breathing apparatus (lungs, abdomen, etc.) you will feel that you are always making more effort. However, when you experience the zero pressure factor you still have some muscle activity (just the necessary muscle activity to perform the action).

Zero pressure factor up to the moment of sound happens in the great players.

BREATHING EXERCISES:

You have to find the simplicity (child like) of the function you are trying to achieve and stay away from the complexity of the biological sciences.

Breathe in with suction and with minimal efforts (in other words, one level of the brain, the conscious thinking level, will tell he other level of the brain, the cerebellum, what you want. In turn, the cerebellum will tell the muscle fibers what to do). You always have to go by the "control panel" in the brain and not try to direct the muscle fibers directly through the thinking level of the brain. Simply, order a product and your body will take care of the rest.

Breathe to expand rather than expand to breathe.

As you breathe this way you do not have to know what you are doing. Your only job is to take a full breath and naturally all of the right systems will work by themselves.

Jacob's said that as a bass player he found that as he kept his bow straight the sound coming out of the bass, as well as his body movements, were correct. Later he discovered that as he kept the wind coming in and the wind coming out of his lips the same his sound and body movements were also correct. He concluded that the sound of the wind (an "oh" type of sound quality) should be the same as we breathe in and out (this is when doing breathing exercises).

Be a copycat and imitate... keep the breath going in and out the same.

The characteristics of a breath taken as "wind" are: large air low, easy work, low pressure, and legitimate function. The characteristics of a

breath taken as friction are: the quantity of flow is small, hard work, and pseudo functions.

When you control the air you control yourbody.

When doing breathing exercises you should be in front of a mirror (without a shirt on). You should observe (without self-analyzing) the movement of your body as the air moves in and out and create a mental picture of yourself. Use maximum change - from full to empty, frog to tip - with no rules (allow the shoulders to raise as well as other crudities). By observing yourself breathe (using you sense of sight) you will learn faster because you are multiplying the senses you are using all on the same subject. (Incidentally, by using the sense of sight, by doing the breathing exercises, you will also cancel out the sense of feel).

When doing the breathing exercises you should aim for contrast; from black to white. This is done to move your awareness of your body's movements far apart. In actual performance the changes in your breathing are compared to subtle changes between shades of gray. However, in breathing practice you should strive to go from black to white (full to empty).

Another tool to help you achieve ease in breathing is a piece of tube (about the length of a trumpet mouthpiece and the circumference of a trumpet mouthpiece rim). You use this small piece of tubing by putting it inside your mouth (it has to pass underneath your teeth) and breathing in and out. This exercise will introduce strangeness to your training (this is specially useful when trying to throw off a negative and old breathing habit). Also when breathing with the tube in you mouth you will be able to feel a "cold spot" in the back of your mouth which is the point where the air is hitting. When taking a breath while playing the trumpet you can also aim to feel the same "cold spot" as you breathe in.

Base you breathing in the factor of quantity; with time added as a controlling factor.

Quantity is the communication between the brain and the body. You have to tell your body how much you want and then tell it how fast you want it. Always be specific about it.

Most players will order a cup (or a pint) at the moments when they should be ordering a full gallon. If you simply order your body to breathe that is non-specific (this is the way you get into the negative curves of pressure fast)..

Breathing Exercise 1: Breathe in keeping the mental focus at the tip of the mouth because this is where you have the most nerve sensors (there are nerve sensors in the chest but they are subtle). make guesses on how much air you have just taken then, fill up a "test lung" and see how much you actually took. Repeat this exercise several times.

The sense of quantity has to be the dominant factor rather than the sense of stretch.

Breathing Exercise 2: Take a full breath "from tip to frog" and watch your body movements (you can use the test lung or, if you do not have a test lung, do only three repetitions to avoid hyperventilation. Also you should take frequent breaths because carbon dioxide is slow to recover and fast to deplete). Then divide you breath into thirds; each one has to have a sufficient pause for you to be able to self examine. Now, make a guess as to how much air you have in your lungs.

The next step requires you to put your hand on your mouth and as you exhale one third of your breath you move the hand forward. Then you let out the second third and you move your hand forward again.

Play with this idea and let out two-thirds and take one take back in (all while moving your hand accordingly). You always do this exercise away from music (just as people). This way you will learn quantities when taking wind.

Breathing Exercise 3: In 5/4 time take a full breath while counting to four and blow during the fifth beat. (By counting in 5/4 we add the time factor to the mix). You can also try this exercise in 8/8/ (breathing in to seven and blowing out on beat eight).

While breathing in make sure that you keep the "oh" sound to your breath to avoid throat closure. It is important to note that if the opening of your mouth is larger than the diameter of your throat you will , as a result of a built-in reflex, close your throat (to avoid foreign object from flying in to your "naked lungs").

Breathing Exercise 4: Breathe counting to five then lift your hands to your side and hold your breath. After about two or three seconds let go of the breath.

Watch yourself in the mirror as you do this and you will see that your ribs will go up (as your diaphragm goes down). This is called the "bucket handle" effect in the movement of the ribs (with the bucket handle effect you have the greatest distance from rib to rib and the opposite is when you are out of breath your ribs are closer together).

For the bucket handle effect to happen you have to sit down straight up. It is only then that the sternum will go up (as the diaphragm goes down) to create a huge chamber in your intercostal area for the air to rush in.

As you work with the bucket handle effect you will notice that you are working with little effort. The main reason for this is because you are using lots of muscle group so each muscle will work a light load (also the control factor is much better if there is a wide diversity of muscles). (Jacob's recommends the study of the Alexander technique

to learn the correct alignment of the body as used in music performance. The study of the Alexander technique will help you "not fight gravity" so you release the muscle activity not necessary for performance).

The ribs that go high and a diaphragm that goes low; vertically not laterally. (The eleventh and twelfth ribs are not bound by cartilage so they can move laterally. In any case, there will always be some lateral expansion in all of the ribs as you breathe in).

THE MENTALIS:

The mentalis is attached to the chin bone and it is also attached the lip muscle. When it contracts it pulls the lips down

THE MUSIC WE PLAY:

We rare the product of the music we play. Do not learn to play your instrument in order to play music. You should instead establish musical challenges that will bring in muscle development. For example, high playing practice in the form of a Rochut etude an octave higher (avoid playing long phrases because you will be likely to play with a mediocre sound towards the end of the phrase).

Anything that is good music is good for practice. Your goal is to be comfortable through the entire range of the instrument. Play with an extrovert attitude playing each note in your head and blowing "out there".

A worried mind is a wonderful receptor but a disaster for performance. Allow yourself to miss notes.

In brass playing we are close to singers as we play the music in our heads (what comes out of the bell is a mirror of our thoughts).

Compared to the horn on your head, the horn in your hand is relatively unimportant.

You sing with the lip (that is where the vibration appears) and the instrument serves as an amplifier of whatever comes out of your mouthpiece. From the buzz of the mouthpiece there is a 20db (if the pitch of the mouthpiece is in tune) increase by the instrument. You always have to provide the motor activity and the vibration.

If you formalize the approach of pitch recall using solfege you will train your brain in one of the most efficient ways to recall sound as you play. You should talk to the trumpet as you talk with your voice; do not ask questions but instead make statements. You should teach the audience what is on the page with a lot of show business (it is habit forming).

We have to have a sense of communication as we play. You just do not make noise with the instrument; you always put something extra to it. In other words, we do not do push-ups and sit-ups in music. Yes we have to do drills but we put them in a musical context (e.g. the scales could be part of a cadenza). This has to do with what you think when you see the "ink spots" in a piece of music. You have to have a visualization of what things sound like.

PROBLEMS IN TONGUING:

Problems with tonguing can be fixed using the reflexes learned in speech as children. Tongues are enormously complex muscles and they are also quite different (in terms of size and shape) in all of us so it is difficult to set specific rules. Instead go the back way and use the strong speech patterns you learned as a child. Learn by using "tah", "toh" or "tooh".

BERNULI'S LAW:

When the air goes into the aural cavity, as your tongue is arched up, it goes into a small chamber. This causes the inner aural pressures to go high and as a result you might loose 15% to 20% of your lung capacity. For this reason when tonguing (especially in the high register, you need a bit more wind because it will come under pressure.

MOUTHPIECE PLAYING:

When playing in the mouthpiece think that you forgot the instrument at home but you still have to entertain your audience. You will see that as you play the mouthpiece the storytelling aspect of your playing will increase (this is partly do to the introduction of strangeness from the part of the mouthpiece).

Do one hour of mouthpiece playing a day to start the training of music making. Then, when you add the mouthpiece to the instrument your sound will sparkle. This mouthpiece training will connect your musical thought patterns to the tissue.

While playing on the mouthpiece also make sure you search out for music without thinking of technical rules (just use the musical rules of sound and music).

Do not make rules about the meat but about how you want your music to sound like.

MOLTO STACCATO:

The molto staccato is legitimate in some places but not everywhere. You want your tongue to go into a vowel (eh, ah, or oh). Use the single consonant "ta" and not "tot".

LARYNX:

Do not control the larynx because you do not have much feel in that area anyway. If you try to control the larynx by feel you will get into all kinds of trouble because you will be tensing unnecessary muscles around that area (peripheral musculatures). Instead you have to find in nature what moves the larynx down - a breath (like a yawn) does it.

You do not have sensory feel in most of the muscles involved in respiration. In other words, you cannot have much control of the respiratory activity by feeling your way through it (trying to control each muscle involved). Instead, you should use the sense of surprise to lower your larynx; this way we are simulating nature.

You must always be aware where the air lands outside your body and not from where it comes from. If you focus your attention where the air comes from your brain will start to activate the mechanics of pressurization.

VOCALIZATION WHILE PLAYING:

Vocalization while playing your instrument is a syndrome that has an easy cure. The most common cure is to blow objects outside yourself (be it a match or a candle, etc.). The incentive spirometer is a great tool to transfer the wind "out there". (By doing this you will free up the diaphragm region, bypass the throat, and play with a soft belly).

You blow from your lips not from your belly. We are wired to do things without knowledge of our muscles as single units - simply ask for a product and your body will take care of the rest. You must practice breathing exercises away from the instrument (later you can synchronize the functions learned back to the instrument).

It is wise to always use "black and white" comparisons while learning breathing functions away from the instrument (shades of gray might not good enough). Always go from "as wrong as it can be to as good as it can be".

The neck region cannot be corrected directly; you always have to go around it and sneak in through the back door (the main reason for this is because neck functions are connected to the brain at levels which we do not have direct access). We must always find related neck functions (like swallowing, or yawning) to change the desired functions.

You must first change the stimuli to change the function.

BUZZING:

Do not buzz without a rim. It is so close to being right that it is dangerous. the lips form like a little oboe reed; so there is a space between them. The vibration will be around the space opened up in between the aperture. When you buzz without the rim you cannot form the proper function of the buzzing unit because the breath becomes elevated in order to move the lips apart (this is turn will activate all sorts of pseudo-functions in the respiratory system).

The act of buzzing brings a focus to the function of buzz that is very healthy. The rim brings the shape of the lip.

The lips are quite complex in structure. The lower lip starts back in the upper part of the cheek area. The top lip starts in the lower part of the cheek area. Interwoven in between the large muscle groups you have feeding up like a basket weave all sorts of muscle groups (quite small) which have to do with the protraction and retraction of the lip. (You have to have a fresh cadaver in order to study those small muscles because after the cadaver dries out the small muscles will be very difficult to define). The small muscles are outclassed by the mass of muscle fiber of the obicularis oris. To put them into function you have to use a rim (visualizer) as isolation pressure (hence, there must be mouthpiece pressure). (According to Jacobs the trick of playing a trumpet hanging from a string is non-sense because you end up developing a mass of muscle out of the obicularis oris

which will overpower the protractors and the retractors. You give those able players something to play that moves around a lot and they will not be able to do it).

Use sensible contact but isolate the small muscle fibers. You cannot do that buzzing without a rim. You have to work too hard to keep the lips apart and you will run into the danger of transferring that "hardness of blowing" back to your trumpet playing (also you will have a tremendous resisting power in the embouchure). The lips have more power to close compared to the power of the wind to open them up.

You must always go by the tone production properties of your instrument. You want an embouchure that wants to vibrate - and also you want to isolate that vibrating area.

Jacobs mentioned Vic Hyde (a man who played with three trumpets).

When you play a brass instrument you must think buzz, buzz, buzz and not blow, blow, blow. In a car the engine moves the wheels (it is not the gasoline moving the wheels).

Embouchure is important because we function based on motor skills. The seventh cranial nerve (the facial nerve) is a wiring hook up from the brain to the lip. (it has branches - triterminal, facial, etc. - for various functions). The triterminal nerve is the sensor of the lip region (so if you touch your lip you can feel it - that is felt through the fifth cranial nerve which has nothing to do with actual performance).

The ability to perform is tide in to you sense of message (as when you use your lips as vocal chords).

Embouchure is a constant variable. You must learn to stabilize the music.

Find out where it works and through the years you will cut out the extra changes. People talk in different ways so in trumpet playing you must let the players find their own way - do not over teach in this area. What you must teach instead is music with maximum amplitude of buzz (forte) and with minimum amplitude (piano). Do it by sound not by energy of pushing air. Do it as a musical endeavor. Increase a great tone in sound for forte and decrease for piano.

All sound has to have the same quality of resonance.

Practice decrescendos and hold the piano at the softest point. Stop and start there again. This way you will develop a beautiful command of soft entrances.

DOUBLE-BUZZ:

Double buzz is a segmented sound; so the embouchure is buzzing at different speeds. The cause of the factor is in the insufficient thickness in the column of air. As a result your embouchure is set to vibrate at a faster rate to what you are playing (at the given air speed). It gets to be too small of an embouchure. It will start to relax where it vibrates in the center (not above or bellow but right there in the center around the aperture) and that will start the segmentation.

Use oh, ah, or ooh vowels to ease up the pressurization behind the embouchure. The problem is a lip that ends to relax to let more air out and thus lower air pressures inside the embouchure (not in the corners or its periphery but in the region where it vibrates).

When playing the mouthpiece play something that moves along so you do not get into mental staleness.

PLAY ONE NOTE AT THE TIME:

Think of each note; build your phrases each note as you come to them. When you listen to music you always hear phrases but the

person playing those phrases builds the phrases playing one note at the time. When you produce a phrase build by each note.

You do not want mediocrity. Everything is habit forming. Show off a little - If you got it flaunt it. Dare to make a few mistakes but keep your inspiration.

It is like having a diamond in a trash can. When playing with a bad sound go for the diamond.

Everything that the lip does has to be directed by the brain.

Send a note in that the trumpet can amplify.

BREATH BUILDER

Built by Harold Hanson of Casino Enterprises (California). It takes about fourteen of air pressure to take the ball up but only four ounces of pressure to maintain the ball up. Always keep the breath builder vertically so gravity pulls the ball down. We want thing to go to the extreme as we do the exercises - the complete breath requires the whole system.

By introducing a full breath we make the six units of the lung (six individual sections layer like the petals of a flower) in to one full unit.

If you start a low breath, stop and continue with an upper breath. You will work harder than if you take the breath in one blow (because the low breath will pull the ribs down and they will have to work harder to go back up. Also there is a group of muscles pulling down the ribs that must actually go up.

The "bellows system" works best in a standing postures (sit tall). In this position all of the six separate little bellows in your lung become one.

Take a full breath in and use it in parts of one-third or one-fourth then three-fourths just like you would use a violin bow.

If you touch around your clavicle you will touch where the top part of your lung lies.

When you take a full breath you will have the organization of the musculature, its relationship, and the function of the breathing mechanism.

When doing breathing exercises you must be aware of the feel of the wind at the tip of your lip (that is where the psychology of wind must be).

There are two benefits to taking a full breath: 1- the extra air will you will have to play long phrases 2- the organization that comes in in the organization of the breathing mechanism.

You want to be able to take a full breath - it does not mean that you have to use all the time. Rather than developing strength in the breath you are working for weakness in the breathing system. Large movements without much effort. You must have the breathing muscles work with each other, not against each other. After working on breathing exercises it is natural to still have your attention still on the exercises. You must put back your attention to music.

When you play by feel you will be thrown off by any change occurring in your body. Your brain has to be shouting out stimuli for your muscles to react. This way you will over-ride most changes occurring in your body.

At first you must exaggerate the movements involved in the breathing exercises so you get a recognition of what is going on.

Apart from the diaphragm you have other musculatures that have to come into activity for taking a full breath. (Also the more muscles involved in the full breaths the less effort each muscle has to impart). As the ribs go up you will dis-activate the strength of the abdominal muscles. We do not want powerful abdominal muscles. If you move (pull) your ribs up your brain will order the neural inhibition (it will cancel out the muscles inhibition of the muscles which pull the ribs down).

There is no such thing as a large full breath without the use of the diaphragm (you do not have a sense of position in the diaphragm - you only have pain sensors in that area) so do not worry about it because it will always be activated during a full breath.

SING THE ENTRY NOTE:

Change the tone of your trumpet playing using you imagination to a rich tenor tone.. Start the music from the first note you play. Remember that the first note after the rest in the one in jeopardy. You must protect these entrances by having a clear mental picture of how those notes must sound. Take chances with this. Your solos will become yours. Also you will be using full motor activities as a result of this type of playing.

When you breathe in you are not a musician; you are a musician when you blow out. (Right before you play you must conceive the sound of the first note).

You should never play with anything less than your greatest sound (except if you have a musical reason for it). One of the things that separate a great artist to a lesser artist is the ability to play with excellence at all times.

You cannot have anyone sound better than youself - this is a great attitude. We have great brains but we are not close to using their full potential,

We must become very conscious of our results. Some people get more excellence more of the time because of various reasons. Maybe a conductor has asked them to produce excellence, etc.

BREATHING:

Strangeness creates a new awareness for the brain to focus and start a pattern of change right at that moment.

In general more air equals more comfort.

You must be tone conscious and not breathing conscious. At the job you do not want breathing exercises. You must do those at home.

THE HUMAN BRAIN:

The human brain is such an active organ - always scanning and spinning, etc. People have great musical thoughts right to the moment of physical application then it changes in the brain and suddenly we have a pattern of physical preparation (without the wonderful source of stimuli that is required at the moment of playing).

How do you get a person to have a stimuli for a reflex at the moment needed? The use of a word (vocal application) like the syllables used in solfege.

Use the illustration of a bell and hit yourself in the head at the moment you play "boing". You must use anything to keep the focus at the moment of performance.

You must have two sounds: One in the head and the other one coming out of the bell of our instrument. The one we care most about is the one on the head; this one will tell the computer levels of the brain what to do.

You cannot control your embouchure by using your intellectual brain. You control an embouchure by having a great concept of sound in your head (but you cannot control it by the feel of muscle fibers - you can, however, have a feel of the general shape and tension of the embouchure. That is all).

People who have a lot a "preparatory tricks" before they play a note can be helped by getting them into music (however, you must not make a big issue about it; then as they drop the "trick" make a positive comment about it).

You cannot expect a person to drop (forget) an old habit while he is thinking about it because while he is thinking about it e is reinforcing if (e.g. while dieting the more you think about the diet the hungrier you get). You will re-awake the old habit by the awareness of it. Just bypass all of that by starting a new habit.

The more you play for other the more you over come the nervousness of performing. Get used to getting your playing going out to other rather than going into yourself.

THE RIBS IN THE RESPIRATION PROCESS:

The spine is not perfectly straight by nature (this is when you sit tall). Coming out of each vertebra (in your spine) is a rib. Vertebrae are not perfectly straight but when they are aligned "tall" the upward movement of the ribs will be correct. The relationship between the body alignments is very important.

Dr. Rolf (Rolfing Method) developed a method of body alignment so the musculatures do not fight each other. If you stay tall you are in position to inhale (full) maximally. Correct inhalation will express itself in the second and third breaths if you stay tall. (You can always play music with lesser air quantities however; you will loose certain aspects of your playing). This is most important for short people.

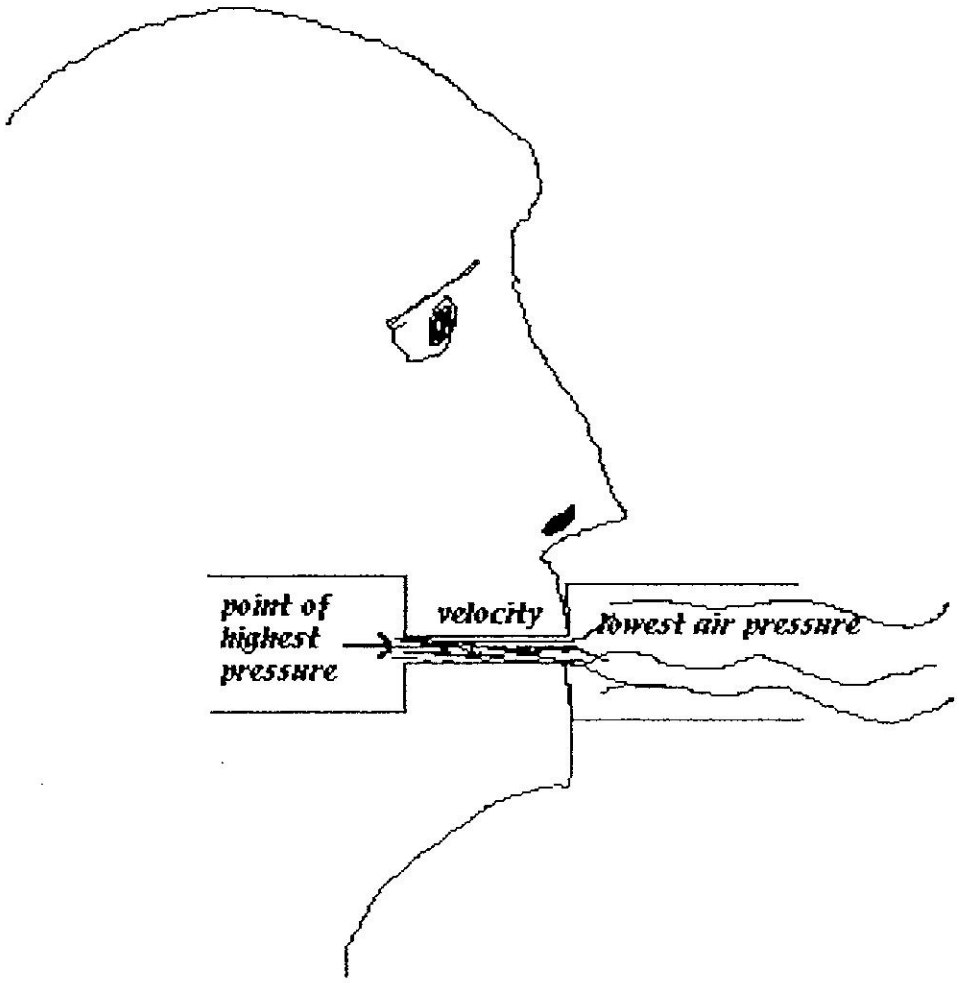
The diaphragm is attached to the sternum in the front but down in the back it is attached in the lumbar arch region. The ribs are high in the back but lower in an angle in the front. (It is like a x crossing). There are benefits to this (if the proper relationship is established; then you will get the maximum benefits out of your breathing system).

Get the correct sound of breathing (like an "Oh" sound) and you will get the correct physical function.

You will have more efficiency in your playing if you use thick air.

BERNOULLI'S PRINCIPLE:

When you have a column of air and three pieces of unequal circumference tubing (wider-narrower-wider) where do you think the point of highest air pressure occurs? In the connecting point between the first and second tube.



You must always get air pressure as thick air like in the drawing above and not air pressure as thin air.

The easiest way to get the complex thoughts of an adult is to reduce them to the simplest thoughts of a child. Song and Wind.

HYPERVENTILATION:

There are early signs when you are about to suffer from hyperventilation: 1- the person's eyes 2- the person's face. In you are about to hyperventilate simply hold your breath for a few seconds.

Try to find simple answers to a complex problem. Stale air can be a signal to the brain to activate the breathing muscles at the same time you are having a blowing out procedure. The muscles will become antagonistic at this point.

You cannot teach by telling a person what not to do. Instead you have to provide a stimuli outside the body and the brain will disactivate the inhaling muscles while you are blowing out (blowing activities outside the body include blowing out matches, blowing papers, etc. At the moment of blowing out the match you are the body to perform an "only out" blowing function.

Introduction of strangeness permits change.

Do an exaggerated amount of work that will simulate what you do in your instrument. Use a black and white approach to your breathing exercises. Only then you will have two opposite patterns.

STATIC PRESSURE:

Static pressures in a cylinder go up and down as well as in the walls of the cylinder. Some players have static pressure behind the tongue, which can easily move to the throat. The sensors in the lungs adjust to the signal of pressure at the tongue and at the throat and they will accept that fact following the biology of pelvic pressure syndromes. Pressure in the lungs is supportive to a downward constricting diaphragm (it gives an additional two or three pounds of downward pressure) and it will always involved closure in the throat region.

When playing the instrument you must pretend that you are blowing something outside yourself. Blow the air do not release the pressure. Order motion rather than air pressure. You must practice a few minutes a day blowing out candles, papers, etc. You must always remember that when talking about air 15% is about air but 85% is about music.

When playing loud excerpts make sure you do not overblow them (especially when playing in an audition situation). In the orchestra however, you will be able to get away with the "forced-overblown" sound because you are part of the "composite sound" (you must depend on the sound around you).

STUDY OF SOUND:

Faster collapse of the body and much less back pressure. Instead of blowing hard you will have much less resistance. Then the tone will become a bit more musical. Keep the same style and have more beauty of tone.

We must be versatile and change the motivation - put in a soloistic sound - power of tone is not the major; beauty of sound is.

Woodwind players have reeds and they work with them. Brass players have to know how to work their "flesh reeds". Lips can fight back the breath. When you have a strident sound is an embouchure that is starting to fight back against the pushing power of the breath.

There is no way you can blow and pull your lips apart with your wind because it is an unequal struggle. We cannot encourage this at all. We have to encourage instead increasing the vibration. Take a mid-range note and give it a great tone - give a beautiful singing line to it. Put vibrato to it. Then you can approach fairly large dynamics with beauty of tone. The vibrato will throw the instrument into resonance (pitch average) without forcing. Increase your sound not your effort.

If you have a larger quality of sound you will have larger volume of sound. The tendency of putting larger physical effort for producing a larger sound is like lying to your own tissue. You must order the sound; the other approach has to do more with the methodology of how to produce that tone.

Order the product not the method.

You must start the development of sound in the mid-dynamic so you get the core of the sound (so the focus is on beauty of tone). Then as you get louder you will have the same quality of sound.

Develop your sound with a mellow approach. Use your intuition and figure out how to get results. Get to the point of playing in which you say, Bravo, that was good! and not, God, I cannot stand it!.

Find the norm (beautiful tone) and just like the volume of your stereo you will play louder or softer with the same quality of tone. What you do is to put the rough sound quality of your sound farther and farther away into the outer peripheries of your dynamic levels.

Play the big excerpts with a mellow tone. You can change the words a conductor gives you (and/or terms) into a thought pattern your body can use at the moment of performance. Be willing to be wrong. Get a big-beautiful tone based on your mental concept of that tone so the physical effort is not dominant but the quality of tone is. Do not spoil it by thinking how we do it. Do not go by feel or habit.

A great ability for symphony musicians is to be able to convert verbal instructions into form of stimuli in the brain.. If the conductor says to you " you are too loud" and you think "I must play softer" you might get all "screwed -up". But if you think on how it sounds like played softer then you will have the proper stimuli to play.

You always convert to sound - words mean nothing to the body.

You have to start with a musical approach and follow up each note with that musical approach.

Build your excerpts note by note.

Organize your playing under stressful conditions (auditions, concerts, etc.).

Watch out for the lengths of notes - do not get disorganized. Take charge of the length of you notes. Use your voice to figure out their length.

Play the trumpet as a soloist. The intensity of your approach has to be that of a David Oistrach even in the accompanying passages. Practice this way. Play Bruckner with a wonderful organ like quality.

Search the lack of resistance by getting more buzz.

Nobody has to be perfect. We are all allowed a quota of mistakes. However, you must be perfect in the brain even if you are rotten in the lips. You must have accurate thoughts. Depend more on your thoughts and less on the trumpet.

Do not get caught up in the physical structures. Come down in the scale of complex thought and self-analysis and turn up the scale of musical communication.

The instrument is an extension of the player.

EQUIPMENT:

Use the right equipment for the right job to avoid frustration. Otherwise you will be ordering more potential of volume out of a small mouthpiece. Also, the overtone characteristics will be altered by using different equipment.

Big instrument=big fundamentals=small overtones.

Small instrument=big overtones=small fundamental.

You have three variables in your playing: 1- player 2- instrument 3- mouthpiece. You can initiate change by changing the instrument, the mouthpiece, he embouchure, etc. but all of these changes affect the relationship of overtones to their fundamental.

With small trumpets you will have more overtones but you can bring it to a balance by getting a bigger mouthpiece. However, you can never change the amplitude the instrument can give. An instrument cannot make up for its size.

Jacob's played often on an adjustable cup mouthpiece. He said that if you are playing light music you can choose a small-shallow mouthpiece (instead of changing the instrument). The small mouthpiece will lighten up the tone. To play Bruckner 8th you have to use a bigger cup because you need a big fundamental. However, if you forget your extra mouthpieces at home you can do your best by using your mental concepts of sound (and thus letting the embouchure make the changes).

As you get louder you are going to tend to change the overtone content in your tone. At this point you will have distortion. To fix this problem you have to play a bigger mouthpiece at a softer volume.

You can change the characteristics of your sound by changing your mental concepts.

To give a character to your tone you depend on the overtones.

Work by changing the mouthpieces and avoid changing lead pipes (because they are fixed items). Lead pipes have very much to do with the ability to resonate a horn as well as the ability to establish intonation. A lead pipe is extremely important to your horn so make sure you get one that gives you what you want. Usually you loose something as you get something. (Step size lead pipes are excellent

because if there is change of length there will be change of overtones).

There are men who are artists at building instruments. You get a fine player and a fine maker and you come up with something excellent. Vincent Bach was a good example. The gorgeous Bach trumpet is a product of great players stopping by the factory and trying them out. You can never make a good instrument by pure mathematics.

MOUTHPIECES:

The thinner the wall of the mouthpiece the more dissipation in the energy of the sound waves (not reinforcement). Much less sound comes out but it is a good quality sound. It reduces the entire dynamic range. Jacobs tells the story of a Schilke "thin mouthpiece" which he used to play the brass choral section if Mahler's Second Symphony.

Jacobs adjustable cup mouthpiece was made by Schilke ca. 1951. Jacobs used it for the first time in the Chicago Symphony Brass Quintet. It is like a small trumpet cup - great for brass quintet but not for orchestral playing because it got the overtone range of the trombones and therefore it would get crowed out.

There is nothing wrong with experimenting with mouthpieces (different thickness, etc.). This way you will have a great control over the spectrum of sound. Switch around depending on your musical requirements.

All of your mouthpieces should have similar rims (either all flat rims or all over-rounded rims). This has to do with the development of the protractors and the retractors in your lip.

Jacobs used to change mouthpieces to keep things interesting in the orchestra in terms of variety of sound.

When you change mouthpieces you do not get as dependent on the feeling of familiarity of the mouthpiece. If you play based on feel you will limit yourself because then you will have to always have the same equipment, acoustics, etc.

You do not have to feel the same; you just have to sound the same.

If you send in right notes, right notes come out.

You can standardize the measurements of the instruments but you have to have great craftsmen making those instruments. Machine instruments are fine if you have a good "first design". However, if you have to change anything in the design you have to go through the whole factory changing things.

Once in a while you should change mouthpieces because it brings strangeness. Think of Maynard Ferguson changing from trumpet, to trombone, to slide trumpet.

There are limitations in doubling. So if you are a player in a major symphony orchestra you want to do your work on your main instrument.

HIGH RANGE SICKNESS:

Get a small instrument and play high (that seems to be a good cure). The tissue development using the small instrument is going to be the same regardless. To vibrate at the higher frequencies your embouchure has to do certain things to vibrate fast but the ability of the small instrument to resonate what you are sending will be better. It is also more musical. The aesthetics of what you do musically will be better as well.

You want a full range out of your equipment anyway so also get used to playing high notes on your large instruments (just in case you are

stuck having to play a high note in your large instrument). It all has to do with sound qualities and with range and with the ability of the instruments to resonate the notes.

RIM BUZZING:

There are benefits and hazards. However, with mouthpiece buzzing there is benefit with no hazard. You can go to a vacation and take the mouthpiece so you can play anything you want.

If you know what the danger is in rim buzzing you can avoid the danger. Jacobs does not recommend too much high range playing on the rim. Lower register playing is fine. Only advance players can benefit from high range rim playing.

The rim is not an acoustical device. The pressure relationships are different than when you play on the mouthpiece. There is a little more effort on the rim than on the mouthpiece. The danger of playing on the rim is that you might transfer the increased pushing of the breath and the decrease ability of your embouchure to vibrate back to your instrument. This way you might harm your playing. In the instrument you must reduce backpressure but if you are not familiar with buzzing on the rim you might transfer the pressure.

You have to have your lips always vibrating. They are like vocal chords. Psychologically they have to want to vibrate.

When you establish the concept of sound you will find that the tissue function has already been formed.

PRACTICING WITH THE BREATHING TOOLS:

The problem with practicing with the breathing tools is that the tools have no brain. It is all in what we do with them. Always find the use of minimal motors as you work with the tools. Then transfer that to

the instrument. Always try to play with greater ease and with a good product. Too many people use too much pressure and then they start playing by the application of pressure.

PEOPLE WHO HAVE ACCIDENTS ON THEIR FACE:

This really depends on the extent of the damage. First you have to recognize that the person is worried (which is quite normal because we are human) like "what's wrong? - My face feels bad! These are common thought for these people. They are working based on sensory nerves.

Bud Herseth's accident in 1951 left tremendous damage but he came back playing better than before. It is all in the ability to send signals from the reflexes available to function. You can still function up to the potential of your tissue but if you play by the feel of your embouchure your playing will stop cold.

The loss of movement on one side of the face - paralysis or partial paralysis - where the strong muscles will pull the weak ones over. You will find often that there is in this case little wrong in the tissue but you will surely find something wrong (worried) in the head.

If there is collateral damage in the lip, simply move the mouthpiece over to the other side and hyperthropy will set in after a period of practice. You are still a great musician. in your brain. There will be a loss of range but that will come back.

Lips are not delicate. There are few ailments that strike them because there is such a healthy supply of blood going through them. A jagged tooth has to be fixed by a dentist immediately. Nerve damage has to be fixed by a neurologist.

For the psychology of playing Jacob's recommends the following books: The Inner Game of Tennis by T. Galwey and Psycho

cybernetics by M. Maltz. Anything that focuses the mind is beneficial if it is focused on the right thing.

According to Jacobs you cannot overdo positive thinking. Jacobs comes from a family of pessimists. He learned to have positive thoughts. Positive attitudes will give signals to many levels of the brain so you have to make sure you order what you want. Your body works so more efficiently when you think positive thoughts and you will feel much more comfortable as well.

The whole truth about any book is that you are going to get good information but the application of that information might not be there. For example, if you want to play you not only have to have the will to play but also the stimuli for each note. We are constantly working for the stimuli. We need to produce results and you will not find these in any textbook.

When you walk and breathe we take it for granted that we have so many natural and learned reflexes. When we play we have to work the same way - based on the thinking of what we want (the product).

Jacobs had to study about pregnancy and about disease to fully understand brass playing. He said that the study of the human body was his hobby and that was the only way he could justify all the study. To fully understand a person you have to look at all of the aspects of what we do.

Out of all of that study comes a complex picture but your job is to find simple answers. When it comes to your body you must order a product and not a method. (The Inner Game of Tennis will help you in focusing your mind back to the product).

MINDLESS BUZZ:

A mindless buzz (like some people play when they do "sirens" on the mouthpiece) will not connect the brain to the muscle tissues of the lip, as effectively as playing familiar tunes will.

Professional musicians never cool-off. You must try to minimize your warm up time. Do not emphasize it. You must turn on the sound of your notes before you play them.

SPLIT TONE (DOUBLE BUZZ):

An embouchure that is set up to play the high register but a tongue that is set up to play the lower register (or vice-versa). It is when your embouchure stays small (especially in the high range legato playing) and your tongue does not go up because of the volumes of air that you might experience problems. You do not need thick air for high playing. However, you can use thick air based on the position of your aural cavity. The small embouchure (needed to play in the high register) can work equally as well with small air volumes in the airways as long as it is sufficient. As you come down to the lower register then you might experience the segmentation (bigger embouchure with thin air) if the tongue is in the high position.

On the mouthpiece see if you can get a vowel "OH" in the sound (this changes the response with the technique of the vowels). Play around with the vowel sound so you learn to control the position of your tongue. The nervous system of the tongue is different than that of the skeletal musculature because it can fire four times faster (however, the ability to feel the tongue is small - besides pain sensors).

You can bring your tongue under control not by feel but by the study of language. Use the brain control panel you have since you are young.

With the study of vowels you will get different sounds and you will have a larger set of "sound tools".

A great open airway (or thick air column) from the lung to the embouchure must be based on musical needs. There are parts of the anatomy that will reduce that column of air, which we do not have any control over. You must order a musical product in order to activate these areas.

You must imitate the sound of wind as you breathe. You can alter the quality of your tone by using different vowels (for example, eeh! or ah!). Use a little tongue (say oh!) to change your tone without changing your equipment. (By the way, by using this technique you can eliminate the double buzz).

The healthier embouchure is the one with the thick air column.

USE OF "AH-EEH" IN SLURRING:

The "ah-eeh" slurring technique changes the quality of sound. What we want is the best quality. We want to change sound qualities for musical purposes and not for range purposes.

As the high-pressures (over two pounds) come in (like in piccolo playing) there will be a reduced airway do to the physiological changes. "Eeh" vowels are good for use but they must be put in the right perspective. "Eeh" vowels must always produce a musically pleasing sound. To do this you must sing as "oh" in your brain right ahead of each note you play. Have lots of ballads in the high range using the "oh" sound.

Music is music and all players can play it. For example, the Charlier etude #2 can be played by a tubist or by a trumpet player.

SING EACH NOTE IN YOUR HEAD:

The danger with playing the piano from an early age (as your only instrument) is that you get accustomed to having the pitches right there for you - at the press of a button. Is you get used to that feed back you might find it difficult later on to play a brass instrument. To play a brass instrument you must put perfect notes into the instrument from your head. In other words, you must sing each note in your head.

The ink spots in the paper have to be connected in your head as a mental picture of sound so the ink spot becomes the stimuli.

As you formalize this action you will become more adapted to it. You must sing the first note of what you are about to play.

You do not have to be born with that ability (in the Chicago Symphony Orchestra there are maybe ten players with absolute pitch) but we develop a recall (approximate) for the notes.

By formalizing this process (through the study of solfege for example) you will develop faster and the action will become deeply rooted.

AIRY ENTRANCES:

If you hear first air and then the tones that is a sign that you are depending on air to make your lips vibrate. Your psychology has to change to "song" where you depend on buzz and not air.

Woodwind players have to send air to make a reed vibrate. Brass players cannot do that. We have to have our lips want to vibrate. Be intuitive and buzz, buzz, buzz. Remember that you can blow without buzzing but you cannot buzz without air.

Put words to your music (lyrics). Do this with excerpts and concertos. This way your lip will want to vibrate.

Your song has to be like the round tone of a singer. The air is out there outside the body. You must get into the psycho dynamics of song. Let each note sit on a cushion of wind.

PLAYING BACKWARDS:

If you have your students play backwards you will hear that they will play with a better tone on each note (so the entry note becomes the last note). Every time you start a phrase you out in jeopardy the tone of the second tone you are going to play. If you could leave your musical brain "on" for the first, second, third, fourth notes you would sound much better because the neurological messages must travel down the seventh cranial nerve to the lip for each note. However, if you just blow and hope for the note to come out you will depend on old habits. You must have each note in your head; sing right at the breath.

The instrument is a resonator (an amplifier). It cannot give you anything. You have to give it to the instrument.

SING THE PARTIALS:

Where the partials are spread out you will not miss too many notes but as soon as you get to the high register (where the notes are closer together) you will miss the notes - unless you have the "song" in your head.

There are very simple thoughts involved in doing well. Complex thoughts are usually in doing things (in brass playing) not well.

We feed sounds into our brain (we imitate or we create them) it is like putting a tape and the bio-computer will read it out.

Avoid listening to yourself after playing. There is an after-glow in your rests. If you have to come in again you have to, instead of listening to the after glow, listen to the next entry note in your brain.

The important thing is the organization in the brain not the organization in the lip.

Talk to the audience with your trumpet. Anything you want it is your story.

If we do not like the message we put out we do not change the lips but instead we change the message.

THE CONTROLS IN YOUR BRAIN:

If you are a mechanic you can find all of the parts that are off and turn them on. You could also go to the control panel and change the motivation and another part of the brain will change them anyway.

Do not take charge of the changes involved in you body during trumpet playing as if you were a machine without a main control panel. We are already programmed.

LOSS OF MUSCLE MASS:

The brain does not forget brass playing but the muscles will. Studies done with athletes as to when the muscles start to loose strength show that of you lay off a week here is very slight loss of hyperhtrophy. The loss of muscle mass begins after two weeks (at this point you begin to loose a little). However, you will always loose in endurance, range but not in function. In other words, there will be reduction in abilities when playing the extremes

TRILLING:

The trill is based on the embouchure's activity of two notes (and valve activity as a reflex). It has to develop over time. The quality of your instrument plays a role is the ease of the trill. Some instruments are easier to trill than others.

You have to do a combination of lip and valve movement (you cannot do valve movement alone).

The sound of the trill has to always be the major. The physical aspects will follow. To learn to trill you should play small groups of trills (avoid trilling by the minute). It should always be done in rhythm and in pitch. Practice low trills at first (because here you will find the most favorable conditions) and then you move up. Use a successful result and sneak into an unsuccessful area.