

Arnold Jacobs Master Class United States Marine Corps Seminar 1991

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General Bourgeois

“To make sure that he feels that it is his band, to fit into our background, I would like to introduce you to General Arnold Jacobs!”

AJ; I've been a tail-gunner all my life, I like being a general much better. I should have graduated years ago from the Symphony. You know, 44 years on the same job, its great. I appreciate it, I enjoyed it, but I see that there are other things in life except the Chicago Symphony. One of them is the great Marine Band, frankly I just feel honored to be here. (gets microphone...)

I just want to say again that I am honored to be here, I love band music. And when I say I love the marine band, I have to say some of my best friends are in the Marine Band, I graduated from the Curtis institute in 1936 and I know that quite a few of the boys from Curtis joined the service at that time. As we would tour I would meet them, they had very successful lives, they enjoyed what they were doing very much, . They were fortunate enough to make records and send them to me and I enjoyed that. I was a tuba player that never really had much of a chance to do much tuba playing, what are you going to do when they play Beethoven? You have to stay at home and practice the parts. I know that there are nine measure, I think nine measures in a Chorale at the beginning of the slow movement...I was playing in Gunnison and they gave me the bass part to play and it was like a new work, it was wonderful. All those notes that the basses have to play, the pizzicatos which are a little hard on my tongue but, I enjoyed playing all that great music. I would like to play all that band music even though I am graduated although I have lost so much of my eyesight through Glaucoma, I can't see the music so it is a strange situation. I own a tuba, it is great, I can still play it, I can't carry it but I couldn't see the music if I could so, my wife has a lot of company at home. She doesn't have a baby to take care of, she has a husband to take care of now...

Now I should get down to what I came here for. And once again, I must confess that I have, oh, a little strange feelings..when I left the symphony I was invited to the Minneapolis Orchestra for their enrichment program, they brought in Janos Starker for the cellists, Andre Watts in there...and they asked me if I would spend a week with them for their wind players and to consult with them on respiration, a little help here and there...It was one of the finest weeks I had, I don't know if they enjoyed it but I certainly did. And when I was offered a chance to come here, I just hope that I will have something that might be of some benefit to some of you because you are certainly willing to have any knowledge of anything I might have, you are certainly welcomed to it, I won't hold anything back...I know that with professional musicians, sometimes to bring another musician in it is hairy topic ya know, I don't want it to be that way you know, I want it to be a nice visit and as I say I won't force anything on anybody but don't hesitate to ask anything of me because if it is something that I have an answer to you are more than welcome.

I see that I am listed to discuss respiration with you. Now respiration is one phase of being a human being. In other words gas exchange and respiration is very important naturally, we wouldn't survive very long without it! I am not being facetious, but it has to do with everything that we do in life. You can't just discuss respiration unless you understand the needs of respiration by your body and we have to leave music for a while we are discussing the subject. After all if you are discussing the Lamas method or

childbirth, you cannot be thinking about playing a clarinet or a trumpet. You are going to be giving birth to somebody and you are still worried about respiratory activity. Now I want to make this as simple as I can and as profitable as I can and to do this I will call for a volunteer in a few minutes to come up here because the words that we use should be made practical by bringing in the sense of sight to understand what is going on. I don't have enough vision to see the faces in front of me but have any of you worked with me before, if you have please raise your hands So I have a core, a small core of people who have already been to see me...Alright, I am not drumming up business you understand, it is just how I have to direct this talk...

I don't have my usual anatomy pictures, I could call for a volunteer, a male, a we could strip him down to the waist and we could draw on him because I don't have the anatomy charts I usually have...but I don't think that is necessary because you are a sophisticated group and I think that we could get by without it. I will expose my hairy chest and that should be able to do it...(takes off jacket)

I have been teaching for many many years, near a half century, and I have run into all sorts of body types, somatypes of individuals, which are important...ideas about respiration, how to breathe, what to do with it...ideas that were developed in different parts of the world in different periods of time and I thought I would discuss these a little and get a little understanding of this a little bit with you before we start to go into the playing itself. In the last century where most of the research was done, pulmonary function as far as wind instrument playing is concerned, the research was done mostly by tall men...flute players who were about that tall (very tall) oboe players who were also quite small, also with small instruments; flute players too have similar problems as we do in the lower brass family... But the big voices were from the singers, the oboes and people from the low flow instruments. One of the readings that I did indicated very strongly that, discouraged showing enlargements in the body. That when you take a breath, no body should know that you breathed. For singing that is fine (he sings: speaking in a vocal style) I am moving maybe 2 liters of air per minute, on my tuba, if I play a note as soft as a whisper, I may use as low as 7 liters per minute flow, and if I play as loud as I possibly can, I will use up to 140 liters per minute flow rate. With the voice, you use practically no air. I took Ray Still, when we were still together, I took him to my studio and measured his flow rates when playing the oboe. When he was playing the oboe, he used maybe 8oz of inter-oral pressure to drive the air as high as 20 oz in very loud playing, but I don't have my figures with me but, the flow rates were extremely small: about 2 ½ liters per minute in pianissimo, that means he could sustain for a minute and use 2 ½ liters of air, and he had a 51/2 liter lung capacity which means he would have all sorts of air left, even after a minute but he would become uncomfortable because of the accumulation of carbon dioxide, so he would have to exhale or choke or be miserable like so many oboe players say they sometimes feel. Playing as loud as he can he could use up to 5 liters of air, in other words he could use more of his lung capacity. But when you play the tuba with a 7 to 140 liter per minute flow rate, it doesn't equate.

In other words, the problems of one instrument in its requirement, you can't just set rules: do it my way, you have to answer the requirements of the instrument in making music it takes a certain amount of, you might say, fuel...that is what our breath is, and we have to have enough, it doesn't cost nothing, it's free. We have to take enough in, even on an instrument like the oboe, that we take enough in so we are not fighting our own bodies trying to make use of it. Because there are complications that I will go into later. But in the history of it, I want to point out that so many of the rules that were accepted early in this century, were created in the century before and were not practical for all instruments.

They were not practical for all instruments, they worked in some cases, they didn't work in the other cases. So with modern investigative procedures, we can come up with much better answers and it doesn't take a genius on the part of the individual to do it, it just takes someone to work with, make the tests and find out. Course I had excellent help in doing it. I have plotted most of the instrumental requirements you might say, how much air it takes if you are a trumpet player, general range of use of air and air pressure compared to the clarinet compare it to tuba. Compare it to anything else. Each instrument has their own requirement. That is why when people come to see me, I kind of shudder just a bit when a little lady about 4 foot 10 comes walking in and she is carrying a flute. Because a flute even though it is a small little instrument, takes a great deal of air to play it very well,. By a great deal I am speaking of the percentage of the portion of the body that we have what we are equipped with. I would like to talk with some of the flute players who are at the convention that was just completed here, and find out what they were saying about the breath. Because some of the people like Julius Baker and I are old friends, we used to play together. And I see that Wally Kujala was here who with the CSO and many friends of mine were here. I am just very curious as to, I haven't asked them, I am just very curious as to what their thoughts are. I get a constant flow of flute players into see me that need a little help in adjusting their pulmonary function requirements for their instrument.

When I see a person walking in that is that tall (over 6 feet), I know, barring illness or pathological condition that he or she is going to have large lung capacity. In other words it has to do with the height, the weight, the somotype of the individual, and the age figures into this as well. When I see a person walking in who is this tall (4 feet), I begin top worry. If he is playing a low flow instrument like the oboe, it doesn't bother me, but if he is playing flute, bass trombone, then I do worry a little because this person is going to have a fairly small lung capacity. If he plays with efficiency, it will be enough but so often no doubt, but so often it isn't and it needs to be helped along a little. Lots of people that come to see me do not take in an adequate breath. In other words, an adequate breath, I would like a breath that when you finish a phrase that you, you have some reserve, that you are not out of air. (talk)

Again in looking out we have a number of ladies, and a number of males. Some large ones, medium ones, I don't see well enough to see if there are any small ones or not. Again, lung volumes vary between individuals, but the need for air doesn't vary that much. In other words if three people are playing the same type of music on the identical instrument, the air requirement will be very similar. There will be a fluctuation, a plus or minus side of 10-15% at the most, and probably even less. So the instrumental requirement will set up the need for air, in other words the embouchure will have to vibrate at a certain amount of amplitude if you are playing a brass instrument, the acoustics of the instrument will be as such that the reed will have to vibrate a certain amount, but whatever it is going to be..if we were going to think in terms of fuel, of gasoline, oh a quart of gasoline for a certain distance of driving, or a quart for a certain amount of notes in a phrase, it wouldn't vary very much between the individual. One of the individuals may only have two quarts in the tank, that may be the capacity there may not be any more. The next one may have 6 quarts of capacity, in other words, one may have a great amount of reserve potential and one may have very little reserve potential. They both can play the same phrase. There may be situations where you can take it too far and you just won't have enough air and you have to learn to sneak breaths, and there are ways of doing that too in order to have sub-phrases and still complete the music. This is sort of an abstract conversation, it really should be developed with

players actually demonstrating this in the act of playing, if not today, we will be doing this in the days that remain. I just want to equate you with some of the problems that I have seen as a teacher of pulmonary function and which some of you may experience with it.

The focus, we'll say if we go to the brass instrument, if we play a brass instrument..the focus that I am talking about...there is a way of thinking of your instrument and your playing...This is just a tuba ring (Buzzes Till Eulenspiegel theme, plays again on the Right side of face, then left, then with crossed lips...) As you see, you can't stop it, it wants to vibrate,. In other words it is going to vibrate no matter what I do as long as I want it to, it may not be the best sound in the world, but it is highly functional. As you can see it is going across my entire mouth. Every neuron in my brain is sending signal along a seventh cranial nerve to the lip where ever fiber in the lip is receiving the same message from the brain (sings..buzzes).. As I say it is all potential functional. (The embouchure on the side) are all undeveloped fiber groups that I would have to be developed to be highly functional as a player, but they could be, and they could be developed very well.

I had a young man that came to see me many years ago and he played so far out of the corner of his mouth that he played this way (off to the side) that he bothered all of his colleagues. I remember bending his mp forward so he could play the slide forward to solve the problem but I did not Ask him to change his embouchure. He would go through the Walter Smith Top Tones for Trumpet and play the whole thing on trombone, with the embouchure all the way over here. He was playing with one of the big named dance bands and doing a beautiful job, why would I ever ask him to change the embouchure. I wouldn't ask him to change, I would ask him to add additional function to the lips, so he could play in more than one opposition. I don't want anything changed, if we an increase his ability, that is another story. But I don't believe in correcting embouchure as much as I believe in correcting music, correcting sound and finding what is best for that individual...it is not always a textbook answer. Many things enter into embouchure and as we begin to discuss it, you can sense that there is a complexity here.. Traditional thoughts are not always accurate, the potential of an embouchure is very great. If you take a pair of "chops" as you call them, and find that they are not working and decide that why they are not working, and you look at the embouchure and it is a beautiful looking embouchure but no sound, the answer really is not in the study of the meat, it is in the study of your brain. What you are trying to do with the embouchure is where the answer really lies. You have to recognize that this part of the anatomy responds reflexly to a stimuli. If you poke your finger in your eye, you would have a real difficulty because that eye would close automatically as your finger go close, it would be a natural biological reflex. A conditioned reflex, you touch a hot stove, you have instant withdrawal. The next time, you don't even reach the hot part of the stove; you still have a withdrawal reflex anyways, because you have experienced it. These are reflexes, they are not biological reflexes, they are conditioned reflexes but they become just as valid as any other type of reflex. When we are playing musical instruments, this is what we are using. W are using all sorts of conditioning factors which we developed in practice, we are developed all sorts of responses that if we want to change anything, we can't go and change the mechanism, we have to change the motivation that brings them into being first. We have to change the stimuli before we can change the reflex response to that stimuli first. This is important information because it makes things much easier one you understand it because it is so easy to make these transitions, and we will be getting to this and actually getting to it in the course of the week where you can actually see it being done, but all it is you stay in your art form and you don't treat your car like

a mechanic where it needs working on, or a body that is ill, an you need medical intervention. In other words we have a wonderful Cadillac and you are driving it, you may not like where you are going, but it doesn't require that you lift the hood and get into the motor or the transmission, just change direction... go the way you want to that's al. The same with the musician, we have to make sure that the musician is in the brain and the tissues will then start to cooperate with the messages from the brain. You might have to have a little help in get this started, but really it is a very simple matter. It is so simple that the brain will tend to miss it. We think with complex thoughts as adults.

The heart of most of my teaching is based on this in the sense that, you are sitting there and you are watching me, listening to me, you are gathering information through the senses, through the receptors of the eyes, you can see what I am doing, body language all of this. you can hear through the auditory nerve through the ears, you are picking up the sound through vibrations down through the auditory nerve to the brain, which is then converted and analyzed into its meaning based on your prior experiences. In other words we have 5 senses that we deal with: we have tactile sense, sense of touch you will feel yourself right away, touch your lips! In other words we are learning, we are gathering information. It is going down a one-way street to the brain, or up a one-way street to the brain, We have the sense of sight, the sense of sound, the sense of taste, the sense smell but we learn about the outside world through the senses,. We gather information like you are doing now; I am in turn imparting information, using motor activity. Now the motor nerve is a one-way street. It goes from the brain along a chord to the effectors so I can influence the external environment in any way I choose. I think I will make a little noise...(taps microphone) I did this as a motor activity, I wanted to make some noise so I touches the microphone and made some noise. That is psycho-motor. The thought that proceeded the actual movement. The nerve is a one-way street, the electron flow from the brain to the effector. The sensory nerve is a one-way street where it goes from the receptor to the brain. It goes inward to the brain it is one-way street. What is not readily known is that playing a brass instrument, playing a woodwind instrument is a motor activity, not sensory. If you are an actor and you are onstage playing a role and you have to make people cry, you may have just won the jackpot, 20 million dollars...you have a job to go onto the stage and make people feel very sad, you make the mental adjustments and you live the life of tragedy that you need for that particular amount of time to become believable, and tears will be in the eyes of the audience very quickly. You can reverse that any way you like. Imagination has the ability to change the situations of reality for yourself. Those of us in music do this all of the time...These are our tools that we use as artists, you cannot just play an instrument by pressing buttons, you can make sounds that way but you cannot be an artist...you are a storyteller of sound. If you are in a section, then you are telling that story as part of a group, just like singing in a chorus or whatever, but it is still the art of being a storyteller.

I think that the simplest way to put it, our habits as we are growing up are so strong in the gathering of information, that they tend to guide everything that we do in life. In other words when you go to school, when we are first born, the ability to gather information is just tremendous. You must learn, everything is wide open for the incoming stimuli, all the information that you can gather. Anything that you do on a repetitive basis is habit forming, there is a conditioning factor involved. By the time we get into higher education, the habits of learning are very strong, if it is not learning from a textbook, it is learning about life from your colleagues and from other experiences you have on a daily basis. But the mind is tremendously active in the gathering of information...how active is it to send information? Those of us in

music send information, now we have to make sure that when we are teaching somebody else or training your own self, that when you practice, somebody along the line is there listening to you. If they are not there in person, they can be there in your imagination. Have a mirror and maybe you will become the audience in the mirror or just pretend that somebody is there.

I received a scholarship when I was 15 years old at the CUM in Philadelphia. My practice room was situated along a corridor such that people had to walk by my studio to get to the more important parts of the building. Leopold Stokowski used to walk by, Fritz Reiner used to walk by, all the fine musicians of the Philadelphia orchestra that were on faculty used to walk by, there was no way that I was going to sit in my studio and sound bad. If there was music that I couldn't play, I wasn't going to make it obvious that I couldn't play it. I would slow it up note by note, play it an octave lower if it was too high, an octave higher if it was too low, But the very difficult things I would take home, the rest that I worked out in the studio always had to sound good. I was 15 years old when I started, my instinct told me that I couldn't sound bad. I attribute that to whatever success I had later, was that marvelous conditioning of being forced to have people like Reiner and Stokowski walking by my studio. I couldn't see them, but they could hear me. I forced me into a, trying for excellence all of the time. Using the imagination all of the time,. You know I was just a kid and I knew that I need a job, I needed people like that who would want to hire me. I do this now with my students at a professional level where, based on the imagination, I have them playing for somebody else, not themselves.

Play for a tape recorder, listen to the playbacks later. There is always going to be some feedback when you hear yourself when you are playing but, it should be at such a low level that it doesn't interfere with that ability to tell that story to the audience. Now this has to do with part of our Biology, for us to do anything to influence the external environment, I must use motor activity. Picking up this glass, that is motor activity...transferring it to the other hand, it is not that simple...When I did this the weight of my arm increased and then the muscles in the back of the scapula have to tighten down because if this gets heavier then the fixing of the scapula, the arm will go down and the scapula will come up. As soon as I do that gravitational factors come in, immediately there are all sorts of changes there, balance factors there would be little muscle groups tightening up to compensate for this, the body is in a constant state of falling anyway...I did research at the University of Chicago Medical Center many years ago and one of the physicians I was working with said to stand as still as I can, and they put strain gauges on me, I thought I was perfectly still but on the graphs it showed that I was constantly falling, straightening out, falling...it was going on all of the time. He had me blow through a piece of tubing, blow as steady as you can, without a waver or anything. I tried that and I figured I could be pretty good at that, it should be a successful; test. And there was always a little line going through it showing motion and when we did it with a mechanical pump, there was line at all...Our nervous system fires at a particular rate and our nervous system showed up on the graph. Your body is in a constant state of change,. There are things going on that your brain cannot comprehend, and what we must understand is that we are an enormously complex piece of machinery, but made very simple for use by what I would call it, bio-computer level of the brain. Regions above the brain stem where the coordinate functions of widely diverse fiber groups that coordinate what ones to fire, what ones keep you straight what ones should not fire, and it takes all of these things at a computer level rather than at the intelligence level of the person. You don't even know that they exist and that makes you free to do what you want with your body cause you don't have to worry about it. Only in music do I find people worrying about using their

bodies right. Go to the products, get the results. Don't worry about the body just make sure it sounds better than anybody else, that is the big factor. Take enough air so you can waste it...as I say it's free it don't cost nothing. Recognize that the intelligence of the human being has to do with the phenomenon of life outside our body, it doesn't have to do with the phenomenon of life inside your body. Inside the body there is a system of controls internally that takes charge of it constantly, homeostasis, the ability to maintain temperature, acid alkaline levels, all of these things are taken care of in a level of the brain so that the intelligence is free to cope with all the phenomenon of life of the things you want to think of or do, where you want your body to go. You don't have to worry about the variety of hundreds of muscles, you don't have to try and control each one, it is done elsewhere in the brain. If you transfer this to music, it becomes a joy, it becomes so simple in playing.

There are a few things that stand in the way, that of course is in the study of habits, the conditioned reflex...So often it has to do with, inadequate ventilating of the lungs, the brain gets connected with the tongue instead of the region where you want vibration so that air is actually being signaled with your tongue, rather than, if you are brass players, than the vibrating of the lip. It had to be always connected to the vibration needs of the embouchure, and I suspect on the woodwind instrument it has to be connected to what will cause the reed to vibrate one way, in other words there always has to be a source of vibration or there is no source of sound. Usually, if you could use electronics instead of breath, you wouldn't need any air. But you could never do with out the source of vibration,. That is the important factor, whatever the vibrating sources might be. That is where a great deal of the concentration must go and you function on a brass instrument based on the seventh cranial nerve, the motor nerve that comes from the brain and at the region of the lips, it is carrying the signal of motor activity to the lip and the lip acts reflexly to the signal from the brain.(demonstrates singing and buzzing). It is so easy...If you don't get into your own way, it is not much of a problem but if you try to tell the lip how to do it, then there is going to be a problem. It is a trial and error procedure where you have to be somewhat ignorant about tissue and somewhat knowledgeable about vibration.

Are there any questions?

I don't know as much about the woodwind family as I would like to. One man made the remark to me "why are you teaching clarinets, you don't know anything about clarinet..."I said that I am not teaching clarinet, I am teaching the player that plays clarinet a certain phenomenon about his own body. The ways in which he approaches the clarinet. He has to figure out what he is going to do with the clarinet while I help him normalize the functions of his own structures so that he can have air as motion rather than , as you might say, the pelvic pressure syndrome. Because in nature, the respiratory muscles are only respiratory for breathing, but the identical musculatures are used when you have to give birth to a child, when you have to have pelvic pressure(pushing down)..there will be pressure, a blockage, in other words the larynx will close, without the charts I will have to do the demonstration on myself I suppose, see if I can do that.

The front of the diaphragm is fairly high in the body, the rib cage is here and so forth. In the old days, teachers used to say put your hand on the diaphragm down here (lower stomach). Now, there is no diaphragm here, it does not exist in nature here. Now it is up here, the heart is generally recognized as being here (center of breastbone), well the heart is attached to the upper side of the diaphragm, right

under there is a little knob called the (xiphoid process) at the attachment at the sternum, and here sits the heart and there is a tendon, it is called the central tendon of the body, and that tendon will also have the right lung sitting on there that goes all the way up to the clavicle, the collar bone...the left lung goes all the way up. If I open my shirt, when I weighed a lot more you could see it, you should see a swelling if I put air pressure in there, that is the apex or the upper part of the lung,.. it goes that high in the body, and it is of course attached to the diaphragm

Under the diaphragm is the liver, a big organ, about the size of my hand...Liver on the right side, stomach on the left side, there are other things like the spleen and the gall bladder, if you get in any problems you will know about it because it is going to hurt like the dickens! Of course we have all sorts of intestines and things down here...It is all part of respiration, in nature it is like a bellows...larger, then smaller. If you had a tube here you would expand the bellows and the air goes in, you push the bellows together and the air goes out...as your body gets larger, air pressure is going to lower internally so that air is going to move from outside to inside because the air pressure outside is higher than it is inside your body. When you get smaller, the air pressure increases internally and the air moves out. But all of these muscles, these exact same ones, are used for the pelvic pressure syndrome but in a different way. This is one of the confusions that musicians have. It is simply the fact that when you are playing a high instrument, a high French horn or trumpet ad so forth, blowing hard takes a considerable amount of air pressure and not too much air flow. (breathes into his finger and "pops" the air) If you were playing, all of that air would just rush out. If you were applying the pelvic pressure syndrome at the same time, you would find that it would(throat) would snap shut on you. You wouldn't even be able to use this air, you would swear that you could but you would be just simply choking, that's all. In other words this air is not going to be functioning at our embouchures or at your reeds, or anything else. It is very difficult to play under these conditions. We have to learn how to use the air, and this is what I will try to show you, that when we are pushing something, we are not pulling at the same time. You just push until the resistance disappears, you push according to how much resistance there is, and the air, or whatever you are pushing, will just continue to push. If you are locked up, you can still have a tremendous push and when you let go you will have not gained a thing, it is just going to lock. Many of the players that are getting into trouble are doing just that. They are using air as a pressure than as a wind. It is a very important point.

You can blow wind without buzzing, you cannot buzz without blowing wind. That just simply means that if you are blowing, and you are blowing properly, there may be a silence, but there is no buzzing at all if there is no wind, you can have all the expansion and stress that you wish but you are silent. This (neck) will be as hard as a rock, everything will be all closed up.

When I approach this situation, I immediately get away from music. We put the trumpets, we put the other instruments aside and as a human being, we work to get back the functions normalized, having nothing to do with music. We are bringing it into a state of recognition, you might say a certain amount of skill in the function, to a point where some enhancement is being achieved, then we move it back to music so we don't have a substitution because we cannot tell by feel if we have it or not because they are both natural to the human body. The pelvic pressure syndrome is just as natural as blowing is. That is a part of the living person, but they are the same muscles used in different ways. Now this we have to work out with instrumentation (tools)...



Now, body typing, it is a very interesting study, I the CSO we have a trumpet player named William Scarlett and he is about 5 foot 7, and he was studying with me some years ago doing quite well, and I used to noticed that he had quite a few problems playing in the high range on the instrument. I looked at him and his body type was a little bit different than what I was used to, he has a very long torso and short legs...I didn't pay that much attention to it, Herseith has a very normal structure..a great artist,...anyways I am used to people with very long legs and shorter torso. So I had a real surprise with Scarlett, I was doing a great deal of study of the body at the time so I put him on a Spirometer and made a Spirogram of his lung capacity and activities generally and found out that he had 6500 ml of air That is ridiculous for a man of 5 7. That is usual for someone who is 6 3 inches tall, that is the lung capacity for a very large person. So here is this little guy, so I called the school and they didn't know what to make of it, I couldn't find any texts on it so I started a research program and it was the study of body typing. It just happens that we can take three people of the exact same height with different body types, they will all have different lung capacities. It all depends on the length of the torso, whether it is flat or it has great expansion potential, if it is barrel chested and it won't expand...

You have to recognize that there are allsorts of factors that if you don't know about them it can be very confusing that is why it is kind of important that you must not tell a person that "you must do it this way or that way". You must get the results but get it the best way that they can, in their own way..find the way. In other words, stabilize the product, you don't stabilize the methodology in how to get it. In studying body typing it became very important because immediately things fell into place for me for many students that I had because I was just going by the height and weight. Now I go very much by the height, weight and the body type of the individual. I know that there are a real variety of people here as well, and it means that you can get just as fine of a result regardless, if you have enough fuel you can be the greatest player in the business. You don't have to have a 9 liter lung capacity to be a great player, that just means that you have a big long bow, if you have a normal bow, there is nothing wrong with that. I have never had much of a lung capacity, I think the maximal lung capacity was around 4  $\frac{3}{4}$  liters and I think that the maximal lung capacity comes at the age of 20 or 21.In extrapolating the tables backward, I figured that's what I had when I was 20,21..about 4  $\frac{3}{4}$  liters and I had a pretty good career as a tuba player and I probably had less breath than anyone around. If you know what to do with it, that is what counts.

Any questions?

Jacobs begins to do individual work at this point.

(58.00)

Now, lets have a volunteer come up. Is Pat Sheridan out there?! I thought so! Come on up here Pat. Now Pat, you have grown a lot since I have seen you last! (gets some tools) This is an anesthesia bag that holds 6 liters, could you blow this up for us? (Pat is blowing it up fairly full, Jacobs has him inhale and exhale a few times..picking up speed)...Takes a device "would you blow up this mercury column as high as you can?" Instead of taking his blood pressure, we will take his air pressure. Is that blowing as hard as you can Pat? It is pretty hard work, it is up to about 115 mm of Mercury. There are 51.71 mm Hg to a lb. Pat just blew this to about 115, so somewhere around 2 pounds, something like that. The maximum that

most healthy young men could expect to blow would be about 3 lbs of inter-oral pressure on a closed circuit static blood pressure test.

(Continues with Pat...)

The point of all of this is to recognize that when you are plying, you cannot be locked here. Whenever you lock this area up here, you are taking out of service the respiratory musculature. You don't need extreme amounts of strength, weightlifting strength, we do need to buzz the lip..

This is an art form. It should be considered an art form, I don't like this constant stress on instrumental playing, other words...I am learning to play the trumpet, I am learning to play the trombone, I am learning clarinet. Where there is an instrumental learning, I want a tremendous dominance of learning the music for these instruments so the psychology of it goes heavily into the music that you play on these instruments and as you develop the music you are also learning the instrument. I don't want the instrumental dominance over the music; I want the musical dominance over the instrument. In other words, this becomes a fight otherwise here, you begin to fight with yourself, and you fight your horn, or you fight your trumpet or whatever instrument you play, you play better and better. And the whole attitude is I go home and practice my horn more and more, If instead, you do the same amount of practice of course, but you do it in the stylistic aspects of it, what do you want it to sound like? Whether it's a dixieland, jazz, or rock, or wonderful concertos or ensemble music. Whatever it is, in other words, it should always be from you to an audience so that the sounds are dominant over the methodology on how to produce the sound. The reason I say this, I found that the human body always works on products, not methods. If I want to move this chair over, I am tired of standing; I'll just bring this it over and sit down. This is a product, in other words, I am moving this chair from over there to here, and sit myself down in it...I am very comfortable, this is very nice. It is not as practical as standing however, but these are products. No matter what I do I am always going for what I am trying to accomplish not how I am trying to accomplish it. This takes a little mental shift where it comes to your instrument, with a beginner it is difficult to keep the musical dominance when you don't know what the first step is on the instrument, usually the teacher will demonstrate for the student. I once had one of my wife's girlfriends sons ask me to teach him the trumpet so I had him come over, took his mouthpiece and buzzed on it a little because I am not a trumpet player. So I played it a little, and he is listening because he had never played at all, and I told him that this was his trumpet, so I played him a G with a nice vibrato, I played a little tune, and I had him listen to it in silence and had him think about it, he was already beginning to establish recall of what Mr. Jacobs sounded like, and after each time I played I would have him just it and try to recall what I sounded like. The point was then to be able to post hear, to be able to hear that sound after I stopped. Then I said, I played a few things oin the mouthpiece, I said take this home and play a lot on the mouthpiece, do anything that you would like, take this music and play it for your father and say this is what Mr. Jacobs sounds like. Anyways, he did that and the next time I saw him he began to get a trumpet sound, it began to work. I worked with him a number of times and a few months later I got a call from his bandmaster and he said "Mr. Jacobs this boy that you are training sure sounds great he has a tone like a pro but he can't read a note!" At least he had a fine sound which means his tone production was proper and the reading is something that will come as he begin to work more and more towards it. I Am a strong believer that you study this, you satudy music.

I grew up in California, my mother was a fine professional pianist. And she played everything. I started off as a bugler, so she played all the bugle calls. I remember playing a Silver plated bugle award for the Scout's competition but I wasn't old enough to be a Scout, and I won anyways. When I was playing tuba,

she was playing the theatres at the time, I played the Poet and Peasant, I would play all the violin parts and she would play the rest of the parts on the piano. I was playing the tuba but I couldn't read bass Clef yet, I was still mentally a trumpet player and when I went to the Curtis Institute, I played the Herbert Clarke Carnival of Venice and the Stars in the Velvety Sky and I was getting a scholarship. I didn't really want to play the tuba, I liked trombone the best but the trombone was lost. We had it tied onto the car, and we were traveling around and when we stopped there was no trombone. Oh when I went to school in Santa Monica, I told the bandmaster and he says "well, we have a brand new King Sousaphone and no body to play it" That was my entrance into tuba playing. People liked the way I played and then I got this scholarship so I was stuck with it.

I wanted to say that I did not have great teaching but I was challenged artistically at a very early age, that is the most important part of the story. I was also in the movies and did some radio announcing in my years. My mother played piano on silent movies on the movie lots for a number of years, and they would go around and ask if they could use the kids as extras, so if you ever see an old Mary Pickford movie with a little blond boy eating an ice cream cone, that was me. They gave me the ice cream and \$5. I never saw the \$5. but I did get the ice cream, it was a very short career.

The reason I am saying all of this I want you to think a little bit about this, I don't know you as individuals, there are many musicians who analyze themselves. They analyze their embouchures constantly. The 5th Cranial nerve is the embouchure field, that is, it is the sensor that takes the information from the lip to the brain. There is no way that you can get the information from the cranial nerve as to what your lips are doing. Your lip can feel good, it can feel bad but you get not details about the various fibers that make up the embouchure. In other words it is kind of a waste of time analyzing your embouchure. Instead if you study the phenomenon of buzz.

I do not recommend buzzing the lips without a ring, buzz in the lower mid-range, one octave, no high notes on the ring at all, because you begin to mask, disguise the problems that come with the instrument...if you are buzzing in the high range you will have to create a much higher pressure which you might transfer to the instrument. If you buzz in the lower range you will sense a much lower resistance, and what we are getting at is trying to get the lip to respond without being forced to respond. We need the isolation of the rim so that the fibers of the embouchure can do their shaping and so forth. Otherwise you are sending messages to the whole mouth, it is not just sending messages to where there is vibration, you can not come to the precise embouchure by just buzzing without anything, it will be close but it will not be your embouchure at all. Use the ring, use the mouthpiece. With the mouthpiece you can play concertos, do whatever you want, very beneficial.

I will tell you a story about that. With the mp, this has been one of my main tools that I have promoted for half a century. I was hospitalized when I was a youngster, the first girl I ever kissed gave me a disease. It was Scarlet fever, we were playing spin the bottle. I kissed this girl and two days later I began to swell up and I got passed the Scarlet fever pretty fast but the complications were with my kidneys, I developed Nephritis, of course in those days they didn't have the antibiotics, they didn't have treatments for it. I was in the hospital, and I spent pretty much an entire week in there, when I began to feel a little better, my mother brought my mp for me. I remember they moved me out of the section to a wing where no one could hear me. And I practiced everything I could think of I played on the mouthpiece. I was in the hospital about a total of 2 ½ 3 months. After I got out, it took me a few moments to find the partials on the instrument but I sounded better than when I went in. It felt great, the lip was very responsive. What it did was connect the ability of the brain to conceive very well with the ability of the tissues of the embouchure to respond reflexly to the stimuli of the brain. It made a

better conception than when I went in, so actually I was much more advanced in the matters of tone production when I came out of the hospital than when I went in. Even though I was very young, I remember a story being at the Curtis Institute and people would be having troubles with their lips, and there was this one trombone player who was having a great deal of problems with his embouchure and he came up to me one day and asked if I could help him at all and I so I had him play on his mouthpiece and just for luck I had him play on my tuba mouthpiece as well. It was good advice but at the time I didn't know why. I knew it would work but I didn't know why.

What we were doing was breaking into his prior conditioning with strangeness. With strangeness you can change an old habit, you can begin to have different response patterns come in if you are motivating them. Otherwise your conditioning is so strong that no matter what you do with the parts you are trying to change, the signal from the brain is just counter it and sending the same signal that it always sends and you get frustrated it because you can't change your lip. So by doing this I was able to free him up enough to where he could get good results on the embouchure which was difficult to hold, but he started a pattern of change which soon developed into a different way of playing which was very successful. Years later I studied the subject and found out why it worked, I didn't know why it worked then. It was just a fortunate set of circumstances.

Again the embouchure is part of us, that is there are three parts to sound, any sound at all. There is always a source of motor activity, there has to be a source of vibration and a source of amplification or resonance. On the piano it comes from the factory, and they set it up for you, all you have to do is provide the motor activity because the factory has provide the other two. The factory has provided two phenomenon, pitch vibration and acoustical resonance. One sound board covers all response patterns. As a result all the player has to do is provide the motor activity and work the pedals for the other effects that they may use. This is not a put down for pianists, this is just the way they work. When they send out a piece of brass, it is a stupid piece of brass, there are no brains involved. That means I have to provide the motor function and the pitch vibration, it has to match the acoustical laws of the tuba, but I am providing those two important factors and the tuba is providing acoustical amplification. Those instruments we must provide 2/3's of the 3/3 of the sound phenomenon after it is sent from the factory. We are confronted with a little different problem than that of the player of the piano. They use one (motor function). That is on a brass instrument we have to make sure that we don't use the technique of a pianist and play it by oppressing a button. Sure we press the button but we have to be very aware of the pitches that we send in, and it must have the right length that it can amplify and resonate the vibratory rate that we are sending in.

In other words. Our brains have to work very much like a singers brain; I don't think of this like a wooden reed (embouchure) tome it is like a set of vocal chords, instead of here, we use it as a set of vocal chords for the instrument. But all the refinements of tone production, the change of sound and pitch, just like the voice. Most of it without a feedback phenomenon, some of it we can feel. When we start getting into the large pitch changes, but if I get into a step (playing), and tuba is like a bass fiddle in terms of size compared to violin or trumpet, and if you are standing beside me you won't hardly notice a change in the lip, but it is changing, because I am singing it. I am changing it in the brain. If you are trying to change it in the lip you are going to get into trouble. If you change it in the brain it is going to change in the lip but all of these things would have to be viewed under a microscope, to find out what is

happening. The point is, you have to become a singer in your brain. I was a singer so it was fairly easy for me, this potential exists in all of us. There is recall and recognition of sound and if there isn't, I teach solfege, sight singing. I do ear training studies. It is amazing how over the course of a year how somebody who considers themselves tone-deaf, how they will pick up in recognition. Of course in two years, they are already starting to become excellent. I have a young man who I use as an example; he plays in one of the major orchestras. He came to me many years ago and he was having a great deal of trouble playing and I found out why. He was about as close to being tone deaf as anyone I had ever met. I would sing a note and ask him to sing it, and he couldn't so it. I would ask him to play it on the piano, he couldn't so it. There was just no sign of recognition, then I asked him to sing something from his school days. (sings) Well, he sang this tune and he did it fairly well in tune. So I figured that he wasn't tone deaf, if he could remember that and sing it fairly well in tune, so I started immediately ear training. We had just the tape recorder brought out and I had the Conn 12 window strobe tuner in my studio. I used multiple senses, the sense of sound and the sense of sight. In other words we just watched the strobe and we didn't use the voice at all, we just worked from the piano, and looked at the strobe. Every time he would see it, I would have him stop in silence, re-hear it in the brain where no body else can hear it, cause the problem is the problem of the brain, it is not a problem of tissue. We began a developmental program where we began to increase his ability to have recognition. In a very short time we put him back on his instrument and he began to hear the notes and once we started, this man has had a career, he is almost ready to retire now, it just showed that once the connection was established, the effort was put where it should be, the advancement was tremendous. The answers lie in the brain, not in the musculatures. In other words you don't control meat to control sound, you control sound to control the meat. And once this is understood, you don't have to worry about the embouchure.

The biggest thing then would be blockage based on large tongues, being held too high in position (SSSS). The nuisance value that I run into now that I find most prevalent, and I suspect that most people don't realize are the tonsils. It coincides with a great big tongue. If I am dealing with a trumpet player, because there is tremendous variability in the size of people's tongues. Because the tongue in repose is taking up nearly all of the area in the oral cavity, and on top of that if you have very large tonsils, there is very little chance to get the air to the lip. The answer is then, not necessarily to go to a surgeon, but to learn the use of a vowel. In other words; ah oh ou are the three lower vowel forms. If you say these, you will notice the feel of these...now go to the other side of these say ee, I, y...you will feel the tongue hanging way up high...Hee Tee, it should be at the roof of your mouth. Now if you are playing as soon as you use your imagination, don't try to control the tongue as a muscle and use the reflexes of speech, it takes imagination but you can hear a trumpet that sounds like some great soprano voice, and that trumpet sound is given the name of a vowel (toh..Tchaik #4) The tongue will try to get out of the way based on your concept of the vowel. The three low vowel sounds are ah, oh ou. Now you go to the lowest point because you want some extremes in the change, you can modify it back to anyone you want. But as an artist you have tools where these things do not have to be approached by fear of the tongue or consequences or anything. It is simply you play with your tone production, but the tools for playing are psychological, not physiological. If in your imagination you can hear your sound as if it were a human voice, proper speech, proper language, it will work right away (Tchaik #4 opening again). In other words there are times where you want a veiled pianissimo (sotto voce) using the ee vowel deliberately to get that very sweet pianissimo which is a wonderful tool for an artist...You may want to have that sound where you can change your dynamics from very soft to very loud without any change, that way by

blowing slow, you have less amplitude of vibration so you can play very soft and as you blow faster and faster, you increase the amplitude, you are getting louder and louder...but you still are controlling the whole thing with a concept of vowel. So, the wind is always played down into a secondary phenomenon and the sound is played up as a primary phenomenon. This is as it should be, in other words, your actual sound, the one you want your audience to hear, you always conceive what you want them to hear and you simply have a playback from your trumpet. Do you sound like you want to sound like? That is the important factor. Breath, as I say you waste it, it don't cost anything, don't make too big a deal out of it. Try to get a lot of it into the lungs, and usually try to protect the end of the phrase so you end comfortable. You don't want to end (all choked up), this type of thing. Where it becomes quite difficult to take a second breathy. I will be going into the ability to take the snatch, very fast breath. The very efficient fast, inhalation. It is so easy to do, my own colleagues never knew when I was taking a breath. But you should be able to, as fast as you can move your arms, be able to fill your lungs in that time. Not just take a little gasp but i mean take, full full lungs in a short space of time. Oboe players don't know about these things because I'll swear that they will never need it. Ray Still came to me a number of weeks ago after playing the Strauss Oboe Concerto and he was showing me a little device that he invented, it was a little drain that came out of the corner of his mouth, and he said that it helped him to help get rid of his air. Usually if you have a chance , I work with Mike Henschel, one of the oboe players in our orchestra, I think it was on the Tchaikovsky 4th Symphony, the long oboe solo, he was having problems with the hyperventilation. I don't know if he realized it at the time, he was very young then, but just by calmly taking three or four breaths before his entrance, to lower the CO2 level so he could go through the 45 seconds or whatever the solo was, very successfully because it took that much longer for the CO2 to build up to the point until nature takes over and makes you very uncomfortable if you don't exhale. I don't think it solved the problem for him but still in certain works like the Strauss, it is still a big problem. I have worked this out with many woodwind players but they always have to tell me if I am doing anything right because as I say, I have never played one in my life.

Any questions? Yes sir? (inaudible...)

Pat had studied with me while he was in Chicago at Northwestern University, and he used to come over and see me, that's why he knew what I was doing. But you will get a feeling, breathing to expand rather than expanding to breathe. You see, there is a naturalness about taking air into the mouth and blowing out. There is another level in the brain that will cause the enlargements in the body, the key word is suction. When you suck the air from outside into the frontal region of your oral cavity, there is a feeling that goes with it and a smoothness that, I could tell that he was doing it right because of the way he was moving his body, and he was doing it quite well. See,. I have to always watch or I palpate, meaning to touch, I palpate these regions to tell if we are getting primary shape change with some inhalation, or if we are getting the real thing by pulling outside air to the mouth. When you pull it up here, another region (in the brain) will begin to fire up the motor systems to enlarge the body. When you take the thinking part of the brain and start to enlarge the body, there will be less efficiency in the breath. I have a little device that will test it right away. It has nothing to do with the instrument; it has to do with what the person is thinking when they are inhaling. Just because they are holding the bag does not mean that they are going to do it right. Many times they will enlarge their body and take a moderate amount of air but they will have major shape change...They are expanding in order t breathe. Theoretically that is what we do. Because of the way we are wired up to the brain, we have to make sure that we are cooperating

with nature which is breathe to expand. So that the breathing is dominant (breathes in)When you do this you will feel it yourself. Try it when you get out of here, you will get much more air that way.

Any other questions? Nice to have questions. Yes sir? (inaudible) (A lot of teachers will tell you to.....) They haven't gone far enough in their studies, please come up here.

Jacobs demonstrates with the student behind him with hands on chest and side, breathing in deeply, and then just acting as if he is breathing..

There is a little difference, but if you notice that there is virtually no difference in the bone structure when I do the barrel than when I am inhaling. (Same)..It was the same wasn't it? Now place your hand here (over Liver area), Most people do not notice the difference that when you breathe to expand, you are going to get the air volumes, when you expand to breath, you will get substitutions. Part of you will expand and part of you won't. You will find that that the efficiency of it is gone, (draft meter)...(illustrates the draft meter). The valuable part of this is that you are sensing the inspiration at the mouth. This is where the inspiratory control should be, at the lips. We never want more space at the front of the mouth than the size of the pharynx, otherwise you will have a primary friction to the entrance of the throat. This one gets very hard to control, this one does not. (works with him). There is a difference right away, if you expand to breathe in these regions you don't have nearly the connection to the brain that this one does. The controls are much more biologically natural if you go by the lips. (The guy is worried about shoulders raising)...Oh don't worry, the shoulders are involved in capacity breathing, if you ever watch an asthmatic.