

Russo - Taped Interview With Arnold Jacobs, Principal Tubist of the Chicago Symphony Orchestra (as broadcast on WFMT Radio)

Jacobs: [Interview already in progress] Actually the instrument is a larger resonator. I frequently am asked, "Where do you get all the breath to fill that big tuba with air?" Well, of course, you don't do that. You use your breath to vibrate the lips. The lips and vibration -- if they happen to be tuned to the frequencies that the horn can respond to -- the instrument at that point will resonate and amplify and color the sound that is sent into the mouthpiece. It has acoustical laws, which we must obey. Actually, it's a big resonator and some of these larger horns take less breath than the smaller ones because they're greater amplifiers. I may put in a sound on a mouthpiece and have something in the order of a twenty decibel amplification by the time the sound comes out the bell, plus the characteristic of sound associated with the instrument. So, these larger ones -- while they're hard to carry -- in some instances, are quite easy to play.

Interviewer: Was it your playing the tuba that got you started on this whole business of clinicing and the work that you do as a diagnostician for brass and wind players and so forth? How did that come about?

Jacobs: Well, I needed a hobby. The doctor that I used to visit in the early forties said, "You're too much music, everything is always music. You need a hobby. You have to do other things." I think he intended for me to go out to play golf, but I had a problem with my leg so rather than playing golf, I decided to study biology as a hobby. I was interested even from childhood. So, I talked to our family physician about that -- a little lady doctor -- and told her that I was quite interested in human structure and function. She picked up several volumes of information for me to go through -- anatomy, physiology -- and guided me in my early studies. And I was so fascinated with the studies that I stayed with it. In fact, I'm still with it. That was in the early forties and I had been studying structure and function as a hobby, mostly human, from that time on.

Interviewer: That was about the time you came to the Chicago Symphony Orchestra.

Jacobs: That's right. It was in my second year here.

Interviewer: Well, how did you develop it into such a -- well, it's rather a structure thing now. I mean, you have a certain amount of testing that you go through with every player that comes.

Jacobs: Well, I had no intention of using the biological studies that I was doing and the teaching pursuit at all. It's simply that certain factors were obvious. In other words, once I began to learn how we function, then it was obvious if I'd see somebody doing something prejudicial, will say to the use of his air flow. In other words, a substitution of function in the respiratory musculature. Because, after all, we do use respiratory muscles in childbirth and in pelvic pressures, in stabilizations in athletics and so forth. And if I see a phenomena existing in an individual in the way he uses his musculature and I know that he can't move air at that point, I may work with him a little bit as a therapist just to establish the air flow, to get him back into the use of the bellows activity that we have in respiration. I took this objective phenomena of our work, in many instances, and made it objective by bringing in the sense of sight, where we can actually through the use of pneumographs, three pneumographs strapped around the

chest. In the respiratory activity, we can see on the read-out device or gauges, we can see the movement of the body and respiration. We can compare it with the movements of air to the use of spirometric equipment. But I've taken a certain phenomena, which we just have to guess at, and made it somewhat objective by the use of sight or by the multiple senses that reinforce each other. But we never substitute any of this for the study of sound, phrase, the art of making music and of communicating of others. When we work at this subject, we do it away from music. We just normalize the function of the person as in individual in respiration. But we keep the psychodynamics of music so always it's an art form. In other words, in the brass player it's like being a singer. When we play, our lips have to be able to act as vocal chords. In other words, it will read out our thoughts. So the instrument has acoustical laws that must be obeyed. But we send in frequencies just like a vocal chord would do we send in frequencies to the instrument that have to be resonated. Now to do that, we have to sing in the head while playing. The seventh cranial nerve transmits the thought of sound in the brain to the lips just as we speak. I mean, we speak into the horn. Some students that come to me are teachers themselves and they come actually for a little help in the teaching art and so frequently I have to explain to them what they're dealing with and give them a very short course in structure and function as far as our anatomy is concerned. And particularly how we motivate function. In other words, it's like the study of machine systems. Whenever you build a machine, you must put in a set of controls. From the moment you have the controls in, you don't work the machine by its individual component part, but what you want the machine to accomplish. And you do this, you communicate through the control system. Our controls are in the brain. We never play by segmented tissue, such as diaphragms and lips and various segmented parts of our tissues. We play by song. We use our motor activities based on the flow of wind, which will be our fuel supply. But we don't segment into parts. We have a level of the brain that I call the computer level -- a region above the brain stem that we knew today has a great deal to do with the coordinate phenomena of function -- and we allow this computer level to coordinate our physical movements. We have to order the products, what we want. It's very much like in speech. I'm using body language as I talk to you. I'm using very complex tissues, but I don't know a thing about them The controls are in the brain and based on conditioning, based on habits that are already formed, I'm ordering products constantly. But you really can't segment into the individual.

Interviewer: What you're doing in a way, though, is saying that, for instance, if I had a slight speech problem, you might be able to help me overcome that speech problem by showing me what I do to make speech, perhaps?

Jacobs: It would depend very much why you had the problem. In other words, is the problem in the brain, is the problem in the nerve that transmits the signal from the brain to the tissues or is it in the inability of the tissue to receive the message. Much depends on the problem itself. But, invariably, you always strive if a person can't do something based on a pathological condition, then usually you look for collateral function to build up elsewhere to replace it. But one way or the other, we do try to create an accomplishment .

Interviewer: One thing that I've heard a good deal about is your work in the area of the human capacity for providing wind. For instance, the capacity of the lungs to hold air. This has really been an almost kind of pioneering area you. How did that start? Is that a function of a tuba player, just a wind player?

Jacobs: Well, we do have the requirement for probably the largest quantities in terms of flow and flow rate based on a per second basis or per minute basis. We use much more air than any other instrument when we play in our fortissimos and in the low register of the instrument. We have flow rates that are very, very large. If we think in terms of liters, our flow rates can be as low as -- in extreme pianissimo -- as seven liters per minute and we do go as high as a hundred twenty, a hundred forty liters per minute. Well the average person will have four to five liter lung capacity, so obviously we're not going to have a great extension in terms of time if we're blowing as loud as we can. So, I do try to help people find the natural limitation. In other words, take as much air and use it comfortably, but to work with nature and find out what we can do. A tall person usually will have a little more lung volume than a short person. So, if they're tending to use only a small portion of their fuel tank, in other words, maybe if we just relate this to fuel, on one of my cars I have a twenty gallon capacity. If I were to fill it half-way and run to empty, - I would be simulating what some of my students will do with their lung capacity. They may take a breath after emptying out to half-full and play towards empty. There are complications in this. The last quarter of the fuel tank becomes very hard to empty and also in the lungs, as we get to the last quarter of the -- you might say -- the quantity of fuel in our lungs, the moveable air. It gets very difficult to get it out of the lungs. And increasingly so, the closer you get toward empty. It's a complicated subject and I don't want to complicate it for the audience in any way. But, if we were to have three-quarters of a tank of fuel and play down to one quarter -- in other words, still use a half-tank, but locate it a little more towards full -- we avoid the complications near the end of the breath. And it's much freer to replace the air, much more comfortable to use in a blowing instrument without the signs of strain and without some of the physical evidence of pulmonary malfunction, which comes from emptying the lungs out too much.

interviewer: So you tuba players wind definitely needs to have the amount of air it takes.

Jacobs: Yes, we use the greatest quantity of the wind but we also use the lowest pressure to get the wind out in the brass family. The trumpet players use approximately three times as much air pressure to move air out and through the instrument, but only about one-third the quantity. We use three times the quantity of the trumpet player, but only one-third of the pressure. These are approximations. It varies with individuals and instruments.

Interviewer: What about woodwind players?

Jacobs: Woodwind players use the air much more slowly. The oboe is almost like a static breath pressure. Ray Still has the lung capacity of slightly in excess of five liters. He has a flow rate of actually about five liters per minute. So, if he were to take a full breath at that particular flow rate, he could obviously hold a note for a full minute. Now, if he's playing very soft, he will have a flow rate of maybe three liters per minute. So he can go considerably in excess of a minute. They have the problem then of carbon dioxide build-up in the blood, which will cause him to want to breath. With a little hyperventilation before playing, they can play enormous phrases on a single breath. I get jealous. I get so jealous when I hear that because so often I can only play two seconds, three seconds and I must re-breath. Sometimes in pretty loud playing, one second. The average phrase for my instrument would be anywhere from two to five seconds.

Interviewer: And so you come as a bass tuba player to, I suppose, another study of how to make music, how to make a musical phrase from the standpoint of little two or three second increments.

Jacobs: Well, that's inherent in the player, of course. In other words, there are challenges in music where we must phrase, where we have to have lengths. Now, if I play softer, I can hold longer. I can sometimes hold as long as seventeen seconds, twenty seconds. I have students who have double my lung capacity that can obviously go twice as long. In other words, the very large person with a seven liter lung capacity -- and if he plays rather softly using a fifteen liter per minute blow rate -- he has considerable length. The potential for longer phrases are there. I was speaking primarily of the louder orchestral type, bombastic type of playing which we do so much. But, always the musician is the one who plays the instrument. It's just a piece of brass. It hasn't any brains. We have to learn how to phrase, we have to learn how to communicate musical thoughts to others and the challenge for the development of the player demands that we play general music. In other words, I may go home and practice *Un Belde* from *Madam Butterfly*. I happen to like it as music. It's a lovely soprano solo. So I play it on the tuba. I don't do it in public, but it's a lovely solo. If I hear a player do a beautiful phrase on his particular work, I may go home and practice that. I may have to do it in three breaths while they do it in one. But I still accept the challenge of interpretation and the study of styles or phrasing and so forth for the development of myself or for the development of the musical minds of my students. It's one thing to listen to music and it's another thing to produce music. We have to get to the point where we can interpret and produce music so that others can enjoy what we do. There's a great deal involved in it, but it's an acceptance, a variety of challenges and the growth occurs as you respond to these challenges. My main teaching is based on this. In other words, the work that I do as the therapist here is an important aspect. It is helpful, very helpful where I have to do remedial teaching. I have a young man studying with me now from Munich, Germany. He has considerable problems in playing. Well, the diagnostic work is done very, very quickly. We can tell quite rapidly what's wrong there. And then we have to encourage a type of development that will bring him back to a more normal situation. And it's not like a machine where you fix the components or throw away parts because they're no good. It starts with the person's brain, with his motivation. And these devices very frequently are to create certain challenges that will tend to bring about a norm. Also they attract his attention and we deactivate some of his self-questioning, self-analysis as I challenge him to control a ball with his breath and hold it a certain level on a flow valve. He has a circuitry building up in his brain where he wants the ball to be at a certain position and he blows it and holds it there as long as I ask or as long as the challenge occurs. At that time, he cannot be asking questions of his own structure. So we turn him around psychologically into motor function, which has some similarity to playing. But this is always done with one thought in mind. It's a simulation of something that he is doing -- you might say -- that is necessary to do to make music. But it is not music. It's one aspect and I never let a player segment into parts when he plays. When the instrument is in his hand, he must be the artist and it's like telling a story to somebody. We establish normalizing conditions away from music. But when the instrument is there, the art form is dominant and at that time, I don't permit the self-analysis that would involve, you know, whether I'm breathing right, or am I breathing wrong. We precondition away from the instrument where we know he'll be doing it right. I love to teach the ability to communicate. We do this in so many things in life. We can transfer it to music. Once we understand that we do tell a story, in other words, there's emotion in music, there's anger, there's love, there's surprise, there are wonderful lines. We have so many things inherent, in a sense, in living that can be expressed in music. Thin, actually I think, is what it's all about. I

don't care if a person plays all wrong if he sounds great. A classic example is Miles Davis. He tells a wonderful story with his trumpet playing and he's certainly not the greatest trumpet player. But his message is there. What he does, he does very, very well. Now I do think it could be healthier tone production and still do it. But I wouldn't fault him in any way because his message is obvious. He is an artist in his own right. Now, it's not the healthiest trumpet playing, in other words, it would be limiting factors. So, we would try in a person of this type to keep his artistry and to add more abilities. It's like an arsenal of tools. We don't want to undo anything with a student. We add new tools to their work, new dimensions. I don't like this research. This fighting old habits. This business of "I do this wrong, I have to do it right." We just change the motivation and permit the student to develop in a manner in which I know will be right.

Interviewer: Any serious musician is -- I never realized, of course, that you have to fight against this, too, to a certain extent. Any serious musician is constantly in a state of self-evaluation. There's always a constant "what am I doing wrong."

Jacobs: He should not be. At the moment he's communicating, it's like a speech. When you're delivering messages to somebody else, you should not be analyzing what you're doing. There's always feedback, there's always the subconscious awareness, there's always minor feedback going on. So you'll know pretty much what you're doing and there will be certain phenomena, but it should be in ten percent, twenty percent of the intellectual capacities. Eighty or ninety percent should have to do with the message and the delivering of the message so that somebody can receive it. We cannot allow this self-evaluation. What the brass player is dealing with is like a motor activity, the part of the brain that has to do with issuing the message is the same part that receives messages. By that, I mean, the volitional thought. When I talk to you, you hear me. But when you respond, you're delivering messages to me. You're dealing with motor systems, not sensory systems. We have to make sure the dominance, when you impart knowledge, is through motor systems, not through sensors. You can't take for granted that you're going to deliver a message if you're analyzing the various mechanisms of deliverance or even analyzing the message. Actually, when you communicate to somebody else in speech, you have the key for communicating with music.

Interviewer: You also mentioned singers, too, I think.

Jacobs: Of course. But by speech, I mean song and so forth.

Interviewer: I think your study of the great vocalists is probably as helpful in playing a wind instrument as any other kind of. . .

Jacobs: One of the most helpful. Not in the physical applications. In other words, the problems in singing are quite different than the problems in brass playing. We certainly don't want our palate open or air would be coming out the nose. And yet, we need the open palate in times in singing for resonance and so forth. It's not always going to be open, but it has to be free to open and close. Well, we can't have that on a brass instrument or air would just scoot out the nose or under higher resistances, you'd have all sorts of problems. Many of the applications psychologically are there. In other words, we are dealing with the phenomena of sound. Not a phenomena of just wind. In other words, we can't give a

dominance to wind. We have to give a dominance to what the instrument is going to deliver in the way of song. And then we have the various inputs that make it up.

Interviewer: I have a friend who insists that he learned more about musical phrasing from listening to Renata Devaldi records than he did from his own studies.

Jacobs: Well, I wouldn't doubt that. One of the things you encourage for a student is to listen to fine musicians in their particular field. But the difference between listening and producing is quite large. In other words, those who listen hear a phrase, those who play have to learn how to produce phrase. That means they have to learn to construct it. Almost like we do in language. In other words, we use individual words to create a phrase for an audience in speech. And we use individual notes to build a phrase. The audience will hear the phrase. We have to structure it as we go.

Interviewer: The bass tuba, of course, provides the tonal foundation. In the case of the Chicago Symphony, I expect a good deal of moral foundation, as well I know as professional musicians, you do not often outside of the rehearsal situation practice together. You don't say, "Well, we're going to breath here. We're going to do this and we're going to do that." Where does that come from? How does that happen?

Jacobs: We've played together so much, It's like family. Eddie Kleinhammer, my partner alongside, without ever saying anything, we breath together, the same length of phrase, we've played together so much, the communication does not need words. We hear each other all the time. I've been a member of the Chicago Symphony for thirty-three years. I'm on my thirty-fourth now. So, that is a long time. We have had some changes in the brass section, but most of the players have been there a good long time. They say that gradually a husband and wife learn how each other thinks and you become one practically. It's the same thing in the orchestral group. But tho thing you have to do in music is to find the art of communication so you're not learning to play an instrument the way you would learn to construct a TV set, or to build a cabinet. In other words, you don't read a schematic on the anatomy, you don't find cut that I move this and I move that and something else results. So I control all these parts. Then the answer would be predictable. It's just the opposite. We go for the answer right away. And other levels of the brain will control the parts

Interviewer: And the answer in this case is making music.

Jacobs: Exactly.