NORTHWESTERN UNIVERSITY

Arnold Jacobs: Methods and Materials of Pedagogy
An investigation into his methodology in private instruction and in master class settings
with specific concentration on materials used

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Field of Tuba Performance

By

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DEDICATION

To Mr. Arnold Maurice Jacobs
(June 11, 1915- October 7, 1998)

For your dedication to and passion for the art of music,
For the time you spent finding the answers that made us all better,
For choosing to be a role model worth emulating,
For touching our lives with your Song…

A chief event of life is the day in which we have encountered a mind that startled us.
-Emerson

Simplicity, simplicity, simplicity!
from "Where I Lived and What I Lived For" in Walden
-Thoreau

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ABSTRACT

Arnold Jacobs: Methods and Materials of Pedagogy
An investigation into his methodology in private instruction and in master class settings with specific concentration on materials used

With the death of Arnold Jacobs in 1998, a substantial void has been left in the area of brass-wind pedagogy. Professionals in this area attest that Mr. Jacobs' pedagogical approach was exemplary and can be considered a model for effective teaching. Jacobs' study of physiology and psychology added to his talents as a performing musician and created a comprehensive approach for students. Unfortunately Arnold Jacobs never fully transmitted this method in a completely organized and publishable form suited to informing subsequent generations of students about his ideas.

This study targets the methods and materials used by Jacobs in his teaching with an emphasis on the sources of his pedagogical knowledge. Through study of secondary sources and archived primary sources, combined with interviews of former students, this investigation intends to illustrate the underlying principles of Jacobs' teaching.

The purpose of this investigation is not to recount the importance of Jacobs' musical contributions. Although these are extensive, there has been much written about his life, including his years before and after his Chicago Symphony tenure. These existing materials have given us insight into the individual and reveal the basic ideas underlying his teaching philosophies. In these texts however, the particulars of his methods are not clarified. Therefore, the aim of this investigation is to assemble lesson materials from his students by means of personal interviews and examination of archival video of his master class teaching. The document contains personal responses from several professional and semi-professional tuba players who agreed to describe their lessons with Mr. Jacobs. Among those interviewed were: Richard Armandi, Nicholas Atkinson, Brian Frederiksen, Michio Funakoshi, Michael Grose, Gregory Irvine, Rex Martin, Dennis Miller, Michael Sanders and Charlie Schuchat. This paper also examines several important texts that Jacobs had studied during his years of teaching in an effort to illuminate sources of his pedagogical ideas.

Several important appendices are included within the document including transcripts from lectures at the 1973 International Tuba and Euphonium Conference in Bloomington Indiana, 1978 International Trumpet Guild Conference in Madison Wisconsin and the 1991 Marine Band Conference in Washington D.C. Further appendices include: Notes from 1990 and 1993 master classes; a bibliography of the holdings in Arnold and Gizella Jacobs Library; a thematic listing of etudes, solos, and melodies generated from interviews; and biographical information on interviewed subjects.

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ACKNOWLEDGEMENTS

The process of completing a Doctoral degree in any field is, to say the least, a study in persistence and fortitude of character. As I began this degree after the 1995 International Tuba and Euphonium Conference, I had very little awareness of where I would end up, how my career would develop and certainly, how my life would change. In studying Arnold Jacobs as a man and as pedagogue over these several years I have become aware of the fact that the people whom I call my dearest friends all retain some of the personal characteristics of the man to whom I have dedicated my dissertation. I am somewhat envious of the students who were able to spend years studying with Jacobs because of their insight into his pedagogy and his personal life, but I am thankful that I was able to meet him on several occasions and perform a few lines from Wagner's *Die Meistersinger Prelude* before he passed away.

There are many people whom I have encountered becoming a Doctor of Music, a degree which began with the thoughts of becoming a medical doctor but was sidetracked because of my innate passion for the subtleties of a musical line and my incompetence as a scientist. There can not be enough words of thanks for my teachers; Nicholas Atkinson, Dennis Miller, Gene Pokorny and especially Rex Martin, all of whom have taken me in as a student and embraced me as a colleague over the years; these are truly special people. They have taught me how to play, how to teach and how to learn from what we are presented with; good or bad. I also have several very special friends whom I would be remiss in not mentioning because they have also been an integral part of my development over my lifetime, and have given me so much love and support along the way: Jamie Blimkie, Jens Lindemann, Jennifer Snow, Michio Funakoshi, Anne Jelle Visser, and Judith Saxton. I would also like to thank the members of my Doctoral committee: Dr. Judith Schwartz, Dr. Peter Webster, Professor Robert Barris for their numerous hours dedicated to making this project a success. I would also like to give special thanks to Mr. Brian Frederiksen, author of *Song and Wind*, whose assistance to the completion of this project has been invaluable.

Lastly, one cannot ever begin to recompense the love and support that one receives from the family. I have been blessed with a family who have seen me at my absolute best and worst and still stood by me with the unconditional support that one could only dream of. My parents John and Cecelia have given me so much guidance and reassurance that this difficult career that I have chosen was what I needed to do with my life. They have given me a life worth living, as have my brothers Paul and Mike and their respective families who have all managed to sit through their fair share of tuba recitals and still come out smiling.

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CHAPTER ONE

INTRODUCTION

The good teacher discovers the natural gifts of his pupils and liberates them by the stimulating influence of the inspiration that he can impart. The true leader makes his followers twice the men they were before.

Stephen Neill, *A Genuinely Human Existence*

After completing numerous years of study with several students of Arnold Jacobs, I had some unanswered questions regarding his approach to pedagogy. It was these questions that laid the foundation for this present document. In my years of study, I recognized that my teachers were presenting Jacobs' concepts in their own manner; in their own language. It was not until some years later that the author was able to study with Jacobs personally, and from these lessons it became clear that Jacobs' method was to create a plan of instruction tailored to the needs of the individual student based on their needs at that time. I then understood that each pupil [now instructor] had been recounting the approach Jacobs had used with them in their lessons to me. I therefore deduced that the teaching I received represented only a small part of the overall picture of Jacobs' pedagogy and my intention was to examine his approach on a much larger scale.

Through my lessons and initial readings on the famous tuba player of the Chicago Symphony Orchestra, I became aware of his research into physiology and psychology and his reputation of being able to teach students who had encountered severe playing problems. In addition, I was able to attend two of his master class sessions at Northwestern University and I recognized that his knowledge and skill in pedagogy was so considerable that it merited investigation.

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The first question that presented itself was: Where did Arnold Jacobs learn the considerable amount of information that he was teaching? Through the inspection of Jacobs' personal library and reviewing specific texts, I was able to draw certain conclusions as to where he may have derived some of his pedagogical ideas. The conclusions of this research appear in chapter two. This research led to the second question addressed in this document: What were the materials that he generally used in his teaching? The process was to interview former students to collect a listing of the material they had used in their studies. With each subject the same set of questions was posed to ensure that uncomplicated comparisons could be made and tangible results could be compiled. The results from these interviews appear in chapter five.

STATEMENT OF THE RESEARCH PROBLEM

It is the intention of this document to examine the sources of Arnold Jacobs' pedagogical approach and also present a more complete overview of the materials and methods he used in his teaching in private lessons and master class presentations.

DISCUSSION OF RESEARCH MATERIALS AND ORGANIZATION

In investigating the materials for this paper, several avenues of research were followed. Initially, an examination of a number of hours of videotaped master class sessions from the Northwestern University Summer Master Class Video Archives in the Northwestern University Mitchell Multimedia Center were consulted to supply the basic information for the document. To supplement these video recordings, I undertook the transcribing of lectures given by Jacobs at the 1973 International Tuba and Euphonium Conference in Bloomington Indiana and the 1991 Marine Band Seminar presented in Washington D.C. The transcription

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of the 1978 International Trumpet Guild Meeting in Madison Wisconsin was acquired through the assistance of Brian Frederiksen, the author of *Arnold Jacobs: Song and Wind* and was further edited for inclusion in this document. I was also able to obtain master class notes from students who were in attendance at various lectures by Jacobs. These notes have been included to present an outline of the most important topics Jacobs touched upon during his lectures from the perspective of other observers.

Further to these sources, I collected numerous journal articles, dissertations, textbooks, and held personal correspondence with the archivist the Curtis Institute of Music, Ms. Joanne Seitter. I was granted permission to examine the library of Arnold Jacobs where I made note of specific handwritten annotations [by Jacobs] to give support to certain conjecture. It should be noted that Brian Frederiksen was particularly helpful in providing me unlimited access to these and other texts pertinent to this document. I have chosen two primary texts to discuss in this document that I felt worthy and important to the thesis. In choosing which texts to focus my readings on, I inspected specific materials which I knew to be discussed by his students or by Jacobs himself.. Two important texts appeared as being rather influential on Jacobs' pedagogy. Arend Bouhuys' *The Physiology of Breathing: A Textbook for Medical Students* presents a chapter that concerns itself solely with the act of respiration where it concerns wind musicians. This text led me to examining similar studies related to this topic including the lecture given by Bouhuys at the Acoustical Society of America [reprinted in *Nature* magazine]. The second text examined was *Psychology for Musicians* by Percy Buck. It has been indicated by several of Jacobs' students, that it was important to understanding his teaching. The examination of these two texts will appear in chapter two.

The second component of this document is to present personal responses from former students of Jacobs. Throughout the course of the interviews I asked of each of the students to recall their lessons with Jacobs, focusing especially on

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the materials that they had been working on, and any other important information. Chapter four presents the series of questions I presented, followed by their responses in chapter five. The following people were chosen not only because of their experience with Arnold Jacobs, but also because they are known to the author on a professional level. I have placed the acronym that will be used throughout the document after their name for reference. Further biographical information can be viewed in appendix nine.

Richard Armandi (RA), freelance tuba and double bass player, Chicago, Illinois. Nicholas Atkinson (NA), Principal Tuba of the National Arts Centre Orchestra in Ottawa, Professor of Tuba at the University of Ottawa, Ontario, Canada. Brian Frederiksen (BF), author of *Arnold Jacobs: Wind and Song*, tuba player, Gurnee, Illinois. Michio Funakoshi (MF), freelance tuba player, former Principal Tuba of the Kyushu Symphony Orchestra (Japan), Evanston, Illinois. Michael Grose (MG), Professor of Tuba at the University of Oregon School of Music, former Principal Tuba, Savannah Symphony Orchestra, Eugene, Oregon. Dr. Gregory Irvine (GI), Professor of Brass at the University of Prince Edward Island, Charlottetown, P.E.I., Canada. Rex Martin (RM), Professor of Tuba at Northwestern University, International Clinician and Soloist, Wilmette, Illinois. Dennis Miller (DM), Principal Tuba Montreal Symphony Orchestra, Professor of Tuba, McGill University, Montreal, PQ.,Canada. Michael Sanders (MS), Principal Tuba Saint Louis Symphony Orchestra, Saint Louis, Missouri. Charles Schuchat (CS), freelance tuba, member of Asbury Brass Quintet, Professor of tuba, Northern Illinois University, Chicago, Illinois.

In organizing the responses from the various subjects, I found it necessary to make editorial decisions to organize the wealth of information into a readable form. Initially, the editing process comprised of the alignment of all similar responses to the series of questions. With assistance from the members of my committee (and patience I might add), I was directed to introductory pages of Dr. Paul Berliner's book *Thinking in Jazz* (Chicago: University of Chicago Press,

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1994) in which he describes his process for performing just such a task. In organizing these materials, I have attempted to follow Dr. Berliner's example:

> My approach in the presentation of this study's data has been to quote and paraphrase liberally from interviews, elucidating many salient issues by allowing artists to speak for themselves....Repeated verification with musicians of my use and interpretation of interview excerpts has made it possible for this study to embody both the intent and the spirit of the artists' words. One of the goals of this work is to present artists in the light by which their own community has always appreciated them... (Berliner, 8-9)

The quotes found herein represent the responses from the subjects and their subsequent reconsideration and reworking of their statements. I have made the best effort to ensure that the transcriptions that appear in the appendices present Jacobs' words as they were related during the various master class lectures. Any editorial changes were made solely for the purposes of clarity.

WRITING STYLE

It will be evident to the reader that there is an abundance of quotations included in the document. The intention of this document is to reflect as close to the true intention of Jacobs' ideas. It is not well known that many of the published articles commonly attributed to Jacobs as the sole author, represent only an interpretation of his ideas. As an example, the article entitled "Mind over Metal" which appears in the 1992 Instrumentalist Magazine registers Arnold Jacobs as author. This was not the case as it represented a compilation of materials taken from several master classes and was edited into its existing format. The present document intends to present the reader with the materials from Jacobs' teaching without complicating the issue with unnecessary interpretation. After reading the materials collected in the initial chapters, the reader is then encouraged to read through the transcripts from the 1973, 1978 and 1991 master classes to further understand how it was that Jacobs presented his ideas.

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CHAPTER TWO

EDUCATION

To gain a true perspective on Arnold Jacobs' approach to teaching, one must fully understand that his teaching was in a constant state of change. From his earliest years of working with students in his basement, to his last days of teaching in his studio in the Fine Arts building in downtown Chicago, his ideas were undergoing constant modification. This is because Jacobs, although maintaining the same basic tenets of good musicianship and tone production, was seeking to find the best possible approach for each individual student. His method evolved from the integration of personal research into the areas of physiology and psychology combined with his vast experience as a professional tuba player. Jacobs was able to incorporate these two endeavors into an approach that concentrated on two fundamental ideas: Song and Wind. Many had suggested to him that he needed to produce a method book such as what Jean Baptiste Arban[1] had done a century before to ensure that his ideas were available as a reference for future generations. This was never completed. The reasons for his decision not to do so may have come from these circumstances:

(a) Time constraints due to his intense schedule of performing and teaching.

(b) In working with each individual, his procedure was different in achieving the goals set forward. In setting forth a permanent method that is somewhat generalized, Jacobs ideas and methodology might have been misunderstood without live instruction and explanation.

(c) He was aware of the impact of written methods on students' approach to playing. Jacobs concentrated on the musical rather than the technical, and therefore a method book as such would not serve his needs adequately.

---

[1] Jean Baptiste Arban, *La Grande Méthode Complète de Cornet à Piston et de Saxhorn par Arban (Paris*: 1864).

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It is worth emphasizing the second and third points as listed above. What Jacobs would recommend to one student to counter a difficulty could ultimately be detrimental to another person's playing. The same can be said for the words that Jacobs chose for the student; each situation demanded a different "language" for the student and in putting down a method in a concrete form, it could never suffice as his true teaching approach. Although it is not possible to know the exact reasons behind his reluctance to write down his ideas into some concrete form, André M. Smith speculates:

> The reluctance of Jacobs to publish may seem a subtle way to avoid his obligation to those who may not have the opportunity to study personally with him or of shirking a presumed responsibility to his pedagogical descendents. But we must remember that any act of creativity in teaching that depends for its successful realization on the active interplay between two personalities can be seriously compromised, or distorted beyond recognition, in the absence of the master of the two. This has happened often enough with the principles that Jacobs elucidates to his students to cause him to realize that wholesale distortion and petrifaction by others may very well result from any attempt by him to cast his ideas into a permanent form.[2]

In the few items that Jacobs did author, namely "Special Studies for the Tuba" located in the last few pages of the Hal Leonard Advanced Band Method,[3] we find only simple exercises and carefully worded pedagogical instructions for the student. It is obvious that Jacobs took a great deal of care with the words he did write to ensure that the student would not misinterpret his concepts. An example of Jacobs' language follows:

> I would suggest that the student be more aware of what good articulation should sound like, rather than what it should feel like. With success, in good articulation, will come sensations with which the player can familiarize himself, but he should not look for it as the important factor in order to achieve successful tonguing.[4]

This careful wording appears to be Jacobs' way of ensuring that the students focus is primarily on musical ideas. However pedantic in tone the above example seems, Jacobs' students recall that he would present concepts in a much more informal manner:

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[2] Andre M. Smith, "Respiration for Wind Musicians," *T.U.B.A. Journal,* 28 (Summer 1993), 39.

[3] Harold W. Rusch, *Hal Leonard Advanced Band Method* (Winona, MN: Hal Leonard Music, 1963), "Special Studies for the Tuba," by Arnold Jacobs.

[4] Ibid., 56.

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> (John LeBlanc) I was having an attack problem and I said "Should I say *toh?"* He said "I don't care if you say your name"[5]
>
> (David Fedderly) [Jacobs' thoughts on articulation] "That you use the tip of the tongue. He would have you say "time to talk turkey," and that was as hard as the tongue needed to hit in the mouth when you played..."[6]

This was the true nature of the Jacobs' approach: to concentrate on the music first and to reserve technical explanations until the situation demanded it.

Arnold Jacobs had an immense wealth of knowledge at his disposal and was able to use this information to diagnose problems with a variety of performers. One of the questions being considered within this document is where Jacobs acquired all of this knowledge. This chapter will address aspects of his training beginning with his studies at home with his mother. Following this, a synopsis of his studies at the Curtis Institute of Music will be presented, highlighting the people whom Jacobs considered his most influential teachers: Fritz Reiner, Marcel Tabuteau, Renée Longy-Miquelle, and Philip Donatelli. Following his years at Curtis, Jacobs began his professional career, playing in several major symphony orchestras, furthering his education with personal research into the areas of physiology and psychology. This research led him to designing studies on respiration as they related to brass players which he performed at the University of Chicago. The final segment of this chapter intends to highlight materials that can both elucidate Jacobs' ideas, and present the suspected sources of their origin.

BEGINNINGS OF AN APPROACH

There have been two major texts dedicated to Jacobs' life including *Arnold Jacobs: Song and Wind* by Frederiksen and *Arnold Jacobs: Legacy of a Master* by Stewart, both which present excellent insight into the sources of musical inspiration over

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[5] John LeBlanc, "The Legacy of Arnold Jacobs Teaching and the Future of Tuba Pedagogy," (DM Diss., Manhattan School of Music, 2001, 65.

[6] David Fedderly as quoted in "The Legacy of Arnold Jacobs Teaching and the Future of Tuba Pedagogy," by John LeBlanc (DM Diss., Manhattan School of Music, 2001), 72.

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the years. From these texts, it is clear that there were several moments considered crucial to Jacobs' development as a performer, and more important to this document, as a pedagogue. As revealing as these texts are, they do not explore the sources of Jacobs' concepts concerning performance and pedagogy; the intent of this chapter is to address this.

Born in Philadelphia and growing up in Long Beach California, Jacobs was the son of an accountant [who also studied medicine] and a professional pianist. His mother Mary Singer Jacobs (1890-1936) had formal training as a concert pianist and was a regular performer on the *Pantages* vaudeville circuit. She also worked as a pianist for several organizations, in addition to accompanying silent films in the neighboring film studios. She taught Arnold piano for one year but as he was more interested in learning to play the bugle at the time, the piano lessons were put aside. He remained with the bugle for some time, learning by ear until his father bought him a valve instrument; a Wurlitzer trumpet. He learned the valve combinations through experimentation, writing down the valve combinations as he discovered them, and would again play along with his mother. He taught himself to play Herbert Clark's *Carnival of Venice* and other melodies before he had a real ability to read the printed music. Jacobs recalls:

> 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 [on the piano]. I remember winning a "silver plated bugle award" for the Scout's competition but I wasn't old enough to be a Scout, and I won anyway.[7]

The type of learning that Jacobs had in his home is comparable to the teaching found in the Suzuki School of Music. This method, established by Shinichi Suzuki, focuses the responsibility of learning on both the student and the teacher:

> Suzuki based his approach on the belief that "Musical ability is not an inborn talent but an ability which can be developed. Any child who is properly trained can develop musical ability, just as all children develop the ability to speak their mother tongue. The potential of every child is unlimited."...The ideas of parent responsibility, loving

[7] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington D.C.," transcribed by the author from videotape, see appendix 7.

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> encouragement, listening, constant repetition, etc., are some of the special features of the Suzuki method.[8]

Jacobs later became acquainted with Suzuki's approach to teaching and found that encouraging the student to learn through imitation and focusing primarily on the musical products was quite successful:

> The encouragement of the child in the Suzuki method: the constant repetition, which is a conditioning factor for the brain and the learning process, and the ability of the muscles to respond to these thoughts, are being illustrated in a beautiful way.[9]

Jacobs developed rather quickly as a young musician and he also learned to play the trombone. He recalled that he loved to play the trombone but it was lost on a family trip. When he returned to Junior high school, Jacobs' band teacher[10] recommended that he play the tuba in the band. Jacobs recalled starting on the tuba, learning the new instrument in the same manner as he had learned the trumpet:

> [I recall that] I played the *Poet and Peasant* [along with her] -- 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. 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 offered] 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. So, when I went to school in Santa Monica, I told the bandmaster and he [said], "well, we have a brand new King Sousaphone and nobody to play it" That was my entrance into tuba playing...[11]

He continued to play the tuba with a local newsboys' band [Santa Monica] , and eventually attended school at the Los Angeles Manual Arts High School. Jacobs' teacher was so impressed with his talent that he suggested that he attend the Curtis Institute of

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[8] The Suzuki Association official website: www.suzukiassociation.org/hist.htm, accessed December 1, 2001.

[9] Arnold Jacobs, "Lecture at the Second International Brass Congress, Indiana University, June 6, 1984," in *Arnold Jacobs: Legacy of a Master*, ed. Dee Stewart (Northfield, IL: Instrumentalist Publishing Co., 1987), 139.

[10] Frederiksen notes that Jacobs had never mentioned the name of his band teacher in California.

[11] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington D.C.," transcribed by the author from videotape, see appendix 7.

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Music in Philadelphia, his Alma Mater. In 1929, the Jacobs family returned to Philadelphia, but prior to attending Curtis in 1931, Jacobs went to the Jules Mastbaum Vocational School for two years. Edward Whitfield[12] recalls the impact had on the music department and the young musical community:

> The year is 1933; I had graduated from Northeast High School the previous June 1932. There being no jobs available, many of us went back to school, and I was in attendance at the Jules Mastbaum Vocational School in the music department where Arnold Jacobs (Jake) had already left his mark on the low brass section. The above mentioned schools were and are in Philadelphia, PA. and had as their principal instructors Meyer Levin and Ross Wyre,[13] both of whom had graduated from the Curtis Institute of Music and both were eminently qualified for their duties.--The Annual contests for the All-Philadelphia High School Orchestra and Band were already out of the way and all the finalists were in their places in the ensemble including Fred Whitley from Overbrook High and myself from the Mastbaum Vocational, both of us on tuba. I had only played the instrument about four months--Fred had considerably more "experience", that of about seven years; so I knew I wasn't "first" tuba.
>
> We were both awaiting the arrival of the third man, Arnold Jacobs. Neither Fred nor I knew him personally, only by reputation, and that was considerable! In order to play on a larger tuba, he had taken the only one available at Mastbaum -- a small E Flat upright model, pulled all the slides out to their maximum, held the fourth valve down and fingered it as a B-Flat!! When he appeared for the first rehearsal of the All-Philadelphia group, he was carrying a large BB-Flat sousaphone, the weight of which curved him down a bit. At the time, he was 5' 10" and all of 135 pounds. Like many of us, he has gained a little over the years! In proceeding to "warm-up," Arnold showed considerable virtuosity in that among other work-outs he played the solo horn part from *Till Eulenspiegel* an octave lower than written for the horn. Fred and I never had heard anything like it; and we had our "first" tuba.[14]

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[12] Edward Whitfield was one of Jacobs' first private students.

[13] Ross Wyre had studied tuba at the Curtis Institute with Donatelli and graduated in 1934.

[14] Edward J. Whitfield, "Remembrances and Recollections of Arnold M. Jacobs," T.U.B.A. *Journal* (Fall, 1985).

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THE CURTIS INSTITUTE

In a 1925 catalog of the Curtis Institute, for the *Courses in Orchestra Instruments*, the announcement read as follows

> There is in the United States as serious lack of players of wood-wind, brass, and percussion instruments qualified to hold posts in the many symphony orchestras scattered throughout the country. There exist today more excellent positions, waiting to be worthily filled, than there are players ready to fill them. Especially is this now true that the present immigration laws have practically cut off Europe of such players. It is the plan of the Curtis Institute of Music to build a school to supply this demand.[15]

The Curtis Institute has long been considered one of the finest music conservatories in the world, not only because of the quality of teaching, but also because of its philosophy. The mandate of the Institute as stated above in their recruitment advertisement is to train young musicians for performing careers. This is not unlike the motivation of most musical institutions today; however, the institute provided a substantial merit-based full-tuition scholarship to all its students, ensuring that the daily concerns regarding finances were left behind.

> When Mary Louise Curtis Bok first opened the doors of The Curtis Institute of Music in October 1924, her mission was to train exceptionally gifted young musicians for careers as performing artists on the highest professional level. According to Mrs. Bok, Curtis students were to learn "...to think and express their thoughts against a background of quiet culture, with the stimulus of personal contact with artist teachers who represent the highest and finest in their art."[16]

Mary Louis (Curtis) Bok was considered one of the foremost contributors to the education and development of American musicians. Her vision of an education system would bring together some of the most prestigious instructors and promising students to work together under one roof. Many important musical personalities graced the halls at

---

[15] Laila Storch in *Marcel Tabuteau's Lessons,* ed. John de Lancie (Boston Records, Compact Disk BR1017CD), liner notes.

[16] The Curtis Institute of Music official website: www.curtis.edu/info/history.htm, accessed November 12, 2001.

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Curtis including Samuel Barber and Leonard Bernstein. Curtis' faculty of highly esteemed artists was employed by the Institute from the Philadelphia orchestra:

> With artistic insights from Leopold Stokowski and Josef Hofmann, Mrs. Bok assembled a faculty in 1924 that would attract the most promising students, including such noted artist/teachers as Leopold Auer, William Kincaid, Marcella Sembrich, Marcel Tabuteau, and Efrem Zimbalist. The relationship between teacher and student has always been of primary importance, and today the faculty of The Curtis Institute of Music continues to include some of the most celebrated musicians of the 20th century, as well as some of the most promising of the 21st.[17]

The daughter of publishing icon Cyrus Herman Kotschmar Curtis,[18] Mrs. Bok came from a musical family and was trained in piano and music theory at an early age. The Curtis family had a close relationship with Leopold Stokowski, and from this relationship, the Curtis institute was established in 1927. Her dedication to the Institute is renowned. She was enthusiastically involved with the students and faculty until her death in 1970: "Although students had to meet their living expenses, Mrs. Bok (as she is known in the History of American music) frequently subsidized these from her own resources. She wielded absolute control over faculty and staff and closely followed the progress of the students."[19]

LESSONS AT THE INSTITUTE

In considering that Jacobs' training to this point of entering Curtis represented personal practice with guidance from his mother and some high school band; he would be exposed to an intense learning experience at Curtis. The plan of study for students at the Institute during the years he attended was as follows:

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[17] Ibid.

[18] Cyrus Herman Curtis had established his publishing empire with such notable journals as the *Saturday Evening Post*, *Ladies Home Journal* and the *Country Gentleman*.

[19] Philip Hart, *Fritz Reiner: A Biography* (Evanston, IL: Northwestern University Press, 1994), 59.

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Orchestra Instruments[20]

Double Bass, Woodwind, Brass or Percussion

Piano, Grade B	Psychology
Orchestra	General History
Orchestra Class	Introduction to Science
Chamber Music	Eurhythmics
Solfège and Theory	Physical Training
History of Music	English
French	German
Italian	Spanish

Although this listing appears to be a very comprehensive degree of study, records from the Curtis Institute archives note that Jacobs had only enrolled in English, Solfège, Theory, Orchestra, and several performance classes.[21] It appears that Jacobs spent a large majority of his time focusing solely on performance, choosing to enroll in the majority of the performance classes and passing up many of the academic offerings, including a class on Psychology taught by Samuel M. Fernberger. Jacobs was asked in a 1984 Interview with Eileen Meyer who was his most influential teacher, he recalled that many people over the years had influenced him:

> I would say at an early age my mother was my most influential teacher. She was very influential as a musician, and she and I would play many things together that should have been difficult, but nobody told me! Another influential teacher was [Tabuteau], I had three years of phrasing lessons with him. My solfège teacher at Curtis was also very influential, as was my tuba teacher, Phillip Donatelli....[22]

The following section examines the following individuals whom Jacobs himself noted as being important contributors to his education as a performer and teacher: Philip Donatelli, Renée Longy-Miquelle, Fritz Reiner, and Marcel Tabuteau.

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[20] *The Curtis Institute of Music Handbook* 1931-32, 63.

[21] Personal correspondence with Joanne M. Seitter Archivist, Curtis Institute of Music, December, 2001.

[22] Eileen Meyer, "Career Counseling: Interviews with Arnold Jacobs and Frank Crisafulli," *ITA Journal*, 13, no. 4 (October 1985), 32.

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Philip Donatelli: Tuba

Philip Donatelli (1885-1954) was the principal tuba of the Philadelphia Orchestra from 1923 until 1948. Donatelli was an Italian immigrant who played with many bands throughout the United States, including Arthur Pryor's.[23] Little biographical information is known about Donatelli except for what appears in a Curtis Institute faculty listing:

> Philip Donatelli (d.1954) was born near Naples in a little town named Roseto Valfortare. He studied tuba with his uncle Donato Antonio Donatelli. In fact, his family were so musical, that in a local band of thirty-nine pieces, twenty-eight of the players were his relatives. Mr. Donatelli came to the United States in 1905. He traveled with many musical organizations until he joined Vesella's Band, where he remained for six years. He came to the Philadelphia Orchestra in 1923, and since 1928, has been a member of the faculty of the Curtis Institute.[24]

Jacobs was fortunate that he was able to hear Donatelli play in the orchestra often, and learn a concept of sound that would remain with him his entire career. Donatelli was the first professional tuba player Jacobs had ever studied with and it would have certainly made a strong impression on the way he thought about the instrument's capabilities.

Jacobs recalled that in watching Donatelli play, he learned that it was not the process in making the music that was important, but the music itself. On one specific occasion, Jacobs remembered having difficulties playing an excerpt from Berlioz' *Corsaire Overture*. In this particular excerpt, the tuba is required to play in the upper tessitura of the instrument and can be somewhat troublesome. Jacobs asked Donatelli to play this for him in a lesson and Jacobs noticed that Donatelli shifted his embouchure

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[23] Arthur Pryor was known as "that kid from Missouri." A virtuoso on the valve trombone, Pryor performed with numerous big bands all over the United States and also had a strong association with John Philip Sousa's band. Most of the 78 r.p.m. records labeled "The Sousa Band" were actually conducted by Arthur Pryor. He is described as a champion of the new ragtime music and was also involved as a musical director for the fledgling Victor Talking Machine Company. It is said that Pryor conducted for more recordings than any other man of his era, and the Victor catalogs from 1900s through the late 1920s confirm that over two-thousand five-hundred separate Pryor records were issued, including trombone solos and selections performed by his Band and Orchestra (www.paragonragtime.com/pryor.html).

[24] Donatelli biography extracted from the 1934-35 Curtis Institute of Music Handbook. Personal correspondence with Joanne M. Seitter, Curtis Institute Archivist, June 2002.

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[position of his mouth] as he played the higher notes. This was a revelation for Jacobs as he had come to believe that he should remain in a fixed position when playing at all times. After seeing that his teacher was doing some shifting and still playing the music well, it was a cue for him to do what was necessary to make the music successful, and not concern himself with any "rules". Jacobs stated that "he had little trouble with this passage after this point." Although there appears to be no record of any such event, Jacobs may have also been fortunate to have played with Donatelli in the student orchestra on occasion. Accounts of the student orchestra at Curtis note that the principal players from the Philadelphia orchestra "participated in all the rehearsals seated beside their students."[25]

While studying with him, Jacobs purchased a tuba from Donatelli. This tuba was provided to Donatelli by the Philadelphia Orchestra but was said to be the wrong size for him. Donatelli was a portly gentleman and when playing this particular tuba, the mouthpiece would move away from his mouth because of his shape. This tuba is the York CC tuba, which Jacobs purchased for a mere $175 and played for the rest of his career. Jacobs owned two of these tubas throughout his career [York number "one" and York number "two"] and they were sold to the Chicago Symphony Orchestra at the end of his tenure.[26] Jacobs remembered Donatelli as a fine man who spoke very little, and who was also a strict disciplinarian in his music lessons. Jacobs recalled that "[Donatelli] did not say much or play much in lessons, but I did hear him play at concerts and recitals, and that taught me a great deal."[27]

We are fortunate to have audio recordings available of both Jacobs' and Donatelli's playing to make comparisons in the similarities in their sound and their style of playing. It is certainly clear to the author that Jacobs imitated Donatelli, both his

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[25] Abram Chasins, *Leopold Stokowski: A Profile* (London: Dutton, 1979), 114.

[26] Further information regarding the history of the York tubas can be located in Frederiksen's text, pp.182-186.

[27] Eileen Meyer, "Career Counseling: Interviews with Arnold Jacobs and Frank Crisafulli" *ITA Journal*, 13, no. 4 (October 1985), 32.

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sound concept and in his approach to playing in the orchestra. There are numerous recordings of both players, although there are two that I feel most noteworthy.

The first is the recording of Mussorgsky's *Night on Bare Mountain*. Stokowski[28] recorded his own arrangement of this work for the Disney feature *Fantasia* in 1940. This work has been released numerous times, however, its original release appeared on the Victor label (17900). Fritz Reiner recorded Mussorgsky's original version with the Chicago Symphony in 1959.[29] The second recording is Wagner's *Overture* to *Die Meistersinger von Nürnberg*.[30] Both Stokowski's (1936) and Reiner's recordings (1959) are excellent examples of the two generations of players. It is a difficult task to articulate the similarities in their playing styles, sound, and presence with the orchestra, and therefore the reader is encouraged to experience this comparison for themselves. Even though little has been written on Donatelli and his influence on Jacobs, we can certainly infer this influence from these existing recorded examples.

Fritz Reiner: Conductor

The orchestra director of the Chicago Symphony Orchestra from 1953-1963 was employed at the Curtis Institute from 1931 until 1941. His duties were to include the direction of the Curtis Symphony, and to be the instructor of conducting to a small class of personally selected students. On occasion, he would also be involved in the direction of opera. The association between Reiner and the Institute was quite favorable: He brought to Curtis the caché of international recognition and authority, and in return he received a professional and financial haven throughout the years of uncertainty in his

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[28] There is an excellent website maintained by the University of Pennsylvania examining Stokowski's career. The site curator is Marjorie Hassen, www.library.upenn.edu/special/gallery/stokowski/index.html.

[29] Re-released on RCA Victor Living Series # 61958 in 1994.

[30] *Stokowski and the Philadelphia Orchestra Play Wagner, Volume II* (Re-released on Pearl Records, 9496, 1993); *Reiner Conducts Wagner, 1959* (Re-released BMG/RCA Victor Living Stereo, 63301).

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career and during the depression. Boris Goldovsky, a former conducting student of Reiner's at Curtis, recounts the maestro's presence with the Curtis orchestra:

> From the moment Reiner mounted the podium and faced the student orchestra, there was a silence in that hall such as I had never heard before. The man's look was terrifying. He had a gimlet eye that could pierce you like a dagger, even when he was looking at you from the side, and he had a tongue to match.[31]

In working with Reiner at Curtis, Jacobs was exposed to a professional conductor whose expectations were extremely high. Reiner expected of all of his students that they have a complete knowledge of the music they were playing [or conducting], and that they all held the same level of professionalism. The orchestra met once a week, working on standard orchestral repertoire and preparing concerts for the public. Philip Hart notes, "(public) programs were very conservative, the most adventurous repertory being some Wiener folk-song arrangements and a movement from the Second Symphony of Randall Thompson."[32] Jacobs recalled that Reiner did not particularly like to teach, but was able to manage his severe approach with the students and extract excellent performances from the group at all times. Reiner was very discriminating in his ideas for sound, and most notably was his desired orchestral tuba sound:

> After Jacobs bought his York tuba from Donatelli, he brought it to the Curtis rehearsal. They were playing an arrangement of Bach's *Toccata and Fugue in D minor*, which was perfect for the large tuba. When he played his first note, the difference in tone from the school's tuba was so noticeable that Reiner's head jerked up, and he stared straight at Jacobs. During the break, Reiner asked him to play his York at all the rehearsals.[33]

Reiner went so far to ensure that this "sound" was at all of his rehearsals that he sent his personal car and chauffeur to Jacobs' house on every rehearsal day; this was so that Jacobs would not have to endure public transportation. Jacobs admittedly stated "with the

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[31] Philip Hart, Fritz *Reiner: A Biography* (Evanston IL: Northwestern University Press, 1994), 60.

[32] Ibid., 61.

[33] Brian Frederiksen, *Arnold Jacobs: Song and Wind,* ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 8.

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York Tuba, which is a tubist's version of a Stradivarius, and with a conductor like Fritz Reiner, I had a tremendous start for a career."[34]

After completing his studies at Curtis, Jacobs performed under Reiner in the Pittsburgh Symphony Orchestra from 1939 until he joined the Chicago Symphony Orchestra in 1944 under the direction of Désiré Defauw. Jacobs became reacquainted with the maestro once again when he became the music director in 1953: "I think he just kept following me around. I saw more of him while I was growing up, than I did of my own father."[35] Jacobs' experience under Reiner amounted to some twenty-two years and despite Reiner's reputation, Jacobs seemed to know how to keep the conductor confident that he would always perform to the best of his abilities:

> I soon became aware of his testing, and at intermissions, particularly in Pittsburgh and Chicago, I would play the parts alone because he was always around listening. I would take the difficult parts and play them where he could hear them, and at my own leisure and pace. It would sort of get him off my back. He liked the idea that you would have enough initiative to cover the material without jeopardizing performances.[36]

It can be clearly deduced that because of Jacobs' early exposure to a conductor of the level of Reiner, he was forced to become a "professional" at a very early age. His relationship with Reiner throughout his post-Curtis years also provided some consistency in his development as a musician.

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[34] Ibid.

[35] Peter Schwendener, "The Best Tuba Player in the World," *Chicago Reader* (June, 1984).

[36] Paul Haugen, "T.U.B.A. Profile. Arnold M. Jacobs, Tubist of the Chicago Symphony Orchestra" *T.U.B.A. Journal*, 4, no.2 (Winter 1977), 3-4.

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Renée Longy-Miquelle: Solfège, Theory

The daughter of the distinguished artist and pedagogue Georges Longy[37], Renée Longy (1898-1979) served as the instructor of solfège, theory and eurhythmics at Curtis. Her interest in music education was quite well-known, and she eventually succeeded her father at the Longy School of Music. The Longy School of Music remains similar to the Curtis Institute in its primary objectives:

> Longy's preparatory curriculum, serving students ages 18 months to18 years, is carefully designed to provide enjoyable musical experiences and thorough musical training at all levels. Longy's experienced faculty combine the highest professional skill with a warm and caring attitude. The needs and desires of the individual student are given full consideration in the assignment of a private instructor.[38]

Ms. Longy had also held positions at the Peabody Institute in Baltimore and at the University of Miami, and also authored a book on music theory entitled *Principles of Musical Theory*. It is not clear if she used this specific text with Jacobs' class, but being published in 1925 it may have likely been teaching material that she employed. Most important to this document is the material that can be found in the final chapter of this text. Longy presents the student ideas of how to grow in their pursuit of musical interpretation; something that most theory texts avoid. Longy stressed that musical phrasing should be considered similar to speech, aiming to instill the ability of the student to recognize, and be able to perform musical punctuation. "...We would say that a Perfect Cadence (with the tonic in the Soprano) corresponds to a period; a Perfect Cadence (with the third in the Soprano), and a Plagal Cadence corresponds to a question mark."[39]

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[37] Georges Longy, the eminent principal oboist of the Boston Symphony Orchestra, founded his school in order to provide comprehensive training in musicianship and performance in the Paris Conservatory model. The curriculum emphasized individual attention to each student, as well as solfège and theory as the basis of sound musical understanding. Extracted from www.longy.edu/history.htm, accessed November 22, 2001.

[38] Longy School of Music webpage, 209.238.237.123/longy.htm, accessed Dec 6, 2001.

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As a solfège teacher, Ms. Longy taught the students the concepts of pre-hearing musical lines through assignment of specific pitches to syllables. This system of "Fixed-Do" is standard practice in the French Conservatory and was used by many of the instructors at Curtis. This course seemed to make an impression on Jacobs as he became quite proficient at solfège and later encouraged his students to sing the musical lines [in any manner] before they played them on the instrument. Jacobs' use of solfège [mnemonics: using the specific syllables, numbers, words, etc.], helped the student create a story line for the music; connecting the thoughts from the brain to the other parts of the body. Jacobs would put words to any melody; using the student's name or reciting something as benign as a shopping list. Two examples follow:

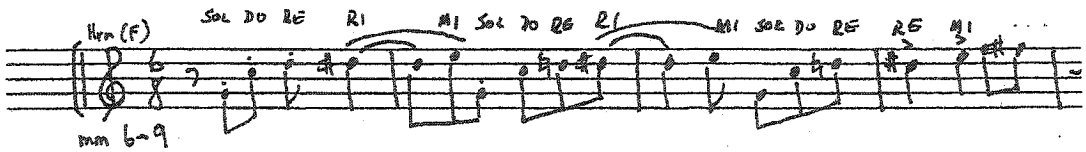
How Dry I Am (from: The Near Future, Irving Berlin, 1919):



How dry I am... How dry I am... It's plain to see... How dry I am...(etc.)

Opening Horn solo from Richard Strauss' *Till Eulenspiegel's Merry Pranks* (Op.28)

mm.6-8; Version 1, solfège; Version 2; author's words

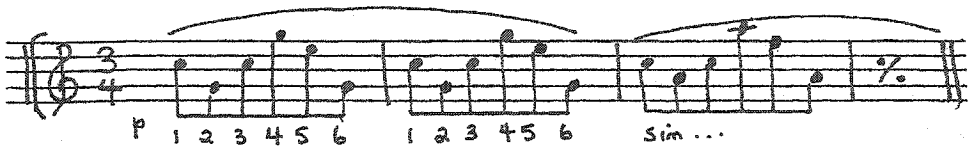


/Till eul en Spie/gel...Till eul en spi/egel...

(MF) Mr. Jacobs would have me put numbers on these notes [Broiles etude #65] and then sing it in English. Singing in a different language requires a great deal of concentration. He would push me and say "faster, faster!" Then when I went to play it on the tuba, it was much easier. It was incredible!

[39] Renée Longy-Miquelle, *Principles of Music Theory* (Boston: E.C. Schirmer Music Co., 1925), 99.

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By doing this, Jacobs found that the student was able to pre-conceive the musical line and then reproduce it on the instrument with much more success. The concept of adding strangeness to a situation, in this case adding words and telling a story, would compel the student to address musical issues rather focus on than technical. Jacobs came to believe in the importance of hearing every singular note before playing it, giving it the characteristics of color, volume, and most importantly, quality.

> [You must] build a phrase through the individual notes. You create music through what you do with the individual notes, just as a sentence is made out of individual words. Music notes and printed words are just ink spots on the page, but as soon as you see the word *swim*, it represents something to you. Musical ink spots represent pitch, color and phrase.[40]

Jacobs must have experienced a real connection between his lessons with Longy and his ability to play the tuba as he maintained throughout his career the importance of hearing the music before it was played. This connection became the most basic element of the concept of Song that he spoke about. Also, in considering that Jacobs appeared to have mentioned very little (if anything) about several of his other classes at Curtis including Brass Ensembles, Longy's lectures and approach to music making certainly made a strong impression of Jacobs' own ideas.

Marcel Tabuteau: Chamber Music, Phrasing

According to all written accounts, the most influential teacher from the Curtis Institute was the professor of oboe and chamber music, Marcel Tabuteau.

> All wind players would be in one class as a group, and we would study his concepts of phrasing and play exercises to develop control of the instrument so that we could

[40] Arnold Jacobs, "Mind over Metal," *The Instrumentalist,* 47, no.3 (Oct.1992), 14.

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> develop phrasing. I rarely played tuba parts in Tabuteau's class, because, in order to get the greatest benefit from the class, I had to be exposed to a wide variety of music that would require all types of phrasing. I found it one of the most rewarding classes I had at the school.[41]

Marcel Tabuteau (July 2, 1887 - January 4, 1966) is considered to be one of the finest oboists of his time, as well as an exceptional pedagogue. He was employed by Walter Damrosch [the New York Symphony Orchestra which later became the New York Philharmonic] then moved to the position with the Metropolitan Opera Orchestra for a further eight seasons. His career then took him to the Philadelphia orchestra in 1915 where he would perform for some thirty-nine seasons until his retirement in 1954. Tabuteau worked at the Curtis Institute at its founding in 1924 until his retirement in 1953. He taught oboe, woodwind ensemble, phrasing, orchestral winds and percussion class and string classes.

Jacobs had participated in several group classes of Tabuteau's during his time at Curtis, one being a class on phrasing.[42] Using chamber music [with a variety of instruments], he worked on balance and color with the students so when they were presented with a musical difficulty in other ensembles they would have the training to react in an appropriate manner. Tabuteau stressed with his students to think musically instead of technically: "I always tell my students that if they think beautifully, they will play beautifully. For it is what you have to say in music that determines the quality of the performance."[43] Jacobs reiterated this concept numerous times throughout his career insisting that if the player wanted to sound good he must know what he wants to sound like to begin with, then the body will follow. "It's important that you conceive what you want to sound like; you simply listen [and ask yourself], do I sound like I want to sound

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[41] Arnold Jacobs as quoted in *Arnold Jacobs: Song and Wind,* by Brian Frederiksen, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 9.

[42] Jacobs also participated in numerous chamber music classes at Curtis, which would have on occasion been lead by Tabuteau.

[43] Marcel Tabuteau, "Instruments of the Orchestra: Oboe," *Musical America* (November 25, 1944), 29.

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like?[44] Jacobs seemed to recognize the importance of what Tabuteau was teaching at his early age as he attended the phrasing lecture for three years instead of the required one.

One of the ideas that Jacobs recalled from this time was Tabuteau's use of a numbering system to create a balance within an ensemble: "Tabuteau formalized the concept of controlling phrasing and dynamics by a numbering system. Each dynamic would have its own level, depending on the instrument. During the class, Tabuteau would have us play at various dynamics by asking for "oboe, number five" or "tuba, number three." It was magnificent training.[45] Tabuteau's complete system of numbers was quite complex and contained many variables, some only applicable for the oboe student. Several of Tabuteau's students have continued to teach his method over the years and have written several articles that explain this approach. One such article was written by Andrea Kapell Loewy which presents a simplification of the four main principles of Tabuteau's number system in a 1998 *National Association of College Wind and Percussion Instructors* (NACWPI) article entitled "Musical Concepts of Marcel Tabuteau."[46] This article is noteworthy as it provides us evidence of Tabuteau's ideas on pedagogy and what concepts he may have been relating to the students involved in these phrasing classes.

Tabuteau's teaching exemplified a very disciplined and systematic approach to performing music. He was a consummate musician who had strong opinions regarding what students of music, specifically oboe, should be studying: "He should study solfège, piano, theory and voice in his early years. When he has reached the age of 13 or 14, he is ready to begin with the oboe itself and he must master the art of phrasing from the beginning. To the student who has already acquired a sound sense of rhythm and musical structure, the purely technical problems of the oboe will be infinitely easier."[47] Tabuteau

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[44] Arnold Jacobs, "Master Class Video, Northwestern University School of Music, 1987," Reel 1.

[45] Arnold Jacobs as quoted in *Arnold Jacobs: Song and Wind,* by Brian Frederiksen, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 10.

[46] Andrea Kapell Loewy, "Musical Concepts of Marcel Tabuteau," *NACWPI Journal* 37, no.2, 13-15.

[47] Marcel Tabuteau, "Instruments of the Orchestra: Oboe," *Musical America* (November 25, 1944), 29.

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appeared to be interested primarily in making the student sound good on their instrument and approached each student as an individual: "Each student must be treated as an individual problem. How often have I had the experience in teaching a class of three or four, of correcting one student with a certain observation, and finding myself called upon to say the exact opposite to the next one."[48] Tabuteau has been regarded as one of the foremost pedagogues of this century and has been said to influence several generations of woodwind players with his ideas and approach to teaching.

Other Teachers

Archival records from the Curtis Institute note that in addition to the before mentioned teachers, Jacobs had also studied with the following people during his time at Curtis: Elbert Lenrow [English Composition], Sylvain Levin [Opera Orchestra], Saul Caston [Brass Ensemble], and Charles Gerhard [Trombone Ensemble].

JACOBS RECALLS HIS CURTIS YEARS

It is clear that Jacobs felt himself privileged to be at the Institute surrounded by so many of the most important musicians of the day. Confident in his abilities and eager to impress others, Jacobs learned important concepts from his teachers and was able to refine these into his own approach over the years. The constant stimulus of having professional musicians of the caliber of Tabuteau and Reiner at such a close proximity had given Jacobs further incentive to always perform well:

> My practice studio [at Curtis] was situated along the corridor where people had to walk by my studio to get to some of 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 the faculty used to walk by. There was no way that I was going to sit in my studio and sound bad by taking music that I couldn't play and letting it be obvious to the rest of the people outside that I couldn't play it. I'd either slow it up and play it note by note or, play it an octave

[48] Ibid.

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> lower if it was too high, or an octave higher if it was too low, but the very difficult things I would take home and work out. The rest I would work at in the studio. It always had to sound good-- I was only fifteen years old when I started and my instinct told me don't sound bad. I attribute a lot of that to whatever success I have had to that marvelous conditioning of being forced to have people like Reiner and Stokowski walking by my studio where I couldn't see them but, they could hear me.[49]

A MULTI-INSTRUMENTALIST

In addition to his studies on the tuba, Jacobs was a fine vocalist and had also taught himself to play the double bass. This interest in playing the bass developed from performances with Jazz and Dixieland bands in local clubs in the evenings as an extra source of income. Jacobs recalled that these performances helped him to reconnect his ability to learn by ear:

> About 1932, the dance band I was working with said they wanted me to take up string bass because of the new microphones that were coming in. They were using the string bass more and more, and they didn't want to let me go because I was a very good tuba player and there some shows that they still wanted the tuba in. I started taking lessons on it [the bass] and eventually I became quite a proficient player. I had another nice career on the string bass, all aside from the tuba to the point that I became a staff bass player at CBS in Chicago.[50]

Jacobs also performed with a trio named the "Three Blue Blazers" which consisted of a violin, guitar and string bass, performed on a regular variety show at WBEN radio in Philadelphia. This show soon led to singing with a vocal quartet and working briefly as a voice-over personality. Jacobs excellent speaking and singing voice also brought him recognition and he was offered another scholarship to Curtis, this time for voice. Jacobs declined, believing it would have meant several more years of study. When associated with the Pittsburgh Symphony, he spent part of his time as a bass player due to the reduced workload for the brass section in those years. Jacobs recalled that he became proficient enough to be able to perform Beethoven's Fifth Symphony as a member of the

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[49] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C.," transcription by author from videotape, see appendix 7.

[50] William Furlong, A *Season with Solti* (New York: Macmillan, 1974), 301.

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bass section. Upon arriving in Chicago, Jacobs had numerous freelancing opportunities which involved playing both the bass and the tuba. Freelancing on the bass ended around 1959 when Chicago Symphony obligations became overly demanding. Jacobs recalls his decision: "I loved to play the bass, and I did not stop until 1959 when everything just got too busy, then I decided to stick to the tuba.[51]

FURTHER STUDY: PERSONAL RESEARCH

For anyone who had the opportunity to observe a lecture given by Jacobs, it was apparent that he was an inquisitive person, interested in many subjects. In his post-Curtis years he continued to be intrigued by numerous educational and scientific subjects. The personal circumstances with his own health led Jacobs to further his knowledge of physiology and psychology. Jacobs struggled with ill health throughout his life and had been diagnosed with COPD (Chronic Obstructive Pulmonary Disease): "The definition of COPD that is recognized by both the American Thoracic Society and the European Respiratory Society is a disorder that is characterized by reduced maximal expiratory flow and slow forced emptying of the lungs; features that do not change markedly over several months. This limitation in airflow is only minimally reversible with bronchodilators."[52]

Jacobs recalled that in the mid-1940s he had suffered some medical troubles and had sought medical advice from his family physician and friend, Dr. Margaret Buck. During his consultation, Jacobs asked how he could learn more about human anatomy and function in order to understand more of what was happening to him. She provided him with an introductory list of reading materials:

> Dr. Margaret Buck--now we're going back into the 40s. I talked to her about my desire to learn a bit of structure and function. She guided me through this period in terms of

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[51] Arnold Jacobs as quoted in *Arnold Jacobs: Song and Wind,* by Brian Frederiksen, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 24.

[52] Dr. Vince Mak, "Chest Medicine On-Line, www.priory.com/cmol/copd.htm, accessed April 10, 2002.

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> advising me on literature and where to start. She suggested that I study the skeletal structure first, learn a bit about anatomy, but do it on a sensible basis. Just don't start with respiration. Learn what human beings are, how we are structured-- that was 1944 and I'm still at it.[53]

From this introduction, Jacobs continued to study further in a more formalized fashion, auditing classes and working on experiments the University of Chicago Pulmonary Functions laboratories in his spare time. Jacobs had several tests conducted on him to explain some of the physical events that were occurring when he was playing. Jacobs recalled one of these experiments which illustrated the functions of the nervous system:

> I did research at the University of Chicago Medical Center many years ago and one of the physicians I was working with asked me to stand as still as I could as 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 then had me blow through a piece of tubing; He instructed me to blow as steady I could without a waver. I tried that, and I figured I could be pretty good at that--it should be a successful test. There was always a little line going through it showing motion and when we did it with a mechanical pump, there was no line at all. You see, our nervous system fires at a particular rate and our nervous system showed up on the graph. You 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 you body because you don't have to worry about it.[54]

In another set of tests, Jacobs wished to examine his own respiration when playing the tuba: "According to their tables, the volume of air that I was moving in and out of the lungs, I should have been in massive hyperventilation."[55] The conclusion of this experiment determined that the breath Jacobs expelled into the instrument contained

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[53] M. Dee Stewart, "An Arnold Jacobs Biography," *T.U.B.A. Journal* (May, 1988), 16.

[54] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C.," transcription by author from videotape, see appendix 7.

[55] William Furlong, *A Season with Solti* (New York: Macmillan, 1974), 303.

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carbon dioxide, and when he took a breath to replenish his lung supply, not only would he would get fresh air in through the corners of his mouth, but he would also be re-breathing some of the air that he expelled into the instrument. That breath contained an excess of carbon dioxide and, when he brought it back into his mouth, it muted the pure oxygen effect on the brain. Jacobs began to formulate further experiments after this point, the most well known of these involved several members of the Chicago Symphony brass section.

Frederiksen notes that in the late 1950s, Jacobs had a student, Dr. Bruce Douglass, who was a physician at the Mayo Clinic. Douglass was familiar with a respiration specialist in the Chicago area and arranged a meeting between Jacobs and Dr. Benjamin Burrows at the University of Chicago Billing's Hospital.[56] From this meeting, Dr. Burrows was able to help Jacobs conduct a series of experiments using the sensitive laboratory equipment. The experiments were designed to examine and record the flow rates of each of the individuals, and the differences in the physical pressures while playing. The conclusions that Jacobs was able to gain from this research helped further his understanding of the similarities in playing all brass instruments. Jacobs was also able to make certain deductions regarding the relationships between the physical act of playing and the psychological phenomena involved:

> We use a little tube and just insert it into the mouth while playing, and the pressure is recorded on a read-out device. Now, Dr. Benjamin Burrows at the University of Chicago who helped me with these experiments was helping me graph some of [the results] on paper. He was rather intrigued with the fact that you could draw one curve for the entire brass family in terms of how much air is used and how much pressure is used in producing this flow rate on the instruments. Whenever we played notes that were enharmonic, in other words the same pitch, even though they were on different instruments, our work efforts and flow rates were practically identical. There are many implications, [one most notably] psychologically: those of us who play the tuba must realize that we don't have to work too hard when we play in the high range.[57]

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[56] Dr. Benjamin Burrows M.D. worked at the University of Chicago until 1971. His research centered on COPD and published numerous articles on this topic. Dr. Burrows was also an amateur tuba player who took lessons from Jacobs on occasion.

[57] Bill Russo, "An Interview with Arnold Jacobs" in *Arnold Jacobs: Legacy of a Master*, by M. Dee Stewart (Northfield, IL: The Instrumentalist Publishing Company, 1987), 120-121.

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Jacobs' experiments at the University of Chicago, although quite innovative where they concerned brass pedagogy, were not entirely new. Previous research of this type had been completed and published by various scientists such as Barton (1902)[58], Faulkner (1959)[59], and Bouhuys.[60] We will be examining the research and its relation to Jacobs' pedagogy in the next section.

In a personal interview with Adolph "Bud" Herseth [subject of these tests and Jacobs colleague],[61] he recalled that Jacobs had been studying materials that related directly to these tests and with the assistance of Dr. Burrows, was able to make the necessary arrangements in the laboratories at the University of Chicago. Although Herseth could not specifically recall the exact literature Jacobs had been studying at the time, an examination of Jacobs' library gives us insight into where he had inferred some of his ideas.

THE ARNOLD AND GIZELLA LIBRARY COLLECTION

As an examination the listing of books in the *Arnold and Gizella Jacobs Collection*[62] suggests, it would be an understatement that Jacobs just read books on physiology and psychology. Jacobs owned over three hundred textbooks, and as evidenced from the handwritten notes in the majority of the texts, thoroughly studied the majority of the volumes.[63] In studying the concepts in these subject areas, Jacobs could

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[58] E.H. Barton and S.C Laws, "Air Pressures used in playing Brass Instruments" *Philosophical Magazine* 3 (Series 6, 1902), 385-393.

[59] M. Faulkner and E.P. Sharpey-Scahfer, "Circulatory effects of trumpet playing," *British Medical Journal*, 1 (1959), 685-686

[60] See bibliography: Bouhuys, A: 1964, 1965, 1968, 1969, and 1977.

[61] Personal interview with author, June 5, 2002, Northwestern University.

[62] See appendix 1.

[63] What is not noted in the collection of his books are the numerous novels, fiction and non-fiction, whose subject matter was on the brain and science.

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be (and was) considered an expert in each of these disciplines. Coupling this wealth of scientific information with his chosen profession of music would then create an entirely new area of specialty for Jacobs. He had acquired a thorough understanding of not only musical concepts, but also have a scientific perspective that few if any before him possessed.

> I had no intention of using the biological studies that I was doing in the teaching pursuit at all. Once I began to learn how we function, then it was obvious. If I saw a phenomenon existing in an individual in the way that he uses his musculature, and I knowing that he cannot 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.[64]

Although many of the books in the collection are standard reference materials for medical sciences such as *Respiratory Muscles and the Mechanics of Breathing* by Campbell and *Gray's Anatomy*, there are two texts that appear to be influential in Jacobs' approach.

The Physiology of Breathing

The *Physiology of Breathing* by Arend Bouhuys, the late professor of Medicine at Yale University "is intended to provide students of medicine with a comprehensive framework of knowledge concerning respiratory physiology."[65] This text contains the summations of research concerning functions of breathing where it concerns speech, singing, and the performing of wind instruments.[66] Bouhuys' research appeared under several covers over most of a decade: "Lung Volumes and Breathing Patterns" (1964), "Sound Power Production in Wind Instruments" (1965), "Pressure Flow Events During Wind Instrument Playing" (1968), and "Physiology and Musical Instruments" (1969).[67]

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[64] Brian Frederiksen, *Arnold Jacobs: Song and Wind*, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 98.

[65] Arend Bouhuys, *The Physiology of Breathing: A Textbook for Medical Students* (New York: Grune and Stratton, 1977), vii.

[66] Bouhuys was a bassoonist.

[67] See Bibliography.

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> Arend Bouhuys probably contributed most importantly to the present knowledge on physiology of wind instrument playing. He studied pressure, airflow, sound power, efficiency, CO_2 variations, heart rates, and other aspects. Using a pneumograph he assessed qualitatively lung volume variations and also discussed some respiratory techniques, such as circular breathing.[68]

Although this textbook is a collection of the materials that Bouhuys was researched, it can not be confirmed that this was the only text that Jacobs had studied of Bouhuys' work. It is probable that Jacobs had read most of the research in the various journals before this textbook was released in 1977.

In chapter 11, Bouhuys discusses the subject of intra-abdominal pressure, flow rates and lung volumes. He gives clear explanations of the physiological processes occurring when performing a wind blown instrument without offering any specific pedagogical solutions. He also explains the phenomenon of increasing muscle use as the air volume decreases. Jacobs would often call this process "playing in the *negative pressure zone.*" Bouhuys explains this concept:

> As lung volume decreases, inspiratory muscle activity decreases, while that of the expiratory muscles (internal intercostals) increases. Even though considerable inspiratory force is required to produce soft tones at high lung volumes...EMG recordings suggest that the strongest inspiratory muscle, the diaphragm, does not contribute to this force. The diaphragm remains electrically silent, while the external intercostals muscles show marked EMG activity.[69]

> The amount of pressure that the expiratory muscles can produce is limited, and this sets a limit to performance for some tones that require high pressures. In figure 10 (following), mouth pressures from three tones on the trombone are compared to the maximum expiratory pressures in healthy males reported by Cook and associates (1964). Lung volume is shown as percent of total lung capacity (% TLC). When one produces a positive pressure in the lungs, lung volume diminishes according to Boyle's law. If the expiratory effort begins after a maximum inspiration (100% TLC) and pressure is increased from atmospheric pressure (0 in figure 10) to over 200 cm H_2O, i.e. to about 1.2 atm, lung volume decreases by a factor of 1/1.2, i.e., to about 80% of the TLC. This explains why the shaded area in figure 10 does not extend to volumes higher than that. Similarly, when one develops pressure on the trombone, starting at 100% TLC, lung volume decreases as the pressure is built up, although no air

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[68] Leonardo Fuks, "From air to musical Acoustical, Physiological and Perceptual Aspects of Reed Wind Instrument Playing and Vocal-Ventricular Fold Phonation," Ph.D Music Acoustics KTH Royal Institute of Technology (Sweden), 1998, www.speech.kth.se/music/publications/leofuks/thesis/contents.html, accessed March 23, 2002.

[69] Arend Bouhuys, *The Physiology of Breathing: A Textbook for Medical Students* (New York: Grune and Stratton, 1977), 270-271.

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leaves the lungs. The tone starts to sound when the Pm is reached. Pm remains about constant, and lung volumes decreases, while the tone sounds (lines 1,2, and 3). As lung volume decreases, the maximum pressure that the expiratory muscles can develop decreases (shaded area). At the points where 1,2, and 3 reach the hatched areas, the Pm required for the tone can no longer be maintained...[70]

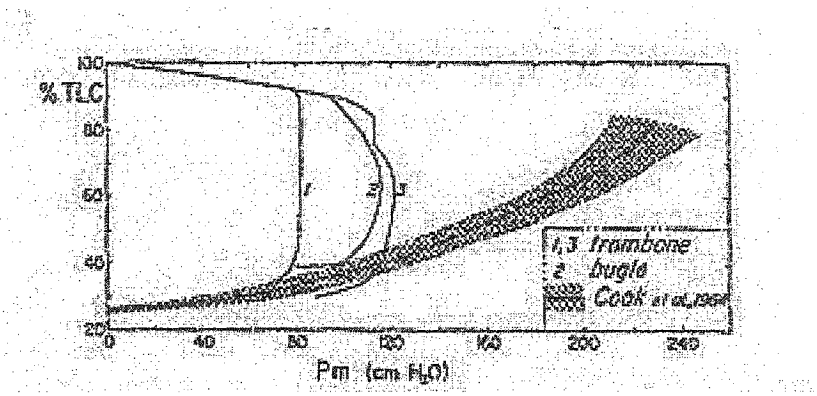


Figure 10. Expiratory pressures (Pm) versus lung volume (% TLC)...

This type of empirical evidence rejects many of the ideas that were commonly believed in the area of brass pedagogy. Most notably is the notion that the diaphragm, the primary muscle for inspiration, does not contribute to the expulsion of air from the body past a certain point. That is, when the diaphragm returns to its original position (after descending upon inhalation) it no longer contributes to the act of moving air from the body; this is done with the pressures exerted from other muscle groups. The pedagogical notion of "support from the diaphragm" was therefore dispelled by Jacobs based on scientific evidence. Jacobs provided this evidence to the student to have them concentrate on other aspects of performing, namely the musical aspects, rather than a complex and rather unimportant issue such as the actions of the diaphragm.

Other research by Bouhuys presents further empirical evidence that Jacobs studies and used in his teaching of the fundamentals of brass playing. As stated above, this type of scientific information was used only to dispel any myths or misinformation that the student may have acquired; the focus remained on the musical aspects.

The following chart represents Bouhuys and associates studies of intra-oral pressures while playing various instruments. This data illustrates the ideas that Jacobs researched and addressed in many of his master class lectures. Jacobs mentioned having

[70] Ibid.

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created a similar study with Dr. Burrows [with the assistance of colleagues from the Chicago Symphony] to graph the variances in intra-oral pressures on different instruments, playing the same enharmonic (middle C). The following chart [Bouhuys data] does not represent Jacobs' findings; however, it does represent published conclusions regarding this same material. From this type of experiment, Jacobs could deduce that "whenever we played notes that were enharmonic, in other words the same pitch, even though they were on different instruments, our work efforts and flow rates were practically identical."[71]

Instrument	Low Note			High Note			Highest Pressure, mmHg	Highest Flow rate, ml/sec
	cycles/sec	dB	mmHg	cycles/sec	dB	mmHg		
Woodwinds								
Bassoon	58	81	31.0	659	84	54.4	89.7*	704
Alto Saxophone	139	98	20.8	622	102	45.8	56.2	561
Flute	262	77	22.8	1760	91	36.5	77.8	612
Piccolo	880	76	26.2	3520	101	48.4	58.3	736
Brass								
Bass tuba	**55**	**94**	**9.9**	**220**	**110**	**63.7**	**77.6**	**1679**
Tenor tuba	55	86	10.3	740	100	64.7	64.7	574
Trombone	55	88	11.4	554	98	126.0	126.0†	784
French horn	55	83	11.6	699	98	79.2	115.9	593
C Trumpet	**110**	**80**	**11.5**	**880**	**105**	**95.8**	**125.8**	**469**

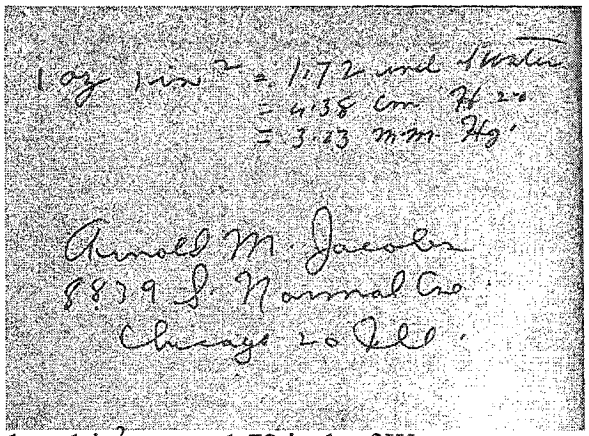
(440 cycles/second =A) Above graph represents only extract from original table. Columns 3 and 6 are sound level readings (dB), Columns 4 and 7: mouth pressure in mm Hg. * Obtained during staccato playing † A maximum pressure of 158 mm Hg was found in the muted trombone.[72]

[71] Bill Russo, "An Interview with Arnold Jacobs" in *Arnold Jacobs: Legacy of a Master* by M. Dee Stewart (Northfield, IL: The Instrumentalist Publishing Company, 1987), 120-121.

[72] Arend Bouhuys, "Lung Volumes and Breathing Patterns in Wind Instrument Players," *Journal of Applied Physiology*, 19 (1964), 972.

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To convert the data from the study into a useable format, Jacobs used the following formula[73]:



1 oz 1 in^2 = 1.72 inch of Water
= 4.38 cm H_20
= 3.23 mm Hg

Therefore, the two tuba examples versus the trumpet examples (listed above in bold) are converted as such

Tuba (low note)	9.9 mm Hg = 3.065 oz/ in^2	= (x .0625) 0.191 lbs in^2
Trumpet (low note)	11.5 mm Hg = 3.56 oz/ in^2	= (x .0625) 0.2225 lbs in^2
Tuba (high note)	63.7 mm Hg = 19.72 oz/ in^2	= (x .0625) 1.23 lbs in^2
Trumpet (high note)	95.8 mm Hg= 29.66 oz/ in^2	= (x .0625) 1.85 lbs in^2

What is important about this material is that Jacobs often demonstrated that the human body was capable of generating very high pressures for the processes of protection, defecation, and child birth. On many occasions, he would have a student lie on the floor and have his wife Gizella stand on the student's midsection, demonstrating that the body could support these types of pressures. These pressures, over 100 pounds or more, are not usable by the performer.

> On the trumpet, which is the highest pressure instrument in the brass family, I have measured many people and they hardly go up to three pounds of pressure...Physically we have reflexes in each lung that will not permit us to use any of this kind of strength. Any time you exert a great power in these powerful

[73] Arnold Jacobs' handwriting located in inside cover of *The Respiratory Muscles and Mechanics of Breathing* by E.J. Moran Campbell.

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> muscles, this has to do with reduction...It's foolish to use enormous strength when you are dealing with one to two pounds.[74]

The final material that I will present of Bouhuys illustrates the relationship between the percentage of Vital Capacity (y axis) and Pulmonary Pressures exerted (x axis) over time (duration of blowing). This evidence illustrates that in high flow instruments, such as the tuba and piccolo, the player uses up nearly their entire capacity of air while maintaining a relatively low pulmonary pressure. The inverse is seen in lower flow instruments such as the trumpet and French horn. One notable exception is that of the oboe wherein it uses very little of the vital capacity and maintains a very low pulmonary pressure reading.

Jacobs understood that the requirement of the different instrumental groups in terms of consumption of air was an important consideration in understanding the pedagogy for each instrument. Instruments such as the tuba or bass trombone used considerably more air and less pressure than the trumpet or French horn. What this evidence does show is that in the higher pressure instruments, air pressure does not equate to air volume. Jacobs emphasized this point with students on many instruments, showing them through simple exercises and an explanation of the Bernoulli principal, that higher pressure is directly related to a lower output of air volume. Jacobs stressed with the players of higher pressure instruments to avoid the temptations of creating artificial pressures (that is, by bearing down and creating a higher pressure inside the body in an attempt to move the air through the instrument) and focus on the art form as a guide, allowing the body to perform its own regulations of air pressures.[75]

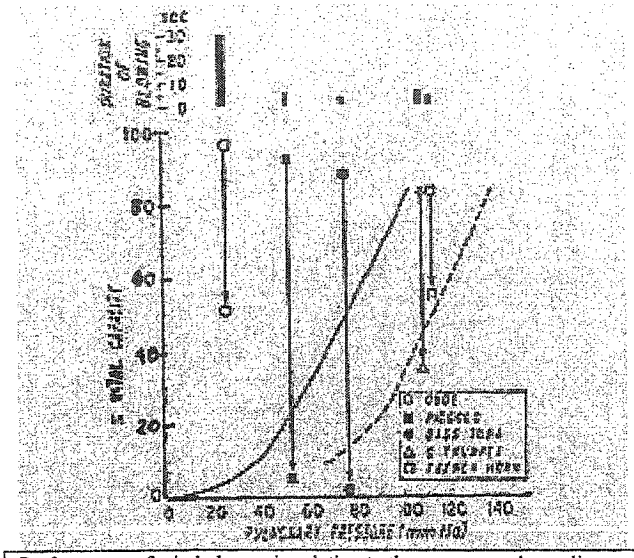
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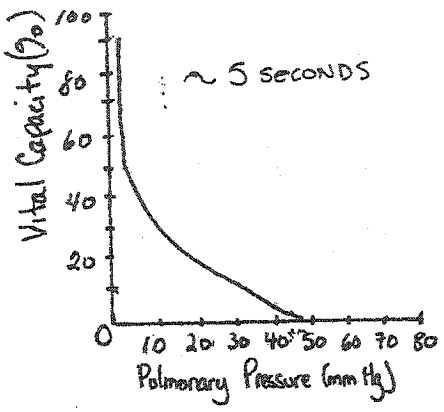
[74] Arnold Jacobs as quoted in *Arnold Jacobs: Song and Wind* by Brian Frederiksen, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 100.

[75] An explanation of the following graph is needed at this point. In comparing the results for the Oboe and the Bass tuba (first and third lines respectively), the Oboe player has inhaled some 95% of his capacity and over a 30 second duration of blowing [pitches not noted], he has expelled some 50% of his capacity while maintaining a relatively low Pulmonary Pressure reading. The results for the tuba show a distinct difference in that the tuba player has inhaled 90% of his vital capacity and over ~ 5 seconds of duration, has expelled all of his capacity with an increase of pulmonary pressure of ca. 50 mmHg. I have extrapolated the data for the tuba and presented it on its own to the right.

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From left to right: Oboe, Piccolo, Bass Tuba, C Trumpet, French Horn.





Performance of wind players in relation to the pressure-volume diagram of the lungs and chest. Average values (drawn line) and average values + 2SDS for maximum expiratory pressures at different lung volumes as reported by Rahn et al. (18) Each vertical line represents a note blown on different instruments, starting from maximal inspiration. Duration of blowing indicated above each line. These represent maximal times these particular notes could be sustained. The point of maximum inspiration is displaced to lower lung volumes as pressure increases, because of compression of the lung gas (18).[76]

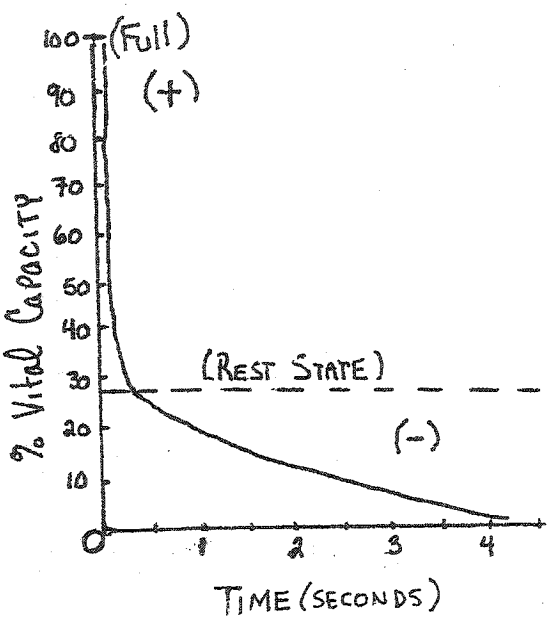
Much of this scientific information is of little use to the average performing musician, and Jacobs appeared to understand this. It appears as though the material that Jacobs did present in his master class lectures was a distillation of the material that we have seen above. Jacobs employed a similar graph that is clearly derivative of the Bouhuys models. Jacobs' graph aims to illustrate visually that as one is expelling air from the body and approaching equilibrium [rest state] the body naturally resorts to contractions of musculature to expel the remaining air. Jacobs spoke about this at numerous master class presentations and the following is extracted from the 1978 International Trumpet Guild Seminar:

In this test, you start blowing the air out at high velocity and no matter how hard you blow it starts to slow up. In some individuals it will slow up drastically. In the healthy young male you figure 80% of the air can be removed in one second and then three seconds later, he can remove the rest of the useable air..... When a person sleeps at night, you have approximately five liters of lung capacity with full inflation down to the zero point. There is always some there; you could blow out without breathing in. At this point, we would have a *rest position* of the respiratory muscles that would be about

[76] Arend Bouhuys, "Lung Volumes and Breathing Patterns in Wind Instrument Players," *Journal of Applied Physiology*, 19 (1964), 973.

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roughly ¼ to ⅓ filled without taking a breath or blowing out. In a fresh cadaver you would have enough air that if you pushed down on the abdomen and chest, you could measure the air coming out. By taking the arms and moving them back, there would be a certain amount of air there regardless, unless you deliberately remove it at the rest position without active contractions of muscles. You will have anywhere from a ¼ to ⅓ of your vital capacity, which could be moved in or out in one breath.



One of the problems when you take a large breath is that you move further and further into this curve. As you go further, there is a constant increasing in the elasticity of the work effort. The elasticity in a large man like me may be as high as ¾ of a pound of air pressure with just a sigh. If we measure that sigh, we would start out anywhere from a ½ to ¾ of a pound of pressure and it would fall rapidly to the zero point, but it could easily be as high as ¾ of a pound of positive pressure. The graph falls gradually, but constantly all the way down to the zero, and now here we have the symptoms in reverse; the negative curve which is doing exactly the opposite. At this point, the elasticity here that is helping the air get out of the lungs, this elasticity is doing the very opposite. You have to overcome it in order to get air out of the lungs. It would help to get air in but makes it harder to get it out -- and during this negative curve we have some unpleasant things happening. One of them is the intra-thoracic pressure -- here you have to push much harder to get the air out.

There are certain other problems; but these could be applied in a positive way against whatever resistance you are doing. You have an internal resistance that must be overcome before you ever do anything with the lips. This constantly increases this curve -- it can get quite large. Unfortunately, as you grow older, this curve (negative) becomes larger and larger and this part of the curve (positive), becomes smaller and smaller. What I want to get across here is that there some unpleasant consequences of this; as you increase your pressure you begin to collapse the airways. You actually begin to collapse the small tubules in the lungs and it's a cycling phenomena; each thing tends to make it harder to get the air out and also to get the next breath. The problem is that with empty lungs, if you take a limited breath; we'll say you take a diaphragmatic breath with moderately low ribs, you take a 50% inhalation from empty, you start out in the plus curve very comfortably but within a matter of a couple of seconds, you are entering the negative curve. You may start out with half a breath and it takes you part way through the phrase very quickly, if you have any kind of a phrase at all. You are now entering a region where it gets harder and harder to get the air out of the lungs. You will not sense

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it in this way because the brain does not pickup these types of signals; you will feel it as a stiff lip, a sluggish tongue, a little throat involvement, and sometimes as an irritation in the larynx. You get many signals which can indicate this, but unless you are familiar with the subject, it might be a little difficult for the individual to find. I will find it very quickly because I am very used to it and I have the material to analyze it, and also the knowledge to analyze it.

This curve here is a source of great problems, but as I say, it comes near the end of the breath. There is another problem on an instrument like the trumpet. Many players pre-compress the air and then blow it out. If you have very full lungs you are pre-compressing the air, you already have all sorts of air pressure. It would be when you add your own pressure to that it could cause spasms of the throat; you could start choking and you could be very uncomfortable. There is a way of getting around which is very simple; it is like a study of a jar. When you take a large breath it is like having a big fruit jar or a gallon jug. You are full of air but the throat is open at atmospheric pressure internally and the same thing happens. Blow all you want: gently, powerfully, whatever you want, but you have to first find that zero a phenomenon which takes a little researching of yourself. One of the best ways to do this is to start counting "one", "two," "three," and using no air-- blow very simply. You are still in the plus curve and this energy is actually being applied to the breath when you need it-- a very definite sense of energy.

This curve is a constant variable. When you are sustaining a note, you will find that if you go into muscle psychology and into studies with electronic equipment, you will learn information which is unusable for brass playing. Let me put it as simply as I can; your body is reacting differently every instant of this curve. When an artist learns to hold a sustained note, it is like a computer. It is adjusting how many fibers have to contract in the body. As you are holding this sustained note, the body will show under investigation all sorts of change. If you play by feel, you cannot do it because feel phenomena is also a constant variable. If you crowd it out by just plain tension, then this is not a very productive thing and not productive for the movements of air. If you sustain and learn your phrase in terms of quality of tone, these are handled through a level of the brain alone. The brain stem is fairly new knowledge, but nevertheless we have a marvelously efficient portion of the brain that will fire up the mechanism as needed. When you get out of its way you do it by studying music - you do not do it by studying body. You can study breathing, but not the breathing apparatus. You may find that you have substituted all sorts of stretch, shape, and change but you have not taken the breath at all.

The reason that I stress this curve is because it is truly one of the important reasons you must stick to the art form. You cannot handle the bellows systems as if you were handling them by hand, only as some unit that you could have sensory feed back during awareness. It is one constant variable.[77]

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[77] Arnold Jacobs, "1978 Master Class: International Trumpet Guild, University of Wisconsin," extracted from www.winsongpress.com, used with permission, see appendix 4.

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The most revealing statement from Jacobs in this explanation of the physical processes involved in performing come at the very end where he returns the student to the core or his approach. He reminds the student that all of this information, the physical aspects, are only one variable and they cannot be handled in a absolute fashion, therefore the student must focus on what they can control; that is the art form.

There appear to be other notable similarities between the Bouhuys research and Jacobs' own approach to pedagogy. Specifically that Jacobs compares the function of the lungs as a being like set of bellows:

> It is all part of respiration in nature-- it is like a bellows-- larger, then smaller. If you had a tube here [in your mouth], 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. According to Boyle's Law, when you get smaller, the air pressure increases internally and the air must move out. But all of these muscles, these exact same ones, are used for the pelvic pressure syndrome 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 and so forth-- blowing hard takes a considerable amount of air pressure and not too much air flow-- [breathes in, puts his finger in his mouth and "pops" the air]. If you were playing all of that air would just rush out. If you were applying the pelvic pressure at the same time, you would find that it [the 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, at your reeds, or anything else. It is very difficult to play under these conditions.[78]

Bouhuys also notes this:

> The respiratory muscles help to generate most of the energy, which goes into playing the horn. They act on the chest, which is for our purposes essentially an elastic bellows. When the chest (that is the lungs in it) is full of air, the chest tends to collapse. Just try for yourself: inspire as far as you can, relax all muscles, and you expire with a sigh. Now try the opposite, which is more difficult to do: breathe out as far as you can. Now relax all muscles, the air flows in. The resting position of the chest bellows is somewhere in between, roughly in the middle of the volume excursion range of the chest.[79]

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[78] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C.," transcription by author from videotape, see appendix 7.

[79] Arend Bouhuys, "Physiology and Musical Instruments," *Nature*, 221 (March 1969), 1200.

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Bouhuys, being a wind instrumentalist himself, makes mention of one important conclusion from his research: that it is not important that the student know any of this to improve the ability on the instrument. He recognizes that how we learn to play an instrument is very different from the studying of an academic discipline, and that the two should remain distinctly different. He asserts, "it does not help the pupil, usually, if he tries to describe the motions in detailed anatomical terms."[80] Jacobs advocated this, reminding the students that they did not need to know how the "machine" works to be able to use it. He would provide the student with a lengthy discourse on respiration and function to serve as a diversion so that the student could focus primarily on the sound he was trying to produce.

This line of study by Bouhuys and his predecessors seems to be the precursor for the studies that Jacobs performed at the University of Chicago. Although no complete record of the tests from the University of Chicago describing the conditions and results of the experiments have surfaced to date, the evidence leads us to the conclusion that Jacobs, through Burrows or Douglass, was directed to this type of research, and this in turn gave Jacobs ideas to design his own tests. Jacobs also mentioned at the 1991 master class at the Marine Band Seminar, that he was motivated to do research on brass players primarily because the research that had been done before was done primarily by people who didn't play these types of instruments:

> In the last century, where most of the research was done [on] pulmonary function as far as wind instrument playing is concerned, the research was done mostly by tall men; flute players who were [very tall] and oboe players who were quite small. Flute players have similar problems as we do in the lower brass family, but the big voices [opinions] were from the singers, the oboe [players] and people from the low flow instruments. One of the readings that I did indicated very strongly that [they] discouraged showing enlargements in the body; that when you take a breath, nobody should know that you had done so. 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. If I play as loud as I possibly can, I will use up to 140 liters per minute flow rate.
>
> 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

[80] Ibid.,1203.

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> making music. It takes a certain amount of, you might say, fuel. That is what out breath is, and we have to have enough, it don't cost nothing, it's free. We have to take enough in, even on an instrument like the oboe, that 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 worked in some cases, and 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.[81]

In working with the evidence provided by Bouhuys and the other scientists, it appears as though Jacobs' own experiments served as further verification for his understanding of the functions of the human body when playing a wind instrument. As we will come to understand in the following pages, at some point Jacobs came to understand that knowing the functions of the body was only one aspect of being able to address playing problems in students. Using another approach, working with the basic concepts at the brain level, would prove to be entirely successful.

Psychology for Musicians

Psychology for Musicians by Percy C. Buck was published in 1944[82] and dedicated to the pupils of the Royal College of Music, London. Sir Percy (Carter) Buck (1871-1947) was considered to be one of the more influential and eloquent writers on music. His career saw him as a writer, music editor, teacher, organist, and composer. Buck's writings on music are considered both intelligent and insightful from his own personal perspective. He was influential in the establishment of teacher's courses at the Royal College which included highly successful lectures in psychology.

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[81] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C.," transcribed by the author from videotape, see appendix 7.

[82] Although published in 1944, Buck states that the book was completed in 1939 at Christmas time. Due to wartime events, the text was destroyed along with all of the notes, papers and his personal library. Buck states that this version was written completely "out of my head" from his memory of things he had talked about for many years.

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In evaluating the text, it is quite clear that Jacobs had not only read the prose by Buck, but it was influential in the way that he thought about teaching. In considering that this text was published at approximately the same time that Jacobs began his individual studies, there is a strong likelihood that he became well acquainted with it early on as there appears to be several significant parallels between Buck's language and Jacobs teaching methods.

One notable feature of this book is that it self-admittedly, not a treatise on psychology. It is designed by a musician, for musicians, who are interested in the correlation of the art of music making and the science of psychology. Buck begins his text with a chapter entitled *Prolegomena*. Buck quotes the philosophy of Locke, reminding the reader that when you are teaching a pupil, "The thing that you are really teaching [and must make contact with] is the pupil's mind." From the outset of the text it is clear that Buck wished to make clear that making music was more a mental process than a physical one. He proposed that the body was merely a machine affected only by the will of the mind. Buck presents us with a familiar allegory:

> Let us first determine what the mind is, and its field of action. Suppose your car is at your front door, and you are going to drive somewhere in it. You take a seat, turn on the petrol, start the engine, and go through all the necessary drill. At the right moment the engine connects with the car and you are moving...Now I want you to notice just one fact: that the car is the machine, whilst you are a mind. The car did everything solely because your mind made it act in that way.[83]

Jacobs expresses this idea in very similar wording:

> If you study machine systems or the structure of an automobile, you find an enormously complex mechanism that is put together by people in the manufacturing business. They put together nuts and bolts and pistons and all sorts of pieces that are very complex, but when they're through assembling the car, they always put in a control panel in the driver's compartment so the driver can communicate to extremely complex machinery through simple controls. This leaves the driver free to cope with the phenomenon of transportation through traffic and as a rule; he doesn't have to

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[83] Percy Buck, *Psychology for Musicians,* 11th reprint (London: Oxford University Press, 1977), 2.

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> worry about what's going on under the hood. The communication to the parts is simple; it is what's under the hood that is complex.[84]

What is important to note is that Jacobs seemed to have recognized that Buck's opinions were sound and worth exploring further. Historically, brass pedagogy has concentrated more on the physical and technical applications than mental aspects, and the assertion by Buck that the student should look to the brain as the important element for improvement seems to have influenced Jacobs thinking. The remainder of the text looks at a variety of subjects from "Habit," "Memory," and the "Elements of Thinking." Although all of the chapters are important, three of the chapters are most significant to Jacobs' pedagogy.

Chapter two, entitled "Reaction", examines the concept of reaction where it concerns Psychology. Although this chapter is quite brief, it presents several important ideas that Jacobs spoke of continuously. Buck begins by outlining four classes of reaction that psychologists agree on: Stimulus, Sensation, Perception and Concept. What is most important from this chapter is the understanding of the term *Concept*. Buck explains:

> If you know only one Sonata in the world, that constitutes your perception of a Sonata: but if you have a nodding acquaintance with twenty sonatas you have in your mind an idea of the Greatest Common Measure of them all, and that is your Concept of a Sonata."[85]

It becomes evident when studying Jacobs' approach that he wanted the student to draw upon their imagination for creating the sound that they wanted; this imagination contained the ideas, or concepts of what they wished to sound like. A sound concept comes as a result of the acquired reactions gained while studying by either taking lessons with someone, attending concerts, and/or listening to recorded examples. Jacobs would ask the student to imitate another player; if it were a trumpet student, he would almost always suggest Bud Herseth as a model. If it was a tuba student, he might ask them to imitate him. Charles Schuchat recalls Jacobs teaching a trumpet student in this manner:

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[84] Arnold Jacobs, "Lecture at the Second International Brass Congress, Indiana University, June 6, 1984," in *Arnold Jacobs: Legacy of a Master*, ed. M. Dee Stewart (Northfield, IL: Instrumentalist Publishing Co., 1987), 134-5.

[85] Percy Buck, *Psychology for Musicians*, 11th reprint (London: Oxford University Press, 1977), 8.

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> (CS) You know, Jacobs would always have the same things. I remember that there was this trumpet player at a master class and he was pretty good. He got up in front of everybody and just before he was about to play, [Jacobs said] "hey, do you know the opening of Pictures at an Exhibition?" He always had to hear that. Then he played it, and Jacobs said "Have your ever heard the CSO do this? So-- you know what Bud Herseth sounds like? -- Could you play it for me like Bud would play it?" Then the guy said he would and it was much better. It was obvious to everybody in the room. Then Jake pats the guy on the knee and says, "Bud's a better player than you".

What makes this pertinent when examining Jacobs' pedagogy is that he seemed to understand that the student's ability to impart musical statements [Song] was directly related to his or her learning processes. It was these areas he chose to address rather than focusing on the technical information that could only help the student in a limited manner. Having the student listen to fine examples musicianship and tone quality would help to bring about stronger concepts in the mind. Jacobs understood that in altering the stimuli the student could initiate change much easier:

> With a musician, you have to realize that conditioned response demands a study of stimuli and we have to work with a stimulus. It's like a piano player roll, for a simple explanation; we don't operate the keyboards, we go directly to the roll and get the function right there and the keyboards will respond.[86]

Buck's explanations about reactions and stimuli seemed to have an impact on the way that Jacobs was thinking about how to work with student's problems. Jacobs formulated a statement that summarized this approach: "I have two tubas--one in the head and one in the hand. The one in the head is all sound and that's the one I work with. The one in the hand is a mirror of my thoughts and I let it be a mirror--In order to have it that way I have to give it something to reflect."[87]

> The basis of my teaching is in a way that you cannot use the sensory nervous system as a dominating factor at a time when you are imparting knowledge. When you are doing some critical motor activity, you have to be involved in the message that you are communicating...It is always the study of the product, not [the] methods. Methodologies we don't do. We have methodologies when we practice but that has to do with the production of sound, it is not what we want to do with the music...[88]

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[86] Bill Russo," An Interview with Arnold Jacobs," *Instrumentalist* (Feb, 1973), 30.

[87] Ibid., 29-30.

[88] Arnold Jacobs, "1993 Master Class: Northwestern University School of Music," Reel 1.

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Buck continues in this chapter, describing the functions of the physical process of sensory impulses and how they reach the brain:

> When a friend speaks to you on the telephone the vibrations of his voice are conveyed to your ear along a wire; and your voice travels back to him along the same wire. If, for the moment, you look on your senses as five friends-which they are-telling you about something that has happened, their messages come to you along wires; but your messages back have another set of wires to carry them...The nerves from the surface of the body to the brain are technically called *Afferent* or Sensory nerves; those which, when you have decided what steps to take, carry a message back to your muscles are the *efferent* or motor nerves.[89]

Jacobs embraced this idea. He reminded the student that nerves were "one-way streets," and the process of acquiring information was one type of event and the imparting of information was another:

> I want to say that we have two types of nerves: we have motor nerves and we have sensory nerves. You all know the sensors. When I talk-- you hear; that's an auditory nerve-- a sensory nerve. You wish to feel whether the water is hot or cold; you put your finger underneath it. There you have a sense of temperature-- you have the tactile sense. You have the various senses that carry the senses inward. Motor nerves are quite different. A nerve in a human body is a one-way street. A motor nerve carries a message from the brain to the effectors; to the muscle which is going to contract. A sensor carries the nerve [signal] in the opposite direction. In electronics we use a wiring hookup where we can send a message along a wire either way-- you cannot do that with the human nerve. In other words, it goes one way only. Now, we play through the motor systems, not the sensors. The sensors are important, I am not putting them down, but the emphasis in the musician must be always on the art of communication.[90]

Jacobs discovered that the student who was in trouble was often confusing the two signals by asking questions [seeking sensory information] instead of issuing statements. That is; they are making an analysis of their own playing [tone quality, articulations, dynamics] when they are trying to perform, and this causes a conflict at a very basic level in the brain. To begin to work on getting the student to return to the process of issuing these musical statements, Jacobs would have the student perform

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[89] Percy Buck, *Psychology for Musicians,* 11th reprint (London: Oxford University Press, 1977), 10.

[90] Arnold Jacobs, "1973 ITEC Master Class (Part I), Bloomington, Indiana," transcribed by author from www.chisham.com/tips, accessed April 1, 2002.

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simple melodies in various stylistic ways. This would break into their conditioned response to the particular situation and begin to make change.

The concluding point that Buck makes in this chapter is to define the different types of reactions that a human is capable of having. The *reflex* reaction is defined as being any body movements that are performed by the "machine" level of the brain; these are reactions that we have little or no control over. An example of this could be: if some dirt were to enter our eye, the reflex reaction would be for the eye to open and close and then the eye would begin to water to assist in removing the object. We have no control over these types of processes and without extensive research, understand little. Jacobs wanted the student to understand that the segmented parts used in playing our instruments are also not within our control, and therefore were not worth focusing on. These areas such as the fibers of the embouchure [used in shaping the embouchure], react reflexively to stimuli and by focusing directly on this to make change, are not possible. The change therefore should come from the stimuli, which will cause the tissue to react. If you wish to play louder, you must first issue the concept of loud playing and then blow more volumes of wind to help assist this action. Jacobs notes the difference between a reflex response and an acquired, or conditioned response:

> You have to recognize that this part of the anatomy [the embouchure] responds reflexively to a stimulus. If you poke your finger in your eye, you would have a real difficulty because that eye would close automatically as your finger gets close-- it would be a natural biological reflex. A conditioned reflex is different. When you touch a hot stove, you have an instant withdrawal. The next time you don't even reach the hot part of the stove because you still have a withdrawal reflex 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. We are using all sorts of conditioning factors, which we (have) developed in practice. We have 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 stimulus first.[91]

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[91] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C.," transcribed by the author, see appendix 7.

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Buck calls the second type an *acquired* reaction. He states: "It is the simplest of identities: being educated [equals] acquiring reactions which are not native to us."[92] Therefore, acquired reactions [Jacobs terms them as "conditioned responses"],are the responses to situations that we learn at every stage of our lives. These reactions materialize as our habits or tendencies, and are within our control. This becomes very important to Jacobs' approach simply because in teaching the fundamental concepts of playing based primarily on musical character and not technique, the student's *acquired reactions* will be to choose a musical solution rather than a technical.

> Now, the physical factors demand that you do not play by segmented parts. Breath, tongue, embouchure, the various segmented parts. You play by Song. Now after the fact, you can analyze all the separate parts and segment them but to integrate them into proper function you have to do it based on having a message. It's not to have a question in the brain, but a statement. The statement should not be of the physical procedure but of the sound phenomenon. What we are dealing with is the conditioned response to a specific stimulus. The stimuli should not be the spoken word it should be the sound. If we use the word Song, then we use the word Wind with sound, but it must be sound that will excite the embouchure into pitch (and) coordinate the various physical functions. We go right back into the art-form where we belong.[93]

In the third chapter, Buck focuses on the elements of HABIT. Buck outlines his definition of habit as simply being something that is certain in a way a man will act. This is closely related to the previous definition of an acquired reaction. Again, this is very important when we observe Jacobs' diagnosis skills with students and their various problems. Buck asserts: "you have no right to call any process a habit until it becomes *automatic.*"[94] Once the habit has been learned, it cannot be "un-learned" and it must be replaced by another habit. Buck explains:

> When an action becomes automatic, and has thus earned the title of habit, the muscles have, as it were, fallen into a rut; they have memorized a method and sequence of action, and will always act in that way and no other... A letter long carried in the

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[92] Percy Buck, *Psychology for* Musicians, 11th reprint (London: Oxford University Press, 1977), 12.

[93] Arnold Jacobs, "1973 ITEC Master Class (Part I), Bloomington, Indiana," transcribed by author from www.chisham.com/tips, accessed April 1, 2002.

[94] Percy Buck, *Psychology for Musicians,* 11th reprint (London: Oxford University Press, 1977), 14.

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> pocket acquired such creases that at last it refuses to fold any other way...Any practice done without conscientious carefulness is a psychological sin; and if it is only just filling in ten minutes of spare time those ten minutes may well cost you ten hours of expiation...[95]

The reconditioning of responses away from the instrument was a major part of Jacobs' approach. Using exercises based on a multi-sensory approach, Jacobs was able to break into the student's established habits, initiating change in the student's responses through the strangeness of the event. As an example, Jacobs would have a student buzz a simple melody while performing another task such as lifting a leg off the ground or walking about the room. In having the student perform the two tasks simultaneously, the brain will be preoccupied with ensuring that both actions are performed equally well, leaving little room for the analytical thought. More often, he would have the student work with a piece of equipment in an effort to move an indicator such as a needle or ping-pong ball. The act of moving the needle on a Inspiron© or similar device was to change the motivation of the student; no longer was the focus on musical issues, but rather on having the equipment react. Jacobs would do this until he felt that the student was becoming accustomed to this type of stimuli, and then he would adjust the exercises accordingly. Jacobs recalls a specific success:

> I have a young man who I use as an example; he now 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 I would ask him to play it on the piano, and he couldn't do it. There wasn't any sign of recognition--then I asked him to sing something from his school days. Well, he sang this melody 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 the tape recorder brought out and I had the Conn 12 window strobe tuner. 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, because 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

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[95] Ibid., 16-17.

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> 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.[96]

Throughout chapter five, "Ideas and Associations", Buck deals directly with the idea of creating mental images to produce results. Any novice researcher who has observed Jacobs' teaching should recognize that this was the cardinal point in his approach. At the outset of the chapter, Buck proposes that all action has an immediate cause: There must be a cause of some sort...and that cause must be either something in your mind or something outside it: i.e. something subjective or something objective....[97] It is clear that Jacobs' approach was to examine the student's problem as being an element of causation. That is, after looking to see if the student's equipment was functional, the difficulties that they were encountering were almost always due to a conditioned response that the student had acquired through improper practice or conceptualization. Jacobs' objective was to address the musical message as the primary focus, rather than address the technical concerns that caused the trouble. Jacobs realized that the most persistent trouble with students was that they were not making statements in their music; an element of the acquired reactions. Jacobs recognized that the student's education patterns [habits] might be part of the problem.

> Now, if I had to pick any particular fault to find with many young players, I would say one out of ten has no musical inspiration. Usually they will come to see me because they are in trouble. A person in trouble worries, with worry you tend to become hypersensitive to incoming stimuli. Usually with inspiration you would have a message to deliver and things go somewhat better. I have to turn that young mind around and make a storyteller out of them right away. It is so important that I can't stress it too much. I like to phrase it as "You have a tuba in the hand and you have a tuba in the head". The tuba in the head has no valves and no embouchure. This is the one you concentrate on and you allow the one in the hand to become the mirror. Now I find that many players will use lip service to this type of thought but when the horn is in their hands, they don't do it...they don't have a message. They play by air, by

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[96] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C.," transcribed by the author from videotape, see appendix 7.

[97] Percy Buck, *Psychology for Musicians,* 11th reprint (London: Oxford University Press, 1977), 35.

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> fingers and by resistance. I have to somehow break into that. I use the technique of Song.[98]

Buck notes that working with the stimuli to create change, not the procedures that appear to be the cause, may be the best approach to resolving problems. He asserts that in regards to a playing difficulty, problems in conception should be considered the *ultimate* cause, while issues such as poor finger technique and blockage of airways should be considered the *immediate* cause. The process for replacing a habit is first to examine the desired goal of the student, and then examine their concepts. When all of this information is available, an exercise could be designed to change the stimulus for the student, therefore initiating change. Jacobs asserted on many occasions that you cannot initiate change simply by telling the student that "this is wrong," or "you should do this way to be correct." There must be change at the conceptual level for things to make progress.

> The stimulus should not be the spoken word; it should be sound. If we use the word Song, then we use the word Wind with sound-- it must be sound that will excite the embouchure into pitch (and) coordinate the various physical functions. We go right back into the art form where we belong. I have studied this subject for so many years and I cannot use measurement phenomenon in my own playing. In other words, I do not play by my knowledge of structure and function; I play as a storyteller with a tuba.... Any great brass player, any great musician--we are storytellers only we don't use words, we use sounds, then we bring in our physical structures in a proper manner.[99]

Understanding this information, it appears as though Jacobs designed exercises to take advantage of the strength of the strangeness of the situation, and the combining of senses to have the best results. Typically, the equipment relied on the student's sense of sight as a motivation to complete the task, and this is not unintentional. Jacobs would play for the student and instruct them verbally, but there were as many visual aids in his studio as there were tools that lent themselves to the other senses.

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[98] Arnold Jacobs, "1973 ITEC Master Class (Part I), Bloomington, Indiana," transcribed by author from www.chisham.com/tips, accessed April 1, 2002.

[99] Ibid.

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Buck notes that there are two types of methods that people recall information: Mental images [pictures] and secondly, Auditory images [sounds]. Buck states, "Mental images are the outcome of the experiences of [all] our senses." It has been proven that most people have a strong visual recall and the information learned through this sense is often remembered longer. Peter Russell, author of *The Brain Book* [also in Jacobs' library] notes:

> Visual images are generally much better remembered than words. So much so that visual recognition is practically perfect. In fact there is only one study that shows picture memory to be poor, and in that study the pictures were deliberately constructed to be as misleading as possible.[100]

Auditory images are similar to visual images in their description. "Audiles" are people are able to recall information based on an auditory impulse, rather than a visual. These are very rare:

> "Audiles" -i.e. people to whom auditory images come easily are very rare, compared to "visuals". Practically everyone who looks at a sentence in print sees what it means without the help of sound.[101]

Many have alleged that Jacobs' pedagogy focused upon the scientific equipment used in his teaching, this was certainly not the case at all. Jacobs' approach was to present the student with a change in the stimulus to initiate fundamental change in habits, and these tools only capitalized on the strangeness of the situation. One of the most important tools Jacobs used was the buzzing of the mouthpiece:

I use tools such as mouthpiece playing without the instrument. The purpose is there are thoughts. You connect the thought and tissue in responds; in other words, it becomes a voice. The main purpose is the very strangeness of it. You are involving everything that is involved in playing a trumpet or a trombone, except the right hand and the acoustical law of the instrument. You are definitely involved in recalled concept tissue response isolation through the mouthpiece. Much of it remains and much of it is removed, but the strangeness of it challenges the student. I never let them play exercise on the mouthpiece. I challenge them immediately with music. I start off with silly things like "Pop Goes the Weasel" -- if I cannot think of anything else, I make them play the "Star Spangled Banner." Somewhere they have to have something in their mind and I make them play

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[100] Peter Russell, *The Brain Book* (New York: Plume, 1979), 114.

[101] Ibid., 35.

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and entertain an audience psychologically with that equipment. As they do that, there is an immediate strangeness in the brain. As I challenge them as a musician, I keep the focus always in the musical aspect. Many things begin to change-- the student is not at all aware of the change, but I am aware of the things because I am hoping he will change because his intentions begin to alter. Sometimes the angle of the mouthpiece is changing on the lips, and that will be better for that individual. At this point and we go into rather advanced playing. We might have them play a concerto, some jazz, Dixieland or some very difficult things; but it is still an art form approach. I do not let him do it as buzzing as an experiment. I keep always programming, but with that strangeness. Within a few weeks it becomes fairly efficient. It is the closest thing I know of to a short cut in bringing those things about.[102]

Buck's text seems to have had a certain amount of influence on the way Jacobs approached his teaching. Jacobs expressed that after learning about the mechanics of the body, he realized that approaching the student only through physical means was limiting. In working with the student through the psyche, there were no obvious limitations and therefore the student could overcome many of the playing difficulties that they had encountered. This can be considered the primary principle of Jacobs' approach.

In the following chapter I intend to examine several of the teaching principles that Jacobs appeared to adhere to over his years of teaching; an approach that involved the distilling all of the information that he collected through his years of study and professional service. This approach would be later known as simply "Song and Wind."

[102] Arnold Jacobs, "1978 Master Class: International Trumpet Guild, University of Wisconsin," extracted from www.winsongpress.com, used with permission, see appendix 4.

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CHAPTER THREE

PEDAGOGY

While many other teachers are content to dance around the periphery of the essentials of musicianship, Jacobs goes directly to its source. Once the student has grasped the essentials, the details of correct physical functioning have an uncanny knack of falling into place.[103]

At this point in the document it will be useful to examine some of the more important ideas that Jacobs adhered to in his pedagogy. The observer will become aware that Jacobs worked with each student in an individual manner, although his approach was always based on the principles of Song and Wind. Jacobs was quick to diagnose what was [or could be] wrong with the student and work to re-establish healthy fundamentals with them so that they could improve. Dennis Miller stated this quite precisely by stating, "Arnold Jacobs set us up to grow." His method was to get the student to work towards an end product: What did they wish to sound like? The expression "Song and Wind" became a final distillation of Jacobs' entire approach, signifying the simplicity of his ideas: Have an idea of what you wish to do in your mind (Song) and make this happen through the instrument by the blowing of fuel (Wind).

This chapter will endeavor to illustrate the types of lessons Jacobs taught, the materials that he used, and the format of his master classes. The first section will explore the private lesson of Jacobs, illustrating the atmosphere of the lesson as well as his approach and the materials that he used. There will be a discussion of Jacobs' thoughts on breathing, imagination, and the importance of communication. The remainder of the chapter will address Jacobs' thoughts on training and will include several examples of

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[103] David Langlitz as quoted in *Arnold Jacobs: The Legacy of a Master*, collected by M. Dee Stewart, (Northfield, IL: The Instrumentalist Co., 1987), 51-52.

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exercises he used with students to bring about healthier playing habits. Concluding the chapter will be a short outline of the master class format that Jacobs appeared to follow.

JACOBS' PHILOSOPHY OF TEACHING

I have always believed in taking a problem that exists and finding the back door and not the front door; you sneak up on it. You find something good and you work on it, and then transfer it back rather than confronting it.[104]

There have been numerous explanations regarding Jacobs' approach over the past few years appearing in journals and other sources. Several of these attempt to explain the process in which Jacobs taught and the nature of his philosophy, however, these fail to present us with a detailed representation of his approach. There are some points to consider when examining Jacobs' approach to teaching. First, the student rarely understood what Jacobs was doing with them in the lessons; this appears to be intentional. Rex Martin explains that: "He was teaching most of his students to become better players, not to become teachers. He taught very, very few of his students to become teachers. Many people who studied with him received only the information that he thought they needed at that time...."

The techniques that Jacobs used were typically unfamiliar to the student and were chosen because of their strangeness as they helped to break into the established habits of the student. It was often because of this strangeness that some of Jacobs' students felt he was often experimenting and could not recount any specific plan of study that he followed. Second, and interrelated with the previous point, was the fact that the private lesson was tailored for the individual student for the needs of that time. This approach was taken regardless if the student was in theirs first, or twentieth lesson. This helps to explain why many of Jacobs' students were unable to quantify his teaching in terms of a method.

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[104] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master Class notes, see appendix 4.

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This also lends credibility to why Jacobs may have avoided writing anything down because each individual lesson remained different, even though the fundamental principles remained the same.

Many College and University curriculums over the past few decades have demanded that the private instrumental teacher provide a "Course of Study" for their students; an outlining the etudes, scales and musical selections that each level of student should be able to complete in an appropriate amount of time. This is useful for both the student and teacher alike, but it does not apply to the way in which Jacobs taught even when he was on faculty at Northwestern University. Jacobs taught principles and worked with the student to establish healthy playing fundamentals so that they could grow. During our interview, Richard Armandi emphatically stated, "He had Principles! He taught principles! He said "What do we want? "We want a great sound. We want a great end product—"how do we get it?" Who cares! If it works don't fix it." It would indeed be a difficult task to create a course outline that explained the program of study in a "typical" lesson.

> (MG) There wasn't a real strong curriculum in his lessons such as: this week we are going to do scales, next week we will do articulation, the following week, and so on. He assigned you things based on the perception he had of your problem areas. He assigned you things to improve them, to make them better. Out of that, all the bases were covered over time. We did work on some scales over time, and we did work on articulation and note lengths and tessatura and phrasing all those things, stylistic things. All of those things were covered but not in a nicely packed syllabus where week one you will do this, week two you will do that and etc. It was sort of making the rounds of how you were doing based upon how you were doing at that particular time.

> (CS) He would jump around a lot [through the etude books]... that was intentional. He didn't think that you should progress from the front to the back of the book, almost never. Maybe that is the idea of not being finished. You got the feeling that maybe he didn't have a system, that you were not going to cover everything, because he really dealt with you in that moment. How you were playing that day, what you needed to work on, or how you felt. The thing about him was he really believed in treating you, teaching you like an individual. That is something that I believe in with my own teaching. That is why there isn't one way you work through a book. You work at your own pace--people had different things to address. He didn't talk about

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having problems he just talked about habits. That is why [I believe]he would jump around so much.

A final point worth mentioning is that Jacobs' teaching changed over the years based on his individual research, the changes in accepted playing practices, and influences from his colleagues from the Chicago Symphony Orchestra. Jacobs was always learning and teaching this new information to his students; whether they knew it or not.

THE PRIVATE LESSON

Taking a private lesson with a man such as Arnold Jacobs was a journey to say the very least. Jacobs taught lessons in several locations over the years including his studio on the fourth floor Fine Arts building on Chicago's Michigan Avenue. In addition to his studio lessons he also taught at Orchestra hall; fitting in lessons during breaks in rehearsals, before and after concerts, and whenever time did not permit him to teach in his studio. Tuba students from Northwestern were also required to travel downtown to have their lessons as it was most convenient for Jacobs to have them all come to the same location. Charles Schuchat recalls arriving at his lessons with Jacobs at the Fine Arts studio knowing how busy Jacobs' schedule typically was:

(CS) We would all have lessons every time at his studio-- He would always send you down for a cup of coffee [before the lesson]. One time we bought him a coffee maker for Christmas and we thought it was a nice gesture. When Mike Grose and I cleaned out his studio, it was in the box, never open! I believe that he would send you down for five or ten minutes just because he needed a break.

A first encounter with Jacobs for non-regular students would involve the arranging of a lesson over the telephone. Typically Jacobs would have the student call on a Sunday evening and arrange a lesson time reminding them to check back before the date to make sure that there were no last minute changes due to a changeable Symphony schedule and his health issues. Several students recall taking lessons at Jacobs' 8839 S. Normal Avenue home, being welcomed by either Jacobs himself or one of his family members:

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> (NA) I had called Mr. Jacobs from Calgary to set up a couple of lessons-- It was June 1971. My wife and I drove the 1700 miles to Chicago, sleeping in the car. I called him from a motel on the north side of town to get directions. He was teaching; so I spoke to his wife, who told me to drive down the Dan Ryan and turn off at the big embouchure in the sky. There was this advertisement for Magikist carpet cleaning on the Dan Ryan -- a big set of lips on a billboard. You couldn't miss it! My wife thought Mr. Jacobs would be some stuck-up prima-dona. Nothing could be further from the truth. He welcomed us at the door and immediately put us at ease.
>
> On the occasions that you had to wait for him to finish with another student, you would sit in the front room, drink coffee, play with the cats and shoot the breeze with his wife and mother-in-law. His mother-in-law told us stories about her early years in Hungary and about the Chicago gangsters. Mrs. Jacobs showed us the swordfish on the wall that she had caught deep-sea fishing. My first lesson was incredible. I went downstairs into the basement; you could hardly get down the stairs because there was so much stuff on the stairs, newspapers mainly.

When Jacobs was ready, the student would proceed down the narrow stairway to the basement, navigating the enormous collection of material that Jacobs had acquired over the years to arrive at the location where they would begin to work. For many students the environment of his basement was akin to a scientist's laboratory. There was a great deal of equipment such as decibel meters, stereo equipment, as well as tubas and other musical tools that he used in lessons. John Taylor[105] recalls his memories of Jacobs' basement studio:

> Once down the stairs there was a vast sea of things to the left; a slight kink in the path for the washer and dryer and then through the big door into the studio. I recall a skeleton, a flip chart that added or subtracted layers of the body. He had a good bit of stereo equipment, a couple of tape recorders and an antique high-boy that was located under the telephone. Opposite from the telephone were two chairs, his a swivel chair, the other a student's straight model, both of aluminum--they even matched. There was also a desk over which was a bathroom medicine cabinet filled with mouthpieces.[106]

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[105] John Taylor is a former student of Arnold Jacobs. Mr. Taylor has served as the editor for the T.U.B.A. Journal (now ITEA) for a number of years and also edited the book *Song and Wind* by Brian Frederiksen.

[106] John Taylor as quoted in *Arnold Jacobs: Song and Wind,* by Brian Frederiksen, edited by John Taylor (Gurnee IL: Windsong Press, 1996), 172.

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Richard Armandi conveys a similar recollection:

> My first lesson was at his home on Normal. I had my tuba in one hand, and a briefcase in the other and God bless him but his place was a mess. He had stuff every where, I mean there were TV's, and there were dishes and newspapers. I came in, Mrs. Jacobs let me in and I could hear the lesson before me, [all I could hear was this] huge sound. And then it was my turn. He had a little dog then, and I was trying to make my way without touching anything because everything was piled up, and the dog is nipping at my feet! I go down the stairs to the basement and there are more piles of stuff. And when you finally make it down there, it is like Dr. Frankenstein's lab! There are machines and horns, a big UHER tape recorder, as tall as a fridge. There was stuff everywhere and there was enough room for a couple of chairs. I remember he had this device he referred to as a 'Christmas tree' set up, a tube with multicolored lights that measured dynamics, it was a real experience...

In an interview with Paul Haugen (1977), Jacobs was asked to explain his philosophy of teaching. The answer that Jacobs provided illustrates more his approach rather than his philosophy on teaching, but is important nonetheless as it gives the reader a clear outline of what his goals were in the lesson. I have made divisions in his answer to underscore his approach with a student to illustrate a process he would follow:

Initial observations:

> Basically I try to help the student based on what I perceive to be the problem. Once we find the student has a fine instrument and a good mouthpiece, then the problems are in the player and not in the equipment. At that point we delve into the problems of the player. I have to know where the problems are; I need to know what the student is motivating. I make a survey of what the student is like when he comes into the room, based on the way he approaches his instrument and musical characteristics, and based on physical characteristics as well. I try to be helpful to the student, primarily in his art form so that the music is dominant over the things that may go wrong. The positive aspects of what must be right musically are what we enhance.

Basics in approach: Breathing, Tone and Phrases

> You can't teach one way in terms of physical application; you teach principles. There should be quantitative inhalations based on at least three quarters inhalation for general playing purposes. Tuba players use air in large quantities very freely under low pressure, but in fairly large quantities. We have to be free to use this comfortably to where it doesn't give us much of a problem. Then we can concentrate on our tonal aspect and of our message to the audience.--Primarily, we try to avoid getting too far toward the end of our breath; that frequently means to start with more so you can protect the end of the phrases. I usually express myself by saying that you should be free to waste your breath, not try to conserve it, but establish excellent tonal

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characteristics as you do that you are conserving breath anyway. In other words, as you control the tone, you will have controlled not only the musculatures, but you will have controlled the air as well.

Imitation and Imagination in the Art Form

Even from the youngest student trying to play the instrument, I frequently ask that they start out with an excellent sound. I play for them; I take their instrument. Listen to this carefully [I will say]. This is what a good note sounds like on your equipment. This is what a bad note sounds like. Then I have them think about it for a moment and establish recall in silence; then I ask them to try to sound the way I did. Imitation is like putting a player piano roller on so that the keyboard knows what to do. So what I am indicating is the development of the brain of the musician; not worrying about the lips, the diaphragm, the various segmented tissues, but his art forms.

Interpretation, Storytelling, Communication, Becoming an artist

You actually have to have the motor activity of communicating to someone else while playing. There's always feedback; it should be [ten to twenty percent] of the total. So, eighty to ninety percent is the elementary artist who is going to deliver the message to somebody--interpret for somebody--interpret for somebody else like an actor. He has to communicate. [The student] has to always work with motor systems, which in nature has to do with influencing the external environment not the internal environment. That means his tools are very much like those of an actor or a singer--he has to become an artist.

Training

The student has a series of challenging elements that he responds to. You might compare this to a prizefighter. I like to put it to the students in this manner: Forty percent of their practice time should be in the conditioning studies, the bag punching and rope jumping, and sixty percent of their time in the interpretive aspects of music.

Avoiding Analysis

If you segment into the parts that bring it [music] into being, the building of the machine, you will be bypassing the excellence of your own brain where there is a computer like activity that will establish the controls.[107]

Jacobs outlines several important issues that he looks for in all of his lessons. First is the assessment of the student in terms of how the student approaches the act of playing his instrument, his motivation; this was one of Jacobs' strongest gifts as a

[107] Paul Haugen, "T.U.B.A. Profile. Arnold M. Jacobs; Tubist of the Chicago Symphony Orchestra," *T.U.B.A. Journal,* 4 no.2 (Winter 1977), 6-9.

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teacher. Many students believe that Jacobs often knew in the first few minutes what exactly was wrong with them, and for the remainder of the lesson time he worked with them to formulate an individual plan of study. This first step also gave Jacobs an idea of the true strengths of the student, and he encouraged the student to concentrate on these positive aspects instead of focusing only on the negative elements in their playing.

> (RA) I did respond to his musicianship and him. I remember him saying "Armandi--now is that Czech or Italian or what?" I said that I was Italian. He said "Oh well, my goodness. The Italians have a fantastic history of fantastic music making, great artistry. When you play, sing!" That, I really identified with. And so he basically spent most of the time dealing with musicianship and just turning a phrase.

Michio Funakoshi recalled that Jacobs was very sensitive to the individual background and abilities. Since Jacobs had students coming from Europe and Asia, Jacobs would encourage these students to be their own individual player, and work with what they already had acquired instead of trying to have to the student play like him. Jacobs realized that the student's brain was already programmed to sound one way, and if he let the student explore this and develop the healthy habits of playing, progress would be made rather quickly:

> (MF) Mr. Jacobs had many European students coming to him, and these countries have a very strong identity. Each country: Italians, Hungarians, and the Dutch--their performance styles are all very different. He never said to them plays like this-- or they must play like this--he never said that. I was always amazed he always picked up on their individual personality. He would ask them to sing something which was in their personality or style, and that would sound very strange to us; but he never said "No". That is what they want, that sound; he always let them go. He would then ask them to sing something in a different way or exaggerate something more, and then they recognized that this is what they really wanted to do. Then he would often move to working with air or something else. In this way they still have kept their identity, and they know what they want.

The second aspect of Jacobs' teaching concerns how he addressed the fundamental issues of playing a brass instrument. At the time when Jacobs began to learn about the physiological and psychological aspects of the human being, very few people understood how any of this information could be related to playing a wind instrument. He was able to incorporate these scientific ideas with his strong musical intellect to create

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an approach that was quite adaptable to any situation, or any instrument. Jacobs had recognized that many students, both professional and amateurs, were coming to him with very similar problems. These problems stemmed from an improper and unhealthy approach to playing. The foremost issue Jacobs dealt with throughout his entire career was respiration for wind instrumentalists.

THE BREATHING DOCTOR

The most common problems I have seen over the last sixty-odd years I have been teaching are with respiration and the tongue. When you are starving the embouchure for air volume, giving it all sorts of air pressure but not quantity, it cannot work. Very quickly you will be struggling to produce your tone. Just increase your volume of air--not by blowing hard, but by blowing a much thicker quality of air. Very frequently the air column is just too thin.[108]

At the time that Jacobs began to learn about physiology and psychology, there were many ideas concerning the proper way to breathe when playing a brass instrument. Irvine's research (2001) cites numerous examples of the types of pedagogy that was prevalent when Jacobs began teaching:

> Other approaches to breath intake at the time were less concerned with quantity, and more concerned with *how* one should breathe in...with the main thrust of the concept holding that when air is drawn into the lungs, it should be drawn to the bottom of the lungs first, so that the lower abdomen expands in all directions. Meanwhile, there should be little to no "chest breathing" allowed...In an article in *The Metronome* from 1935, Bill Costello claims that if one fills one's chest with air when one breathes in, that one will only be able to "grunt" the notes out. Further he states that filling the chest while breathing "contracts the lungs, reduces their capacity and congests your air passage so that it becomes impossible to provide your lips with the even, continuous flow of air that is so necessary to keep them vibrating."[109]

Traditionally brass pedagogy has been learned through private instruction: students learn their teacher's methods and then in turn, teach their students the same

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[108] Arnold Jacobs as quoted in *Arnold Jacobs: Song and Wind,* by Brian Frederiksen, edited by John Taylor (Gurnee IL: Windsong Press, 1996), 122.

[109] Gregory B. Irvine, "Arnold Jacobs: Pedagogical Approach: Context and Applications" (DM Dissertation, Northwestern University, 2001), 35-36.

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information. This process created the different "schools of pedagogy" without having a great deal of external validation; scientific or otherwise. With so much information regarding respiration available, it is not surprising that brass players were puzzled about what was the correct "method" to follow. In studying respiration as a scientist and a musician, Jacobs became an authority on breathing issues encountered by wind instrumentalists. Many brass players then consulted Jacobs on the recommendation of colleagues because their careers were in jeopardy of ending, and because few had the knowledge that Jacobs did regarding physiology and psychology. He quickly gained a reputation as being the person to see. Jacobs dealt with the issues regarding respiration his entire career and would dedicate a portion of each of his master classes to discussing the subject seemingly in an effort to give the students the proper information. It seems that Jacobs was somewhat reluctant to focus on respiration and physiology in his lessons, but as there were so many questions regarding these topics, he did address them to present accurate information:

> (DM) He said to me once "Dennis, I am a qualified music teacher you know, but hardly any one comes to me for music lessons." I think that is incredibly important, that said so much. I heard a man who wanted to talk and wanted to be there to interpret music; what we do much more today as teachers especially at the graduate level. He didn't have that opportunity because most of his students were coming in with serious problems; they were crippled. They needed his attention because nobody else had a track record in addressing those [issues] except for him.

Jacobs worked on breathing with virtually every student at some point whether they were aware of his intentions or not. He would address the issue of respiration directly with some students, and with others, he had the ability to work on many different areas without the student ever knowing. He would present them with a simple musical challenge and it would compel the student to play more efficiently. Jacobs believed that the act of respiration was made too much of. He considered that it was a simple process, and it should not be studied out of context:

> 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

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> 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 Lamaze method or childbirth, you cannot be thinking about playing a clarinet or a trumpet. --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.[110]

To illustrate Jacobs' ideas on breathing, it will be worthwhile to outline some of the ideas that he spoke of in his master class lectures and with some of his private students. The point to remember when discussing this topic is that Jacobs wanted the student to keep the act of breathing simple; not to be concerned with the complexity of the respiration system.

Jacobs recognized that the air is only one component of creating music [he often referred to it as the fuel, or wind]. Air in itself does not make the music, and by concentrating on the processes of respiration, the musical message can be compromised. The player must have an initial concept of what he wishes to sound like and then take in enough air to make the musical idea work:

> We have to know what our message is going to be. We have to have fuel; we have to use it, but we don't play by air. I am here to give a clinic that will probably be dominant on respiratory activity, but I have to indicate even before we get started on that that we never play a brass instrument by air, we play by Song. We use air, but we don't play by air--we play by Song. In other words, we go by the complete product, the message; not by air. By blowing breath, our embouchure does not have to respond; you can do that all day and not have a sound. There has to be another element added for the embouchure to function [the Song]. When we do this, the breath becomes fuel, it is a very important phenomenon, but it is not the end product. It is not the art form that we are working with; it is only a segmented part of it.[111]

Jacobs also asserted that breathing [and phrasing] is highly individual for the player. An individual's breathing potential can be considered their "bow" length and this length is a factor of their somatotype. A person's somatotype is quantified by a

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[110] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C," transcription by author, see appendix 7.

[111] Ibid.

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combination of the body type (long torso, wide chest, etc.), the condition of health, and the age of the subject (vital capacity decreases with age). Jacobs had initially been making his judgments on student's vital capacity based solely on their height and weight and had found some discrepancies with that approach. This led him to make a study of body typing. It seems quite probable that Jacobs may have studied the data of William Sheldon [American Psychologist, 1898-1977] who had done extensive research on this topic in the early part of the 20th Century. To support this opinion Jacobs owned a well-worn copy of Sheldon's *Atlas of Men*.[112]

> For his study of the human physique, Dr. Sheldon started with 4,000 photographs of college-age men, which showed front, back and side views. By carefully examining these photos he discovered that there were three fundamental elements which, when combined together, made up all these physiques or somatotypes. With great effort and ingenuity he worked out ways to measure these three components and to express them numerically so that every human body could be described in terms of three numbers, and that two independent observers could arrive at very similar results in determining a person's body type. These basic elements he named *endomorphy*, *mesomorphy* and *ectomorphy*, for they seemed to derive from the three layers of the human embryo; the endoderm, the mesoderm and the ectoderm.[113]

Sheldon's ideas regarding somatotypes further included the study of how the somatotypes affected the individual temperament, and what the interrelation of the different types of somatotypes were in society. Jacobs did not appear to pursue this avenue of study past the basic information, but this seemed to lead him to an understanding of a student's vital capacity based on their somatotype. Jacobs recalls his discovering the science of body typing:

Now body typing is a very interesting study. In the Chicago Symphony Orchestra we have a trumpet player named William Scarlett and he is about five foot seven inches tall. He was studying with me some years ago and doing quite well, and I used to notice 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-- Herseth has a very normal

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[112] William H. Sheldon, *Atlas of Men* (New York: Gramercy Publishing Company, 1954), see appendix 1.

[113] Summary extracted from "Tracking the Elusive Human; I, Chapter 4: William Sheldon's Body and Temperament Types", www.innerexplorations.com/catpsy/t1c4.htm, accessed October 2002.

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structure and he is a great artist. Anyway, 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, and found out that he had about 6500 ml of air. That is ridiculous for a man of 5 foot 7. That is usual for someone who is 6 foot 3 inches tall--that is the lung capacity for a very large person. I called the medical 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 that was the study of body typing. It just so happens that we can take three people of the exact same height with different body types and 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 all sorts of factors that if you don't know about them, and it can be very confusing. That is why it is kind of important that you must not tell a person "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 my maximal lung capacity was around 4 ¾ liters, and I think that the maximal lung capacity came at the age of 20 or 21. In extrapolating the tables backward, I figured that's what I had when I was 20 or 21--about 4 ¾ 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.[114]

Jacobs came to understand that every person has a different breathing potential [bow length], and that their musical phrases should reflect these differences. If one player is in need of a breath at a point in the phrase, he should take it and not worry about what others are able to do. Teachers who insist that their students perform phrases the same length as them are in fact creating the problems for the student because their somatotype is rarely the same. Jacobs' approach was to guide the student to preserve the end of the

[114] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C," transcription by author, see appendix 7.

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phrase, having the student breathe when necessary to preserve the musical ideas and then work to become more efficient at hiding the breaths within the music:

> 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.... If we were going to think in terms 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 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 six 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, so you have to learn to sneak breaths. There are ways of doing that also in order to have sub-phrases and still complete the music.[115]

> You cannot play a high flow-rate instrument with shallow breaths. I like to teach that you always play for the end of the phrase, not the beginning. You must be comfortable at the end so you can replace your breath for the next breath unless you have plenty of time. In a high flow instrument like tuba or trombone, especially bass trombone, where the flow rates can be easily 60-80 liters per minute and even higher, then it is very important that you have plenty of air in the lungs or you can't get it out.[116]

There have been many ideas on how to breathe proposed over the years (see research in Irvine, Kohut, et al.), and Jacobs appeared to be aware of these ideas. He did not seem interested in challenging the ideas of his predecessors; rather teach the concept of breathing as a simple process. To paraphrase Jacobs: We must learn to suck air in at the mouth and not concern ourselves with the complexities of what occurs after this point. This was the psychology of wind. If we are breathing naturally, the musculatures of the body will function as they were designed and allow the air to move to the intended

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[115] Ibid.

[116] Arnold Jacobs, "1973 Master Class: ITEC Bloomington, Indiana" (Part II), transcription by author, extracted from www.chisham.com/tips, accessed April 01/2002, see appendix 3.

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areas. In concerning ourselves with this highly complex system, we are distracted from the main purpose, to simply communicate the musical idea:

> Now, what is actually involved in this is a very simple maneuver. You have to learn to suck. By that, the biological of suction without friction [Jacobs inhales] -- you can actually hear that I am sure. Now as soon as you do that; I use sensors at home-- I use measuring devices you'll see, or if you palpate with the hand-- as soon as you pull the air in here, if psychologically you pull air into the mouth, another region of the brain fires up the regions where it must go. If you go by the mechanical principals and try to enlarge them by the thinking part of the brain, you are bypassing the wonderful computer aspects of the brain and getting in your own way. If you simply suck the air into the mouth [inhales], it goes so fast, and in so doing you will find that the diaphragmatic descent, the rib-cage ascent. It is the simplest thing in the world to do but as I say the key is to work with the air and pull it into the mouth but avoid the apparatus aspect that pulls it in.[117]

> (NA) There has been more nonsense written about breathing than any other aspect of playing. It still goes on. People who should know better write articles about it, using as many complicated terms as possible. Mr. Jacobs always used to say: "Keep it simple. Suck it in and blow it out. Focus the air at the lip. Don't be afraid to waste the air; it's free. When you suck the air in you should get bigger; when you blow it out you must get smaller. Think about a target for the wind." Of course, his favorite phrase was "wind and song." The song in the brain determines what you do with the wind.

Jacobs taught a wide variety of instrumentalists his ideas on respiration including oboes, trumpets, and singers on occasion. Being able to relate ideas on playing to other instrumental players would have been somewhat challenging for most teachers, but it seemed as though Jacobs was able to convey his concepts by keeping them simple and amendable. One of these issues concerned playing an instrument that had a naturally higher amount of natural pressure; i.e. the trumpet. Jacobs had many thoughts on playing the trumpet and the problems associated with playing in the upper range of the instrument:

> The small embouchure surface needed for high pitch and the big push needed for the amplitude makes a delicate situation. Danger lies in pushing against resistance. Instead of hard blowing, move toward a bigger sound based on the buzz of the

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[117] Ibid.

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> embouchure. Zero in on the buzz of the lips in a lower octave then keep the same feeling for buzz, play in the upper octave.[118]

Some teachers of these disciplines believe that Jacobs' approach to playing was not applicable to their instrument. This line of reasoning is somewhat irrational because it seems clear that Jacobs' method of teaching was such that he was not interested in making all players breathe like a tuba player. He worked with all of his students to understand the psychology of the wind; to move the air from the body to influence the external environment. Nicholas Atkinson concurs:

> Some trumpet players would say "we don't use that much air on the trumpet." They all miss the point. What Mr. Jacobs often tried to do was to get you to exaggerate some aspect of your playing in order for it to become normal, or make you think of it in a radically different way in order to solve a problem.

Jacobs was indicating to the players of these instruments that they needed to avoid the physical creation of pressure when playing. Jacobs noted that according to the *Bernoulli* principal[119]as air pressure increases the volume output [of air] will decrease, thereby making it more difficult to play. In bearing down [using muscular force to assist the air to move out], the body undergoes a natural process where the throat becomes closed off in order to increase the intra-abdominal pressures needed for childbirth, defecation, and defense mechanisms. These types of closures are not conducive for healthy brass playing.

> Do not think for a moment that because you have air under pressure that it has to move, it does not. Air pressure is used in childbirth, in the study of pelvic pressure, and bowel movements, etc. It is a reinforcement phenomenon for activities within the body, and the brain is fully adjusted to it. It is a reinforcement phenomenon, like a hiccup. There is air pressure and many of the inspiratory and expiratory muscles are in isometric conflict. The potential for movement is not there unless some muscles let go-- you do not use dimension, it is that simple.[120]

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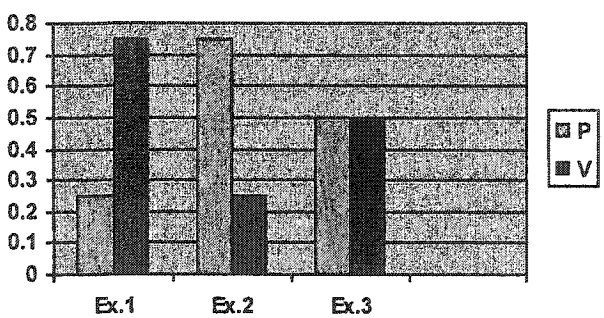
[118] Arnold Jacobs as quoted in "*Arnold Jacobs: The Legacy of a Master* (Northfield, IL: The Instrumentalist Co., 1987), 168.

[119] The *Bernoulli Principal* states that for horizontal fluid flow, an increase in the velocity of flow will result in a decrease in the static pressure.

[120] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master Class notes, see appendix 4.

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Jacobs would draw a very simple diagram to represent the idea of volume of air versus air pressure and often regaled the student with a detailed explanation of it. According to the Bernoulli principal, if you increase the pressures inside the body with muscular force, the amount of air that will *actually* have the ability to move out of the body will be decreased. Jacobs wrote the following graph in many of his students' etude books, on the blackboard during his master class lectures, and it was also etched on his music stand in the studio in the Fine Arts building. The following graph represents the relationship of air pressure (P) and air volume expelled (V). Jacobs indicates:



> As your body gets larger, air pressure is going to lower internally so that air is going to move from the 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. [Boyle's Law definition] 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 and 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 pelvic pressure at the same time, you would find that the throat would snap shut on you. You wouldn't 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, at your reeds, or anything else--It is very difficult to play under these conditions. We have to learn how to use the air so 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.[121]

[121] Ibid.

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The above graph is a far more technical version of the one Jacobs would draw but it illustrates the concept. Jacobs worked with the student to have them move large quantities of air without resorting to using excessive pressures. Example 1 illustrates what goal the student was to aim for; low pressure with a large output in volume. Example 2 illustrates the inverse; the result of pressurizing the air by muscular force. Example 3 illustrates what Jacobs was working towards more often, a balanced state of pressure and volume. Jacobs stated the important aspect of understanding all of this information:

> The psychological focus of blowing is wind as moving air. The idea is air as wind, not air as pressure. To move more wind requires more pressure and problems arise when pressure increases without an increase of wind. A common problem is the inhalation muscle group working against the exhalation group. The psychology of wind is to achieve an end outside the body. Blow out matches, watch a strip of paper move in the stream of the wind, and externalize the air movement. To blow a large quantity, use fast air.[122]

Jacobs also demonstrated the movement of wind in another simple way; he would have the student blow against the back of their hand in a variety of ways. The first was to have the student blow very hard through clenched teeth, having the air come out with a loud "hissing" sound. He would then have the student take another breath and blow gently onto the back of their hand without their teeth being clenched. He would inquire as to which way of blowing produced the greatest amount of wind on the back of the hand. Invariably the student would respond that the gentle blowing produced the best result and Jacobs would have again made his point in an uncomplicated manner.

> If you want to know about air, you work with air where it can be felt as it enters the mouth. When you blow, it is very wise to do a little blowing away horn in your music practice. Blow against the hand, matches, blow into a balloon, or through the horn. The big hang-up in respiration is isometrics-- that is breathing in when blowing out and blowing out while breathing in. These are cancellations. As soon as you begin the positive maneuvering of inhalation-- taking in of air--blowing out of air, the brain always will cooperate. It is a wonderful thing because if you only learn to order your

[122] Arnold Jacobs, "Arnold Jacobs Master Class Notes 1988," by Charles Lipp, see appendix 5.

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> body correctly, you can do anything you want. But you have to learn the key [to all of this], which is communication.[123]

This approach was to have the student understand the motivations for moving wind. What is required is a target for the wind and an idea of what the air was going to be used for, then all of the body parts can respond in a correct manner. Jacobs had numerous ways to motivate the student to blow wind, some which involved the use of medical equipment that Jacobs had become so famous for.

The use of these medical devices in the studio: the Inspiron, Spirometer, Breath Builder, and Peak Flow Meter, are less important than the concepts that Jacobs was trying to present. These tools were often used to try and better present the idea of the phenomenon of wind as it entered and exited the body, and had very little to do with anything musical: "The psychological focus of blowing is wind as moving air. Visual cues from the spirometer turn the attention away from the inner body workings and helps separate muscle function.[124] Descriptions and photographs of many of these devices appear in Frederiksen (1996) and also can be viewed at the Windsongpress website [www.windsongpress.com]. As the description and function of this equipment do not serve the general purposes of this paper, they will be omitted. It should be noted that the interview subjects were asked specifically about the use of these tools because Jacobs would at some point, turn to a piece of equipment to help illustrate a concept. The answers from the subjects appear in chapter five. As important a subject as respiration is, Jacobs wanted to keep it as a simple maneuver of sucking and blowing, with the main focus being the communication of the musical idea to the audience. Jacobs summarized his thoughts on breathing with this statement:

> Your lip does not have to respond merely because you blow. You can blow air from now to doomsday and not have an embouchure respond. You can have an embouchure that looks perfect and responds to all sorts of external measurements and

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[123] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master Class notes, see appendix 4.

[124] Arnold Jacobs, "Arnold Jacobs Master Class Notes 1988," by Charles Lipp, see appendix 5.

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be completely unproductive, usually because it's not receiving a signal from the brain.[125]

COMMUNICATION: IMAGINATION AND IMITATION

You actually have to have the motor activity of communicating to someone else while playing. There's always feedback; it should be ten to twenty percent of the total. So, eighty to ninety percent is the elementary artist who is going to deliver the message to somebody. Interpret for somebody; interpret for somebody else like an actor. He has to communicate.[126]

Communication for Jacobs was one of the most important aspects in playing a musical instrument. He asserted that the performer must always be sending messages, musical ideas from the brain, and only at this point the body would respond correctly. As stated earlier, Jacobs discovered that the students with playing problems were not concentrating on a musical message. This may be because students who encounter a playing setback, in attempting to fix their own problem, often become over-analytical about their playing and can create a paralysis in the mind in their approach the instrument. The symptoms of paralysis can be anything from poor articulation, respiration troubles, to a total inability to play the instrument. Jacobs recognized that there could be many causes for these conditions and he would make assessments of the student as they played for him. The primary direction that he seemed to pursue was to have the student work to improve their ability to communicate their musical ideas. This point seems simple but in many cases, it could be the crux of the student's problem. Previously quoted in chapter two, Jacobs recognized the importance of getting the student

[125] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master class notes, see appendix 4.

[126] Paul Haugen, "T.U.B.A. Profile. Arnold M. Jacobs, Tubist of the Chicago Symphony Orchestra" *T.U.B.A. Journal*, 4, no.2 (Winter 1977), 8.

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out of their negative patterns, and have them focus on becoming a storyteller of sound: I have to turn that young mind around and make a storyteller out of them right away.[127]

In an effort to understand the importance of communicating ideas to the audience, Jacobs related the playing of an instrument to being an actor on a stage. The actor is required to play a role that is often unlike their own personality, but without this "role playing"; he or she would have little success their art form.

> All art forms have certain basic characteristics, otherwise they would not be an art form--it is the ability to express yourself through the media of your choice. It could be a paintbrush and a canvass, an actor or an actress on the stage. It is obvious how they express themselves; they interpret other parts, other person's lives, but they do it and they become very believable. In a sad scene you might go away crying or in a happy one you'll smile or laugh if it is funny... but all art forms are forms of communication.[128]

It seems as though Jacobs understood that successful communication must have two elements: the performer must have a strong belief in the message, and they must have a vivid imagination to be creative with that message

> Imagination has the ability to change the situations of reality for yourself; those of us in music do this all of the time. These [instruments] are the 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. You have to learn the emotions, the message, and in our art form we must let our minds fill with sound. We must recognize that we play with a condition response to stimuli and our thoughts must go on to the stimuli as we overcome the challenges of music we are learning and the physical phenomena of the playing. If you try to learn to play the trumpet to learn to play music forget it. You learn to play music and as you learn the music, you are then learning the trumpet. I'll be happy to debate this with anyone.[129]

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[127] Arnold Jacobs, "1973 ITEC Master Class (Part I), Bloomington, Indiana," transcribed by author from http://www.chisham.com/tips, accessed April 1, 2002, see appendix 3.

[128] Arnold Jacobs, "1973 Master Class: ITEC Bloomington, Indiana (Part II)," transcription by author, extracted from http://www.chisham.com/tips, accessed April 01/2002, see appendix 3.

[129] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C," transcription by author, see appendix 7.

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We have examined two of the texts that were seemingly influential on Jacobs' ideas, and the following lends us further insight into why it was he changed his focus from a physiological to a more psychological approach:

> "I went through the stages of studying the machine, the human machine. When I realized how little that meant, I had to start seeking out function. How are we controlled? In other words, what permits this to be a function? You have to go into the brain. You have to go into lifestyles and life patterns; body types, all sorts of things you'd never expect."[130]

Michael Sanders, principal tuba of the Saint Louis Symphony reiterates that communication was central to Jacobs' approach:

> This is really the greatest message that we receive from Arnold Jacobs. He helps us with our problems, but he continually encourages us to perform. He wants us to tell a story with the music we play. We don't have to be playing the first movement of the Hindemith (Sonata) on a beautiful new tuba. We can be playing "Row, Row, Row, Your Boat" on a mouthpiece, and it is all the same to him.[131]

Having now described two of the main features of Jacobs' pedagogy, Respiration and Communication, it is worthwhile to turn our attention to other aspects that made up his approach. First was Jacobs' proficient way of getting past the student's established habits and presenting them with the tools that would lay the foundation for healthier playing practices. Following this are the elements of training that Jacobs would suggest to help condition the student with valuable routines.

BREAKING INTO HABITS

Even though I was very young, I remember a story being at the Curtis Institute and people would be having troubles with their lips-- 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. 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

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[130] M. Dee Stewart, "An Arnold Jacobs Biography" *T.U.B.A. Journal* (May 1988), 16.

[131] Michael Sanders as quoted in *Arnold Jacobs: The Legacy of a Master*, collected by M. Dee Stewart, (Northfield, IL: The Instrumentalist Co., 1987), 71-72.

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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 just counteracts it and sends the same signal that it has always sent. You get frustrated with 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[maintain]-- 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....[132]

This story about Jacobs' "fortunate set of circumstances" confirms that even at an early age, Jacobs was formulating ideas and concepts regarding pedagogy. As a fifteen year old student, he was able to recognize that if a student was having a specific problem, that the best way to assist him or her may be, not to confront the situation head-on, but rather "come around the back door" of the problem.

Some of Jacobs' students were coming to him with considerable problems and well-established habits, his approach was to bypass their habits by initially moving them as far away from the conditioned responses as possible. Jacobs would begin by attempting to alter their manner of thinking by introducing something completely new to them, thus breaking into their established learning patterns. After playing a few measures of an etude or piece, Jacobs would stop them, introduce a piece of equipment into the lesson, or provide the student with a discourse on respiration in order to show how incredibly complex the topic was. He would then tell the student that they could never recall all of this information when they were playing, so it was best just to forget about to it all together. Several of Jacobs' students affirm this:

> (RM)As you have probably found out from others that have studied with him, when they recall the very first lesson, certainly the way I recall my first lesson; it was an experience of near sensory overload. I think that was a lot of his intention, to keep the student somewhat overloaded so that at that point, he could introduce a very simple idea that someone could hold onto and think, "YES, I can do that, that is

[132] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C," transcription by author, see appendix 7.

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> something I can understand !" as opposed to all the medical terminology that most tuba players had never heard before.
>
> (Eugene Dowling)[133]
>
> In my first lesson I must have played all of 12 notes while we worked on breathing. As anyone who has experienced the environment of his studio knows, the first lesson is one of sensory over stimulation. It is simply impossible to comprehend the depth of his knowledge that first time. You mind simply becomes an open vessel to receive the larger points he is making...I believe that this is Jacobs' intent because these phrases [Song and Wind] serve as a summing up of his approach and distill the essence of his message.[134]
>
> (GI) What I can tell you is that I remember getting so much information in the first lesson that my head was spinning and I couldn't possibly take it all in...I do remember him doing a lot of explanation of how things work with the body and the brain and kind of being overwhelmed by that. I remember telling Dick [Erb] about that after the fact and he said he thought that Jacobs did this on purpose so that you couldn't think, so that you had so much information that there was no way to sort it out and the only thing you could do is just to play.

Jacobs had the student realize that the functions of the "machine" [that is the human body] are so tremendously complex that it is impossible to control them as they naturally occur. Jacobs illustrated this with an analogy that we now know as being previously attributed to Buck:

> When we play our instruments, we cannot be aware of our individual musculatures. "We can't be aware of individual regions of function and still make great music. It is like having a wonderful Rolls Royce automobile. You get in and drive it, you pay your 100,000 [dollars], but you really don't need to know what's under the hood."[135]

The methods in which Jacobs broke into established habits was simple yet entirely creative. He would address a difficulty by redirecting the student's focus on something other than the problem. This demanded that the student use his or her imagination and not analyze the exercises presented to them:

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[133] Eugene Dowling has served as principal tuba of the Victoria Symphony Orchestra, professor of tuba and euphonium at the University of Victoria and was a student of both Leonard Falcone and Arnold Jacobs.

[134] Eugene Dowling as quoted in "Arnold Jacobs: The Legacy of a Master," collected by M. Dee Stewart (Northfield, IL: The Instrumentalist Co., 1987), 11.

[135] Arnold Jacobs, "Master class, Northwestern University School of Music 1988," Reel 1.

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> I have always believed in taking a problem that exists and finding the "back door" and not the front door; you sneak up on it. You find something good and you work on it and then transfer back rather than confronting it. It is just like learning to come in on a high C or any high note as an attack. I listen to players who want to just attack and attack--they are trying to improve their attacks on the high notes. One part of the brain doesn't judge right from wrong, but judges repetition as learning how to give a very bad attack. While one part of the brain says, "I need this, I need that," another part just says, "well you are doing this all the time, it must be what you want."[136]

The focus of the student must be on what they wished to sound like. If the student could allow themselves to involve their imaginations take control of their playing, the body would be a mirror of the ideas in the mind. Jacobs likened this to a player piano:

> I sing in my head what has to go out of the horn. It's like the relationship between the player-piano roll and the keyboard. I'm always on the player-piano roll and never at the keyboard. I don't care how the lip feels; I don't care how I feel. The psychomotor aspect of playing is a message from one part of the brain that is fed to the lip through the seventh cranial nerve. My whole concentration is not on what I feel like or what I sound like, but what I want the audience to hear. It's like telling a story, but instead of words you tell it with concepts of sound...[137]

If the student were unable to have a concept of what they wished to sound like, Jacobs would encourage them simply to imitate another player. This would not necessarily be a player of the same instrument, but he would encourage the student to use his or her imagination and imitate someone. Jacobs would use the example of Pavarotti, Heifitz, or one of his colleagues in the Chicago Symphony such as Bud Herseth. He would question the student: "What would Herseth sound like on this? Think about it for a moment, Play it like Bud would!" This suggestion would encourage the student to recall Herseth's sound and try to play like him. In most cases the student would be performing at a higher level; not necessarily sounding like Herseth, but playing with more confidence and communicating their idea of the famous trumpeter to the audience. Michio Funakoshi recalls his impressions of this approach:

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[136] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master class notes, see appendix 4.

[137] Arnold Jacobs, "An Interview with Arnold Jacobs. Part I," *Brass Bulletin,* 33 (1981), 45.

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> We have to recognize what we want to do. He had told me many times to imitate somebody because it is a very good way for getting a sound concept. If we have no idea of a concept, then just imitate someone. Imitate cellos, piano, and singers-- imitate better musicians. Try to imitate ten or fifteen different people, and then you know what you like and what you don't like. Just train yourself to imitate someone and then your imagination becomes expanded and then we can choose a voice to use at any time.

As stated in the outset of this document, Jacobs did not write down his thoughts on these subjects, but we do have other sources that reveal his ideas on teaching the student through imagination. The following three quotations from Jacobs outline his thoughts quite clearly and require no further explanation from the author:

> What I'm doing is working with the human being who plays a musical instrument. He has a piece of brass in his hand and since that brass has no brains; we cannot limit ourselves to the potential of it. We cannot say, "well, I'm learning to play the trumpet, or I'm learning to play a horn or tuba." You're learning to play music with these instruments so the dominance is the sound that comes out of the bell. It's like circuitry in electronics. You must conceive the sound you want either by imitating the teacher, a colleague, or a record, but you conceive-- then you listen to find out if you sound like what you want to sound like. The important aspect of this is not what you sound like; it is what you want to sound like. Eighty five percent of the intellectual approach to music is conceptual thought. Fifteen percent is the readout that comes out of the bell of the horn, which is sensory. The horn has no brains, it can't really give you anything; you have to give it to the horn.[138]

> The intelligence of the human being should be in the study of the art form. We should be there studying the music as a phenomenon of sound, of emotion, of sonority, of rhythm, of its meaning to the person who it is sent to. We have to learn to order excellence in the product, not excellence in the muscles. Excellence in what we are doing trying to accomplish with the muscles. Once you get that attitude, things begin to move very fast.[139]

> This is an art form; it should be considered an art form....Where there is an instrumental learning, I want a tremendous dominance in learning the music for these instruments [and not the technique]...and as you develop the music; you are also

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[138] Arnold Jacobs, "Lecture at the Second International Brass Congress, Indiana University, June 6, 1984," in M. Dee Stewart, *Arnold Jacobs: The Legacy of a Master* (Northfield, IL: The Instrumentalist Co., 1987), 141.

[139] Arnold Jacobs, "Master Class 1988, Northwestern University School of Music", Reel 1.

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learning the instrument. I don't want the instrumental dominance over the music; I want the musical dominance over the instrument.[140]

TRAINING

Playing a scale is like a fighter punching a bag and jumping rope, but it should be more than that. It should be a cadenza from Mozart or Brahms, something that can be put in the art form of music.[141]

Training for a musician involves the practicing of scales, arpeggios, and etudes that can become tedious if the student chooses to approach them as drills. Jacobs believed that training is something that all musicians must do but the musician must keep a balance between the conditioning and the interpretation aspects of music. Conditioning studies involve work that concentrates on tone, finger work, range, articulation, and etc. Jacobs proposed that students should work on these conditioning skills no more than forty percent of the practice session, having the other sixty percent dedicated to the act of interpreting music; playing melodies and learning to communicate ideas to an audience.

The conditioning session might include: buzzing the mouthpiece to secure the song in the brain, respiration practice, tone studies, vowel shaping, and finger drills. Jacobs would approach each of these areas from a musical perspective; he would present the student with a musical challenge that would help to develop the technical aspect rather than having them practice the technique blindly and then try to apply it to some musical situation. Each etude that Jacobs assigned seemed to be adaptable for most of the elements of technique. Some of the etudes were specifically designated as tone studies, but others would serve to develop several areas such as flexibility, articulation, or dynamic contrast, depending on the style that student chose to play it in.

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[140] Arnold Jacobs, Portrait *of an Artist,* edited by Frank Byrne et al. (Compact Disk Summit Brass Records DCD 267, 2000), track 14.

[141] Arnold Jacobs as quoted in "Arnold Jacobs: Song and Wind, by Brian Frederiksen, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 157.

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Mouthpiece Buzzing

Mouthpiece practicing is extremely valuable. I know teachers that say it is not, but I think it is a great tool. Consider a trumpeter who has played for some years-- If the instrument is put in a certain position he immediately has conditioned reflexes based on that position, he has automatic habits based on the trumpet. You can communicate [this idea] to the student, but he cannot communicate to his tissues because the signals are based on old habits. Maximum efficiency comes from upsetting the student (habits) and introducing strangeness.[142]

The ability to buzz the mouthpiece with a certain amount of competence can be considered beneficial in two distinct ways. First, a less important issue is for the development of tissue fibers in the embouchure; the protractors and retractor muscles. Second, and primary to Jacobs' approach, the buzz solidified the relationship between the music in the student's mind and their ability to produce the same pitches in the mouthpiece. In removing the instrument, valves, and natural pressures associated with the instrument, the playing of pitches is left as the sole responsibility of the musician. It is here that the student can make the best assessment as to if they are actually buzzing the correct pitches. Jacobs recalled how he came to the conclusion that mouthpiece buzzing was beneficial for developing on an instrument:

> The mouthpiece 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... but the complications were with my kidneys, and 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 mouthpiece for me. I remember they moved me out of the section I was in to a wing where no one could hear me, and I practiced everything I could think of on the mouthpiece. I was in the hospital about a total of two 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 reflexively to the stimuli of the brain. It made a better

[142] Arnold Jacobs, "Mind over Metal" *The Instrumentalist*, 47, no.3 (Oct.1992), 16.

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> 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.[143]

Students of Jacobs confirm the benefits of mouthpiece practice in their personal development. Paul Ebbers states:

> Playing on the mouthpiece alone removes the instrument, but it does not remove the need to think. Mouthpiece practice helps to connect the ability to hear a pitch in your head with the ability to play a pitch with your lips.[144]

David Fedderly:

> It is an efficiency expert....It forces you to control flow and pressure; it forces you, because there is no real feedback, to send that message from the brain through the seventh cranial nerve to the lip...[145]

Jacobs rarely spoke of a proper way to buzz the mouthpiece. In fact, in the text by Farkas[146] there are several revealing photographs of Jacobs' embouchure which illustrate that it was less that what some would consider "perfect." The only concern that Jacobs would warn against was the buzzing of the lips without the aid of a mouthpiece or visualizer rim.[147] Jacobs discovered that a player who buzzed without the assistance of the isolation of the mouthpiece rim would be have to create an embouchure to be able to buzz that was not natural, therefore instilling a unhealthy habit in the process:

> I do not recommend buzzing the lips without a ring; buzz in the lower mid-range in one octave, no high notes at all because you begin to mask or 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 that 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.

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[143] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C," transcription by author, see appendix 7.

[144] Paul Ebbers as quoted in *Arnold Jacobs: Song and Wind*, by Brian Frederiksen, ed. by John Taylor (Gurnee IL: Windsong Press, 1996), 148.

[145] David Fedderly as quoted in "The Legacy of Arnold Jacobs Teaching and the Future of Tuba Pedagogy," by John LeBlanc (DM Diss., Manhattan School of Music, 2001), 82.

[146] Philip Farkas, *The Art of Brass Playing* (Bloomington, IN: Brass Publications, 1962).

[147] Many mistakenly call these rims "embouchure visualizers," but they have more uses than to observe the placement of one's embouchure. The real value is to isolate the lip's muscle fibers while buzzing.

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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 cannot 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, [it is] very beneficial.[148]

Breathing Practice

(CS) You always did breathing away from music. He would always say "put the tuba down, breathing in is not a musical activity and divorce it from the tuba". He didn't want you thinking about breathing in when you were playing the tuba; What he wanted you to think about when you were playing was about blowing, about buzzing about the tune, but not about breathing. He wanted you to build the groundwork away from the tuba and then when it came time to take a breath, your brain would have an idea of what it was to take a full breath.

Jacobs always wanted the student to think of respiration as a simple process, and any drills for breathing were to be used as efficiency exercises; always to be performed away from the instrument. Jacobs reminded his students that we are already competent in breathing, and if we were not, we would not be able to live. The difficulty in playing a high flow instrument such as the tuba or bass trombone is that players do not have, in most cases, the ability to perform long musical phrases completely without the need of a breath. Composers [and conductors] do not always take into consideration the physical needs of an instrumental group, and this leaves the performers to deal with making musical sense out of phrases that are longer than vital capacities can sustain. With this in mind, Jacobs would have students learn to take breaths [again away from the instrument] in a variety of ways so when they were confronted with a situation they could do so, and maintain the musical intent of the composer. "The ideal breath should have the sound of

[148] Arnold Jacobs, "1991 Master Class: United States Marine Corps Seminar, Washington, D.C," transcription by author, see appendix 7.

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wind: a large volume of air taken in freely. If there is no sound, there may be no air taken in. The art of inhalation is based on suction, not on the expansion of the body."[149]

The concept of moving air as wind is tremendously important to Jacobs' approach. He would train students to recognize the feeling and the sound of wind passing through the lips and notice [not concentrate on] the enlargements that occurred in their bodies. This gave the student some sense of his ability to take in large quantities of air and then move towards doing so as a habit, not as an exception. These exercises were to be done away from the instrument.

> Take large breaths based on suction with minimal friction and keep it as simple as that. If you dwell on the engineering principals, it gets complicated. Pretend you are pulling a long spaghetti noodle toward you through inhalation. Don't worry about correct or incorrect breathing; breathe in large quantities with decreasing strength. Large quantities are the key to this.[150]
>
> Blow through the instrument-- you can use all sorts of psychological meters. You have a match-- you pretend to blow out the match. As you blow you have to sing the tune, mentally of course, so the end product of air is outside the body, not in any body cavity. If it is in a body cavity, the brain can interpret it as pressure.... there is a very simple approach; if you want to take a breath, you breathe-- there will be resultant change. If you want to blow; you blow-- there will be resultant change.[151]

Once the student understood this, Jacobs might proceed through further exercises to solidify this concept with the student. It was at this point Jacobs might turn to one of his tools such as a draft meter [with a small tube at the corner of the mouth] to illustrate in another way the concept of suction without friction. These exercises motivated the student to take large quantities of air into the lungs and then move it outward from the body. Jacobs also explained that the student had to remain free in the abdominal region so the body could work at its maximum efficiency. Jacobs would palpate the student's torso to check for tension and displacement of the organs below the lungs. Nicholas Atkinson recalls Jacobs' approach with him:

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[149] Arnold Jacobs, "Arnold Jacobs Master Class," *Instrumentalist*, 45 (June 1991), 24.

[150] Ibid, 26-27.

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> In the early sessions, when I was spending a lot of time moving balls up tubes and needles across dials he would say: "Think about the needles when you play the horn. If you want a *mezzo forte*, imagine moving the needle to 3. A *forte* might be a 5, and so forth." I still have "think needles" written in the back of my Arban's from the first lesson. I spent a lot of time filling and emptying a 5 litre anaesthesia bag (which I still own), working on air speed and large changes in body size. He used to say that "we have to build a memory bank of good sounds." In order to do that we would work with the machines, to develop a sense or memory of different airflows and speeds, and he would then play and get me to imitate his sound and volume. From time to time he would touch my neck, chest or abdomen to check for tension. He would take my hand and press it to his ribcage and demonstrate the tremendous movement when air moved in and out. He was a human bellows! Often he would blow air onto my hand, in order for me to feel the thickness of the air column (one of his favourite expressions). Sometimes he would buzz on a rim so that I could see his chops in action. Then I would try to put it all together. The various stimuli work in different ways. Again, it is your imagination that goes to work and you become less concerned with physical sensations. I would even buzz the mouthpiece or rim or the cutaway mouthpiece that fits your horn and try to imitate his tuba sound. Then, finally, on the horn, the sound would often be magnificent. I suspect that most of his students have had the experience of making the most amazing sound without actually feeling as though they were doing anything, without being even aware of their chops. If it WAS good, he would say: "Remember that sound and try to reproduce it from your brain, not by feel."

Many have false impressions of the relationship between air volume and air pressure. Over the years many teachers use the term "support the air with the diaphragm," which implies some ability of the student to have control the diaphragm muscle, which is only used primarily as a muscle for inhalation. These educators may have in fact intend to have their students blowing larger quantities of air, which is what Jacobs was trying to illustrate, but their language created certain misconceptions. Jacobs presented the problems with this kind of conceptualization of air: With wind there is always air pressure, with air pressure, there is not always wind. If you concentrate on the air pressure, which can happen in any body cavity, the danger is that you may have

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[151] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master Class notes, see appendix 4.

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stimulated the Valsalva maneuver, the pelvic pressure syndrome, or isometrics, which do not involve movement of air.[152]

> We all tend to go to the machine study and by-pass the regions of the brain that would be competent to give it to us. In other words we have to stop controlling the systems by the muscles involved and instead go to the signals and life that control these. If you want to take a huge volume of air into the mouth; you merely draw it into the mouth [demonstrates], it goes somewhere. You will find that you will have the expansion. All you have to do is suck that air into the mouth with soft muscles. It will have enlarged and you will have it so easily that very frequently I will put a tube into a student's mouth and this upsets the old pattern of breathing habits. With the altered stimuli, I ask him to take in a large volume of air through the tube and they take it in and they have everything I have asked for without ever knowing what they are doing. I am always against you knowing what you are doing where it comes to the interior of your body because there is no way we can know what we are doing. I examine other bodies to find it out or in dissections you get answers, observations, but you cannot get it through your own sensors. Long after it is right, you will get some awareness of what is happening based on a generalized concept. There are no details; you have no tools for analyzing.[153]

In the article "The Dynamics of Breathing," Kevin Kelly summarizes how Jacobs would approach the differences in pressurized versus free flowing air:

> Jacobs used a wide variety of non-musical exercises to get players to feel and hear the difference between blowing air out freely and blowing out in a choked manner that results in a tight chest and abdominal muscles. For example: blow onto the back of the hand using a tight hissing sound through the teeth, as loud as possible. You will feel very little air. By blowing out freely onto the hand, you will feel a considerable amount of air under low pressure. The hiss is under high pressure, but there is little quantity. By closing the lips in the midst of the hiss and then releasing the sound explosively, you will have felt considerable pressure behind the lips and also behind the tongue.[154]

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[152] Arnold Jacobs as quoted in "The Dynamics of Breathing with Arnold Jacobs and Davd Cugell, M.D.," by Kevin Kelly, *Flute Talk*, 9 (Oct 1989), 19.

[153] Arnold Jacobs, "1973 Master Class: ITEC Bloomington, Indiana" (Part I), transcription by author, extracted from www.chisham.com/tips, accessed April 01/2002, see appendix 3.

[154] Arnold Jacobs as quoted in "The Dynamics of Breathing with Arnold Jacobs and Davd Cugell, M.D.," by Kevin Kelly, *Flute Talk*, 9 (Oct 1989), 19.

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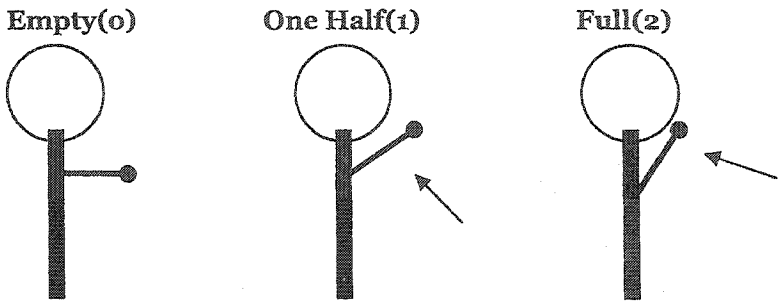
Other non-musical exercises Jacobs employed included having the student use his arm to represent a gauge or "dip-stick" for determining how much air was being inhaled and exhaled. He would begin by asking the student to consider the arm at full extension [out] as representing "empty." Jacobs would direct the student to pull the arm towards the body and inhale while doing so [the body would fill up with air and giving the student a visual cue as well as tactile sense of what was happening with the air]. Jacobs related to the student that the lungs do not have the sensors that can relate what volume of air they contain; they only have stretch receptors that will provide any sort of information for the student. In performing these exercises, the student learns to take full breaths and not be guided by some other sensory information such as expansion in the chest area. This premise led to one of Jacobs' most familiar instructions: Breathe to expand, do not expand to breathe.

Several variations of this drill have existed over the years as the concept proposed by Jacobs was meant to be simple and modifiable at the same time. At a 1990 master class, bassoonist Charles Lipp recorded a typical example of several breathing exercises Jacobs used with the students:

> *Slow breath exercise to develop sense of fullness and emptiness. Work for six months to two years. "Help" the breath in and out with an accompanying arm motion. Be patient with yourself.*
>
> 1. Breathe in, filling up one half at a time: Blow out, releasing one half at a time. (See below)
>
> 2. Breathe in, filling up one third at a time: Blow out, releasing one third at a time.
>
> *For learning to take large quantities of air at different tempi, practice with a metronome (Author)*
>
> 3. In 5/4 time: Blow out for counts 1 through 4: Breathe in on count 5: Repeat.
>
> 4. In 4/4 time: Blow out for 3 1/2 counts, Breathe for 1/2 count: Repeat.
>
> 5. In 8/8 time: Blow out on beats 1 through 7, Breathe in on count 8: Repeat.

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> In the different meters above, always observe a large quantity of air passing the lips.[155]



These exercises were to be done away from the instrument and done to condition the brain with concepts of good respiration. In time, healthy respiration patterns would be established in the player and he would have to perform these drills less frequently.

> Exercises for simple inhalations are the start. If you want to learn to take a fast inhalation, you create situations; fast inhalations. Always insist that the student be aware of his motivations. We never motivate time in inhalation as the big factor. Time is not a biological stimulus that would organize the respiratory system. Quantity whether it is small, middle, or large, it doesn't matter. Quantity is a biological communication for your tissues, time is not; it is a secondary factor. We learn about quantity through the slow breath then we take a study of this type; maybe take a study in 5/4 time where I exhale for four counts and I replace the quantity I use in the fifth count. I am adding time but the quantity is dominant. I must replace what was used within that time factor, but the quantity is the dominant factor--time is the secondary phenomena. Then I take the air in, maybe in a faster note, maybe $1/8^{th}$ note. There again I am replacing whatever quantity was used for the quantity within time is the motivation. Time could be anything for it has nothing to do with quantity, so the legitimate signal has to be quantity and the time is the secondary phenomena. But we must do this away from the instrument.[156]

Although Jacobs worked with almost every student on respiration, generally he did not wish to draw attention to it. The main purpose of addressing respiration in this way was to set up a healthy fundamental approach to respiration, and allow the student to focus on the musical issues at hand. Jacobs asserted that the student should let the

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[155] Charles Lipp, "Arnold Jacobs Master Class Notes," trumpet.dana.edu/pedagogy/jacobs.html, accessed March 25, 2002, see appendix 5.

[156] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison, Wisconsin," Master Class notes, see appendix 4.

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musical challenges be the focus, and from this point the issues of respiration and etc. would sort themselves out:

> In this art form, we are dealing with sound. Respiration is made too much of. We need sufficient quantities of fuel that we can use easily--as I say, waste it, it's free-but don't make a big deal out of it. We don't start anything with skill. Skill is developed over a period of time in spite of yourself. We have to make sure that we don't take the level of the brain at which we have volitional thought, and try to take charge of the human machine through its individual components-- we can't handle it. You've got to get out of the way and allow your body to function for you. The point is to sound great when you play.[157]

Vowels

Jacobs' vocal training seemingly gave him some unique perspective on producing a good tone and clear articulations on a brass instrument through a focus on vowel shapes. Many of the method books that had been written previous to Jacobs' career appear to altogether avoid the idea of having the flexibility of changing the vowel shape to alter the quality of the sound. Several of these books mention only in passing, vowels in connection with articulation. As an illustration of this, Jean Baptiste Arban's method mentions the changing of the vowel to assist in moving between notes but makes no mention of the proper formation of vowels to change the tone quality. Jacobs stressed the idea of using the correct vowel when both breathing in and blowing out because if a friction source is present [a fricative] due to a "high" vowel (such as *'ee'* as in the word *beet*), the ability of the air to move freely is hampered. This situation can lead to other complications such as poor articulation, or lack of flexibility. Jacobs asked that the student become aware of the vowel sound that he was conceptualizing when playing:

> Say *ha* or *ah,* and notice the vowel causes the tongue to move down and out of the air column's way. Strive for pure diction. *Ah,* and *o* are low vowel forms. If you say *ah,* your lips change but for *oh* and *ou*, your tongue does not. *Ee, a* and *I,* move the

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[157] Arnold Jacobs as quoted in "The Dynamics of Breathing with Arnold Jacobs and David Cugell, M.D.," by Kevin Kelly, *Flute Talk*, 9 (Oct 1989), 20.

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tongue up into the air column. So if the tongue is giving you problems, go to a *oh* vowel form, it obeys the dictates of speech.[158]

Jacobs would have students realize the degree of friction that each vowel had by [again away from the instrument] having the student recite the vowel sound, and while holding it in place, inhale and exhale through it. This would give the student instant recognition of the amount of obstruction each vowel created. A short table of common vowel shapes is as follows:

Front Vowels[159]
'a' as in Apple
'ee' as in Key

Dipthong
'i' as in Kite

Back Vowels
'oh' as in Toe
'u' as in You

Combining two of the most used vowel sounds, Jacobs would have the student repeat the inhalation several times, making them aware of the openness of the *'oh'* vowel. This would also make the student aware of the sense of air moving past the lips into the body. An example of this follows:

"Kee" (Inhale), "Ho" (exhale) [REPEAT]

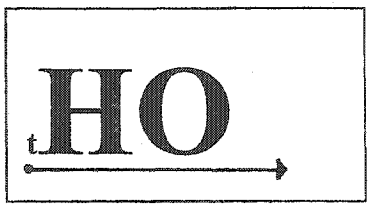
In relating the shape of the vowel to articulation, Jacobs would have the student focus on using one of the open vowel forms, placing a very small consonant (a small "t") before it. The concept was to focus on the vowel form and not on the consonant as the consonant ("t", "k", or etc.) essentially stops the flow of air passing through the air column. Jacobs wanted to ensure that the maximum amount of air would reach the lips where they would

[158] Arnold Jacobs, "Mind over Metal" *The Instrumentalist*, 47 (Oct.1992), 16.

[159] Phonemes of American Speech added from James Carrell *Phonetics: Theory and Application to Speech Improvement* (New York: McGraw-Hill Book Company, 1960), xi.

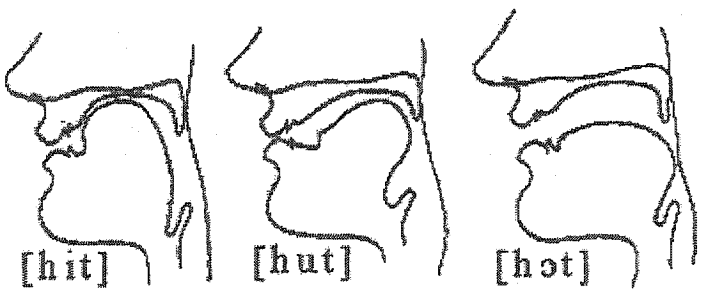
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promote vibration at a specific frequency [designated by the brain]. This results in articulation where notes that had definition, but maintain the same quality throughout. A visual representation of this follows:



> (AJ) One of my big problems is simply that for the professional musician, usually the art form is there, the thoughts of communication are there, but frequently we run into a problem where they will block the air from the lips and not know it. They are taught "Tee" as the mediare form moving from a lower to a higher note. Now, with "tee", these vowels are fine, a pure "ee" and "ah." But a student will very frequently, move to the sibilant "S."
>
> Now, "S" is very frequently substituted for "ee" in the mind of the student without consciousness of it, he then creates a reduced airway. When you go too far into this reduced airway, you rob the embouchure of air--robbing the embouchure of the fuel it needs; unfortunately, the student will feel it as resistance in the lips.[160]

For illustration of these vowel forms, I have included the following diagrams to illustrate the shape of the oral cavity when pronouncing specific words. [The examples are pronounced "heat", "hoot," and "hot"].

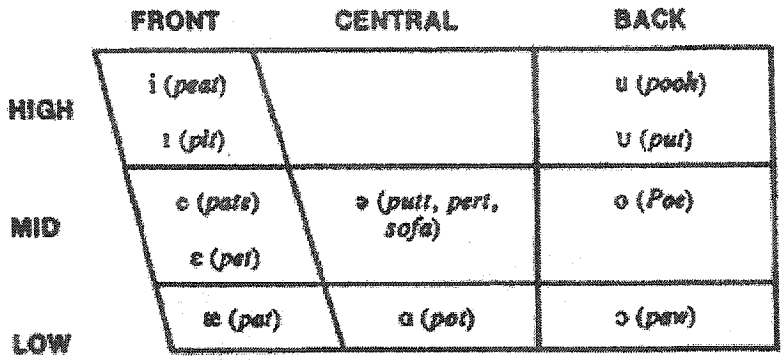


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[160] Arnold Jacobs, "1978 Master Class; International Trumpet Guild, Madison Wisconsin," see appendix 4.

[161] Diagrams extracted from Dartmouth College Department of English, Hanover, NH, www.dartmouth.edu/artsci/engl/engl18/vowels.html, accessed October 31, 2002.

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Using the open syllables, Jacobs would encourage the student to practice with different articulations, noticing the differences in the qualities of the sound, and also remembering the advantages or disadvantages of either form. Charles Lipp recorded a further example of Jacobs' ideas on this subject:

> The word "who" is an example of a blown attack. The word "too" is an articulated attack. Practice the different attacks away from your horn. Say "who, too, who, too" and balance the air flow. Check the air flow by "articulating" on the back of your hand. Use the same air flow but with only the addition of the "t" for "too." --With your instrument, practice sequences of five blown attacks with no stopping the tone between attacks. Five quarter notes, no gaps, only blown attacks.

Singing

Jacobs possessed a wonderful voice for both speaking and singing. He often recalled having to choose between studying voice and tuba at Curtis, and those who had the opportunity to work with him in any setting surely understood why. It is unfortunate that in a document such as this that an element of his teaching that was so enduring cannot be reproduced in any manner. Fortunately several individuals have thought to preserve various master classes and lectures on videocassette and recorded tape. Jacobs's voice was for many students, a sound of positive imagery. Many of his students recount that they need only to remember the sound of his voice to recall positive ideas associated with playing to help them find answers to their questions.

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(Ron Hassleman) Other memorable moments of my lessons with Jake always include enjoying the deep, rich sound of his voice. On occasion I found myself listening to the quality of his voice rather than the content of his message. I have two tapes of earlier lessons, around 1959-60. I've always considered myself to have a bass voice, but listening to that tape, my voice next to his sounds so high-pitched and nasal. In fact, just playing this tape for a few minutes years later, or talking to Jake on the phone and hearing that deep, rich "Hello," would send messages of inspiration and thoughts of air flow through my brain, and my playing would become more relaxed.[162]

(CS) He just had that radio announcer voice. It is funny when you hear a recording of him and a recording of [Ronald] Reagan--they had that kind of star quality to the voice. He just had this singing baritone voice. With this he would solfège. He was pretty proficient. His voice was just rich and singing. His sound was so immediate, so obvious who it was.

(GI) What I do remember about him was his singing and the amazing low range he had. Here I would be playing down below the staff and he would be singing the same notes with this tremendous resonant voice. He did that for my benefit I know, to make me sing more when I played. With all the portamentos he just really romanticized it all, and that kind of approach to the singing helped to get me loosened up.

(DM) The vocal thing was always there all the time and that of course was an inspiration. But I have always loved to sing as well, as part of my learning and as part of my teaching. I can actually say that I don't learn a piece of solo music without learning to sing it as well.... It was always an important part of the lesson because he always sang with that most amazing voice; it had so much resonance.

Michio Funakoshi explains that people are able to recall Jacobs' voice clearly because Jacobs had the ability to communicate with such a strong message on a variety of different levels. Jacobs always insisted that his students make an impression with their music, and their life:

(MF) After Mr. Jacobs' death, I really believe that I understood that he was teaching communication, and that his attitude towards life was the same as his teaching method. He always communicated with his colleagues, family, and students--He was always communicating with people--that is why people loved him. The amazing thing is that there are so many people who remember his voice--that is language; that is communication by speech. He once mentioned to me that when he teaches people, people from many countries, that sometimes one word works very well, and sometimes it does not work at all. Each person has a different background; each country has a different culture, so the teacher must be responsible to the student that if

[162] Ron Hasselman as quoted in *Arnold Jacobs: The Legacy of a Master,* collected by M. Dee Stewart (Northfield, IL: The Instrumentalist Co., 1987), 32.

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> the student does not understand, the teacher must say it in another way. The teacher must have another approach; with words or with playing. He was like that always in general. In the lesson he communicated with words and sound, in the CSO he communicated to the audience through his tuba; he always left us with a big impression.

Singing in the Jacobs studio was a necessary part of learning the concept of SONG that Jacobs was teaching. Although Jacobs was very competent in the art of solfège, he did not insist that his students use this practice. Jacobs would just insist that the student sing syllables or nonsense words [mnemonics] to secure the connection between the brain and the vocal chords. It should be noted that singing [with the mouth open] is preferred over humming the melody for the reason that is demands a higher level of accuracy and concentration on the part of the student. In singing, the student becomes immediately aware of the exactness of their intervals, as well as the style they are trying to relate:

> I will very frequently ask my students to sing a part, and then play it. Now many times they will sing it and when they go to play it, their mind blanks out. They've sung it a moment before but they are not singing in the brain at the moment they are playing it and as a result, there is still improper guidance. At that time, I will make up words then I will have them actually concentrate on the words and pitch. Invariably it begins to come with greater ease and comfort and they will find entrances that they couldn't get a moment before. They come quite easily when they stop trying to develop the attack as a formalized procedure but substitute the pronunciation of a word, the whole psychology of it changes and the organization cerebrally alters.[163]

Singing is very similar to mouthpiece buzzing: both require the student to be immediately clear with the musical message and this would assist in building the confidence the student needed to make statements with his music. Jacobs had realized the importance of this very early on in his training, and hearing other important teachers using it with their own students reinforced its value:

> I stood outside (Emory) Remington's studio at Eastman one time when we were playing with the Chicago Symphony. The first thing I hear is that he's singing

[163] Arnold Jacobs, "1973 Master Class: ITEC Bloomington, Indiana" (Part II), transcription by author, extracted from www.chisham.com/tips, accessed April 01/2002, see appendix 3.

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> [Remington drill] with his student, that voice sounded constantly. Well, the indication here is that you program the physical structures, you program yourself by, you might say, two thoughts of thought processes. One is the imitative act, the other is the creative, but one or the other should be in constant use...[164]

MATERIALS

The remainder the student's practice session (60%) was to be dedicated to the playing of music; learning to phrase and interpret music of all styles. Jacobs used numerous etudes, scale studies, orchestral excerpts and the like; some which he owned, many which students had brought in for their lessons. Because there were so many different method books found in his studio, it is difficult to quantify exactly which method books or studies he would use in his teaching from day to day. Chapter six presents a summary of the materials that the author has discovered through the interview process, as being the most frequently used by Jacobs. This list does not have the pretense of being a "complete" listing, but it provides us examples of the type of materials Jacobs preferred to use in his teaching. What we do now about the similarities of the method books Jacobs preferred was that they all included a variety of musical challenges; from the most simple to the extremely virtuostic. It seems that Jacobs never generally chose to use tuba method books. Michio Funakoshi recalls: "For practicing he didn't recommend any tuba books. He said that the music for French horn and trumpet had a much higher standard musically. The music for the tuba has a limited ability; that is why he always recommended music for the trumpet, horn, and some oboe music." Jacobs offers his reasons for not choosing to generally use the tuba methods for teaching and studying:

> A limited musical challenge is going to create a limited musician.... For many years, the talented young tuba player had to imitate the trumpet-- he had to go to the school of trumpet horn or violin, but he could do nothing with the tuba. In other words, the actual taking home of tuba music, there was nothing there to challenge him that would really give him the ladder where he could he could climb to be an excellent interpreter of music and, as a person, we are not tuba players, we are people. To

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[164] Ibid.

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> develop our brains and our abilities, we must be given the type of challenge that will give us the development. In the past, from my period, I primarily went to the school of French horn, school of violin, school of voice but I did very little with the tuba music.[165]

Etude books

One of the etude books that the subjects of this study recall was by Georg Kopprasch. [*Soixante Études*, Op. 6. Leipzig: Breitkopf & Härtel, 1832/33]. These studies were originally written for the French horn and have been subsequently transcribed for the tuba [Robert King]. Several of the Kopprasch etudes became a staple of Jacobs' method and appear in his own "method book" such as #8, #9 and #11. [see "Special Studies for the Tuba" in *Hal Leonard Advanced Band Method*, Winona, Minnesota: Hal Leonard Music, 1963, pp.46-64.] The Kopprasch method is fairly comprehensive as it contains a wide variety of technical drills, scale studies, tone studies, as well as melodious etudes. It appears that Jacobs assigned a great deal of etudes out of this book to his students as is noted in chapter six.

Another method that Jacobs favored, and played out of frequently himself, were the two books of etudes by Max Pottag, the former horn player with the Chicago Symphony Orchestra. [Blue Volume: Max P Pottag and Albert J. Andraud, *335 Selected Melodious, Progressive and Technical Studies for French Horn*, 1955. Red Volume: *212 Selected melodious, Progressive and Technical Studies for French* Horn, 1955]. These two volumes present a wealth of musical selections from most periods in music and contain etudes written by Joseph Gugel (19th C horn player and composer from St. Petersburg), Jacques Francois Gallay [1795-1864], Henri Kling, Ernst Paudert as well as transcriptions of Bach, Mozart, Haydn and Saint-Saens. These books enabled the tuba player to learn to interpret music of different styles and musical periods, as well as learn to read treble clef, giving them access to even more literature.

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[165] Arnold Jacobs, "1973 Master Class: ITEC Bloomington, Indiana (Part I)", transcription by author, extracted from www.chisham.com/tips, accessed April 01/2002, see appendix 3.

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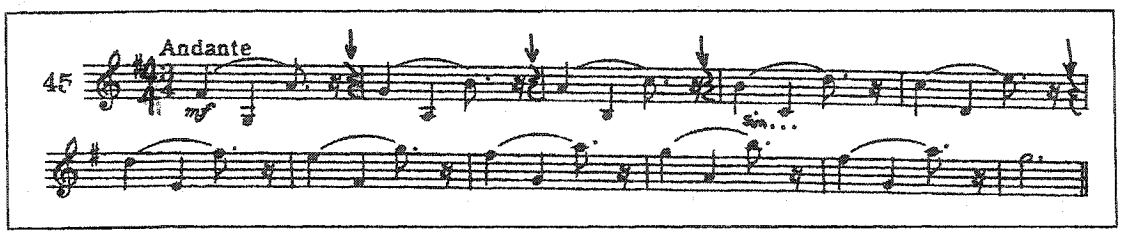
Several students recall Jacobs using the Pasquale Bona [1808-1878] *Complete Method for Rhythmical* Articulation [1900]. This method was written originally a rhythmic training book for singers [*Metodo per la Division*], and has been used by virtually every instrument. It is organized in three parts, each with increasing musical and rhythmical difficulty. The Bona is an excellent example of a method book that Jacobs would use to have the student focus on the quality of their tone and other fundamental issues. Jacobs used a text such as the Bona in such a way that he set up a hierarchy for study: Initially he would have the student learning to play the simplest of materials at a very high level of quality. Then, once this had been established as the norm, he would move them into more difficult material, insisting on the same quality as was achieved in the simple material. Finally, Jacobs would have the student performing extremely technical material at a very high level.

In the outset, the Bona presents long-tone studies, interval studies, scales, and simple rhythmic exercises. With each exercise, Jacobs would insist the student maintain a quality tone on each note while being precise about the rhythms that were written. Scale passages that were written in 16^{th} or 32^{nd} notes were to be played slowly first to ensure each individual note was given attention, then the student could perform these faster to build up technical facility. The second part in this method contains various melodies that the student would interpret in a variety of ways. The third part of the book presents etudes that are a good deal more advanced. Several of the respondents recalled using the Bona method but only remember generally playing out of the first two sections.

Max Schlossberg's *Daily Drills and Technical Studies for the Trumpet* [New York: M. Baron, 1941] was yet another staple of Jacobs' preferred etude books. Schlossberg progresses through fundamental etudes focusing on: Long Note playing, Intervals, Octave and lip drills, Chord and scale drills, as well as presenting a good collection of etudes. The Schlossberg, like the Bona, presents a progressive method of study for the student; moving from the most fundamental of drills through much more difficult etudes.

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Again, Jacobs would use select studies from this text as a tone exercises; working with the student to understand the concept of quality of tone in one range, and transferring this quality to the other notes. These etudes were never to be played without focusing on the quality of the tone, and Jacobs would on occasion alter an etude to make it easier for the student to take good breaths and be able to focus solely on this. As an example #45 (page 12) illustrates that Jacobs would add one quarter-rest to each bar [putting it into common time] so that the student could take a good breath:

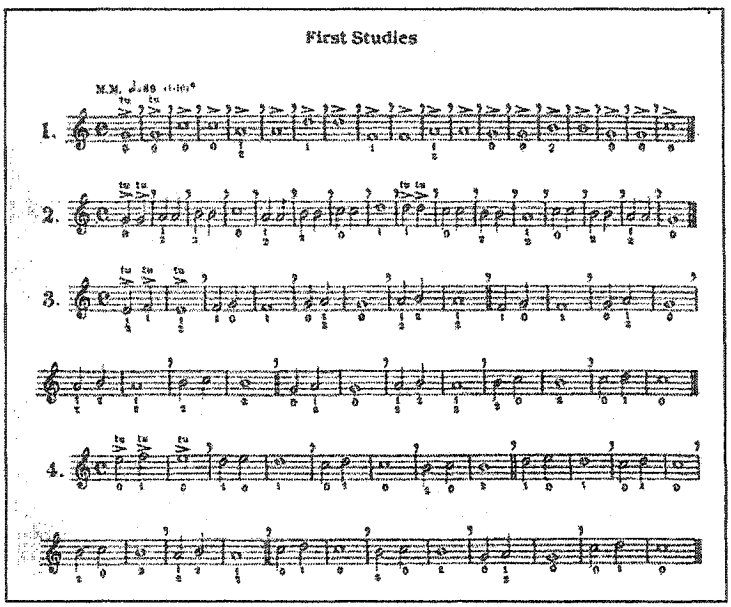


The Arban's *Complete Conservatory Method for Trumpet* [edited by Edwin Franko Goldman and Walter M.Smith. New York: Carl Fischer, 1956. Originally published as *La Grande Méthode Complète de Cornet à Piston et de Saxhorn par Arban.* Paris: 1864] could be considered the most important text used in Jacobs' studio. Long considered the "bible" of brass playing, Arban progresses through virtually every aspect required of the performer. Arban explains in his preface to the method that his intention with this method is "to instruct, and not terrify the student." He accomplished this by not including long pages of text, choosing to provide numerous examples of exercises and examples of fine of music and etudes under one cover. It is a difficult task to itemize the exact etudes Jacobs had used at any given time in the Arban, and we must presume that over his lengthy career, Jacobs had assigned the majority of the exercises in this method. Again,the Arban's like the Bona, the study of this text was progressive. Working on the most simple of material for stabilizing the quality in the sound was the first step. Then Jacobs would have the student work through various sections of this book, increasing the

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technical and musical difficulties, but insisting on the high standard of tone that was achieved in the simple exercises.

One central etude to Jacobs' approach is located on [what most refer to as the "first-page"] page 11 of the 1982 version:

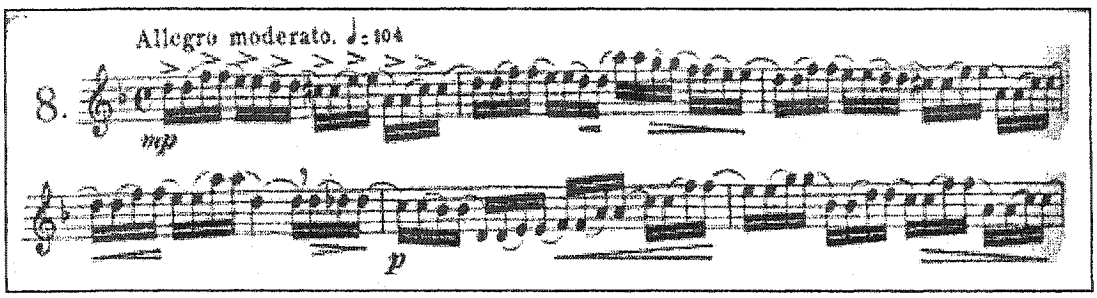


The First Studies [exercises 1 through 10] are tone studies. These studies are for the student to work on developing a clear and stable tone in a variety of ways. Jacobs would have the student perform them as written, either in treble clef (down two octaves), in bass clef, transposed down a perfect fourth, and so on. The thought was to have the student be able to perform these simple drills as consistently as possible, being able to transfer the quality of the tone throughout the range of the instrument. Jacobs would have the student perform [#1 as an example] the exercise, buzz it, sing it, and then return to the instrument. The process was methodical and ensured that the student was able to focus on the tone quality of each note.

The Arban's method also presents some ninety pages of etudes and duets for the performer drawn from a variety of sources. This section is entitled "The Art of Phrasing" appears to be organized in accordance to the difficulty of the etudes, as the other two

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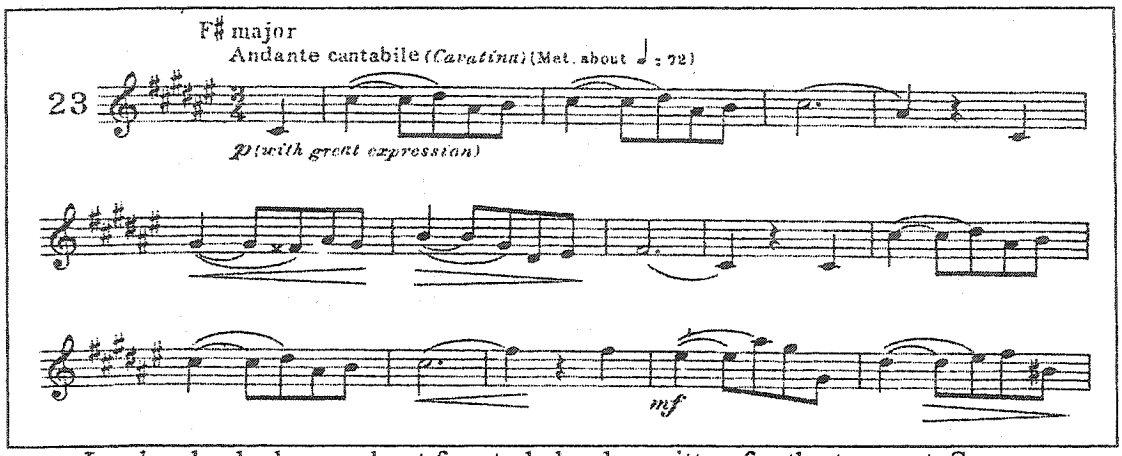
methods mentioned before. Jacobs suggested that the student work through this section to develop the skill at interpretation by playing the melodies of the great composers and using this learning experience to perform their own music at a much higher level. The final section contains the "14 Characteristic Studies," and the "12 Celebrated Fantasies and Airs Variés." Following is an example of a Characteristic Study by Arban (#8): These works represent the culmination of Arban's method, presenting etudes and pieces that involve elements of technique, tone, and style that are found throughout the entire text.



Other methods

As mentioned previously, there are numerous method books that have found their way into one of Jacobs' lessons including those written specifically for bassoon, double bass, oboe, French horn, and tuba. The Melodious Etudes by Marco Bordogni (transcribed for the trombone by Joannès Rochut, New York : Carl Fischer, 1928, 3 volumes) were often used by many students because of their abundance of lyrical melodies in the *Bel Canto* style. Jacobs mentioned to several of his students that he did not recommend these studies for the beginner student as he felt that the phrases were too long to play [for the tuba] at a high level. He often would recommend other similar studies such as the vocal studies by Giuseppe Concone, Zoltan Kodaly, and Mathilde Marchesi [24 Vocalises] because the phrases were often more manageable without being lesser in musical quality.

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Jacobs also had a penchant for etude books written for the trumpet. Some may rightly presume this was because his career as a musician began as a trumpet player, or that one of his greatest influences was his colleague, Adolph "Bud" Herseth. More likely was the fact that these methods [most written after the creation of Arban's method] presented a wealth of musical sources for him to draw upon. Texts such as the *34 Studies for* Trumpet by Vasilly Brandt and the *Technical Studies* by Herbert Clarke focus primarily on technique, however, if approached in the, manner that Jacobs preferred, these texts could help to elevate a player's musical and technical facilities well. The *36 Transcendental Etudes for Trumpet* by Theo Charlier, Maxime Alphonse's *Deux-cents Études Nouvelles, Mélodiques et Progressives pour Cor,* and Fernand Oubradous' *Enseignement complet du Bassoon,* and the *333 Elementary Exercises in Sight Singing* by Kodaly have all been mentioned by students of Jacobs throughout the course of the research for this document.

One other method book that was not specifically written for the tuba that Jacobs used is the *Top Tones for the Trumpeter or Cornetist* by Walter M. Smith. An overwhelming percentage of the subjects mentioned that they had worked out of this book at some point in their studies with Jacobs, and many recount that he would be able to play these impeccably with magnificent clarity, style and tone.

> (NA) A lot of his students, myself included, thought that they had pretty good technique until they met Mr. Jacobs. He used to drive me mad. He introduced me to Walter Smith's *Top Tones for the Trumpeter*....The first time I saw the book he asked me to play #23 which is in six sharps and treble clef. I thought I was sight reading it

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> quite well under the circumstances, but he harangued me about the wrong notes and lack of musicality. Every note had to be clear and musical. The other studies we did are not easy either, but he was just as fussy about them. He certainly raised the level of what I thought good playing was.

Although Jacobs had a propensity for the etudes for other instruments, he did occasionally employ method books written for the tuba from time to time. It was noted during the interviews that he occasionally used the *40 Advanced Studies for the B Flat Bass* by Tyrrell and the method written by Vladislav Blazhevich; *70 Studies for the BB Flat tuba*. Some of the most important materials that Jacobs used were the ones that he collected and presented in the Hal Leonard Advanced Band Method for the Tuba. Jacobs chose materials from some of his preferred etude books such as the Arban method, Kopprasch, and the Pottag, and provided annotations as instruction for the student. Several of the studies have been transposed so they can be best played on the B Flat tuba. One of the etudes that does not appear in any of the etude books mentioned and was a staple of Jacobs approach, was the following simple scale study [some refer to it as a "flow study"] that appears on page 50:



This study is reminiscent of other "flow studies" used by other teachers such as Remington, and Vincent Cichowicz. This exercise works through all twelve key areas and challenge the student to play with his or her best tone in all ranges. It is an excellent example of the simple etudes that Jacobs preferred in assigning to his students when they were developing their fundamental skills.

Although the above mentioned method books appear to be his core material, Jacobs would teach his approach using whatever music was at his disposal. If the student was to bring in a method for the clarinet, he would be able to find an etude, or a set of

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etudes, that would assist the student in overcoming their problems. The majority of the music that Jacobs selected when dealing with fundamental issues such as tone production all held the same qualities: they were simple, the phrase lengths were not overly demanding, the music was tuneful, and the music could be studied in a variety of ways to assist in bringing about the greatest amount of change in the students playing.

AVOIDING ANLYSIS

One final element of Jacobs' teaching was that he encouraged the student to avoid the temptations of analyzing their playing while they were doing just that. Jacobs believed in the concept that the student must "wear two hats"; the one hat was for performing, the other hat was for teaching. Jacobs explained that the two should never be worn at the same time, as it would cause the player to question what he was doing instead of making musical statements:

> Roger Bobo: Do you see a tendency among students to hyper-concentrate on the clinical aspect [of playing]?
>
> AJ: Much too much. It's the type of learning you get in the school system. So much of a young person's life is spent in acquiring knowledge; in an art form you are always imparting information--In other words you are using different nerves. It's the psychomotor aspect of being a musician. Your thoughts have to come from the brain and be imparted to somebody else as a form of communication, whereas the act of going to school, of acquiring knowledge as a youngster, is receiving, not sending. It has to be turned around so that performance is always being able to tell a story in music, even from the most elementary stage.[166]

Jacobs' earliest learning experience was not unlike many of the professional musicians of his era. His early studies were based almost entirely on imitation ,and upon attending the Curtis Institute, he primarily concentrated on performance studies; what we consider a Conservatory training model today. Throughout his lifetime, Jacobs observed a change in the approach to learning music; moving away from the Conservatory model

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[166] Arnold Jacobs, "An Interview with Arnold Jacobs. Part I," by Roger Bobo. *Brass Bulletin,* 33 (1981), 44.

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towards a more academic approach which include many courses in the technical aspects of music and less emphasis on the practical. His idea of wearing "two hats" is an important issue considering this change in academic climate. In today's academic environment, the student is required to deal with several areas of music in their studies rather than a singular learning track. The importance of this well-rounded education was never in question with Jacobs, however, he appeared to feel that this more academic approach trains the student to learn in a different manner than was his. In studying numerous subjects, the student becomes highly skilled at acquiring information and being competent to understand it on various levels. The approach that Jacobs wished for the student is that they keep the process of making music simple; asking few questions and only issuing statements.

THOUGHTS ON EDUCATION

Jacobs suggested on occasion that he had distinct ideas regarding an approach to education and propose an approach that reflected his own training:

> I want to tell you quite frankly that most of the players who write books on playing never learned by the books. They listened to others play; they were required to play songs-- lots of them were jobbing. The written word, even when it is right, is not for the performing arts where you hear with a communication to others. It is like being an actor. If you want to learn to perform, that is fine but if you try to learn in order to express range, what muscles must contract to express range, how do you raise your blood pressure, what do you do to do that; you'll never be an actor.[167]

Jacobs recognized early in his education that one should imitate as many fine examples of musicianship as possible to constantly give great musical stimulus to the brain. Using this approach, the student would have a better chance of succeeding in his art form because of the simplicity of it. Many of Jacobs' private students had been enrolled in a university or college degree program for at least one period in their lives and

[167] Arnold Jacobs, "1978 Master Class: International Trumpet Guild, University of Wisconsin" See appendix 4.

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he seemed to recognize that this studying at a higher level of education was creating this interesting duality of learning. Although Jacobs taught at Northwestern University for some time, he was never responsible for teaching an academic class.

> The tremendous emphasis at a University level, college level [or] High School level is to acquire information and the discuss it. Equal time [should be] given to impart information, that means to study the styles of music [so] that you can go ahead and play a variety of styles of music. --If I had my way, and I had my own school, I would do things the way I wanted; I would have different rules. I would have them get great insight into influencing others through words and body language to develop the ability to influence the external environment through the tools that you have.[168]

This does not assert that Jacobs disagreed with the idea of attending an academic institution. From all accounts, Jacobs believed that to be enrolled in a program of musical study would have a very positive effect on the development of the student. David Fedderly recalls: "Another interesting thing that you have to understand is, people used to say Mr. Jacobs didn't believe in schools which was really crazy. That you didn't need to get good grades, that was nuts. That was always the thing he said to do, make sure to get good grades..."[169]

For many students, the private lesson was not where they were exposed to Jacobs' pedagogy. Over 15 years, Jacobs presented his master class seminars at Northwestern University and also traveled to numerous conventions. The information that the participants received at these lectures can be considered special because it was here that Jacobs discussed many of the principles that he adhered to in his teaching. It was also here that students had their first opportunity to see how Jacobs worked a student [on any instrument] through their playing difficulties. The master class setting presented a summary of many of Jacobs' ideas; respiration, communication, breaking into habits, etc., however, many of the misconceptions regarding his teaching seemed to have had their beginnings from people who only attended these lectures. It is clear that Jacobs'

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[168] Arnold Jacobs, "Master Class, Northwestern University School of Music 1988," Reel 1.

[169] David Fedderly as quoted in "The Legacy of Arnold Jacobs Teaching and the Future of Tuba Pedagogy" by John LeBlanc (DM Diss., Manhattan School of Music, 2001), 72.

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approach was not intended to be wholly accepted by a large group, and for those who took these lectures as being Jacobs' "method" certainly had missed the point.

THE MASTER CLASS LECTURE

Indeed, one of the most important venues for students to see Jacobs teach and learn about methods, was in the formal master class setting. Jacobs presented these classes at Northwestern University, International Tuba and Euphonium Conferences (ITEC), Music Educator's National Conferences (MENC), and a variety of others [see Frederiksen pp. 89-90]. Each of these master classes was as individual as the private lessons Jacobs taught. Frederiksen notes: "There really wasn't any format--he just got up in front of everybody and started to talk." As true as this statement may be, Jacobs did seem to have similar content and order in his master class presentations.

Depending upon the location, Jacobs would have the stage set up with a selection of his tools and graphs for him to use throughout the lecture. Typically, there would be a table set with a variety of hoses, an Inspiron©, a decibel meter, several breathing bags and a selection of mouthpieces. Behind the table was almost always the anatomical flip chart, something Jacobs referred to as the "thin man". This chart had several layers that could be added or subtracted to illustrate the different layers of the human structure. He referred to this chart numerous times throughout the course of a lecture, illustrating where certain physical structures were located such as the diaphragm. Jacobs also carried with him in his shirt pocket: pencils, a small flashlight [to check the student's tonsils] and a visualizer ring.

There were typically two varieties of master class settings. The first type of lecture format presented Jacobs lecturing on his approach to the audience. In these sessions he would work with few, if any students, as time typically did not permit it. These lectures took place at conferences such as the Mid-West Band Clinic [Chicago, IL.] or an International Brass Festival such as the International Trumpet Guild Conference (ITG). In each lecture, Jacobs would ask for questions from the audience and

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attempt to ensure that every person in the audience understood his ideas. Often his lectures would become sidetracked with numerous tangents but he would always return to the subject matter he was originally addressing. There are many examples of his manner of speaking located in the transcripts of his master classes in the appendices of this document.

The second type of class he presented were the weeklong seminars that involved numerous students and a series of lectures. The most notable of these occurred at Northwestern University. From 1982 until 1998, Jacobs was able to work with numerous students [on a variety of instruments] and illustrate how his approach can have success if applied correctly. It was during these seminars that the observer could observe Jacobs' approach to teaching. Jacobs would typically separate the three-hour session into two parts. The initial session would consist of a lecture regarding the materials that he was intending to cover for the remainder of the week. He would then have a question period at the end of this session and begin the next session with teaching students on an individual basis.

What was most interesting in observing the individual instruction that Jacobs gave during these sessions was the manner in which he worked with the student in front of the class. Jacobs was always sensitive to the student who was performing in front of a large class; a class that was often filled with professional brass players. Jacobs gave each student his undivided attention and worked with him or her on the elements that they needed work on. Some students often became intimidated in font of the audience and Jacobs would then divert the attention away from the student and tell some interesting story from his years with the Chicago Symphony. Upon returning to the lesson, the student was almost always much more at ease, and able to continue. As his master classes gained popularity, a variety of instrumentalists other than brass players were in attendance. He appeared to ensure that he worked with at least one of the various instrumental groups per day, illustrating not only his pedagogical approaches, but also giving the spectator a lesson in teaching the various instruments based on this approach.

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In both types of classes, Jacobs typically began his classes by outlining his thoughts on pedagogy; discussing some of the elements that he would be working with throughout the course of the day [week]. In examining the master class transcripts included at the end of this document, we can see that Jacobs introduced the main concepts immediately to the students. An example of a format that Jacobs' used is below. These two summaries represent a grouping of the most important issues that Jacobs addressed but it should be noted that Jacobs did often move between topics freely.

1973 Master Class, Bloomington, IN (Hour 1)

1. Communication
2. Warm-up procedure
3. Variables for playing: Mouthpiece, Instrument, Player
4. Teaching the player, not an instrument.
5. Avoid the analysis of segmented parts: Play by SONG
6. Habits, Nerves, and the Brain
7. Students need to have musical inspiration: Communication and Imitation
8. Benefits of playing etude books that contain great music (Horn, Trumpet)

(Hour 2)

1. Explanation of Boyle's Law
2. Respiration: Capacity, Somatotypes, Bow lengths, Phrasing
3. Learning healthy respiration

1991 United States Marine Corps Seminar (Day 1): Lecture[170]

1 Respiration

2 Previous thoughts on pedagogy

3 Stimuli, Nerves, and Reaction

[170] This presentation was the first day of a weeklong seminar Jacobs presented for the Marine Corps.

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4. Habits

5 Personal Experience: The Curtis Institute

6 On teaching other instruments

7 Anatomy, Body typing

8 Emphasis on his approach: Personal education

9 Training: Buzzing the mouthpiece

10 Breaking into habits

11 Vowels, tonsils, and tongues

12 Conceptualizing

13 Questions and demonstrations

Although these represent only two examples of Jacobs' lectures, they can be considered fairly typical. Through the examination of numerous hours of video recordings and the evaluation of master class notes from a variety of sources, it is apparent that Jacobs worked systematically through each of the areas listed above at some point during his lectures. It should be noted at this point that any misconceptions regarding Jacobs' approach may have been derived from the students who attended these lecture classes. It is entirely true that Jacobs spoke on the elements of respiration at these lectures; frequently using the various tools and charts that have become associated with his pedagogy. What may have been overlooked by many of those present was the fact that Jacobs always returned to the idea of music as an art form, and learning communication. It is not surprising to recognize that if a person's only encounter with Jacobs' teaching was at a lecture such as the 1973 master class at the International Tuba and Euphonium Conference (appendix 3), one may take away that he taught scientific principles, not musical ones.

(MG)He was very good; a wonderful stylist and interpreter and teacher of music and this is one thing that I think gets obscured in his legacy.

If this paper is to serve any function past the elucidation of the materials that Jacobs studied and the materials he used in his lessons, it is important for the reader to understand that Jacobs' approach was not scientific in its intention. The scientific

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information served only to explain certain events that were occurring when playing, and provide clear and incontrovertible evidence for the student and teacher alike. The main focus of Jacobs' pedagogy was clearly to have the student focus on musical issues and work through the challenges presented in the art form, allowing the body to adjust and compensate as it needed to perform the desired task correctly. Any belief that Jacobs method was anything other that musical would not be aware of the complete facts.

Chapter five will present responses from several of Jacobs' students regarding their lessons with Jacobs and the materials that he focused on with them. These responses are intended to assist in giving the reader a clearer picture of Jacobs' approach as a whole. Preliminary to this, chapter four describes the interview procedure followed in acquiring the responses from the subject.

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CHAPTER FOUR

INTERVIEW PROCEDURE

Interview subjects were selected from students of Jacobs whom the author had personal contact with over the years. Biographical material on these subjects where available, was taken from *Tuba Source Book.*[172] In determining the list of subjects, every effort was made to provide a comprehensive survey of students from various stages in Jacobs' teaching career. Respondents were initially contacted via mail and/or Internet (e-mail) and then via telephone. Each of the respondents was presented with an identical set of questions. These questions were constructed from the observation of master class videotapes, printed articles and personal correspondence with several credible authorities. Interviews were carried out over a five-month span and were conducted either by telephone conversation or an in-person interview. In both cases a Mini-Disk recording served as an archival medium. Before each of the interviews, the subjects were asked permission to be recorded and informed that their answers would appear in an edited form within this document. From each of the interviews, a list of materials that were used by the individual was compiled and will appear in subsequent chapters. A brief biography of each subject appears as appendix XI in this document. The material for these biographies was collected from the interviews as well as electronic resources.

The following list of questions was presented. In several cases, secondary questions specific to the individual were also posed. These will not appear in the following list however, if appropriate, the responses to these questions will be included in this document.

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[172] R. Winston Morris and Edward R. Goldstein, *The Tuba Source Book* (Bloomington : Indiana University Press,1996).

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QUESTIONNAIRE

BRIEF BIOGRAPHY OF SUBJECT:
MUSICAL INSTRUCTION BACKGROUND OF SUBJECT

Name:
Profession:
Instrument studied with Mr. Jacobs:
Professional affiliation(s):
Brief professional history including teachers and schools:

What teachers have you worked with throughout your career?
How long did you study with Mr. Jacobs (number of lessons if possible)?
Was this a degree program (if so, which M.Mus, B.Mus, DM, Certificate)?
If you were not in school at the time of the lessons; how was it you had heard about and contacted Mr. Jacobs for instruction?

PRIVATE LESSONS

Describe your first few lessons (if possible) in the terms of a format.
Did Mr. Jacobs seem to have a distinct organization or were these more of exploratory sessions?

After the initial lesson with Mr. Jacobs, did the lesson format change?
What do you remember him emphasizing in the earlier sessions?
Was there any change in his approach to you in the later sessions? Could you elaborate on this if possible?

Most important to this study is the materials that he assigned to his students. If you can be specific, it would be most helpful. What materials did Mr. Jacobs assign to you in your lessons? If we could answer these in terms of:

a) Etudes (specific methods and numbers if possible)
b) Exercises (i.e. Buzzing, Long tones, Scales, etc.)
c) Excerpts (orchestral or solo)
d) Solo works

Mr. Jacobs has stated that his training and advancement was due to his ability to learn "by ear". Was there any time when he suggested that you experiment, or practice the following?:

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a) Drills based on improvisation
b) Academic pursuits; Composition, theoretical investigations
c) Listening assignments

It is clear that the majority of Mr. Jacobs' lessons were aurally based, but there may be further clues to his insight in the written materials or symbols he often used.

Did Mr. Jacobs ever write down specific instructions or written symbols for you either in your method books or in a journal?
Could you describe these and, would it be possible to obtain a copy of his handwritten notes (edited if necessary by you) for inclusion into this document?

PEDAGOGICAL TOOLS

As you know, an important component in Mr. Jacobs' teaching was the stimulating of as many senses as possible to create stronger memory recall. His use of technical apparatus to stimulate other senses, namely sight, was quite progressive and effective. I am assuming that he used some (or all) of these devices with you, could you explain which ones?

Can you describe these sessions and how they enabled you to understand his ideas?
Do you still use these in your own practice or studio?

It is also well known that Mr. Jacobs believed that the recall of sound, excellent sound, also prompted the correct responses in the musician. With this in mind, did Mr. Jacobs ever play for you in lessons?

What did he play other than the materials you were specifically concentrating on?

Were there occasions to perform with him in these lessons? If so, what types of music did you perform together?

BREATHING

Understandably, most believe that Mr. Jacobs taught a majority of his lessons concentrating on breathing, and improving the respiration function of the player. In my opinion, this was in most cases, a secondary issue. I would like you to comment on this.

Did you work on some techniques for making your breathing more efficient in your lessons? Could you describe any of these?

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CONCLUSIONS

How did you observe his teaching change through the years, that is, did his techniques or specific assignments change overall? Please recount anything that may be of use.

Recount if you can, any specific moment or lesson which you felt that you had a "breakthrough" in your playing. How was it that this presented itself and what were the results of this significant moment to your future career?

REACTIONS, PERSONAL STATEMENTS

Several dissertations and articles have been written on his teaching since his passing in 1998. In each of these, certain deductions and simplifications have been made to make his teaching easier to understand for the masses. I would like you to comment on how you perceive people's understanding of his methods. What are the most important aspects of his teaching that you believe will be enduring?

Is there anything else that you would like to add to this discussion?

Thank you for your time.

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CHAPTER FIVE

INTERVIEW RESPONSES

This chapter presents the results from the interviews given to the following individuals during the fall of 2001 through the summer of 2002. The responses have been edited to present the clearest possible answer to the questions. At no time were any of the responses interpreted by the author.

INITIAL LESSONS

Describe your first few lessons (if possible) in the terms of a format. Did Mr. Jacobs seem to have a distinct organization or were these more of exploratory sessions?

»(CS) The first lesson was at the Fine Arts building. I just remember just playing the tuba differently after that-- I didn't have any real recollection if there was a big difference or not. I just remember him saying "Blow" and I said OH, OK! You know everyone else had said that. I remember that him saying [to] blow made so much sense, just to fill up the horn. I remember him being positive, and him being complimentary.

» (RA) He measured my lung capacity and many other things. I believe that he knew me better than I knew [myself]. Thinking in retrospect, I guess I had this kind of ego that was unstoppable and I wasn't really responding to that [the breathing exercises and etc.] but I did respond to his musicianship and him. I remember him saying, "Armandi, now is that Czech or Italian or what?" I said that I was Italian. He said "Oh well, my goodness. The Italians have a fantastic history of fantastic music making, great artistry. When you play, sing!;" that, I really identified with. He then spent most of the time dealing with musicianship and just turning a phrase because the breathing concepts I just didn't understand; I was too busy trying to play fast and high--the breathing was a minor issue in my mind. I remember a friend asking me "so you had a lesson with Arnold Jacobs--how was it?" I said "Oh yeah... he said I have to work on my breathing a little bit but he said that I am a real good player!" --I was such a kid.

» (NA) I didn't know what to expect at all...I was a complete neophyte. I had never taken a tuba lesson from a really first-class teacher. I often tell my students how lucky they are now; they can study with me, or go two hours down the road and see Dennis (Miller). A lot of the professional tuba players in Canada have either studied with Mr.

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Jacobs or been influenced by his methods. So, the young Canadian players are getting the goods right off the bat. We older guys didn't have that luxury. I went down to Chicago not having any idea what I was getting into.

So I went into his basement, he had a skeleton and large diagrams of the human body. I have always been quite interested in anatomy as my sister is a nurse and I have a cousin who is a doctor; It must run in the family. One of the first questions he asked me was: "Do you know anything about anatomy?" So I said, yeah! (laughing). Little did I realize that he knew a million times more than I did.

I remember him saying that the first session with a new student was as much for him as it was for the student. He wanted to see what he had to deal with; in my case there was lots of material! My first lesson was all about producing a good sound. I played about the first two or three bars of the Wilder *Sonata* and that was it. My sound was small and badly produced. We went straight to his machines. He had me breathing deeply in no time; he made me conscious of being half full, three-quarters full, etc. I did a lot of buzzing, blowing and sucking air and watching the readouts on his gauges. I blew into and sucked the air out of an anesthesia bag. He played and sang and had me imitate his sound. I even played his York and he played my Mirafone 186. I had no idea that my tuba could sound so resonant and beautiful. I played some of the early Arban exercises using lots of wind and he showed me some breath patterns in 4/4 and 5/4 time to get me loosened up. He had me enlarge my embouchure quite a bit too. I had been playing for years with a lot of tightness. That first lesson opened me up in every conceivable way, both mentally and physically. When I came back a few days later he was quite pleased with my progress.

» (MS) In one of my first lessons I had brought in the Verne Reynolds *Sonata* or Kraft *Encounters II*. Jake said "ok", but suggested that we simplify all of this. In my second lesson I played a Rochut study (number 24) by memory. After doing this he said to me, very well done and all of that then he said: "Is that one of the Bach Cello suites?" That lesson was one of the few that we worked on excerpts; Meistersinger, the Ride, Flying Dutchman, etc.

Mr. Jacobs loved to be entertained in the lessons. One of my best lessons was when I performed "Makin whoopie" à la George Roberts. After I began, Mr. Jacobs was really getting into it... he was snapping his fingers and almost scatting in the background. He wasn't impressed as he had heard all of the best and the worst players in the world to this point, the music just connected to him somehow. I believe that I just committed to the musical idea and he got it! At this point in time, everything that we had worked for in that couple of moments, articulation, sound, fingers, all worked.

»(BF) I am remembering that old Spirograph in my first lesson. I remember he would always take someone's vital capacity, and of course that would be the first time anyone had seen the thing. I recall that I topped the Spirometer, about 6.1 liters of vital capacity.

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He always used the first lesson to go through-- it was somewhat experimental for him. The first lesson was to try and found out what you are, where you're at and things such as that.

» (MG) My first lesson was very memorable. It was just as if the light bulbs went on and kept going on over my head. Everything he was saying made so much sense and it answered so many questions right away just in the first half-hour. It answered many questions that I had in my own mind after studying with so many people-- and I was having a difficult time bringing together what they were saying with reality. With Jake, he just started saying "keep it simple", and "you want to find the child-like simplicity," "you want to take a full breath"—"don't be tense", all of that.

I remember that at one point in the lesson I began to laugh and he misinterpreted that--he thought I was laughing at him. He said "you think I am joking but I am not, I am serious". I wasn't laughing at him, I was just laughing at how marvelously simple this is. It's not hard-- playing the tuba is not hard; it's the getting out of the way mentally that is the hard part that is what requires the focus. That was pretty memorable.

» (GI) I remember my first time I went down and had the lesson, I also went to see the orchestra. Guillini was conducting and Daniel Barenboim was the soloist in an all Brahms program. I remember my jaw sitting on the floor, I was the first time I had heard anything like that - it was quite an experience. I had my lesson the next day with Jacobs and I told him a couple of times that I had found myself sitting there with my mouth open and that I was in awe; "Oh yes yes, it's a very good orchestra!" he said.

I'm vague on how the lesson progressed. What I can tell you is that I remember getting so much information in the first lesson that my head was spinning, that I couldn't possibly take it all in. I don't remember anything in particular. I do remember him doing a lot of explanation of how things work with the body and the brain and being overwhelmed by all of that. I remember telling Dick [Erb] about that after the fact and he said he thought that Jacobs did that on purpose so that you couldn't think; so that you had so much information that there was no way to sort it out and the only thing you could do was just play. He would confuse you so by giving you so much, especially at my stage-- there was no way that you could think about all of the information and play at the same time.

» (MF) I was very surprised with many things about Mr. Jacobs. Many people told me that he was a breathing teacher. I expected that he would tell me something about breathing [but] he didn't say anything about it at all! What he did teach me was to "Sing in your head, and listen to that while you are playing"-- that's it. He always encouraged people as musicians, as human beings; not tuba players or instrumentalists. I understood in that first lesson that Mr. Jacobs was telling me that only a human being can make

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music and that is why he thinks all people have the possibility and ability [to make music]--he was just teaching the human being.

» (RM) As you have probably found out from others that have studied with him when they recall the very first lesson, certainly the way I recall my first lesson; it was an experience of near sensory overload. I think that was a lot of his intention, to keep the student somewhat overloaded so that at that point, he could introduce a very simple idea that someone could hold onto and think, "YES, I can do that, that is something I can understand !" as opposed to all the medical terminology that most tuba players had never heard before.

[The lesson] began with me playing several etudes that I had from the third Rochut book. I had worked them up well and played them my best, I was really very happy with the way I was playing. I went in there specifically to show him my best playing, so I played some rather flashy, technical things, lots of flexibility and range, technique. Finally after the third etude, he gave me this litany of comments, all of praise, and then he said to me, "let's work on your tone." And I just thought to myself--of all the things I could do, I was probably most satisfied with my sound, with my tone. He could probably tell that I was a bit surprised that he had said that, so he said, "here give me your tuba". He took my horn, a Cerveny CC tuba, put his mouthpiece in the lead-pipe and just played a few notes. I thought... that is not only the most beautiful tuba sound I have ever heard, it is possibly the most beautiful sound of any kind I had ever heard. I immediately knew exactly what we should work on. Yes, let's work on my tone....

» (DM) The first thing I remember was that he was very encouraging. I remember that I had to play different things for him and explain some of the problems that I was having to him. He knew right away... it wasn't like I was speaking Greek to him. Then he started talking, and in those days he talked a lot. He spoke about lots of stuff which was what we called "Jacobs speak"--you know, the seventh cranial nerves and this type of information. It came at you a mile a minute and it was very confusing, but then he stopped long enough for me to do something; and then it made sense.

In his diagnosis, he would try all types of equipment. I found out later that he already knew what was going on, but it was just more stimulating for him to make sure he was doing it right He would put the little gizmos in your mouth and talk about air pressure and talk a mile a minute about the speed of air and so forth. Then he had you play on the mouthpiece--I had never really played the mouthpiece very much although I had done a little because I had studied with [Bill]Bell years before. Bell was very keen on using a cutaway or a glass mouthpiece so you could see what was going on. Jacobs immediately provided me with a visualizer, it was $5 I think.

Jacobs talked about air flow, lips vibrating, and the Song that you had to produce. Then he made it clear: "I am going to have you do some things which, away from the tuba, because we have to have change. We have to have change away from the tuba

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because as soon as we pick up the tuba, years of habit completely come into play. That is what the mouthpiece is for. These exercises are to be done away from the tuba."

After the initial lesson with Mr. Jacobs, did the lesson format change?
What do you remember him focusing on in the earlier sessions?
Was there any change in his approach to you in the later sessions? Could you elaborate on this if possible?

» (RA) I wouldn't say that quite frankly [that there was any change to his approach]. My best recollection was to come in "Oh hi, Rich, come on in, warm up" That was basically the first words as far as the lessons go. I would start playing... I would either play some melody or a scale and almost always, that is when the lesson would start. Three notes after I started the warm up he would say, "Okay...Wait!" He would get you on one of the breath machines or he would try to change my thinking and put my thoughts on the music I was trying to create; not on a warm-up or a scale. He would then say "What do you have for me?" and I would open up to a Bordogni etude or a Kopprasch etude. Generally he would start with some sort of lyrical work and if there any issues, he would turn to certain things in certain books. He used the Arban's in particular, the Kopprasch, sometimes the Blazhevich etudes, of course the Pottag etudes.

» (NA) I should mention that when I first saw him I was thinking of going to Northwestern to do a Masters degree. He said "if you are going to be here all of the time, we can get into a routine but if you are only going to be here every couple of months, we can concentrate on basic production problems and whatever music you are working on." As it happened, my son was born and I got a job instead of another music degree. From Calgary and later, from Ottawa, I would drive down 3 or 4 times a year, stay a week or so and go home and practice like mad. My lessons varied in terms of emphasis but he was always very fussy about the sound, the intonation, the volume, the articulation and, of course, the music. Because I had been a tight player for so many years my high range was awful and I had difficulty slurring wide intervals, especially going up. We spent a lot of time in the Schlossberg and Arban's for the basic stuff, but he challenged me with difficult etudes from trumpet and horn books as well. I did tons of buzzing and developed a very good sound on the mouthpiece. I'll never forget the sound he made on the mouthpiece and on the cutaway rim. That kind of work sorts out a lot of difficulties so that when you get back to the horn everything is more focused.

A lot of people think that Mr. Jacobs was only good for developing good breathing. With me, it was always about music, even in the first lesson. I sounded bad, but he was still talking about music straight away; that is the way he approached everything. I would play an excerpt for him, say, Bruckner or Mahler. He would be very picky about the nuances, about the different colors of the notes. Did they all ring? He was fussy about note values, articulations, and especially dynamics. He made me play very

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softly, he would want me to play very loudly as well but he was really expanding my dynamic range a lot. He would say: "That's too loud, too loud...softer!" In order to get me playing louder with a good sound he would tell me to add tone as well as air speed and to imagine the kind of sound I wanted to produce. I could never get away with just blowing hard and hoping for the best. The tone always had to be good. He would play a lot; the best thing he ever did for me was to play because I never have heard a sound like that. Imitation is a great tool for learning. We do it from birth. Even though I don't sound like him (nobody really does), I was able to pick up on the idea of resonance and liveliness of tone and to work towards my own ideal of sound. It is possible to make even a simple breathing pattern sound musical if you imitate his example.

I think that everyone from time to time does a bit of forcing, and I think that was his main concern with me. I was 25 years old when I first saw him, and I had been playing in bands for 8-9 years with a lot of bad habits. One of his famous sayings was that "I don't want to change your old habits; I want you to start to think about some new ones." Of course, every once in a while, in the heat of the moment, we all start to push it a bit and that beautiful resonant quality goes. I remember thinking, the first time I heard the Chicago Symphony Orchestra, that if you are not producing a sound properly you won't last a week in a section like that. Even when I went back to see him later on, after I had begun playing with the National Arts Centre Orchestra, he would often begin the sessions by working on opening things up again, more airflow, lighter articulation etc. The little "t" and the big "HAH." I remember in one of the very first lessons he said to me: "The tongue can be a villain." A lot of players use too much tongue. They rely on it to get the sound started, forgetting that it is the wind that makes the lips vibrate. A too-present tongue also interferes with airflow and can lead to tightness elsewhere, such as a stiff embouchure and a closed throat. Bad news, in other words! He always worked a lot with clear speech habits to produce good articulation and to keep the airflow loose but well focused. All of my lessons had elements of basic production techniques. It's something I stress in my own teaching. Whenever players come to me with problems it is almost always a basic technique that needs work or reinforcement.

» (MG) There wasn't a real strong curriculum in his lessons such as: this week we are going to do scales, next week we will do articulation, the following week, and so on. He assigned you things based on the perception he had of your problem areas. He assigned you things to improve them, to make them better. Out of that, all the bases were covered over time. We did work on some scales over time, and we did work on articulation and note lengths and tessatura and phrasing all those things, stylistic things. All of those things were covered but not in a nicely packed syllabus where week one you will do this, week two you will do that and etc. It was sort of making the rounds of how you were doing based upon how you were doing at that particular time.

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» (GI) I don't know about a format in the lessons. At first he would always get me to do some buzzing, then I caught on to that and I started doing some buzzing in the hallway before the lesson started... disturbing the student that was in there before me! So, my big thing when I went to him was that I was very tight, very stopped up and basically the procedure was he would give me things such as buzzing on the mouthpiece, in an effort to get me to just let go. I remember a lot of time spent just on the first page of the Arban's book -- the whole page. He did suggest to me that I sit in front of a mirror and play it. I used to let the corners [of my embouchure] go in trying to get this big sound. I completely misunderstood how to do that.

His approach was never to say: "Ok, do it like this." He wanted to inspire me by talking about sound and the ideal, and what I should be trying to match. He did give me a few pokes here and there in the belly, and explained how to take a deep breath. I was pretty messed up and every time I did take a breath it was full of tension - it wasn't easy. We were really dealing with a lot of basic things right up until Christmas time.

» (RM) In the first lesson he had me work on one specific phrase from the third Rochut book. I remember very specifically this one phrase that I then played over and over and over for a good ten or fifteen minutes. He had me play it over and over trying to get the same sound on every note. He would play it, then I would play it. Finally, he was happy with what I was doing and then I played some more etudes. Then we came to something with some fast sixteenth notes and he had me stop and make sure that I got the same tone on the sixteenth notes and thirty-second notes as I got on the whole notes; to make sure that there was no degradation of quality. We worked on that for a good part of the lesson if I remember. I had my Kopprasch book with me, and he assigned first number 21, then number 20. He had me do number 20 very slowly, with an eighth note pulse. I remember I played that for him in a later lesson, and he left to go to the bathroom--while I was playing!! He had me playing it so slowly that I wasn't done when he got back! His studio was on the 4th floor, and the bathroom was on the 5th floor.

Very early on we worked on two sections in the back [of the Arban's], this "Tonguing as Applied to the Trombone" [which is page 200, #135 through #145 in the bass clef book]. All of these were to be played single tongued. He was comparing the big "T"and the little "A" to the little "T" and the big "A" with an "H" on it... with a little of the "H" consonant along with it. We worked on these a bit fairly early, it wasn't the first lesson, it would have been the second or third. More importantly, we worked on these exercises in the back of the double-tonguing section where he had me doing these double-tongue exercises but playing them very quickly but single tongued. He circled from page 190, #98-105 for me to work on.

I remember that in that lesson going back and forth between playing it, buzzing it on the mouthpiece, playing it, buzzing it, etc., until I could get the same tone on each note. I went home and I practiced these things for months until I could just pick up the

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tuba and do it. These are great little exercises, these eight. That took up a good part of those early lessons. Also in the very first lesson, he also assigned the very first one in the [Arban's] book. He asked me to memorize and play every day this simple whole note study because Bud Herseth played it every day. It was a great revelation to experience getting this really great sound on all these notes, and then to get that sound on other types of music. I do recall being a little surprised to be asked to play such a simple little exercise, which was what nine-year-olds practice to learn their fingerings. But very quickly I realized how much easier it was to learn to play with a great tone when there were no technical encumbrances.

» (CS) I can tell you that my last lesson with Jake was the day before I went to the Israel Philharmonic. I was feeling really great, as we were going to be playing Mahler 9. I was sounding really good and I knew that if you went to see Jake and you had been playing the F tuba sixty-two percent of the time the day before, you would sit down and he would say "you've been playing the F tuba?! You have been playing these drills haven't you?" He always just knew.

I went in and I knew I had been doing really well and I played, and it was the same. He was fixing all of this stuff and he was really concerned. I was a little angry because I needed a confidence boost, and what he basically told me was "Charlie, you can play better than that..." To look back on that and to have had him said that to me, that is amazing. My last lesson was "Sounds good, but you can sound better..." and that was true.

I remember one time he played for me in a lesson--it was at his house in his living room, and he took my tuba and he was pretty old and it was hard to hold the tuba. You could tell, he was wheezing a little and it was clear he wasn't feeling well. So he took my tuba and he hadn't been playing, and he played a G. It was the most beautiful G I have ever heard in my life. He couldn't play two of them, but it was the most [wonderful sound]. Whatever he was trying to tell me; me being satisfied with the sound I was getting, I shouldn't have been. There was something that I should have been working towards.

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II

MATERIALS

Most important to this research is the materials that he assigned to his students. If you can be specific, it would be most helpful. What materials did Mr. Jacobs assign to you in your lessons? If we could answer these in terms of: Etudes (specific methods and numbers if possible), Exercises (i.e. Buzzing, Long tones, Scales, etc.),Excerpts (orchestral or solo), Solo works.

» (CS) I remember playing a Rochut and him saying that he didn't like them: "I am the only brass teacher in the world who doesn't like Rochut's".
DK: Did he ever say why?
(CS) He felt that the phrases are too long. I am not sure if he said it then, but I understood this over time. It is nice music but the phrases are too long except for an advanced player. They are a good challenge, but for a younger player you have to shorten the phrases so much to get a good breath, that it doesn't work so well. You need to find simple music that the phrases are not so long, things that you can make music on. I probably played the Kopprasch with him, as I seemed to play that a lot at the beginning. I believe I already had the Hal Leonard book and that to me is such fundamentals of playing. I remember playing #20 (in the Kopprasch) which in D in the Hal Leonard. #21 [in the Kopprasch] has been very fundamental to my playing. It must have also been for Jake, I guess he liked to hear it a lot. #25 made it into Hal Leonard [as well]. Those [etudes] were very fundamental for him.

He would also jump around a lot [through the etude books], that was intentional. He didn't think that you should progress from the front to the back of the book, almost never. Maybe that is the idea of not being finished. You got the feeling that maybe he didn't have a system, that you were not going to cover everything, because he really dealt with you in that moment. How you were playing that day, what you needed to work on, how you felt. The thing about him was he really believed in treating you, teaching you like an individual. That is something that I believe in **with** my own teaching. That is why there isn't one way you work through a book. [You] work at [their] own pace, people had different things to address. He didn't talk about having problems he just talked about habits. That is why [I believe]he would jump around so much.

» (RA)We did a lot of work on the studies that he had in the Hal Leonard Book. The scale etude, the melodic scale etude that goes through all of the twelve keys, and the various warm ups. He would always talk about phrasing. For my particular size he would phrase it [the etude] 3 beats + 2 beats, and etc. and then strive to keep the length of the

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line going, the interpretation. Even though it is just a scale pattern, [he wanted us] make great music out of this simple music. We spent a lot of time I recall with the 1st page [played *forte*] the Arban's book. This was I recall, one of my first lessons with him. I came in wanting to play a lot of flashy stuff for him and he would sit and listen and then he would simply turn to the book and say "Ok, play number one..." And I was shocked because, whole notes, I can play whole notes! But I couldn't. He had to bring me down to earth, to get me to work on simple, ultra simple music in order to accomplish the physical things I needed to accomplish in order to become a better tuba player; to get my breathing together and stuff. [I played these at a]very slow tempo so I could focus on getting a big air column, a big air stream and focus on tone; my sound was somewhat small when I was younger.

He also assigned #'s 24 & 26 [pg.99 & 100], the *Grupetto*, and some melodies in the back. Later of course we worked through much of the Arban, practically the whole book at one time or another. Kopprasch: most of it, particularly #'s 5, 7, 10, 12, 14, 17, 18, 20, 21, 25, 27, 34, 35, 40, 41, 44, 48,49, 52, 53, 54, 56, & 58. Pottag: pg. 13 (the Corelli, Rameau, Gluck, were to be played as a suite), pg. 24, 25, 28 (#20), Mozart 'Concert-Rondo'. Book II: pg. 185, all the Mozart concertos, others. Blazhevich #42, and some others. Walter Smith *Top Tones for Trumpet*: #1, 3, 13, 17, 23, others. Charlier (for trumpet): #1,2,3,4,6,8, the Pasquale Bona *Rhythmical Articulation* 67, 68, 74, 86, 88, 90, 91, 92, 93, 94, 96, 98, and some others.

We did a great deal of buzzing, worked through all the standard orchestral excerpts. As far as solos, we looked at the Vaughan Williams. *Concerto*, Hindemith *Sonata*, Hartley *Suite*, Persichetti *Serenade #12*, Claude Baker *Canzonet*, and many other works.

» (NA) We started with the Arban method. Under the general heading of tone, airflow and articulation development we used pp. 16-20 (ex. 24-46), pp. 24-36 (ex.7-38), pp. 39-41 (ex. 1-15), pp. 179-181 (ex. 98-106 and pp. 188-189 (ex. 135-140). Around the same time he would have me play the exercises in the back of the Hal Leonard Band Method. Soon afterwards we got into the Schlossberg method. We spent a lot of time on p. 12 (ex. 44-45) because I had a tough time on big slurs, especially into the high register. We played them in different clefs and octaves, just to make life even more interesting! Other Schlossberg exercises were along the same lines as those in the Arban's. Some were more difficult. They included: p.7 (ex. 26-27), pp. 10-11 (ex.36-39), pp.14-15 (ex. 49-53), pp. 23-26 (ex. 70-81), pp34-36 (ex. 97-101), p.48 (ex. 128), pp.50-51 (ex.133-136) and p. 155 (ex. 145-146). We also did some work in the Pasquale Bona Book of Rhythmical Articulation.

I spent a lot of time on the first studies section of the Arban method. He had me slur all of the exercises on pp.16-17. In Ex. 24-26 he had me drop the last 3 notes of each 4 bar phrase so that I could use up plenty of air making a smooth slur with a full sound and then take a slow, full replacement breath over 3 beats (or 2 beats in the 3/4 studies).

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He stressed a vocal approach to these exercises. He sang them for me in a rich, full voice in order for me to get the idea of the style he wanted. He had me sing and buzz them, pronouncing a small "t" and a big "HAH" to open up the sound. I still have his drawing of those letters coming out of a trumpet bell that he scribbled at the top of the page. Because my airflow had been tight, both inhaling and exhaling, he really encouraged short phrases with plenty of sound. "Don't be afraid to waste the air. It's free." I wonder how often he said that! On the next page he had me doing similar things with Ex. 28-30. I breathed on the bar lines and tried to produce a very full, resonant, singing sound on each bar of music. I sang and buzzed these exercises too. He stressed the importance of rib-cage and diaphragm collapse in these and other studies in an attempt to prevent tightness and forcing of the tone. He wanted more air flow and less air pressure in my tone production.

On pp. 18-19 (ex.36-40) he was more concerned about articulation. He wanted the air to be fast at the beginning of each note and the tongue to take a subsidiary role. Again, the air flow was of paramount importance and he would check my body for signs of rapid movement, especially collapse, while I was trying to blow as freely as possible. He emphasized the use of the tongue for clear speech and the importance of the vowel sound combined with plenty of air flow. He wanted the short notes to ring with plenty of tone color. Overuse of the tongue kills the sound. Again, he sang and also played to illustrate the concept of lively tone that he wanted. On page 20 (ex. 46), he asked me to play with very fast air, minimizing the activity of the tongue so that each note would ring with considerable resonance and volume. He was not concerned about tempo or rhythm particularly, but wanted every note to jump out of the horn. He also wanted the pitch to be clear and accurate through all the key changes. Needless to say, I buzzed these notes as well. He also wanted me to collapse the lungs quickly as I blew so that there was no unnecessary tension, either in my body or in the sound.

I did the syncopation exercises on pp. 24-25. His main concern was for me to produce an effortless tone along with clear articulation. We used breath patterns on these studies in order for me to keep the concept of a quick collapse in the forefront of my mind. Breath patterns are also useful for energizing the sound and rhythm of any piece of music. He played the studies so that I could imitate his resonance. The syncopation was really a device to encourage extra wind on the stressed off-beats. He didn't want me forcing the sound or volume at any time, naturally. Over the page, the dotted rhythms provided more opportunity for him to stress the importance of air and articulation on the short notes. He really emphasized the importance of this rhythmic pattern whenever it came up. He was so concerned about the 1/16 notes sounding that he would often have me begin on the short note (as in ex. 15) to stress the importance of the first note in any phrase. He used to say that the first note of every phrase was the most important because it had to "teach" the rest. He told me to buzz every note with lots of vowel to keep the sound open and resonant. "Get set before playing; make every note definite, round and full. Don't leave a note until you've got it cold–in time, full and resonant." Also:

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"Maintain the volume on short tongued notes. It takes more air to maintain the same volume on them as it does on the longer ones."

Whenever we discussed articulation he was always more concerned about the vowel than the consonant. The tone quality was always the most important consideration, however short or fast the notes were. He stressed the importance of the imagination: "Let the brain produce the sound via the tissues, not the other way around. Be aggressive about the first note in every phrase. Make a statement; don't ask a question!" And: "Be an actor. Play to the audience. Don't analyze while you are playing; analyze later. Deliver a message vocally and the chops and the instrument will respond to the message. The approach should never be tentative. Sing immediately and make the muscles, air and instrument an extension and amplification of the brain's initial concept of sound." "Paralysis by analysis" was one of his favourite expressions. He didn't want you worrying about the process while you were playing. He wanted you to perform first and analyze later.

At one of the earliest lessons he had me look at the Arban *Grupetto* exercise on p. 99 (ex. 24). First he sang it. Then he had me sing and play it. He wanted me to sing and play with abandon, to really open up emotionally and express myself musically through a resplendent tone and style. His voice was so magnificent and he was so uninhibited, that it was impossible not to respond in kind, however feeble my first efforts were!
The Schlossberg exercises on pp. 24-26 (ex. 76-81) were used as an extension of the Arban articulation studies. The Schlossberg exercises cover a considerable range and are more technically difficult. Mr. Jacobs started at a slow tempo. He wanted the notes to be clear and full, as usual, and wanted to stabilize my embouchure so that I wasn't leaping for the high notes and lunging for the low ones. These exercises are very useful for bringing stability to the chops over a wide range. He stressed air flow so that I wasn't hung up on just getting the notes out any old way. I had spent a lot of time on the earlier Schlossberg exercises (pp. 12-14) so that these fast arpeggios were not as scary as they otherwise might have been. In my early playing years I had tended to choke off the sound when approaching the higher register. These exercises combined with the non-stop emphasis on basic tone production enabled me to open up my sound considerably and to play with a greater confidence and flexibility. We also spent time on the Arban exercises on pp. 179-181 with the same ends in view.

The trumpeting exercises at the end of the Schlossberg book (ex. 149-50 etc) were really an extension of the articulation studies mentioned earlier. This time he wanted me to think stylistically more like a trumpet player. He would often say: "Don't be afraid to make sounds characteristic of other instruments." He was always encouraging me to think about different colours and styles before just blowing away. The thought and concept of sound always had to come first with him.

We looked at quite a few of the studies in the 2-volume Pottag-Andraud horn collection. His main concern here, apart from the never-ending quest for perfect tone production, was the development of style. He always invested tremendous energy and

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verve into these studies. Lots of singing and dancing. #17 and #46 by Gallay illustrate some of the things he was most concerned about. He was always extremely fussy about dynamics. He wanted the note lengths to be correct; he wanted every note to be important--to sing. Above all, he wanted an extroverted sense of style. The Paudert study (#90 on p. 108) was a perfect example of his insistence on quality in all things. He played it first. I thought he was showing off a bit. Then I played it. I was quite proud of my technique and sight-reading and thought that I had impressed him. No such luck. He took me to task for everything: lack of clarity, non-existent dynamics, inconsistent sound, you name it. He made me aware, in no uncertain terms, that my concept of good technique was incomplete. Musical ability involved a lot more than a fast tongue and nimble fingers. It was a great lesson for me. It made me realize that the quest for perfection was never-ending. As Robert Browning wrote: "A man's reach should exceed his grasp."

Kopprasch # 21 has become a particular favorite of mine since Mr. Jacobs first introduced me to it. It covers articulation, range, tone quality, intonation and legato playing all at once. It can be played in any key and you can work on high notes and low notes that are causing problems, always in the context of a simple, technically undemanding format. It gives the player a great sense of the pitch relations between the notes of every scale. We began by vocalizing each 2-note fragment. Mr. Jacobs suggested first that I sing "HE-LLO", to give me a sense of the movement of air and tone. Then we worked on maintaining the consistency of the vowel sound from one note to the next. It's a great concept to bear in mind when slurring over small or large intervals because it keeps everything open. At first glance, the exercise is pretty straightforward, if not actually boring. It is a tribute to his genius and inventiveness that Mr. Jacobs was able to stress the significance of all aspects of tone production in such a simple but musically interesting way.

In my first lesson he buzzed "Pop Goes the Weasel" on the mouthpiece for me. It was one of his party pieces. He told me to play everything on the mouthpiece. Play boisterous tunes, play marches. I had just spent 7 years in an army band; so I knew lots of marches. I had never buzzed the mouthpiece in my life. Perhaps I may have made a few random noises. Even now, people make noises on the mouthpiece, but when he played the mouthpiece, he made music with good pitch and a great sound. He expected you to do the same. There isn't an exercise, excerpt or solo passage that I haven't buzzed. He was always working on the sound. He was very fussy about the kind of sound that you were getting at the beginning of the note. You know how he played; there was so much presence at the beginning of the note and that's what I didn't have when I first started. I'm still working on it! He was always trying to get more action, more tone, more wind movement at the beginning of the note. All of these exercises stress the importance of airflow combined with tone quality.

A lot of his students, myself included, thought they had pretty good technique until they met Mr. Jacobs. He used to drive me mad. He introduced me to Walter Smith's book, Top Tones for the Trumpeter. We spent time on numbers 1, 2, 3, 6, 7, 14, 18 and

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23 and he encouraged me to look at the rest. The first time I saw the book he asked me to play #23, which is in 6 sharps and treble clef, of course. I thought I was sight- reading it quite well under the circumstances but he harangued me about the wrong notes and lack of musicality. Every note had to be clear and musical. The other studies we did are not easy either, but he was just as fussy with them. He certainly raised the level of what I thought good playing was. I have to say he put his money where his mouth was too. He could certainly play them with style and clarity.

I think we played all of the principal orchestral excerpts at one time or another. We played around a lot with dynamics, colors and articulations, switched octaves etc. He really approached everything with the same degree of commitment, whether it was a simple exercise or Mahler 5. EVERYTHING had to be right. Solos we worked on included the Vaughan-Williams Concerto, the Persichetti Serenade and the Strauss Horn Concerto #1. Now that I think back, we really got through a lot of stuff! The faster the passage, the more particular he would be about clarity and tone quality. You could never just whip through something, smile and say what a good boy am I! He wasn't having any of it if it wasn't close to perfect.

» (MF) Mr. Jacobs would always have me play a scale first and he would remind me that "the scale should be played like it is a part of a piece of music, not like you are testing the horn out." He would then have me playing a variety of etudes out of the Arban's method, the Schlossberg, *Top Tones* and the Pottag books. He recommended that I should be playing the music written for the French horn, trumpet or other instruments because the music for the tuba has a limited ability. He believed that the performer, especially the tuba player must expand their understanding of music and learn the ability to create music in all styles. Learning stylistic music is the key to becoming a good musician--this comes before being a good tuba player.

We worked a great deal out of the Arban's book, doing the First studies and that entire page. The reason why he recommended these was to learn tone quality, to get the best sound you could. People can learn the best sound by playing these everyday. We need to pay attention to making sure that each note that follows is the same quality--He used a metronome, and he believed that with using the metronome we have to sing . I think he learned these exercises from his teacher Donatelli. We also played the MAJOR SCALES, only without the staccato. He wanted to hear only tone, he did not want to hear the attacks. I think the reason why he said to me don't think about the beginning of the tone, that was chosen for me--I don't think he said the same to everyone. I think because the Japanese (language) has a very strong T, we tend to think about tonguing and the beginning of the tone, and then we forget about the sound and it gets worse. So, he had me just think about the tone quality and forget about the attacks.

Also #57 on page 168 (triple tonguing section), 60, 98,99,100,101,102,103,104. Also Mr. Jacobs played all of the melodies and all of the Theme and Variations. We did a couple from here, like show tunes--he loved tunes.

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We also used *Tunes for the Tuba* by Swanson. We played the Washington Post and many other tunes that he knew very well. We played out of this book because I had a really hard time with my ear problem, and because these pieces are already programmed in our brain, I did not have to think about the music so much. So he would have me play these melodies, like the *Reveille*, *Taps*, and *To The Colors*. The main idea was to get me to Sing the song; this is a great book.
DK: With you it must have been more a challenge because you didn't now so much of the music that he taught. How did he address that, did he sing it to you?

(MF) He would sing it to me and if I said I didn't know it, he would just have me attempt to sing it. He would have me just put down a finger (valve) and play it. At that time I was so worried about the air and how I should be playing, I never thought about singing. That is why he wanted me to sing everything first.

» (MG) We worked out of the Pottag books [both the] the blue and the red; the Arban's treble clef, the Schlossberg in treble clef, the Bona, the Charlier, and Top Tones if you were making progress. He had of course his book, the Hal Leonard , the Rochut stuff was also pretty popular. He would always lament how trombone players were always bringing in Rochut's: "Rochuts...It's always the same thing, can't they play anything with different articulations?"

I think a very memorable time for both of us was, I was in my Romantic history class and I was really taken with the Schubert's *Erlkönig*. I said that I would really like to put this on a recital, and he said, "Well, you should." He was very familiar with the *Erlkönig*, and being a singer, he was very astute in his observations. I think he really enjoyed working on that with me and I think that we made some real progress on it.

We worked on the Strauss *Concerto #1*, of course the Vaughan Williams, [and the] Hindemith as well as many other things such as *Adagio and Allegro* [Schumann], Wagner songs, a little Mozart, things of that nature. He was very good, a wonderful stylist and interpreter and teacher of music and this is one thing that I think gets obscured in his legacy.

» (GI) I played a lot of tunes out of the back of the Arban's book I remember, the melodies. I also played in the Red Pottag, #'s198, 199, and 200. The reason that he got me to do these, and I remember why we did these things from the back of the Arban's book, is that he was trying to get me to interpret because not only was I physically tense and tight, I was also musically tense-- I didn't really play as expressively as he wanted me to. Those were the ones we worked on, and of course a year just wasn't long enough. I remember that when the end of that year came along I wished that I could have stayed longer.

[I played] Kopprash, I did a lot of that with him. He liked the Hoffmeister version. It was in bass clef, and #15, 10, and all of the adagios were his favorites. Of course many

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of these are in the Hal Leonard [book] from the Kopprash. [I didn't work on many] of the fast things, again I think he was trying to get me to emote.

[Out of the] Schlossberg I played the Bruckner one (#30). First of all, he had me playing the scales at the middle of the book and just the quarter note ones, not the fast things (page 28) and #81, 89. Another one that was a favorite of his was #45. It is in 3/4; he would change it to 4/4 and add a quarter rest. And in #47 and #52, he would get me to play them backwards as well as forwards. Start at the end and go backwards so you could go either way playing, jumping down as well as up.

» (RM) I worked on #19 (page 28 treble clef Arban's) and I know that we worked on all of these, pages 35-38, inclusive. Each one of those has its own little challenge, again it was for the tone, specifically for tone in articulated work, getting the same sound when you are articulating as when you are slurring. He would have me slur them, tongue them, go back and forth, and again between the mouthpiece and the rim, and the tuba. Probably one of the most important things he ever assigned me are here in the "Studies for the Slur." He specifically assigned numbers 6, 11, 12 and 15. All of these I worked on for months. I feel that these are some of the most important ones in the book for many reasons. One of the things that he was explaining here was the development of the protractors and retractors, the tiny shaping muscles of the lips. By practicing those etudes for tone, specifically for tone, and getting the most beautiful tone possible and slurring to another note, ascending slurs is where you really develop that. That is why he assigned these very specifically. They are also wonderful ear training exercises; he gave me one specifically in thirds, fourths, fifths, sixths and sevenths. I think it was secondarily for ear training, to tune all these intervals.

[Solos] I remember my second or third lesson, playing some of my recital material for [Illinois State University]. I played the Bach *E flat Sonata*, I specifically remember in the third movement missing the first note. This is where he introduced the concept to me of pressing down the valves before I began which brings the sound into your head. That is where I learned that-- specifically on that entrance. I also played the Gordon Jacob *Tuba Suite*, and he wanted to hear a movement titled "Jacob's Dream", and he made a little joke about its title. I played the Hindemith *Sonata* at my very last lesson with him a year before he died, and several other solos. Any time it was a solo that he didn't know, he generally didn't want to hear it. He generally didn't like to hear things that he wasn't familiar with it seems. In my Masters recital, I played the Strauss Horn *Concerto no. 1 in E Flat*. I had already worked it up and played it before I studied with him. I remember him specifically also asking me to work up the Haydn Trumpet Concerto to develop a sense of lightness. He generally assigned very specific little aspects of solos or drills to improve some detail of my technique. He would also have me play orchestra excerpts to work on style, interpretation, and to generally try to raise the standard of what I would accept from myself. I did play the Vaughan Williams *Concerto* for him and I definitely played the *Blue Bells of Scotland* for him. I remember him being

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angry with me because I was playing it so fast that it was just kind of a blur, which to him meant it was just being faked. That would really upset him, especially if we just finished doing something with great tone and then I wanted to play this which was just a blur. I remember him specifically saying "A great artist like Herseth would never play it like that..." He would very often relate anything having to do with high standards back to Herseth.

» (CS) There are these scale etudes in the Schlossberg study. I remember that we would play #99, then 100, but you would play the first line of 99, then the first line of 100--then the second line of 99, then 100. It is the same key; I think that he could have written it out but in the lesson he would flip the page. He had that manner. One of the things that he told me was that when you are teaching, you want to use a lot of body language, you want to use other stimuli other than just sound and that reinforces what you are doing. It is funny, I can still remember him doing that [flipping the page] and it helped. I think the fact that he talked about it made me remember it even more. He would always stretch his arms out and move around a great deal.

[Solos] I remember playing the Mozart *Concert Rondo*. I had studied this a lot and listened to many people like Dennis Brain and Barry Tuckwell. Jake said to me "Why are you playing that way?" I told him that I had listened to all these recording and he said "now Charlie if you are really interested in having an authentic performance you shouldn't play it on the tuba. So if you are going to play it on the tuba, play it..."

(DM) The only excerpt I ever remember playing was *Meistersinger* but most of the time it was just the "nuts and bolts" of playing. He said to me he so very seldom had a chance to teach music that: "I am a qualified music teacher, and hardly anyone comes to me for a music lesson. Everyone comes to me for remedial work," and he accepted that as his lot in life but there were those moments where someone actually came and worked on repertoire.

The next areas are of considerable interest to this study as Mr. Jacobs has stated that his training and advancement was due to his ability to learn "by ear". Was there any time when he suggested that you experiment, or practice: Drills based on improvisation, Academic pursuits; Composition, theoretical investigations, Listening assignments?

» (DM) No. The vocal thing was always there all the time and that of course was an inspiration but I have always loved to sing as well, as part of my learning and as part of my teaching. I can actually say that I don't learn a piece of solo music without learning to sing it as well. So if I have a passage like in the Limpid Stream, I can have it figured out, I figure it out vocally. I have immediate success on it vocally and then I imitate it on

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the instrument, and that is much easier. It was always an important part of the lesson because he always sang with that most amazing voice…it had so much resonance.
DK: Did he ever mention any books that he was reading?

(DM) No. I never saw that. The only diversionary thing that I saw him do was that he was crazy about the Soaps. His wife was crazy about them too. And there were televisions in every room including the bathroom. So you go into the kitchen there was a portable, then in the living room there was a large one of course, and then there was one in the bathroom so if you had to go to the bathroom, you didn't miss anything! The TV was always on.

» (RM) Yes, on the mouthpiece-- when he found out, maybe in my second or third lesson, that I was playing in a Dixieland Band at Great America, he asked me to improvise some jazz and he would snap his fingers along on two an four. He would occasionally have me improvise some other things just to get the sound of a beautiful melody. I remember playing in the basement of his house the horn solo from the slow movement to Tchaikovsky's *Fifth Symphony* a few times... It was the same lesson that I was working on the *Ride of the Walkuries*. He was relating it back to a beautiful tone. Also in a couple of lessons, he was teaching me to push my mid-range tone up higher, to extend my midrange to above the staff, he had me play the Bach *Passacaglia in C* from memory. I remember being asked very often to play excerpts from memory, like Bydlo. He expected me to know all of my excerpts from memory. At my final lesson with him he had me play all of the standard orchestra excerpts from memory.
DK: Any academic pursuits?

(RM) Nothing ever required a lot of thought. Everything was about, was always brought down to "This is simple". Never analyze this for a minute. Any time I mentioned any passage ever being difficult, he would tell me "it isn't at all difficult." He would often then play it for me to let me know just how simple it all was.
DK: Listening Assignments?

(RM) No, never. The only assignments he ever gave me were specific drills and etudes. While I was in graduate school he would assign etudes from the Smith "Top Tones for the Trumpet" every week. The only listening assignment he made was to listen to his tone as he demonstrated for me.

» (NA) No, he never did anything specific. But once, amazing though it may seem, I had a lesson at his house at 9.30AM. I had been there the night before and I left my horn in the basement. In the morning he asked me to warm up. I began on some slow flexibilities. He stopped me immediately and told me to warm up musically. Play some tunes. I played the soprano aria from *Gianni Schicchi* and that pleased him a lot. He told me that he used

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to play *Un Bel Di* from Madama Butterfly when he was a kid. Within a few minutes I was playing loud and high. So much for the long warmup! He wanted me to warm my brain up as well as my chops. Professionals don't always have the luxury of a long warmup. Just buzz a few notes to wake up your face and get on with it! From then on I always tried to start a session in the same way, with a song or an aria. It might be Puccini or Gershwin; he loved it all.

I remember once, early on, I was having trouble with some high notes. He said: "Play the horn solo from Tchaikovsky #5 and start on your high A." He would often have me play hard or even unfamiliar passages in different registers, different keys or with different rhythms just to get the brain more involved. Before you know it the high range is singing and the fingers are working because the brain takes over. You are thinking musically and not technically. It's what the great jazz players do all the time. This strategy works well for the low notes too. Tuba players often tend to wallow in the low register, trying to make it lower and darker than it already is. I remember working on the *Ride of the Valkyries* on a monotone, playing all B's or low F#'s in attempt to imitate his buoyancy and lightness. It's going to be big and dark anyway! He would very often have me do something unfamiliar so I wasn't thinking about fast, high, low, 5 sharps or whatever!

DK: Any books?

(NA) He never specifically quoted from any of them. However, I suspect that he was into the *Inner Game of Tennis* when I first started because most of what he taught me was about product. The process was important too, of course; I had a lot of catching up to do. But he talked about the goal a lot. "Always have a target for the wind, a target for the sound." The product might be the movement of a ball or a needle on one of his gauges or the imitation of his sound. I have just been reading a golf book that talks about these techniques as well. It's called *The Inner Game of Golf* (written by the same guy). According to the author there is an instinctive self and a critical self. The main thrust of the book is to develop the primacy of the instinctive over the critical. The critical self is always telling you why you can't do something or what might go wrong. It sets you up for failure. The instinctive self needs to be encouraged, like a baby learning to walk. Of course, they fall down occasionally, but eventually they figure it out. The message is: don't worry about the process, go for the product. It releases your imagination. Don't worry about the feel, don't play by feel , play something musical, sound great, imitate that sound. Bingo!

» (MG) Well he would encourage you to, I remember in the Mozart *Concert Rondo* with the cadenza, he did mention something about constructing my own cadenza [...] there was some of that, but not a lot.

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III
PEDAGOGICAL TOOLS

As you know, an important component in Mr. Jacobs' teaching was the stimulating of as many senses as possible to create stronger memory recall. His use of technical apparatus to stimulate other senses, namely sight, was quite progressive and effective. I am assuming that he used some (or all) of these devices with you, could you explain which ones?
Can you describe these sessions and how they enabled you to understand his ideas?
Do you still use these in your own practice or studio?

» (CS) You know, my theory about all the breathing tubes and that stuff...I believe that he was doing a lot of this stuff to confuse you. You know there was all this stuff and then he would say, "ok let's play music." He would get you so that when you were playing, you were not playing the tuba the same way anymore. I remember him saying, "Don't think too much about these breathing tubes, and don't think. They are good tools but you are an artist, you are going to make music on the instrument". He didn't like for people to write stuff down, he really resisted people taping. He put a video recorder at the very end--- he was very hesitant for people to tape lessons. And near the end he decided that well, I am no going to be around forever, maybe it is good for there to be a legacy. I think his lack of writing stuff down, his hesitance of taping was that he felt that you shouldn't make too much of this, it was really intentional. It was a long process and you shouldn't focus on a snapshot, it is never that important. It is never the answer [that moment] and we are always looking for the answer, one answer.

I remember the second or third lesson you would get into gauges. You would blow into these, and I remember these were very difficult lessons, physically. I mean it was like being in a lab. He would say "Now when you are playing, I want you to see the gauge going to 10 or to 4, and when you are breathing in, see the gauge or ball move..."! Some days, he would test me with a peak flow meter if he thought I wasn't feeling well. He used the the breathing tube, the Breath builder© with the ping-pong ball. He didn't use the bags so much. I had a cut away mouthpiece but he was funny about that. I remember him saying that there were certain times that it was good to use the rim and certain times to use a cutaway mouthpiece; he didn't really explain that to me.

» (GI) I remember, and this would have been in a lesson that I was in with him before I was full time, the decibel reader [the Christmas tree]. Depending on how loud one played, the Christmas lights would stay on longer. Also I remember the TV screen, [Oscilloscope]. It was like a dead picture tube or something, and when I played loud the line got longer and when you didn't play loud, the line became a little dot. He also used the things from Radio Shack, the Decibel meter, to show me what I was actually doing. I

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had this thing where all of my articulations were quite loud and then the sound decayed; I didn't sustain the tone.

» (DM) He did have a lot of Decibel meters around. I remember that he had a rather sophisticated one in these days that cost like three hundred dollars, but you could go get something like it for a lot less at *Radio Shack*, and we all ran out and got them. It was the Christmas tree that I remember being one of the [most] useful tools. He had the decibel meters; he had so much junk that he would pick up anything and say "well at home you could use...this thing!" He had an old reel to reel tape recorder that was busted but the VU meters worked. You would plug in a microphone and [play, checking the meters].

I recall that he said in an early lesson to me " Now, play a low C and really *forte*.." So I played it strong, then he said "How bout a bit more forte", so I did. Then he said "have a look over there in the corner (the tree)" and he says "play me a forte!" So I played a really loud one and one or two lights came on. He says "can you make the third one come on?" So I just played even louder. Then he says "ok, let's do something else" So we tried a few more things, and then I played a *mezzo-forte* note, and he says "that's a nice note?" I agreed and then he said "take a look over there and do it again". Five or Six lights came on. That was the first time that he explained that "What it feels like and what it sounds like, and the sensors you have got don't always add up".

» (RM) He used the visual sense as a way to more easily convey an idea to a student, not for memory recall. He used his charming sayings, which often rhymed, to enable people to recall it in their memory later. He generally downplayed the importance of the "toys", not wanting the students to think about them once he had used them to enable them to produce the tone he wanted.

I remember working specifically with decibel meters and working through a half dozen or so mouthpieces to see if I could play as loud as I possibly could, too see which one could play the loudest; It was great fun! His decibel meter was a very large professional model, but he would occasionally drop it, breaking it, and then he would ask Jim Gilbertsen to fix it. He used a lot of things with me that I don't own and that I wouldn't use because I don't have the expertise he did.

I remember one lesson he had a little vacuum gauge, it was a little tube that was place at the side of my mouth to get me to move the needle over. It wasn't measuring me, it was inspiring me to inhale. It was a way to motivate me to do it right and see the difference between a correct and incorrect inhalation and create this tremendous vacuum. I remember one time blowing into the pipe, the pressure gauge (the negative and positive pressure gauge) which I rarely use now, that was just one time. The Decibel meter came out in lessons several times. Generally it was in buzzing the mouthpiece in trying to get more sound in buzzing. And you know I would be trying really hard and he would pick up his mouthpiece and BANG! It would be so loud, so musical, so beautiful.

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At my first or second lesson he measured my lung capacity. He didn't like to do this with very many people because he was running out of the little cards for measuring and he didn't want to waste them. He did ask me once to blow into the Peak Flow meter. At several of my lessons he was no longer really working on anything specific, we were just kind of experimenting with things. I think he realized I could cope with this, and so he would try new equipment out on me just to see what would happen. He received a B.E.R.P.® in the mail the day of one of my lessons, and so he decided to experiment with me. The result was that neither of us considered that the mouthpiece would now be an inch or so closer to my face, and I smacked the mouthpiece right against my chops. If he ever used that device with anyone else, he perhaps warned them first to be careful.

» (NA) In the early sessions, when I was spending a lot of time moving balls up tubes and needles across dials he would say: "Think about the needles when you play the horn. If you want mf imagine moving the needle to 3. A forte might be a 5, and so forth." I still have "think needles" written in the back of my Arban's from the first lesson. I spent a lot of time filling and emptying a 5 liter anesthesia bag (which I still own), working on air speed and large changes in body size. He used to say that "we have to build a memory bank of good sounds." In order to do that we would work with the machines, to develop a sense or memory of different airflows and speeds, and then he would play and get me to imitate his sound and volume. From time to time he would touch my neck, chest or abdomen to check for tension. He would take my hand and press it to his ribcage and demonstrate the tremendous movement when air moved in and out. He was a human bellows! Often he would blow air onto my hand, in order for me to feel the thickness of the air column (one of his favorite expressions). Sometimes he would buzz on a rim so that I could see his chops in action. Then I would try to put it all together. The various stimuli work in different ways. Again, it is your imagination that goes to work and you become less concerned with physical sensations. I would even buzz the mouthpiece or rim or the cutaway mouthpiece that fits your horn and try to imitate his tuba sound. Then, finally, on the horn the sound would often be magnificent. I suspect that most of his students have had the experience of making the most amazing sound without actually feeling as though they were doing anything, without being even aware of their chops. If it WAS good, he would say: "Remember that sound and try to reproduce it from your brain, not by feel."

Mr. Jacobs, as everyone knows, had a magnificent voice. Sometimes he would have me sing passages or he would sing. Then I would imitate the voice (his was usually better). In order to promote efficient articulation he would encourage me to use normal speech—a clear "TA", "TO", or "TOO" with lots of vowel. He was always trying to stimulate the imagination to the point where a great sound was just normal, as easy as ordinary speech.

Naturally I have used many of his methods, with great success. I never managed to accumulate as many gauges and machines, but I do use a sound meter to measure

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volume. It responds well to playing, buzzing or even blowing air through a straw. The student gets a readout and a visual stimulus. The tube with the ping-pong ball is useful for developing airflow in and out. Again, it provides a visual stimulus. I use straws to get students to focus air and have them blow at pieces of paper to demonstrate to them how the flow must be sustained. The straw works very well for students with articulation problems brought about by overuse of the tongue. I have had great success with trumpet and horn students working on small straws that approximate their airflows more closely. If they are tight we use big straws. Straws are cheap--almost as cheap as air! The B.E.R.P.® also works very well. You can play the horn and buzz at the same time. All of these aids can really help to develop an efficient and sonorous tone at different dynamics. They all stimulate the imagination. Problems can be worked on and solved away from the instrument. I have to say that my favourite aid, both for myself and for my students, is buzzing the mouthpiece and, to a lesser extent, the rim. The buzz, combined with clear speech (I call it speech therapy) has paid dividends over the years. If you are really fussy about the sound, intonation and clarity on the mouthpiece, once you get back to the horn most of the work is done.

I had a young student once who couldn't seem to play louder than mf. I tried everything. Finally I asked him to sing a note softly, then loudly. He did so. Then I asked him to play the note at the same volumes he had sung. He did it, with spectacular success. The great thing about singing as a teaching aid is that it doesn't matter if you don't have a good voice; all you have to do is try. It stimulates the imagination and breaks down inhibitions. We were both very impressed with my cleverness. Thank you, Mr. Jacobs!

» (RA) Most lessons (and I had many!) utilized one or more of his various apparatuses. The mirror was also a favorite, mostly to help create large amounts of change in the chest and abdominal area when inhaling and exhaling. There was also a wonderful, brilliantly conceived apparatus of his own design that incorporated two flow valves – calibrated glass tubes with a small metal ball inside to which he had rubber tubes attached. Those were attached to a "T" that allowed him to control the resistance as you would blow into a tube coming off of that. As you exhaled one of the metal balls would ascend, when you inhaled that ball would go down and the other would ascend. We worked with that one quite a bit and it was most effective for developing a consistent, voluminous air stream. He would vary the resistance from extreme to none, and also have me keep the balls at a certain mark for the maximum amount of time possible. I always wanted to have/make one of my own. We also worked with the original version what's now available as the "Variable Resistance Compound Gauge". I have one and use it often, with myself and my students. He would also use simple everyday items, for example; straws you would get with your soft drink, as learning tools. Breath through one, it would be highly resistant... cut it in half to make two or add another and you decrease the resistance, etc. By using many different items he gave the student a wealth of stimuli to draw from to try to reach the desired goal.

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Were there occasions to perform with him in these lessons? If so, what types of music did you perform together?
What did he play other than the materials you were specifically concentrating on?

» (RA) No, almost never. I do not recall ever playing a duet with Arnold Jacobs. And he would never play along with you on a given piece.
DK: Why do you think that?

(RA) Maybe he didn't wish to play along with people who were not at his level or, he was too busy teaching them the finer points to worry about playing.
DK: What did he play other than the materials you were specifically concentrating on?

(RA) Some, he didn't play a lot. He played sometimes to show off a little, which was always great. He would play melodic snippets, scales, triple-tongued arpeggios, etc. But he also played sometimes out of frustration because I wouldn't be getting it. He would take my horn and play and say "imitate this!" That was mostly in my earlier years of study. Later, he would sing a great deal, offering alternate interpretations, demonstrating various approaches to phrasing, etc.
DK: That's a good point, he would always play your horn..?

(RA) Oh yeah, and [he would always] sound great. And if I brought in my instrument , or another instrument and I would say that there was something not right, he would take the horn and play and say "Sorry, the horn is fine" And one time he made a really pointed statement, "No really the horn is fine, the problem is you!" He said those things when they were necessary and he was never abusive by any means, he had no reason to be.

» (GI) Oh yeah, he would often say give me your horn. He might have a York there, but he would often have a couple other horns that Miraphone left him. He would take my horn-- he didn't like my old horn, the one that I got before the Rudolph Meinl.

» (RM) Rarely. He did play for me at my first lessons, but I don't recall performing anything simultaneously. Later he told me that he would only pick up the tuba and play if he knew that he could do it better than the student in the lesson. He would instead ask me think about Herseth and about how well he would play something, and then ask me to play to the same standard. I was lucky, and performed many concerts with him, but we never played together in lessons.

(MF) Before I took my first lesson, the "Jacobs" style was very famous. It had a lot of buoyancy, vibrato, and always had very strong entrances. I had read an article about Mr.

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Jacobs and they had written that this was a very old American style. He played for me in my first lesson, but before he played he sang for me. I was really surprised, it was the exact same as his singing! He is just listening to his voice when he is playing, even the vibrato. I couldn't believe it--when I heard his sound for the first time I recognized that he was a brilliant teacher.

BREATHING

Understandably, most believe that Mr. Jacobs taught a majority of his lessons concentrating on breathing, and improving the respiration function of the player. In my opinion, this was a secondary issue in most cases with Mr. Jacobs approach, but I would like you to comment on this issue.

Did you work on some techniques for making your breathing more efficient in your lessons? Could you describe any of these?

» (MG) He didn't teach a method, he taught the student. If you didn't need it he didn't worry about it. For me I needed it, I came from that background of keeping my shoulders down and tummy tense and NOW BREATHE!! So, new habits had to be formed. There was the exercise: 5 counts in, 5 counts out, 4, 3, 2,1, etc...There was also the exercise: 1/3 where you would be extending your arm and he would say "now move your arm in 1/3 like a trombone slide", and then 2/3 and etc--correspondingly you would take a third or two-thirds of your breath, then he would say out one third, etc... You would become aware of what is a full breath. He would put you on the breath builder and suck air, blow air, keeping the ball up. That was the goal and by doing these things, you would get a sense of the physical sense of what a full or large capacity was, filling up your lungs because he said once you put this down [Breath Builder®], you forget about it. But when you go to order a breath, your brain has to know, has to have a reference point of what is a good breath [is] and if you have been substituting a half breath for a whole breath for your whole life, then that's all the brain knows. So you have to train and build up recognition what a full breath was.

This was away from music; you always did breathing away from music. He would always say "put the tuba down, breathing in is not a musical activity and divorce it from the tuba". He didn't want you thinking about breathing in when you were playing the tuba; he wanted you to think about when you were playing about blowing, about buzzing about the tune, but not about breathing. He wanted you to build the groundwork away from the tuba and then when it came time to take a breath, your brain would have an idea of what it was to take a full breath.

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» (GI) Yes, many people have that misconception that he was working on breathing all the time, but from what I have come to understand through reading, and historically, what was being taught on brass instruments, with most people he was trying to overcome the things that they had learned which were so restrictive. That's why they remember that [breathing] so well, because it was so different from what they were used to doing. They were used to trying and push their gut out, not move their chest and here he was saying completely the opposite. [He was saying] "Let your chest expand, fill your lungs, the stomach goes out anyway because that is just what happens when the diaphragm crowds the organs below it."

» (NA) As I mentioned earlier, the concept of "breathing" is often over-simplified or, conversely, over-emphasized, in discussions of the Jacobs teaching style. Of course, he wanted to make sure that you were taking a lot of air in. That was my biggest problem at first. Somebody in my dark past had mentioned the importance of the diaphragm. I had never thought about simply filling my lungs! My breathing mechanism was paralyzed by mumbo-jumbo. He also wanted the replacement breaths to be efficiently taken. But I believe that the use of the breath as fuel for the sound is a more important concept. Given his physical problems, Mr. Jacobs had to learn to use his air very efficiently. Allowing the air to do its job, releasing it, focusing it to make the embouchure more responsive—all of these things must be dealt with. I often heard him say that a big part of his success and longevity as a player was due to the fact that his chops were extremely responsive. It is important, of course, to have a large supply of air (although he, famously, didn't). What is more important -- and I believe this is the essence of his message -- is where it goes, how it is focused. We are not trying to "fill the horn." We are trying to get the lips to vibrate with maximum efficiency. Then the horn is full of sound, not just wind. The resonance that begins with the chops is amplified through the horn. The sound must be supported by moving air, not tight muscles. Overuse of muscles inhibits the airflow. A thick and unimpeded airflow allows the muscles to relax and get out of the way.

There has been more nonsense written about breathing than any other aspect of playing. It still goes on. People who should know better write articles about it, using as many complicated terms as possible. Mr. Jacobs always used to say: "Keep it simple. Suck it in and blow it out. Focus the air at the lip. Don't be afraid to waste the air; it's free. When you suck the air in you should get bigger; when you blow it out you must get smaller. Think about a target for the wind." Of course, his favorite phrase was "wind and song." The song in the brain determines what you do with the wind.

In the beginning my use of air was hopeless. At the first lesson he pushed his fist into my abdomen and asked me to resist. Then he asked me to take a big breath and blow it out. His response was classic: "You are a very powerful young man, but you move about as much air as a five-year-old girl." I like to think I have improved a bit since then! He told me that as far as free movement of air was concerned, strength was an inhibiting factor that could set up isometric oppositions of muscle groups. The secret to success was

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relaxation or weakness. "Weakness is our friend; strength is our enemy," he was fond of saying. He measured my capacity, which was just over 5 liters. Then he spent a lot of time getting me to blow freely through his various machines, getting the needles on the gauges to move, getting me to see a result and to imagine what sort of effort was required to do it. I also did a lot of breath patterns—just blowing different rhythms and breathing quickly and deeply on the rests. He was getting my imagination to work. I wasn't worrying about my diaphragm or anything else; I was just trying to move the needles over. I had a lot of trouble initially with inhalation. He had an apparatus like a thermometer. You sucked on it and attempted to raise a small metal ball. I couldn't move it at all at first. But gradually it got better--at least as good as a ten-year-old girl! Later I worked on buzzing or playing into a sound meter, again reinforcing the concept of product over process. I was always stimulated mentally by my visual response to the needles on the dials. This stimulation eventually led to a more acceptable volume and quality of sound. Later on, if I was having problems with a particular passage, he would approach it in a variety of ways: on the mouthpiece, just blowing the air in a rhythmic pattern, playing an octave higher, an octave lower, sometimes in a different key, but always musically. These strategies were just to get me to think in slightly different ways. By the first or second lesson I realised that if you do not have any imagination, you are not going to do well working with this guy. It's not just about breathing. It's a total package. I have sent a lot of players down to him over the years. Some said they could not really understand what he was talking about--they couldn't figure it out. Working with Mr. Jacobs was a bit like reading a postmodern novel; you had to let yourself go, free your mind of preconceptions, be willing to live in the moment.

I realised early on in my career that I was not getting what I needed to excel as a player. I had a lot of technique, but not much in the way of sound, range or volume. I think I was musical, but I was handicapped by my inability to put my ideas into sound. None of my earlier teachers was able to get me onto the right track. They knew what was wrong, but they couldn't fix it. As soon as I met Mr Jacobs I realised that this guy knew exactly what I needed. It was like going to a doctor with a mysterious ailment and having it diagnosed and treated within minutes. You can't imagine the relief I felt! I also realised that if I didn't use my imagination and try to apply some of the same techniques for learning he gave me, it was not going to work. I think many people go to him and come out mystified, grabbing the wrong end of the stick. They say stuff like "he uses too much vibrato." They are impressed by the breathing apparatus but they forget about the musical goals. A lot of people WANT things to be complicated; they can't handle simplicity. Others want lists of studies or "routines," but are unwilling to think about their eventual goal, unless it's a double high C. Some trumpet players would say, "we don't use that much air on the trumpet." They all miss the point. What Mr Jacobs often tried to do was to get you to exaggerate some aspect of your playing in order for it to become normal or to make you think in a radically different way in order to solve a

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problem. So you would have to be willing to go on some pretty strange trips in order to get it. As far as I'm concerned, that is a brilliant methodology.

» (RA) He had a large number of logical, yet highly effective breathing exercises. For example start with empty lungs, establish a slow to moderate quarter note pulse, breathe in 5counts, out 5counts. Repeat 1 or 2 times. Breathe in for 3 counts, out 3 counts, repeat; in 1 count, out 1 count. He would incorporate the movement of your arm from hand touching your shoulder to fully extended while breathing in and out dividing the breath and arm movements into thirds – 2/3 in, 1/3 out etc., with as many combinations as you can come up with. Working with the mirror you would put your hands horizontally where your stomach meets your chest and move them as you fill or empty those regions, separately or together. Once voluminous breaths were achieved the speed factor could be addressed: establish a pulse, blow seven eighth notes (using *tu,tu,tu*, etc.), breathe in on the eighth. This could be modified to whatever rhythmic challenge one desires. There were others, the product of a vast and fertile imagination.

CONCLUSIONS

How did you observe his teaching change through the years, that is, did his techniques or specific assignments change overall? Please recount anything that may be of use.

» (RA) He had Principles! He taught principles! He said "What do we want? We want a great sound. We want a great end product, how do we get it?" Who cares! If it works don't fix it. You have seen Philip Farkas' book the *Art of Brass Playing* and the photos in it and we always marveled at that.. Look Jake's got this "S" in there, How? Why? A lesser person would look at these pictures and think "gee, there is something wrong, it is not perfectly straight"...Who cares, listen to that sound.

» (RM) It changed quite a bit in regards to the gadgets that he used. It changed in that he went still further into the idea of "just think how you want it to sound". I remember going to a master class once at the Hilton, and he talked for an hour about breathing, then he told the audience..."all this talk about breathing isn't really very important, just think about what you want your audience to hear!" In later years he talked a lot less about the breathing and got the players focusing more and more on being performers, and in general, trying to get people to think and play like Herseth, that was, I think, his life's goal. Will Scarlett says: "Bud Herseth spends his whole life being Herseth, and Jake spent his whole life trying to explain that." I agree... he was trying to get people to simplify their thoughts.

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» (MG) I believe that he changed over time, he was not a stagnant teacher. He was always looking for new materials and he was always open to new ideas. I remember when the Breath Builder, that ping- pong ball thing, that came to his studio in 1982/83. That bassoonist from Las Vegas sent him this thing and he thought it was the greatest thing. Shortly after that the Inspirex® Inspirometer arrived. You know, he was a tool man, he was the tool guy and he was really interested in that sort of thing.

» (CS) I think he taught differently over time. I think he changed the idea that he was allowing people to start and write things down. I think, with what I hear, is that he used to teach a little more technically earlier on, more physically. I don't think that he woke up one day and started teaching "Song and Wind", it was an evolution. From what I have heard, it seems like he was pretty secure in Song and Wind but he would also say that there were other ways out there and "if you play the tuba great and you are standing on your head, what do I know?!" He could say that buzzing is good, and all that but when he started maybe it wasn't so obvious.

Have you heard that Herseth changedJacobs' teaching? I think Rex [Martin] told me that Jake asked Herseth "So, what do you think about when you are playing?" Herseth said, "The music." Jacobs replied "Yeah, but what do you think about". Herseth repeated: "The music. The tune" That was the SONG. That was something to Jake. I believe that Jake was this hot shot player, a real talented kid, a great player. And he got into the CSO and he didn't have to think about too much, and everyone loved him and then Herseth came and blew him away.

» (GI) I don't recall any major changes in his teaching. I do recall that when I was preparing for an audition, his approach seemed a bit more direct with regard to my specific needs. Instead of trying to inspire me in the manner he regularly used, he gave me specific drills and so on that were designed to overcome the specific problems I was having with specific excerpts. For example, I recall having difficulty getting tone immediately at the soft dynamic required in Mahler's *First Symphony* -- the slow movement. He gave me a drill in which I would play repeated "D's" over and over at the soft dynamic, trying to train the responses needed for that skill to become successful.

» (NA) In my own case, once I had started to make a decent sound he concentrated more on repertoire that I brought, mainly orchestral excerpts and solos. His emphasis remained on the same basic points: musicianship, accuracy, tone colors etc. If I was having problems with efficiency he might go back to some of the basic stuff for a while, but for the most part he became more of a coach.

He seemed to simplify his basic messages in later lessons. In 1982 I watched a week of master classes he gave at Northwestern. His techniques were the same ones that I had seen but he seemed to stress the mental side of playing even more. "Wind and Song" became a bit more of a mantra at these sessions. He had a lot of the students blowing

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through straws to get their wind focused but really stressed the importance of musical imagination once the wind was working.

Recount if you can, any specific moment or lesson where you felt that you had a "breakthrough" in your playing. How was it that this presented itself and what were the results of this significant moment to your future career?

» (NA) I suppose there were a few. I think the most significant breakthrough came at the very first lesson when I realised that Mr. Jacobs was exactly what I needed and if I did what he said it would sound better and I wouldn't have to worry about it. I came back a few days later and he said: "Yeah, you got it, now let's move on." That happened a few times but not always so dramatically. There were times, especially early on, when I realised that I could actually play this instrument and make it sound good and it was easy. I wasn't killing myself trying to slur up to a high E. We don't quite realise sometimes how it works, it just starts working, we don't need to know. Mr. Jacobs was always very positive and encouraging, even when he was on my case. He was a tremendous builder of confidence. In the late 70's our low brass section from Ottawa went down together to see him; we also had some excellent group sessions with Jay Friedman and Frank Crisafulli.

At one lesson Mr Jacobs let me play while one of the trombonists listened. My colleague told me afterwards that he had never heard me play with such a loud, full sound before. I think I was playing sections of Bruckner 8 and really blowing the walls down. It was one of those times when the sound was everywhere and I was completely unconscious of what I was doing physically. Such an experience really turns you into a believer! I've seen him do it at master classes.

There was a trumpet player at the 1982 Northwestern session who sounded amazing. He had a fat, rich sound and I wondered how Mr. Jacobs could possibly improve upon it. I remember that he had the student blow through a straw into the pages of a book, talked a bit about the song in the brain and then had him play again. The difference was unbelievable. It made me realise that anyone can sound better, even the best players, if the production can be made more efficient. I have done a lot of teaching myself over the last 25 years or so. Watching Mr. Jacobs work with other students has taught me a lot about what is possible, even from really advanced players. I have become a much better teacher than I would have been without the experience of seeing him in action.

» (MF) I could say that the first lesson was amazing for me. He made me understand that playing the tuba, or any other instrument, is simply telling a story; sending a message to someone else. You know the brain doesn't know how to play the tuba, it only knows how to sing and to blow, the body only knows these two things. I recognized that we just have to sing and blow through the instrument, it was very memorable.

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» (BF) Probably the most memorable was-- my mother was a flutist and I would go to the symphony with her. At Interlochen we played the Bartok Concerto for Orchestra and I knew the Reiner recording of the Second movement. It so happened that the CSO was doing that when I was back in town on Christmas vacation and I was up in the Gallery and there was that big sound coming out! That was a real eye-opener.

» (MG) A breakthrough moment for me that was connected to the buzzing the mouthpiece, independently and also buzzing with the Spirometer. The Spirometer was readout of how little air I was using and how I was starving the embouchure of air. When he got me to blow the ball up and then I buzzed and then transferred that buzz with the thick air into the tuba and it was much better! But you know every lesson with him there was something, always some breakthrough. As a teacher now, it is a goal that I aspire to with each of my students, to give them something new each week. It is very difficult; I don't know how he did it! It seemed like every lesson you would come away with some new earth-shattering piece of information.

» (RA) Well, most every lesson, especially my early years of study, he would manage within the first 10 minutes have me playing far better than I though possible, by freeing me up and such. I somehow couldn't get it to work for me at home though, 'till much later. Later it started to take root and I developed steadily. In the past 20 years or so there's hardly a practice or playing session where I don't have some sort of 'ah,ha!' moment. His teaching runs so deep now, and has allowed me to create these wonderful moments for myself and my students, even my Bass students. It's indeed a joy to be able to express oneself in a flowing, singing, unfettered manner on ones instruments, and I have AJ more than any other of my illustrious teachers to thank for that.

» (GI) I don't think that I had a breakthrough moment at the time, but I think the most amazing thing about his teaching was that the message was so strong, over such an extended period of time.[...] I would go so far as to say that the breakthrough moment in my own playing probably came when I was doing the research work for my own dissertation. Reading all of that material, putting it into the context of what he said, seeing how other teachers use what he said to them and subsequently seeing them use it in their own teaching, probably had the most impact. Just the act of consolidating everything at once; was probably the greatest breakthrough

» (RM) Probably the most striking one of all, above everything else, was hearing his sound for the first time. That is what did it for me. I thought, "Man, I am your trusty servant. I will do anything to get that sound!" That was the single most important thing of all. By the end of the lesson I was getting the sound he wanted me to, and by the end of the second lesson I could get that sound all of the time. Then again, I waited four

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months or more before I scheduled the second lesson, since I had so much to work on from the first one.

REACTIONS, PERSONAL STATEMENTS

Several dissertations and articles have been written on his teaching since his passing in 1998. In each of these, certain deductions and simplifications have been made to make his teaching easier to understand for the masses. I would like you to comment on how you perceive people's understanding of his methods. What are the most important aspects of his teaching that you believe will be enduring?

» (NA) I think there are two kinds of teachers, broadly speaking. There are those who stress the physical side: correct embouchure, breathing based on muscular function only and exercises and etudes that build chops. These are the teachers who never get their heads out of the method books, the ones who think that there is actually a perfect embouchure and that it is in a book somewhere. They know all about the diaphragm, they have written articles about it, but they have never heard of Alexander Kipnis or John McCormack. The other kind of teacher, of whom there are fewer, is more inclined to be spontaneous and experimental, selecting methods and styles to suit individual students. I was a bit worried about my embouchure when I first saw Mr. Jacobs, because I play off to one side. His response warmed my heart: "Let the embouchure be a variable," he said. "The sound is the only thing that matters. We are not all built the same." Then he buzzed, placing the mouthpiece all over the place and even distorting his mouth completely. He was able to get a sound wherever it was. I can do it myself now. It's a great way to loosen up students who are obsessed about perfect placement.

What Mr. Jacobs used frequently as a teaching tool was the element of surprise. Instead of trying to fix a problem by going at it head to head or by prescribing a regime of exercises, he would start you thinking about something else completely, often away from the horn. He might talk about throwing a ball, blowing a pea-shooter. It was always spontaneous. This tactic was excellent for clearing the mind of confusing details and mental hang-ups. He could get you to think about a sound concept in such a way that when you were back playing, the concept was paramount and the physical production of it subservient. Most importantly, he kept it simple. The brain would be in control, not the tissues.

I don't mean to put down other teachers. Yes, we need to have chops and fingers and range and all the rest of it, but the music often gets left out. Mr. Jacobs somehow managed to get people to play all over their horns by inspiring them to think and imagine themselves as musical actors. I have colleagues who have worked with the first kind of teacher. They would spend hours on chop-building exercises and wouldn't make a beautiful sound for weeks on end. This kind of approach, efficient in its own way, is sterile and neutral. There is no development of the musical imagination.

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If you studied with Mr. Jacobs you certainly got your share of Schlossberg and Arban, but it was never mechanically presented. If things weren't working he would get you off the horn altogether and into the realm of the musical imagination. He would get you to sing. He would talk about the "tuba in the brain" and letting the brain produce the sound. The older I get, the more I realize how important this aspect of his teaching is.

I think the biggest thing that my very first teacher told me was that I had to learn to teach myself. Mr. Jacobs encouraged a similar philosophy, albeit with more sophisticated methods. His great gift was to open up your imagination and make you realize your own potential. You have to have a good imagination for his methods to work. He would say: "When you are a musician, you have to be an actor delivering musical lines." He instilled positive thinking in his students. He made them believe in themselves. Music is a communicative art. Mr. Jacobs was the most communicative of teachers. He understood the importance of personality, both as a player and a teacher. He certainly wasn't afraid to put on a bit of a show when he was teaching. He turned people like me into good players and good teachers because he forced us to go beyond the physical. I have mentioned that seeing him was a bit like seeing a doctor. All doctors must learn the craft of diagnosis, but good doctors have to have imagination too. They can't just say: "You are sick. Take this pill." Sometimes it works; but sometimes you have to get into the psychology of the person in order to effect a cure.

When Mr. Jacobs talks about song and wind he unites the physical and the mental into a whole that is greater than the sum of its parts. It means that you can't just stick the horn on your face and play long tones for three hours a day and expect to sound like the voice of God. (I'm talking about the tuba!). There has to be intelligence and imagination in there as well.

» (RM) It is difficult for me to know just how much people understand or don't understand about his teaching. In general, the people I have discussed this with didn't understand his overall teaching very well. He was teaching most of his students to become better players, not to become teachers. He taught very, very few of his students to become teachers. Many people who studied with him received only the information that he thought they needed at that time. They received only one small slice of the pie that was his pedagogy. This in itself is certainly not a problem. The problem comes when they then use that information in their own teaching, which at times is inappropriate.

Rarely did Arnold Jacobs confront a problem with someone's playing "head on." Therefore, the problems that the players had would, in their minds, just miraculously disappear. They don't really know what he did. What he was generally doing was simply altering their psychology, in order to get them thinking like performers instead of analyzing their problems. What might happen when that student goes home is that they would actually analyze what he did, and then use the same techniques with their own

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students. Sometimes this might work, and sometimes it doesn't. Sometimes it actually brings on a performance problem with a student where one didn't previously exist.

Teachers tend to teach other people the way they themselves were taught. That means they are teaching people that don't have their problems the information they needed specifically for their own problems. If their student doesn't have any problems, they then might just develop some problems. If they are really good and they have a good head on their shoulders, they might be fine, but otherwise it is very dangerous. In general his comment was "If you don't know what you are doing, just teach music. Don't teach tuba or physiology, just music. Teach interpretation, rhythm--things like that". That's what good teachers should be teaching. That's exactly what he would do when he didn't need to be fixing something.

» (MG) I believe a lot of the older perception of Jake I got from him directly and from Bob Raide, who was in Hilton Head who used to play in CSO. The perception was that he was a witch doctor and that sort of thing. When I came to study with him he definitely had a steady stream of non-Chicago students to visit and take lessons, and as time went on, that increased. He was definitely getting more and more international students through the rest of his life. I think that it was representative of the change of the view of Arnold Jacobs and the change in that witch-doctor view or assessment of his teaching over time. I think that as the decades went by, his earlier students taught others who then went to see Jacobs who then taught others who then went to see Jacobs. Before you know it, between Arnold Jacobs and Bud Herseth, I think you can make a real strong case for the sound of the Symphony Orchestra on a global basis changing because of the aural example that Bud Herseth gave us through fifty years of recorded examples and then Jacobs with his recorded examples but also through his pedagogy.

So for Jacobs, his teaching I think the perception has really changed quite a bit over his life just as successful students of his went on and began teaching. They sprouted other students who came to him and they went out and taught, and it was a real exponential affair. So over time, the last ten years of his life, he really enjoyed an exalted status as a guru and not as a witch doctor. I think he enjoyed that, and I think that it was a good time for him, and I am glad that it happened to him. Now, I noticed that he is almost bigger in death than he was in life! You know because you can't study with him anymore and this is why people are interested in him.

(MF) There are two aspects regarding Mr. Jacobs' teaching that I can say. First, ninety-five percent of the people think that he was just a breathing teacher, and that was not true at all. The other thing is that many people only took a few of lessons with him and they never were exposed to his entire approach to teaching. When he would teach, Mr. Jacobs would choose specific words for an individual, based on what he needed to hear at that time—he would then sometimes choose opposite words for other people. Those words he used in the lesson should only be considered one part of his teaching and they are not

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pertinent for others. If we try to figure out Mr. Jacobs as a teacher of brass players-- we will never understand him.

» (GI) I think that there are still a great number of people who think that Mr. Jacobs' approach to teaching was rooted in teaching breathing technique. Of course, his approach to teaching was rooted in teaching music and he simply tried to remove any obstacles that may have got in a player's way when trying to make music. Many players don't produce the tone in the most efficient and relaxed manner possible, and this can create barriers to one's realization of one's musical goals. Mr. Jacobs understood this and tried to normalize his students' physical approach to their instruments so that they could make the music that they were capable of.

I think that his ability to simplify complex ideas and activities when teaching his students will be an enduring contribution to brass pedagogy. His belief that ordering the musical product in the mind before attempting to play in order to be successful musically is a concept that, hopefully, will become more widely accepted. Making brass playing a musical activity, rather than a physical one is what Mr. Jacobs teaching was all about.

» (RA) While those various articles, etc., try to get at the essential Jacobs methodology, and in some cases do an excellent job of it, they all still fall short because Arnold Jacobs worked with the individual and their personal strengths and weaknesses. He possessed a unique combination of intuitive gifts and finely honed skills that allowed him to interact with a student as I believe no one has before, or will since. Those of us who have worked with him extensively over many years have still only but a clue as to his genius and insight. Certainly, though, the distillation of his methods down to their simplest elements is, I think, consistent with what he was always striving to accomplish with his students, namely production of fine art through focus on its most elemental constituents, SONG and WIND. Keep the product in the forefront, find and develop the simplest, least invasive methods to achieve it. There are so many of his students around the world that are turning out wonderful musicians I'm sure his legacy will be passed on for as long as there is music, however I rather doubt there will ever be another with Arnold Jacobs' or comparable gifts. I consider myself very lucky and blessed to have had such extensive study with such a great artist, mind, and human being.

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CONCLUDING COMMENTS

>>(RM) (*Extracted from the transcript of the Arnold Jacobs Tribute at Orchestra Hall, December 17, 1998*)

Arnold Jacobs was the greatest teacher of any subject whom I have known. Arnold Jacobs was also the finest tuba player I have known. To have achieved such greatness and excellence in two separate fields, teaching and playing, however closely related, is indeed rare and perhaps unprecedented. Mr. Jacobs was a tremendous teacher for many reason, but because mainly he had an absolute mastery of three subjects: physiology, psychology, and musicianship. His command of each of these three subjects was so complete that they blended together to form his own pedagogy. He developed an entirely new way of teaching the brass instruments.

Most people teach the way they themselves have been taught. Arnold Jacobs was largely self-taught, and this gave him the freedom to develop a new pedagogy based on how to sound, and not based on how to play. Imitation is an extremely efficient way to learn, and a tuba lesson with Arnold Jacobs included a lot of it. This was a particularly natural way for him to teach, since he was such a master of his instrument.

My greatest inspiration as a player comes from remembering his tone quality from my very first lesson with him 20 years ago in the Fine Arts Building in a studio many of you I am sure are very familiar with. He had the most crystalline clarity to his tone, and the first time I heard it, I knew that I had just listened to the most beautiful sound of my life. I can still hear those few notes, as if he had just played them for me this morning. Arnold Jacobs had a tremendous influence on my playing, my teaching, my career, and my life. He was not just my mentor, but my friend, colleague, inspiration, and role model. Without a doubt, Mr. Jacobs had the greatest impact on my life of anybody I have come in contact with. I know that he
influenced not only my generation and generations before mine. I also know that he will leave his mark on generations after mine, for many teachers and players of brass instruments subscribe to his approach to music.

» (NA) Mr. Jacobs changed my life. Many people will say the same thing. I went down there and I didn't know what I was doing; I was playing at a reasonable level but I had no idea how to go further. And this guy opened the door. It was like Dorothy's first view of Oz...living color after drab black and white; it was that dramatic! He has given me a career. He turned me into a good player and I have become a good teacher because I have absorbed some of his methods. It doesn't matter that I'm not as good as he was in either

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department. What matters is that there is now a entire generation of players like me. We have inherited the tradition of his teaching and are passing it on to the next generation.

If I am in a rut I often pretend that I am back at my very first lesson with him. I will open up to page 17 of Arban's, remember what he said about it, and start to play. It never fails. I sound better immediately. I'm going back 30 years and it might as well be yesterday. I also have incredibly vivid memories of him buzzing the mouthpiece and playing with great resonance and verve. I'm not the only one. Very few teachers of any instrument can claim to have had as powerful an influence on so many students.

Let me conclude by telling a John Fletcher story. John came to Canada in the late 70's to do a week of master classes. At the first session he asked us all to introduce ourselves and provide a bit of background. I was feeling quite smug when I told him that I was a student of Arnold Jacobs. John's response, characteristically modest, was: "Who isn't?" Not a bad tribute from one great tuba player to another.

» (RA) Jake was a ham! He would come out to his chair [on stage at the CSO or at Ravinia]and just start wailing! He would just start playing scales and arpeggios, melodies-- I am sure that he was just making up on the spot. It was fabulous, he was a virtuoso. He loved to show off a little bit; you know he was a real showman...
I love his line "80% to 90% of our thoughts should be spent on creating and interpreting music. You are musicians first and foremost, telling a story, delivering a message." And when you have a beautiful melody, you can then focus on singing a beautiful song, and to take your mind away from all that technical stuff that is impeding us from doing our real job which is to deliver a message, to sing a song. It boils down to singing a song, singing it beautifully and with interpretation, to interpret each note.

» (MG) I think he could have just as easily gone into the physics of golf but for whatever reason he had an interest in human beings and one question answered lead to twenty other questions that needed to be answered. I don't think he ever thought about it too much when he was playing. I don't know how. That was one of the real great things about the Jacobs CD, with the practice tapes. I remember me a Charlie [Schuchat] saying, I wonder what he sounds like at home?! Well, now we know!

» (DM) When he got started, he was addressing a major problem at the time. There were a lot of fallacies at the time: inefficient, incorrect playing and ways of approaching the instrument out there. He addressed it not for any one else's benefit, but for his own. He knew he had a physical problem that might impede his career so he started to figure out what he was doing in order to address that. He probably had great fears about his health about this whole breathing thing. Whether he had emphysema or whatever, whatever was troubling him. In the course of time, he provided a great service to mankind. It would be very interesting to know what would have happened if he had more time to do more things like play solos. I guess the only solos he ever played was the Vaughan

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Williams with the orchestra. I don't think he ever played a solo recital, but he always used to speak of having a solo recital ready. I don't think anybody asked him to do it. Again, he was a man ahead of his time in 1973-- he was what 58? So around 60 years of age, that is not the usual time to start a solo career, nobody was doing that.

I think one of his greatest gifts was that he set us up to grow. And some of us walked into his studio handicapped, crippled. We came in wounded and he helped us heal and in the process of healing, he gave us the tools, at least he gave me the tools to grow. I wasn't left with too many impediments that stopped my mind from somehow managing to grow. You know, I haven't looked at these notes for years, for decades and, here they are, the things. Many of the things I don't remember him saying but here they are distilled in my mind and I am using sort of similar ideas, they are just a little to the side. But the fundamental ideas are always there.

DK: In 1995, you were at the Conference, and I was there at a reception with you and Mr. Jacobs and the conference people. And he was sitting in a chair and I remember that you went over to him and crouched down beside him for some 20 minutes and spoke to him. What did you talk about? Was he pleased in how you turned out?

» (DM) I think he was. I remember, now that you brought that up, earlier phone calls when I would call and say hello and ask if I cold come in for a lesson or whatever and he always asked me how I was doing and "if I was doing anything interesting." [...] So I went up to him on that evening and I introduced myself and he says "Dennis, how are you?" "I am sorry that I didn't get a chance to hear you" I remember saying to him, you know that I remember that the first time I went to see you way back in the 60's, I said you were the same age as I am now... And he looked at me with a real surprised look on his face and he said "isn't that amazing" And we talked about a lot of things that had occurred over the years, and one thing lead to another. I said that I know that you were worried about your health over the years but did you ever thin that it would be your eyes that sidelined you? He said "you know I have never thought of that, but no. I would have thought it would be something else. I just never thought it would be my eyes that caused me to finally leave the orchestra." We talked about that for along time and it was very stimulating.

» (DK) After completing over a full year of researching the methods of Arnold Jacobs: having interviewed the individuals who contributed to this document, watching hours of his lectures, sifting through the documents that provided some of the ideas for his approach, transcribing some of his lectures, following his life from a youngster in California through the Curtis Institute to his years at the Chicago Symphony-- I have found myself in absolute admiration of this man. This was a man who made the most of his life, even though he had some tremendous difficuties that would have chased away most people from achieving their goals.

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I feel that I now somewhat better understand his ideas, but understanding them is really not enough, and I realize that it will be some time before they will become part of my everyday habits. This was what I believe Mr. Jacobs wanted for us; he gave us the information that would enable us to find our own way; our own voice.

He was able to contribute so much to his art form, both in the areas of performance and in education, and he was respected by such a variety of people within the musical community as well as outside of it. Most of us can only aspire to contribute half as much in our own lives; but he would encourage us to try. The record of people who came to see Jacobs is astonishing: Doctors, Lawyers, Scientists, Policemen, Computer Analysts, and musicians from virtually every discipline. I believe that Jacobs had a gift in being able to see beyond the player. He could look into their fundamental approach to their instrument and in most cases; find the correct etude, exercise, or word to help that student have the confidence to continue with their music making.

I was fortunate to have two lessons with Mr. Jacobs, what some people would refer to as a "casual student". But it was in these lessons that I felt as I had been given the ability to play beyond my assumed abilities. He was able to take the habits that I had acquired from my lessons with other teachers [his students], and make more sense out of it all. It was a benefit for me to see him after these prior years of study because I somewhat understood the concepts, but hearing it from "the horse's mouth" was a revelation. I knew after these sessions that I wished to learn more about how he came to have the ability to make complex ideas simple, and still manage to not be encumbered by this knowledge in his own performance. Charles Mingus once reflected that: "Making the simple complicated is commonplace; making the complicated simple-- awesomely simple, that's creativity." I believe that this unquestionably applies to Arnold Jacobs and elucidates his real gift as a teacher and performer.

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LISTING OF ETUDES

The following list represents all of the etudes mentioned by the subjects during this study as being assigned, and/or played in lessons with Arnold Jacobs. This listing does not represent the ancillary materials that may have been worked on (e.g. buzzing of melodies or playing of scale patterns), as these are difficult to reproduce in any manner. The following list was extracted from the interviews conducted for this study and represents only a catalog of etudes. Further discussion of the approach to select etudes appears in appendix X. The etude and page number correspond to the edition mentioned at the outset of each section.

Jean Baptiste Arban *Complete Conservatory Method for Trumpet*. Edited by Edwin Franko Goldman and Walter M.Smith. New York: Carl Fischer, 1956.

Page Number	Etude Title or Number
11	1-6
12-13	9-14
14	15-19
15	20-23
16	24-27
17	28-32
18	33-37
19	38-40
20	41-46
23	1
24	7-10
25	11-12
26	13-15
27	16-17
28	18-19
29	21-23
30	24-25
31	26-27
32	28-29
33	30-31
35	35-36
36	37-38
39	1-6
40	7-12
41	14-15
99	24-25
100	26
100	26
168	57-58,60
179	98-99
180	100-105
181	106
188	135-137
189	138-141
190	142-145
191-245	150 Classic and Popular Melodies
285-299	Characteristic Studies
300-347	12 Celebrated Fantasies and Airs Vairés

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Pasquale Bona, Complete *Method for Rhythmical Articulation.* Translated from the fourth Italian edition. New York: Carl Fischer, 1900.

Page Number	Etude Title or Number
18	67-68
19	74
26	86
27	88
28	90
29	91
30	92
31	93
32	94
34	96
36	98

Brandt, Vassily. *34 Studies for Trumpet.* Edited by Robert Nagel. New York: International Music Company, 1956.

Page Number	Etude Title or Number
3	1: *Alla marcia*
12	11: *Leonore no.3 study*
14	13: Tchaikovsky Symphony no.6 theme study
27	27: Scheherazade theme

Charlier, Theo. *Trente-six Études Transcendantes pour Trompette, Cornet à Pistons ou Bugle* (Nouvelle edition) Paris: Alphonse Leduc, 1946.

Etude Title or Number
1
2
3
4
6
8

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Colin, Charles and Mel Broiles. *The Art of Trumpet Playing.* New York: Charles Colin, 1967.

Page Number	Etude Title or Number
13	1-3
16	20-21
17	25-26
20	32
32	66
33	67
36	71
37	72
40	75
41	76

Kopprasch, Georg. *Soixante Études*, Op. 6. Leipzig: Breitkopf & Härtel,1832/33. Reprinted as C. Kopprasch 60 Selected Studies for BB flat tuba (Music for Brass No.2006), North Easton, MA: Robert King Music Company, n.d.

Page Number	Etude Title or Number	Page Number	Etude Title or Number
5	5-6	30	37
6	7-8	33	40
7	10	34	41
8	11-12	37	44
10	14	39	46
11	15	40	47
12	17	41	48
13	18	42	49
14	19-20	44	52
15	21	45	53
19	25-26	46	54
20	27	48	56
24	31	49	57
25	32	50	58
27	34	51	59
28	35		

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Max P Pottag and Albert J. Andraud, *335 selected melodious, progressive and technical studies for French Horn*. Compiled and revised by Max P. Pottag and Albert J. Andraud. San Antonio, Texas: Southern Music Co.,1958. [Blue Volume]

Page Number	Etude Title or Number
13	Corelli-Rameau-Gluck to be played as a Suite
18-19	5-6
19	7-8
24	15
25	16
26	17-18
27	19
28	20
42	32
54	38
78	57
79	58
94	75
95	76
98	79
99	80
105	88
106	89
114	99
116	100
118	101
121	104
125	108 Kling-Souvenir de Mozart
127	110
128	111
129	112
156	Concert Rondo-Mozart

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Max Pottag, 212 selected melodious, progressive and technical studies for French Horn. Compiled and revised by Max P. Pottag and Albert J. Andraud, Cincinnati, Ohio: Albert J. Andraud, 1943. [Red Volume]

Page Number	Etude Title or Number
180	190 Siegfried's Horn Call
185	146
242	196
243	198
246	199
247	200
256-257	Mozart Horn Concerto #1
259-262	Mozart Horn Concerto #2
263-266	Mozart Horn Concerto #3
267-272	Mozart Horn Concerto #4

Schlossberg, Max. *Daily drills and technical studies for Trumpet.* New York: M. Baron, 1941.

Page Number	Etude Title or Number
7	25-27
8	30
10-11	36-39
12	44-45,47
14-15	49-53
23-26	70-81
28	89: Scales
34-36	97-101
48	128: Intervals
50-51	133-136
52	139
53	142

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Walter M. Smith, *Top Tones for the Trumpeter or Cornetist*. New York: Carl Fischer, 1936.

Etude Title or Number
1 *in C Major*
3 *in G Major "Tarantella"*
5 *in F Major*
6 in D minor
7 in D Major "Gigue"
9 *in B Flat Major (triple tonguing)*
13 *in E Flat Major*
14 *in C Minor*
17 *in A Flat Major*
18 in F Minor (Octaves)
21 *in D Flat Major*
23 *in F Sharp Major*
26 in E Flat Minor

One of our big problems is that in the past tuba has been assigned a very limited type of music to interpret....We can see that a limited musical challenge is going to create a limited musician. Now we have to of course get out of that period, and thanks to Harvey Phillips and Bill Bell before him, that much of that phase is behind us. For many years the talented young tuba player had to imitate the trumpet-- he had to go to the school of trumpet horn or violin, but he could do nothing with the music for the tuba. In other words, the actual taking home of tuba music, there was nothing there to challenge him that would really give him the ladder where he could he could climb to be an excellent interpreter of music and as a person; we are not tuba players, we are people. To develop our brains and our abilities, we must be given the type of challenge that will give us the development. In the past, from my period, I primarily went to the school of French horn, school of violin, school of voice but I did very little with the tuba music. (Arnold Jacobs, 1973 Master class, Bloomington, Indiana. See appendix 3)

(RM) For every etude he ever assigned to me, every one of them was specifically a tone exercise. Even if he was sort of surreptitiously working on some other aspect, the student only knew these as tone exercises.

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ETUDE INDEX

"Pop! Goes the Weasel"
Traditional Children's Melody

(DK) Jacobs often would buzz this melody on the mouthpiece or visualizer rim as an example of a simple tune he wanted the student to play. He would then move the mouthpiece around his mouth and continue to play, illustrating that embouchure placement was secondary to the message the musician needed to impart. The aim for the student was to have the Song in the mind first and have the tissues react reflexively to the stimulus of the melody.

(DM) Just sing, sing on the instrument, sing on the ring. One of his favorite things was to be able to play any note on the rim, on any part of his mouth; he would just go from one part to another. "See...it all sounds the same!,"-- and it did. Then he would say "but of course the best one is always this one." "It doesn't matter whether you play on one side of the mouth or the other-- it will find itself."



(Arnold Jacobs) *This is just a tuba ring [Buzzes Strauss' Till Eulenspiegel opening theme--plays again on the right side of face-- then left, then with crossed lips] As you see, you can't stop the buzz, 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 a signal along the seventh cranial nerve to the lip wherever fiber in the lip is receiving the same message from the brain. As I say it is all potential functional. The embouchure on the other sides 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.* (1991 Master class: United States Marine Corps Seminar, Appendix 7)

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Arban, Jean Baptiste. ***Complete Conservatory Method for Trumpet,*** edited by Edwin Franko Goldman and Walter M. Smith. (New York: Carl Fischer, 1956.) Originally published as *La Grande Méthode Complète de Cornet à Piston et de Saxhorn par Arban.* Paris: 1864.

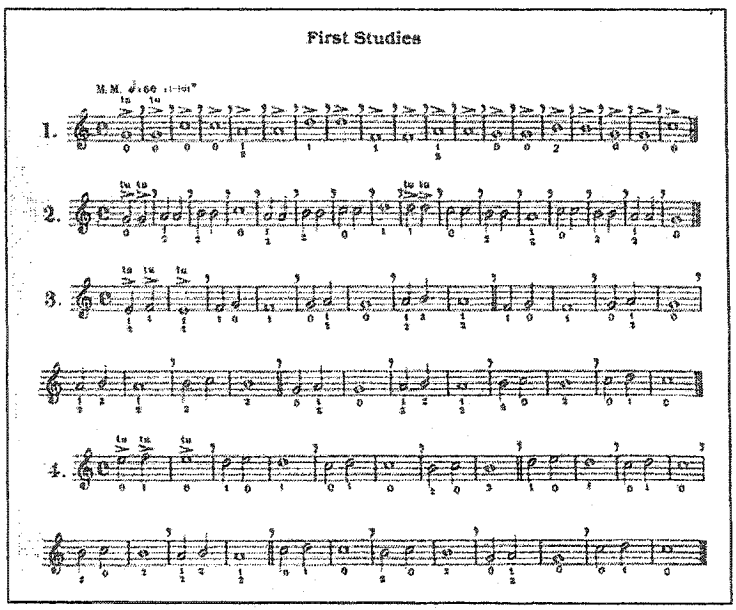
First Studies

(MF) The first study is very important. He asked many people, including professionals to play this. I believe that he played this many times when he was at the Curtis Institute. This exercise starts on a concert G, and he would have people play it a fifth down, and transpose it into many keys. He did this for everything on this page. The reason why he recommended this was to learn tone quality; to get the best sound you could. He would tell me that we need to pay attention to making sure that each note that follows is the same quality in tone. He always used a metronome as he believed that with the metronome, we have to sing. I believe that he learned these exercises from his teacher Donatelli.

(GI) I remember a lot of time spent just on the first page of the Arban's book,--the whole page. He suggested to me that I sit in front of a mirror and play it. I used to let the corners go and I was trying to get this big sound, but I completely misunderstood how to do that and I would let my corners go and my cheeks were puffed a bit. He suggested that I sit in front of the mirror and play these very slowly with the metronome through the first five or six and make sure that I kept my corners firm when I played.--and that really paid off.

(RA) I remember more than one lesson when we would just work on this one page. It was incredibly tiring to play whole notes and half notes at slow tempo. He would have you do #4 *pianissimo,*and then again *fortissimo*. Then he would have you keep that volume through long whole notes, and I simply not used to that. I certainly did not embrace long tone studies as a means to the end. He was much smarter than all of us I am afraid.

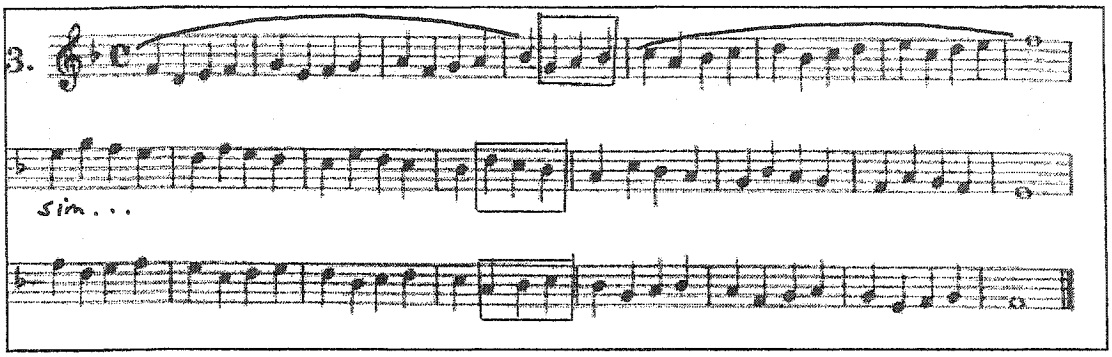
(CS) He would always have me play the first study down an octave, up an octave, sung, up a fifth and so forth. I remember playing it really low, then he would have me play it really high, coming in on a high G.



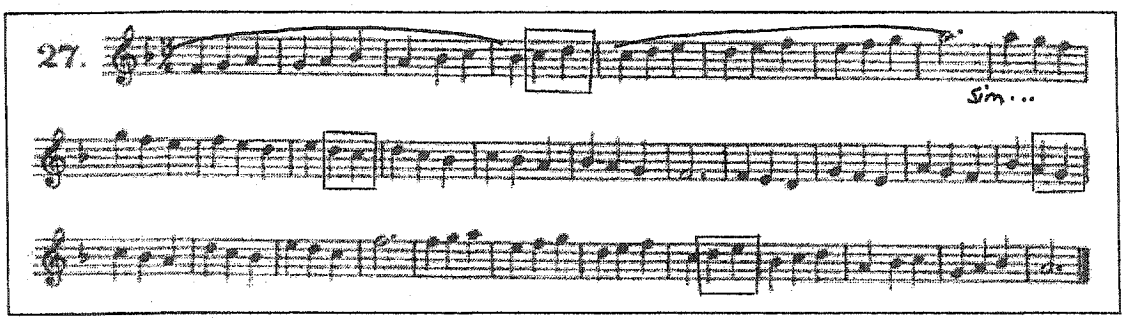
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Page 15 # 3

(RM) All of these exercises are to be slurred and to be played in one [beat to the measure] and in four bar phrases. I specifically remember these exercises to this day because they made me feel really good. I was playing these (last) notes really long and fairly musical and I remember that he stopped me and wanted to make a comment; probably because he had taught this thing to a thousand tuba players. I think he wanted to say: "no no, play that last note shorter so you can get a deeper breath" until he realized that I was actually getting a real deep breath.



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Chord studies

Page 20 #46

(MF) Mr. Jacobs liked #46 a great deal. This study goes through all the key areas, which means we are playing in every key and we are playing every important chord. Mr. Jacobs had told Ron Bishop thirty to forty years ago to practice this once a day, and then we can play any piece because we can hear all the chords. I believe he told many people to play this; it is quite similar to the study in the Hal Leonard book.

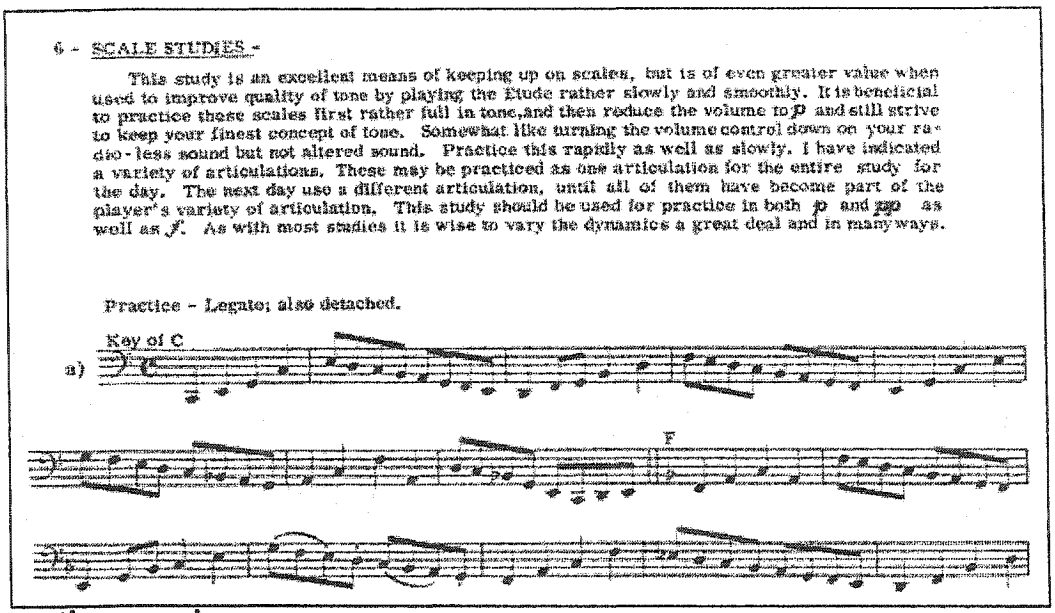


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Chord studies from Hal Leonard (pp.51-52)

(MF) Will Scarlett had told me that about 30 years ago, Mr. Jacobs always asked students to play arpeggios and have the students use a "bouncing air" pattern. This was because the student can learn to play with less stress this way.

(DK) Jacobs provides clear instructions how to proceed with this etude below. He emphasizes the idea of keeping focused on the quality of tone throughout the entire exercise and that the student should begin these exercises with a rather full tone and comfortable tempo. This etude may be played with a variety of dynamic contrasts, articulations and tempo variations.



6 - SCALE STUDIES -

This study is an excellent means of keeping up on scales, but is of even greater value when used to improve quality of tone by playing the Etude rather slowly and smoothly. It is beneficial to practice these scales first rather full in tone, and then reduce the volume to *p* and still strive to keep your finest concept of tone. Somewhat like turning the volume control down on your radio - less sound but not altered sound. Practice this rapidly as well as slowly. I have indicated a variety of articulations. These may be practiced as one articulation for the entire study for the day. The next day use a different articulation, until all of them have become part of the player's variety of articulation. This study should be used for practice in both *p* and *pp* as well as *f*. As with most studies it is wise to vary the dynamics a great deal and in many ways.

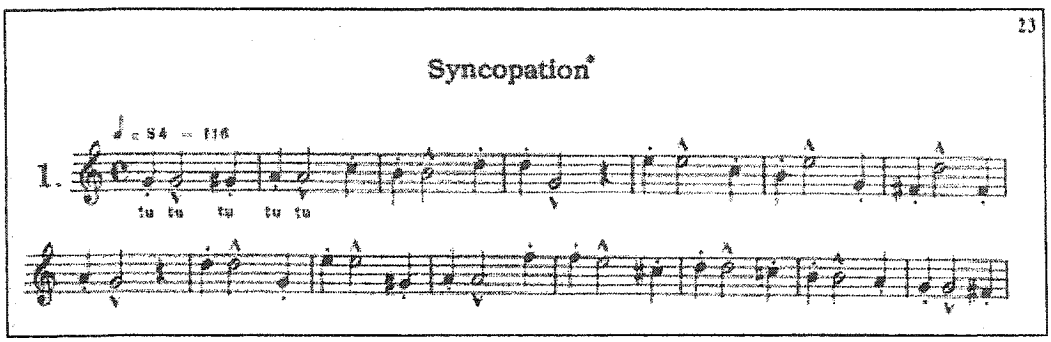
Practice - Legato; also detached.

Key of C

a)

F

Syncopation exercises
Page 23 #1-5



23

Syncopation*

1.

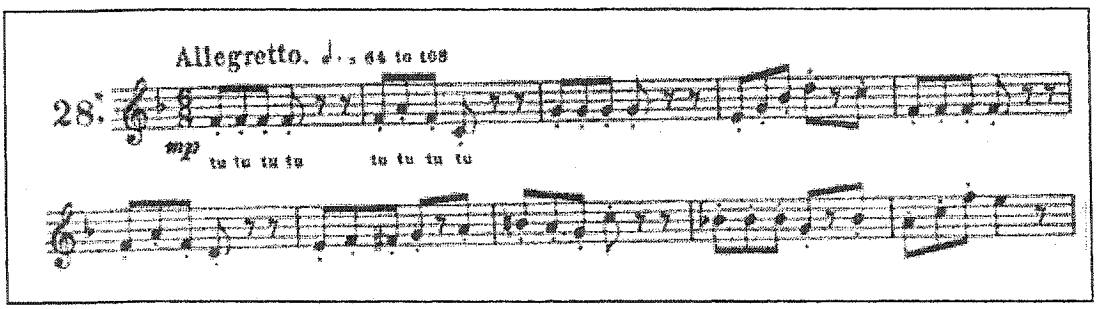
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we have to learn the joy of this rhythm; the syncopation. I didn't understand this at the time but later I did: Style means rhythm, and the exaggeration of the rhythms. Rhythm must have some emotion that comes from the player. We tend to think only of the tone but music is rhythm.

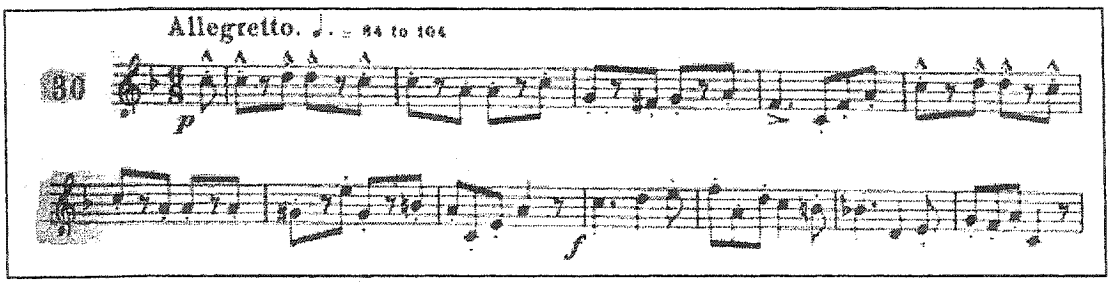
(CS) The one I exercise I really remember was the syncopation drill; it was seemingly for style. I remember spending a lot of time on emphasizing the word "Toh…." That was what I needed at the time. He would say "that darn tongue Charlie"

(DK) The next three exercises were to be approached in much the same manner. The student should focus not only on the quality of the tone throughout the etude but also on the style and character of each. The instructions provided by Arban as far as articulations should be ignored. The student should work to play with a small consonant and an open vowel such as tHAH, or tHOH to assist in maintaining the fullest of tone. Each of the etudes should be performed at a comfortable dynamic and tempo initially to solidify the character of the work. After this, the student should vary the tempo, dynamics, and articulations for the best results.

Page 32 #28,29—Page 33,#30





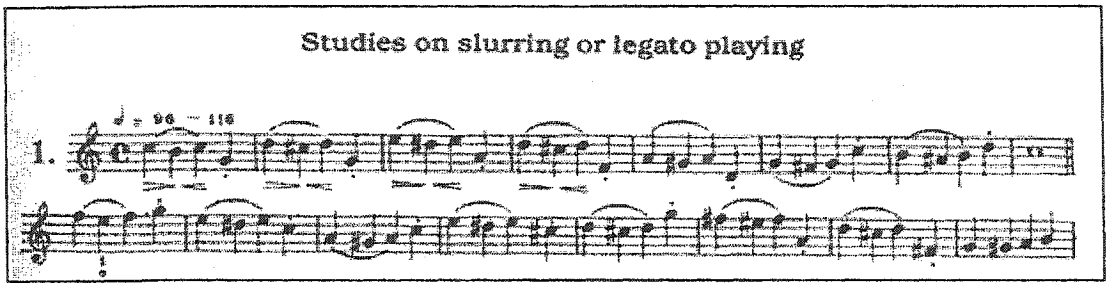


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Page 39 #1

(DK) The intent of this drill is to develop the transfer of quality of the tone from the initial note to the following notes in the passage. The exercise would be played at a singular comfortable dynamic initially, ensuring that the quality of tone remained consistent throughout.

(CS) They would all be played the same dynamic, matching the quality of the low C, trying to get that quality on to the other pitches. I remember spending a lot of time on those. You would read it as written, and then get to the end and then play it in reverse.



Page 40 #11, 15.

(RM) Probably one of the most important things he ever assigned me is here, in the "Studies for the Slur": he specifically assigned #6, 11, 12, and 15. All of these I worked on for months. I feel that these are some of the most important ones in the book for many reasons. One of the things that he was explaining here was the development of the protractors and retractors; the tiny shaping muscles of the lips. By practicing those etudes for tone, specifically for tone, and getting the most beautiful tone possible, slurring to another note, ascending slurs is where you really develop that. That is why he assigned these very specifically. They are also wonderful ear training exercises. He gave me one specifically in thirds, fourths, fifths, sixths, and sevenths. I think it was secondarily for ear training, to tune all these intervals.



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Legato playing, intervals

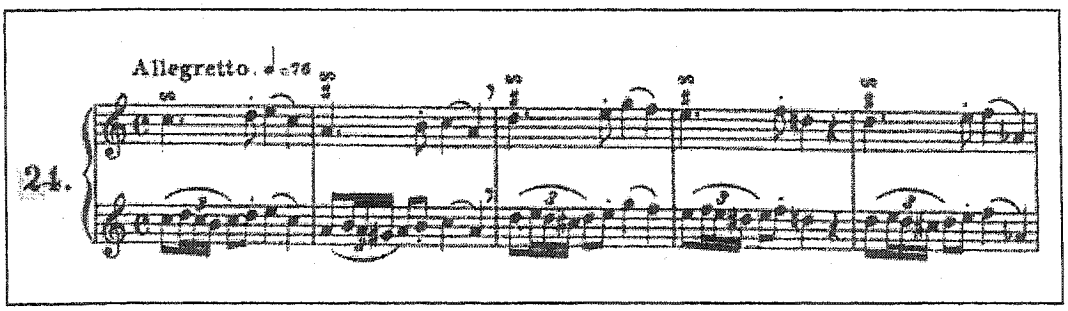
Page 55 #68

(DK) The following etude has a variety of uses. It could be approached as a flexibility drill, a chord study, or a velocity drill. Jacobs would have the student approach this drill initially as a tone study, again focusing on the ability to perform each singular note clearly. The etude was to be played at a comfortable dynamic and with simple articulations. In later study, the student could make variations to the tempo, articulations, and so forth. The focus should remain on the consistency and quality of the tone throughout.



Page 101 The Grupetto (The Turn)

(RA) I remember when I first started bringing in the Arban's book, we would of course work on the first few pages but he would also immediately turn to "Exercises on the Grupetto". He sang these with that big marvelous voice of his in a real smaltzy style and he would say, "express yourself." I am convinced he felt that it was beautiful melody and a great vehicle to get your thoughts on playing interpretive music. I love his line "80% of our playing should be spent on creating and interpreting music. You are musicians first and foremost, telling a story. Delivering a message." When you have a beautiful melody, you can then focus on singing a beautiful song, and to take your mind away from all that technical stuff that is impeding us from doing our real job; which is to deliver a message-- to sing a song.



Tonguing Exercises

(NA) He was fussy about articulation and the clarity of pitch of each note in these exercises, and I believe that it is a very valuble exercise. He also had me working on the little "t" big "A" on the triple tonguing exercise. Even though these were triple tonguing excercises, he would have me single tongue them all using lots of air.

(DK) To produce the best results in any multiple tonguing exercise or passage, the student must have the concept of what the music should sound like with clear articulations and quality tone. Each of the etudes was to be initially practiced slowly so that the student could hear the end product, and then work to increase the tempo over time. When analyzed, multiple tonguing becomes difficult to reproduce under any circumstance. The student is therefore encouraged to have a clear concept of what the passage should sound like in the mind, and then work to reproduce this on the instrument based on what was conceived.

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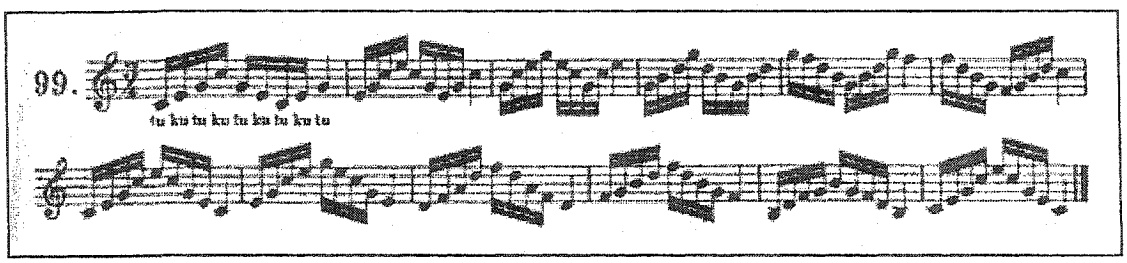
Triple Tonguing: Page 168 #57



Double Tonguing Etudes: #95, 99, 104.

(RM) He had circled these eight exercises (page 179) and I remember that in the lesson itself, not really being able to master these. We were working on getting the same sound on each note, but after we went back and forth, I don't know, thousands of times between the tuba, the mouthpiece, back to the tuba, the rim--finally I was getting this great sound on each note. I went back and I practiced these for months until the first time I could pick it up and I could do it. These are great little exercises, these eight. That took up a good part of those early lessons.





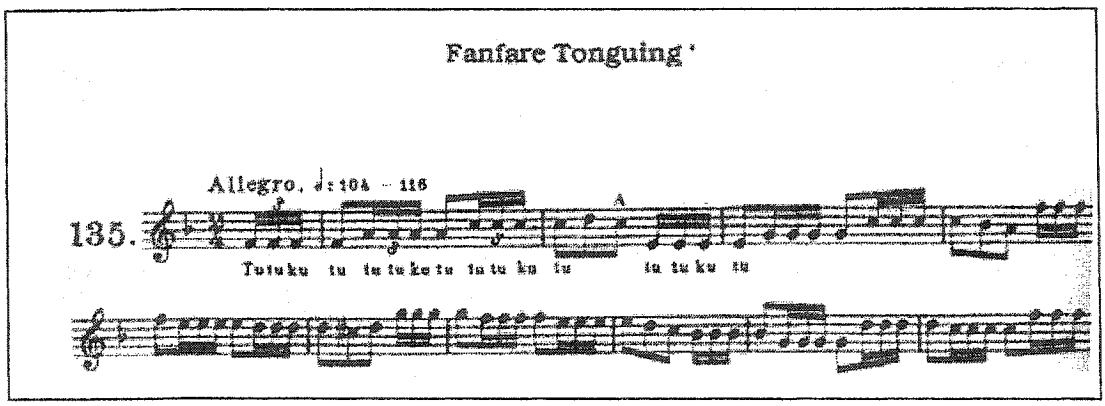


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Fanfare Tonguing Page 188 #135

(GI) Fanfare tonguing is something he had me do a great deal. Fanfares from the Arban's book, fanfares from the horse races, anything. He would also have me play these down the octave trying to get the low register to respond.
(DK) Playing a Fanfare etude was one of Jacobs' favorite methods to have the student imitate a style. He would have the student imitate the sound of a trumpet player when they were performing these, as always maintaining a good quality of tone throughout. By playing simple melodies in this way, the student can usually overcome most of the technical difficulties associated with multiple tonguing.

(RM) Very early on we also worked on two sections in the back: "Tonguing as applied to the Trombone" which is page 200, #135 through #145 [in Bass Clef Version: represented here in Treble Clef] We played all of these always single tongued where he was comparing the big T and the little A to the little T and the big A with an H on it (tHA).



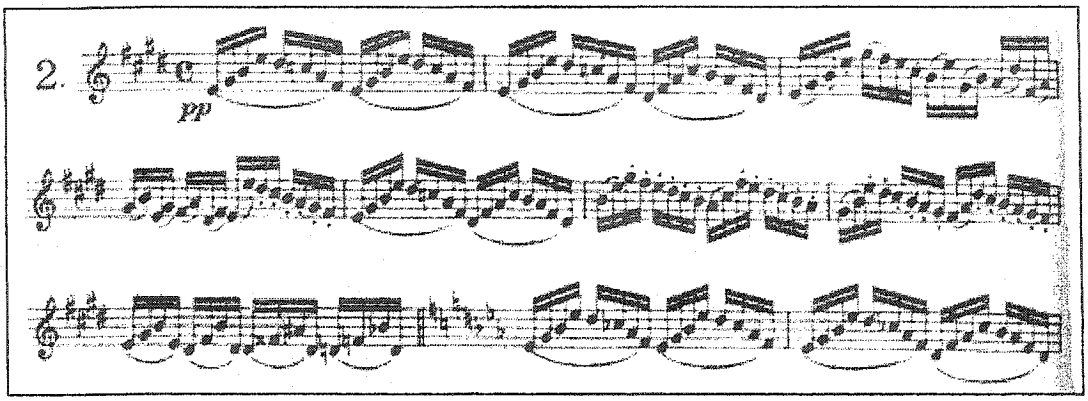
Page 286/292 Characteristic Study #2, 8.

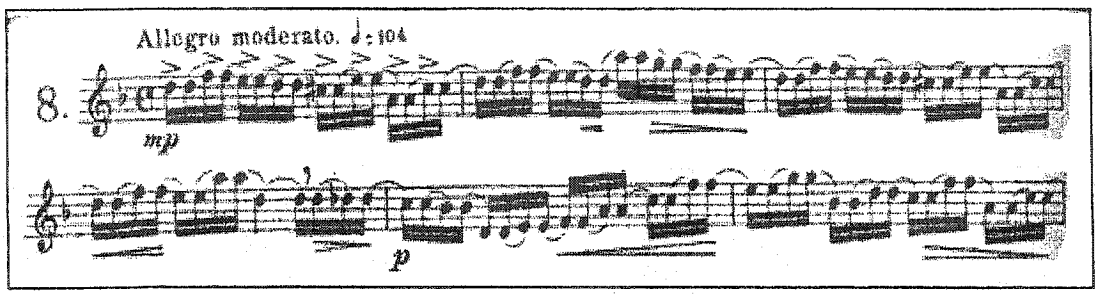
(DK) The Characteristic Studies and Variations are a summary of all of the exercises that are covered in the entire method book. These melodies are filled with a high level of virtuosity, but they require of the player to have sound fundamentals and convincing interpretations. Each of the Characteristic studies addresses a different technical aspect of playing and each should be played with a focus on having the best quality of tone in all ranges before advancing the tempo.

(RM) He specifically assigned Characteristic study #2, and had me leaving out notes so that I could take a good breath; the last 16th of the long phrase. I now realize that you do it without thinking about it, so when you need to take a breath, you just leave out the last 16th in a group of four. This is rarely the most musical way to do it, but it is the easiest way to do it on the fly. He had also assigned #8, and I can very specifically recall, after I had worked it up, him criticizing me for not getting the same tone in the Cadenza as I had in the rest of the work.

I [also] played the *Blue Bells of Scotland* for him. I remember him being angry with me because I was playing it so fast that it was just kind of a blur, which to him meant it was just being faked. That would really upset him, especially if we just finished doing something with great tone and then I wanted to play this which was just a blur. I remember him specifically saying, "A great artist like Herseth would never play it like that..." He would very often relate anything having to do with high standards back to Herseth.

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Schlossberg, Max. *Daily Drills and Technical Studies for Trumpet*. New York: M. Baron, 1941.

(NA) The Schlossberg was very good etude book for me. There was one time when I went to see Jacobs and I was trying to play the Persichetti *Serenade* [the first movement has the large leaps to the high E natural], and I was closing off. We spent a lot of time on p. 12 (ex. 44-45) because I had a tough time on big slurs, especially into the high register. We played them in different clefs and octaves, just to make life even more interesting! Other Schlossberg exercises were along the same lines as those in the Arban's. Some were more difficult. They included: p.7 (ex. 26-27), pp. 10-11 (ex.36-39), pp.14-15 (ex. 49-53), pp. 23-26 (ex. 70-81), pp34-36 (ex. 97-101), p.48 (ex. 128), pp.50-51 (ex.133-136) and p. 155 (ex. 145-146).

(GI) In the Schlossberg he had me playing the scales at the beginning of the book and just the quarter note ones, never the fast things. The "Bruckner" etude, #30, was a favorite of his as was #45. This etude is in 3/4 he would change it to 4/4 and add a quarter rest so that you could take a good breath. Other were #47 and #52. He would get you to play these etudes backwards as well--start at the end and go backwards so you could go either way playing, jumping down as well as up. He also had e work on a few at the back #133 and #136.

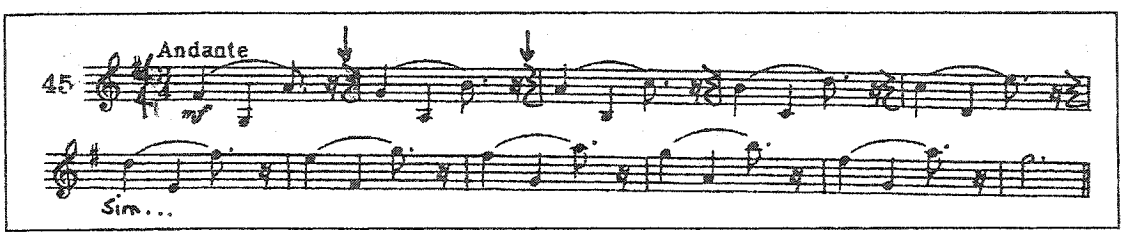
(RM) I can remember his favorites in the Schlossberg: #25,26,27. These were worked on get evenness in tone in the legato, and extend my midrange tone. He and I had worked on this enough that he was happy with that sound, now he wanted me to push that midrange sound higher. #45 is the one that you alter where you take it from 3/4 and makes it a 4/4 so you can take a nice comfortable breath. Not only would you have to play the first two lines, but you go backwards, ending on an F# which sounds a little funny-- so I usually resolve it to the G.

(DM) He strongly suggested that I include in my practice more drills such as scales and more dynamics in the warm up. He suggested that these be done first before the Remington studies, such as Schlossberg #'s 17, 20, all played in the style of *Meistersinger*. He said I could save Schlossberg # 16 until I was really feeling good playing wise. He always reminded me that in these studies that I needed to breathe for the end of the phrase

(CS) I remember spending a lot of time on the Schlossberg etudes. I played #45 in 4/4 and making it pretty soft. In this etude, you would read it as written and then get to the end and then play it in reverse. Others were #47 and #52. He would alter this as well, putting a fermata after the octave, then you would go backwards. He would also have me play the scales, tying everything together--always slurred. I remember that you would always have to breath on the octave. You would be slurring everything, play with a wide variety of dynamics.

#45

(DK) This etude can be played in a variety of ways but is primarily a tone building exercise. The quality of tone should be maintained from one note to another. The student should add a quarter rest at the end of each measure so that he or she can take a full replenishment breath. Play etude from start to finish, then play backwards from the end to the beginning. Play at a slow tempo and with a comfortable dynamic.

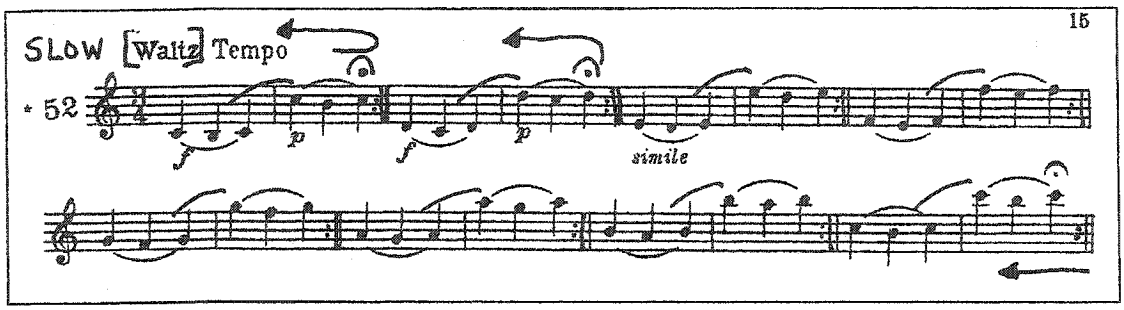


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#52

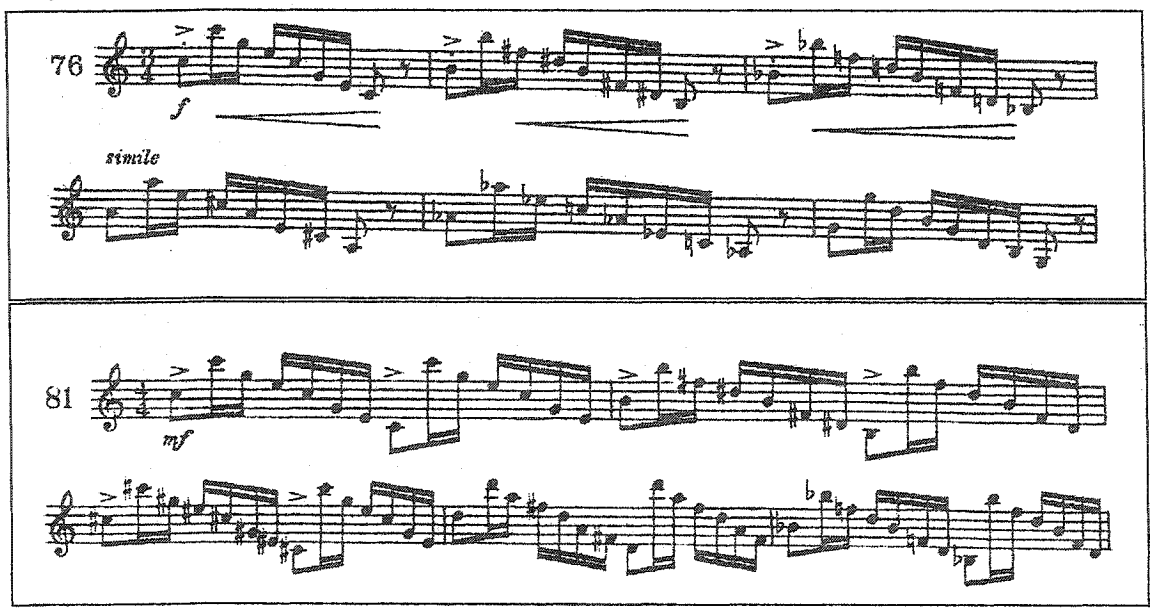
(DK) Play etude with various dynamics in a slow tempo (not as indicated). Play each octave transposition forwards and backwards (2x) as marked below. Take a deep replenishment breath before continuing with the next phrase. Strive to maintain the quality of tone in all ranges.

(MG) He reminded me to "let the lower notes teach the upper notes" what to sound like. He also directed me to think of air [blowing air for notes] in the staff-- think of it in terms of being an octave lower. The air isn't the same an octave above, for example: a C below the staff as opposed the C in the staff. However if you think about it as being as being the lower quality of air, the brain will take care of thinning it out just the right amount. What I was doing was thinning it out, getting involved, and thinning it out too much.



#76, 81.

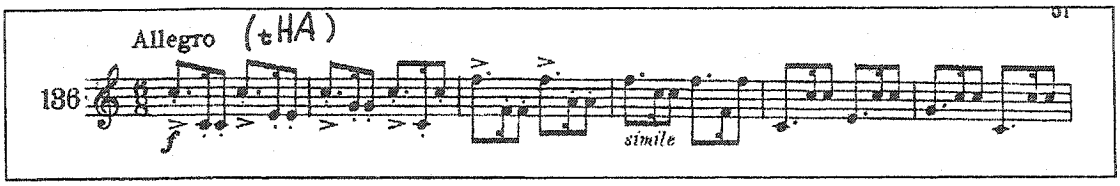
(DK) The following etudes are intended as tone exercises. Begin playing these at a comfortable dynamic and relatively slow tempo, ensuring that each note is played with the utmost accuracy and quality. In time the student should increase the tempo and dynamic contrast of each exercise. In making a crescendo (#76) in a descending line, the student should be aware of the difference in relative volume between the higher and lower octaves as generally the upper octave will sound twice as loud as the lower if played in the same manner. A decibel meter is a useful tool for confirming theses changes. Work to make the greatest contrast in dynamics over time.



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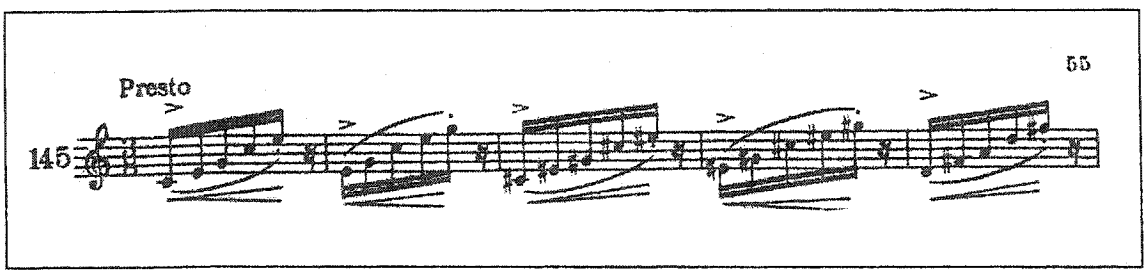
#136

(RM) We worked on #133 and 136 quite a bit. This is one of the places where he introduced to me the idea of the big "A"and the small "t" versus the big "T" and the small "ah". We would play at a dynamic where you got your most comfortable sound; a *mezzo forte*. These two really changed my approach to articulation where I could get the sound that I was getting in the middle of the note at the very beginning.



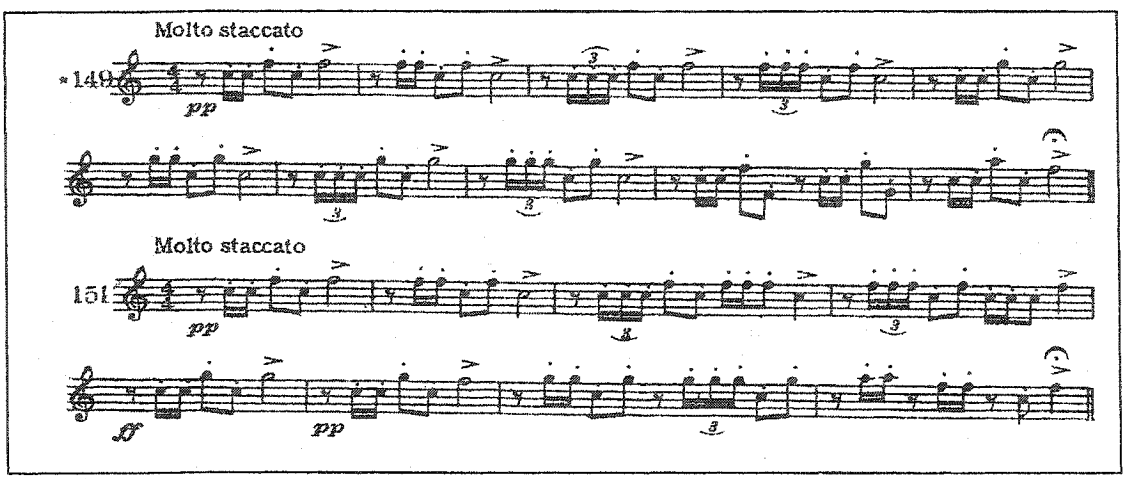
#145

(NA) He had me make a huge crescedo and he wanted me to use huge amounts of air, to accelerate the air through the phrase.



#149, 150

(DK) As mentioned with similar examples in the Arban's method, the student should strive for a true fanfare style, initially performing at a comfortable dynamic and tempo. Focus should be made on the quality of tone on all of the notes, ensuring that the staccato notes also have length and quality.

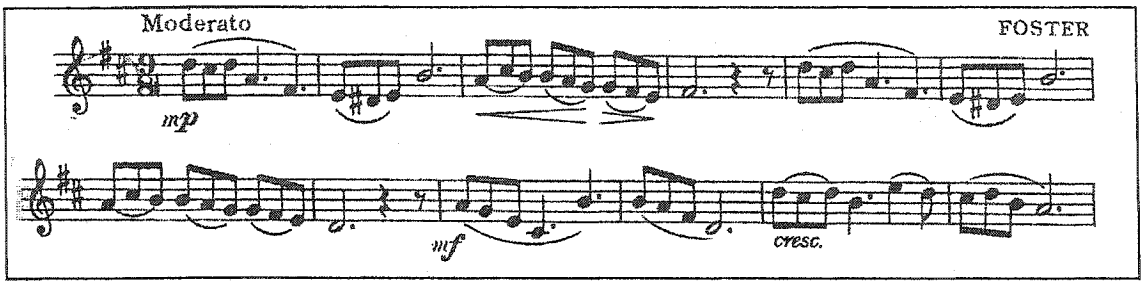


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Pottag, Max P, Andraud, Albert J.
335 Selected Melodious, Progressive and Technical Studies for French Horn. Compiled and revised by Max P. Pottag and Albert J. Andraud. San Antonio, Texas: Southern Music Co., 1958.
(BLUE BOOK)

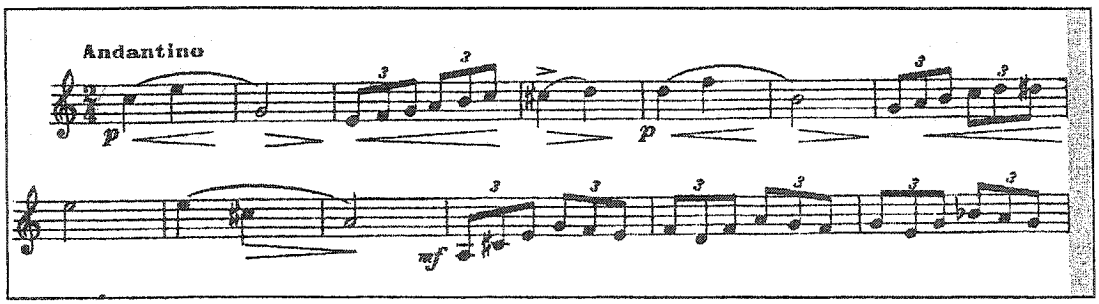
Steven Foster "Beautiful Dreamer"

(DK) Jacobs enjoyed playing melodies from all genres and the following is an example that he would ask some students to play. The melody is to be played down one octave in the bass clef to work on their interpretive skills and concept of tone in all ranges. He would encourage the student to have several melodies such as this memorized so that when they were testing new equipment such as mouthpieces, this melody could become a benchmark for comparison.

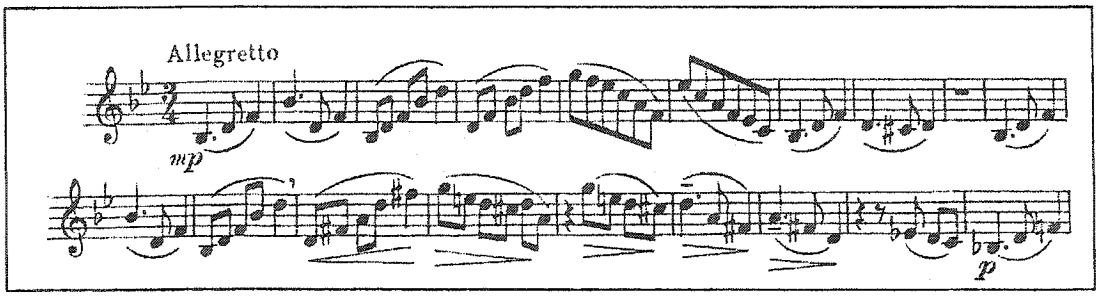


(DK) The following three etudes present a variety of technical and musical challenges for the student. Each etude should be practiced slowly and at a conservative dynamic initially to generate the concepts of tone and style. After the initial reading, the student should strive to convey the style and character of each to his or her best ability and making dramatic dynamic contrasts where written.

Page 8

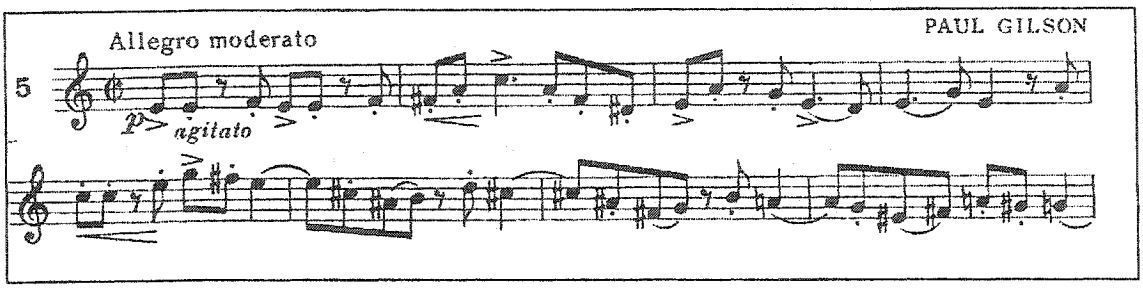


Page 10



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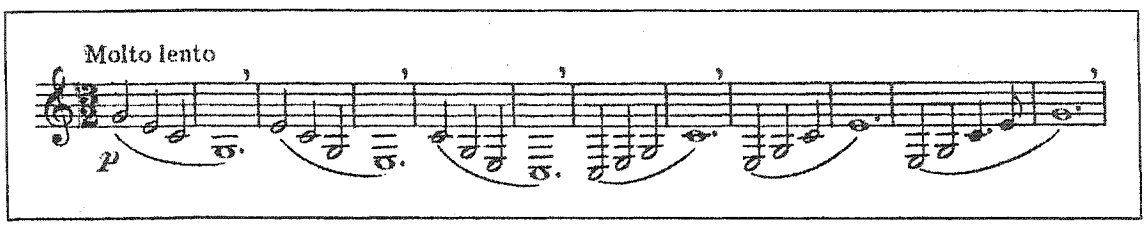
Page 12 #5



Page 12 (Also appears in Hal Leonard Special Studies for Tuba p.55 # 9)

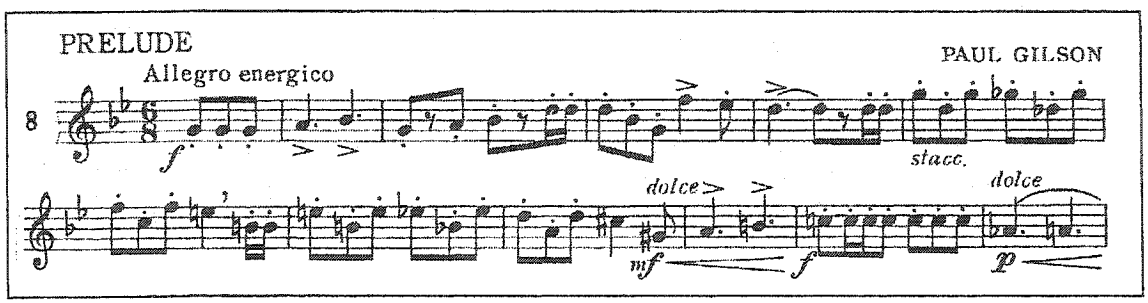
(AJ) This etude should be considered as a media for the development of resonant low range. It should be practiced in a very slow 3 or moderate 6 to the bar…I prefer to think of high and low notes as fast and slow vibrations. It will be found that the space between the teeth widens for the low notes. However, I would not depend on this maneuver to produce the low notes in itself, as the embouchure transition does not necessarily follow this movement. Instead the jaw and tongue movements usually come by themselves merely by playing a great deal of music in the lower range. I always believe it best to be somewhat unconscious of our physical maneuvers and highly conscious of our musical goals.

Many players will have considerable difficulty playing the low range at first but usually the embouchure learns to cope with the low vibratory rate on a trial and error basis. There is a general principal involved in producing range on the tuba. In descending into the lower range of the tuba, we play somewhat thicker surfaces as they will vibrate more slowly and still give a firm sound. Of course the opposite is true in the extreme upper range. Rotate the lips inward upon themselves rather than assuming a broad smiling position. The tighter lip surfaces will vibrate faster. We must be sure that the lips do not become stiff or it will be difficult to obtain proper response. (Arnold Jacobs, page 55 Special Studies for the Tuba)



Page 19 #8

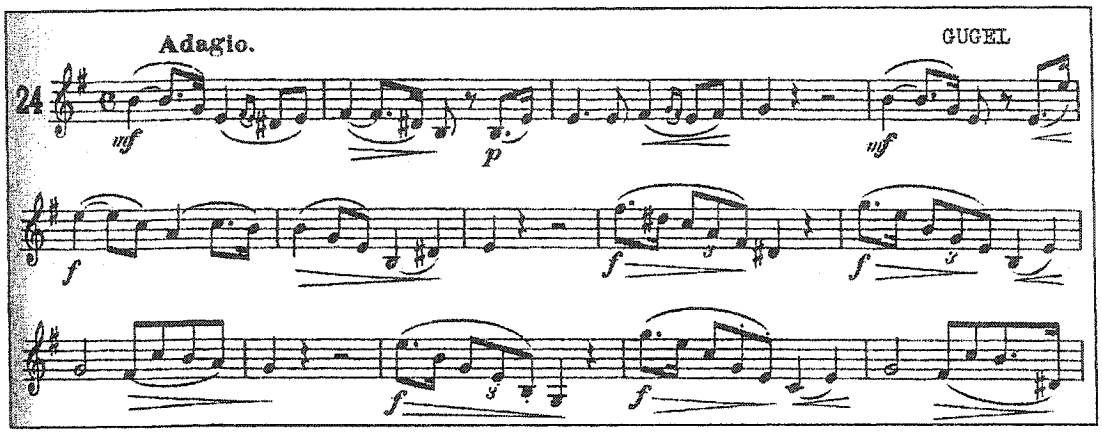
(DK) The following etude presents the challenge of detail for the student. There are a variety of rhythmic elements, articulations, and dynamics to be aware of in addition to the stylistic indications. The student should remain focused on the tonal quality throughout as he navigates through the interval jumps, and make every effort to create a dramatic change in all of the dynamics.



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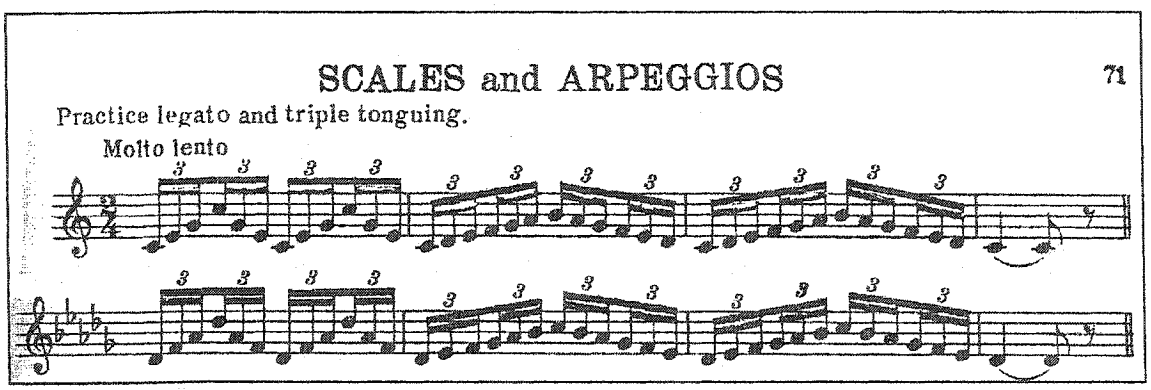
Gugel Etude #24 (Recorded by Jacobs on "A Portrait of an Artist")

(Frank Byrne: editor of *Arnold Jacobs: A Portrait of an Artist*)
This Gugel/Pottag etude was one of Jacobs' favorites and I put it on the CD especially for Rex [Martin], who thought it was the best of all. This shows Arnold doing the real "heavy lifting" – the slow, legato playing required to develop tone quality and control. His liquid slurs, singing tone, and wide dynamic range are to be admired, and as is the dramatic quality he brings to this performance.
(Extracted from Windsongpress with permission)



Scales and Arpeggios

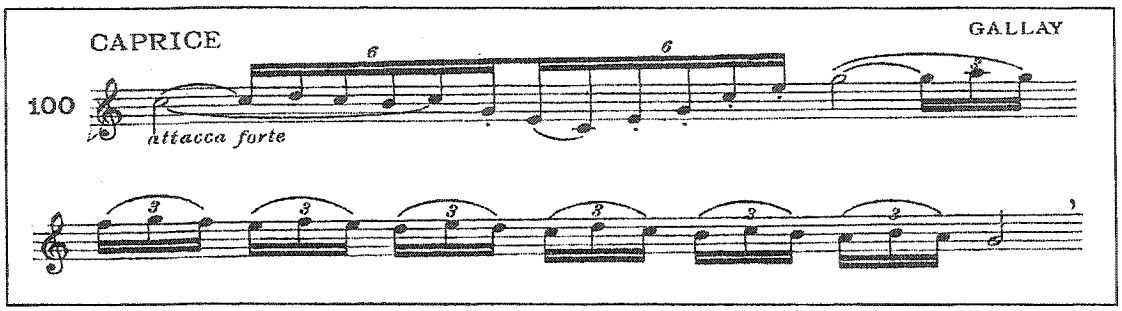
(DK) The aim of this study is not only to work on developing good facility, but to focus on maintaining a quality tone on all of the notes. This etude is to be played slowly at first to resolve any fingering problems and solidify the concept of quality tone. The etude then can be played at faster tempi as a velocity, flexibility, and tonguing study.



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(RM) The Caprice's were assigned to simply get the same quality of tone on each individual note and learn to interpret the music with great flair.

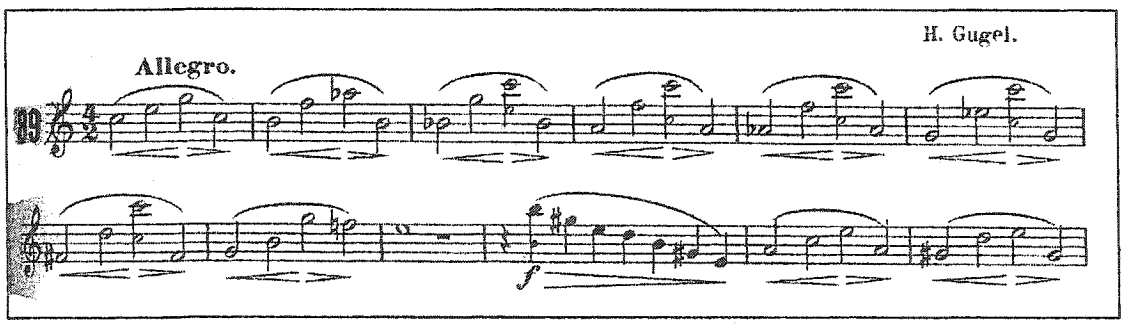
Gallay Caprice #1 , #100



Gugel Study #89

(RM) The intention of this study is to focus on the quality of each note. Although it is quite simple in its construction, the performer must pay particular attention to not allow any notes to have less than the "best" tonal quality.

(DK) This etude can be performed in many different ways. Generally, Jacobs would have the student perform this initially to ensure the quality of tone on each note. Subsequently the areas of dynamics and slurring would become topics for investigation. If the student focuses on the musical elements of this etude, generally these areas are automatically taken care of.

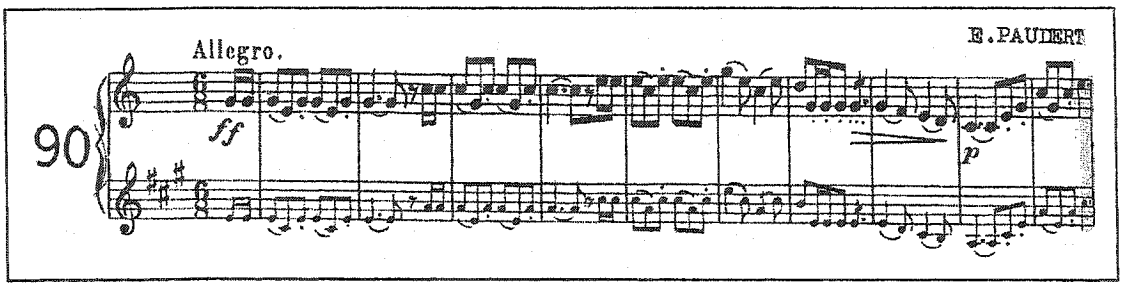


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Paudert Study #90 (Also appears in Hal Leonard *Special Studies for Tuba p.59 # 12)*

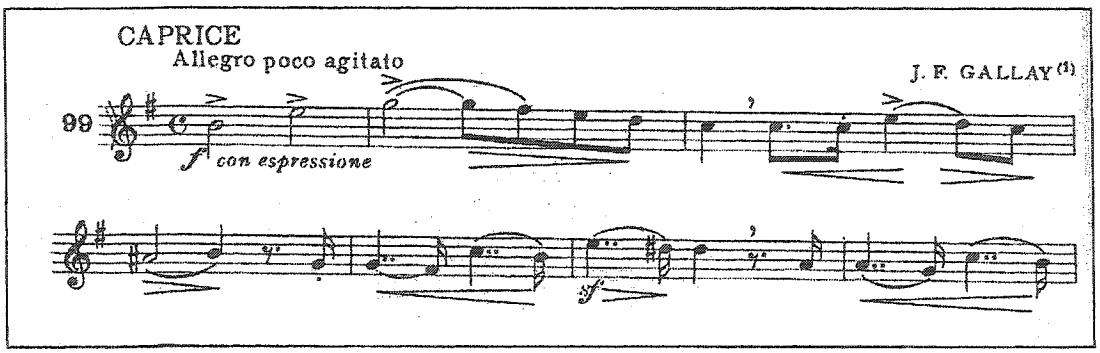
(AJ) This is a very difficult etude as it is not only rather fast, but must be highly articulate and yet very audible. It presents problems to the Tuba player as where to breathe. When I play this etude, I take the liberty of dropping notes in order to breathe. Tuba players use up their breath up about 3 times as fast as the French Horns and Trumpets do, and as a result should be permitted to breathe more frequently. (This comment on air flow is based on playing the same proportionate volume levels as the higher pitched instruments.) In studying the etude, I recommend that it be taken and practiced by the phrase and not from the beginning to the end immediately. The ability to remember the phrases from one practice period to another is important. After the player has mastered the phrases he should use his own musical ideas of interpretation to the fullest. (Arnold Jacobs- *Special Studies for the Tuba*, p.59)

(RM) There are several aspects to performing this etude. It is excellent for ensuring that the performer maintains the same tone on each note using a variety of different articulations. This etude is also excellent for developing virtuosity and also for expanding the dynamic range using a quality tone.

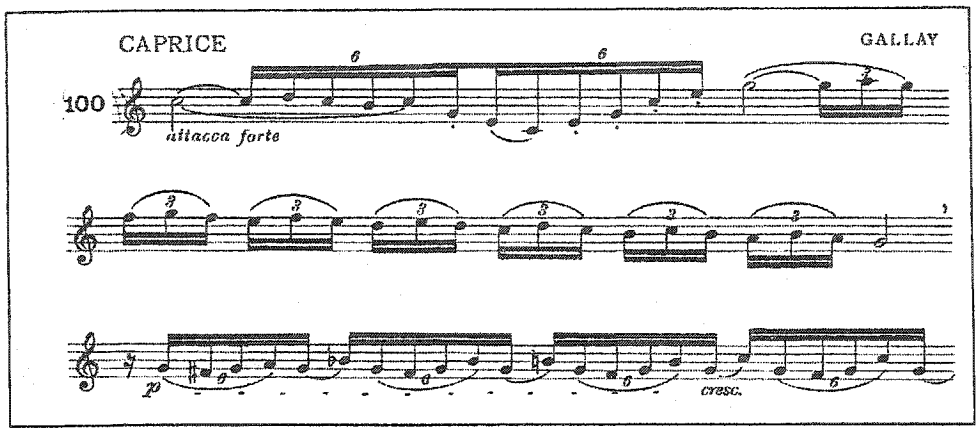


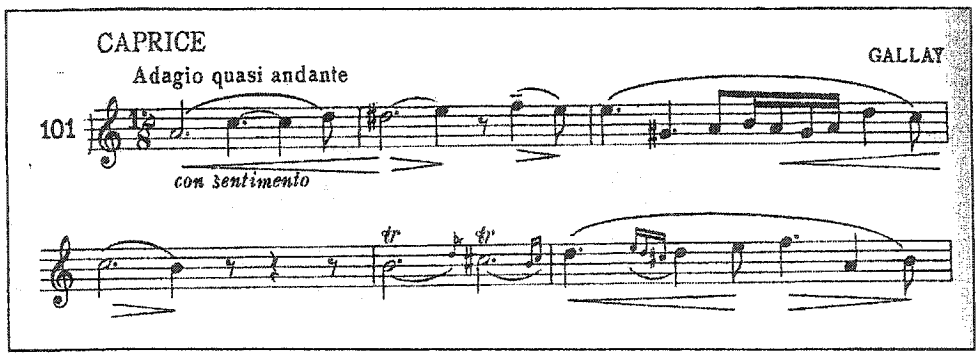
Gallay Caprice #99,100,101

(RM) The following three Caprice etudes were assigned by Mr. Jacobs in an effort to develop the performer's virtuosity with an interpretive flair. As with all of the studies he assigned, one of the most important aspects was to get a great quality of sound on each note.



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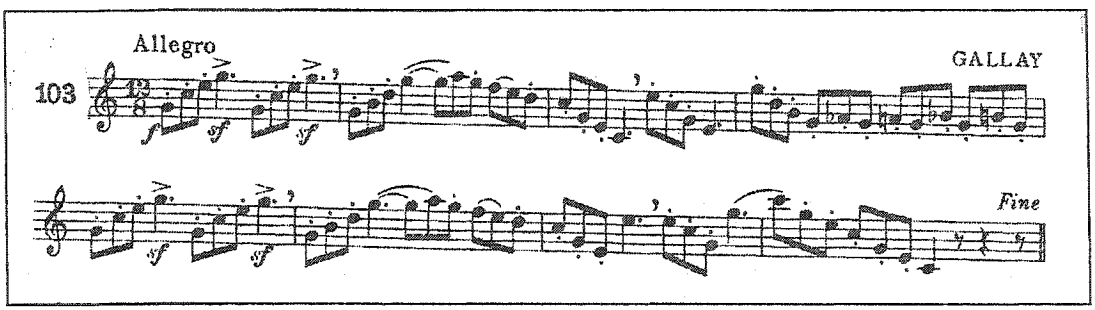




Gallay Etude #103

This also appears in the Hal Leonard *Special Studies for the Tuba,* p.54 in D Major

(AJ) This etude is one of the best for bringing about good form to the embouchure. In its early development, speed is not important nor is the attack to be evaluated. We do want a good attack and a good sound with increasing proficiency. This study can be played faster. I recommend a variety of articulations and dynamics for this study. This etude should also be practiced *legato*. (Arnold Jacobs, *Special Studies for the Tuba,* p.54).

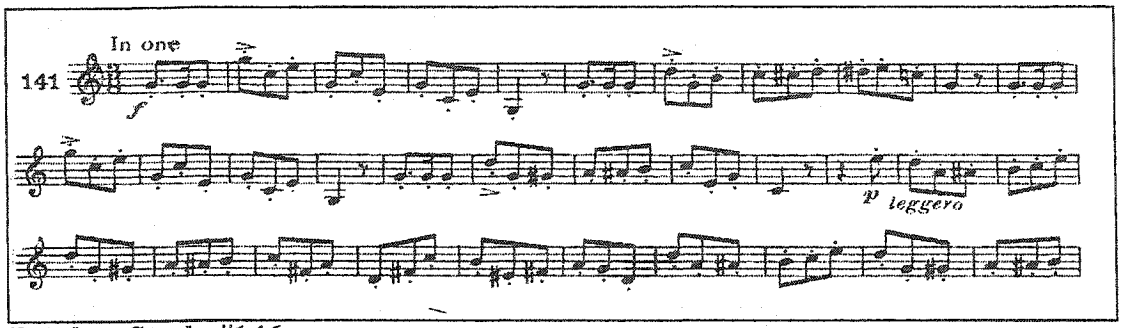


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Pottag, Max P, Andraud, Albert J. *212 Selected Melodious, Progressive and Technical Studies for French* Horn. Compiled and revised by Max P. Pottag and Albert J. Andraud, Cincinnati, Ohio : Albert J. Andraud, 1943.
(RED BOOK)

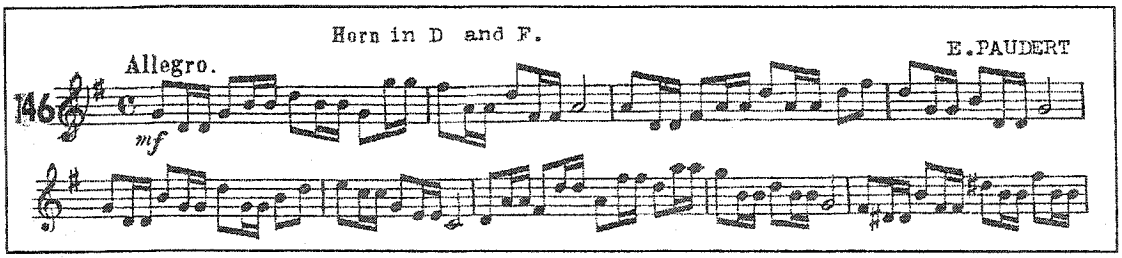
#141 (Play in F Major)

(RM) Mr. Jacobs asked me to learn this one as a horn player would. This etude demands the performer to be not only flexible and articulate, but play with a great deal of flair and an excellent tone on each note.



Paudert Study #146

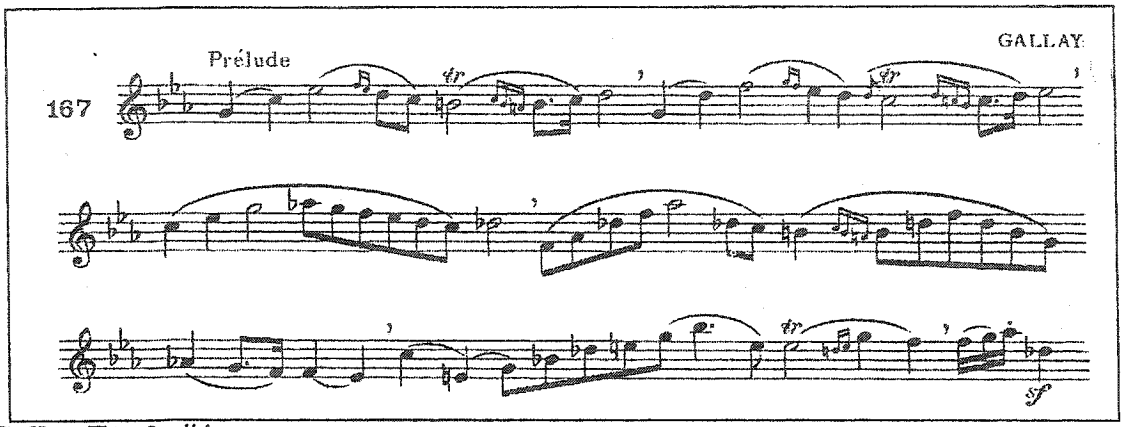
(DK) This etude has several aspects to it. Initially the performer is challenged by the intervallic leaps and musical elements, simple as they may appear. The performer is also challenged to maintain the same consistency of tone on each note, not allowing for any mediocrity to creep into their playing. This demands a great deal of concentration on the part of the performer. The etude should initially be performed at a comfortable dynamic, then played at dynamics which would expand the players ability. This etude can also be transposed into many different key areas.



Gallay Etude # 167

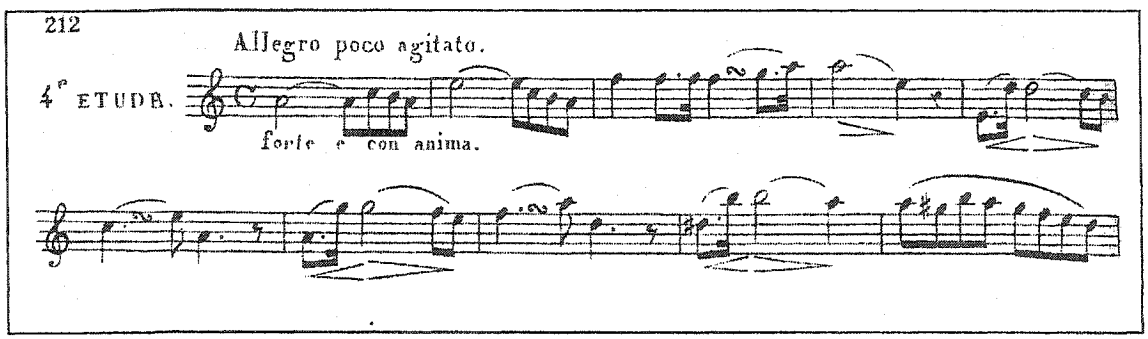
(RM) This etude allows the performer a great deal of expressive freedom. The player should strive to have the best quality of tone on all of the notes, focusing especially on the quality of the smallest notes.

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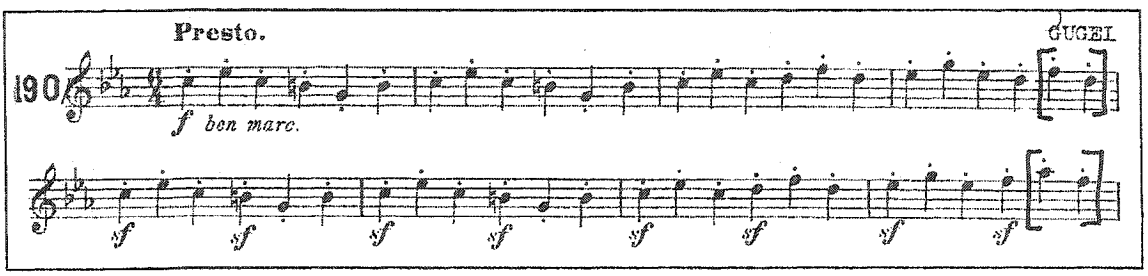
Gallay Etude #4

(DK) This etude allows the performer to play with great virtuosity and flair. The musical directions *con anima* offer a specific idea of how the music needs to be performed. The quality of tone on all of the notes is to be focused upon as well as the clarity of the musical elements such as the turns (m.3).



Gugel Etude #190

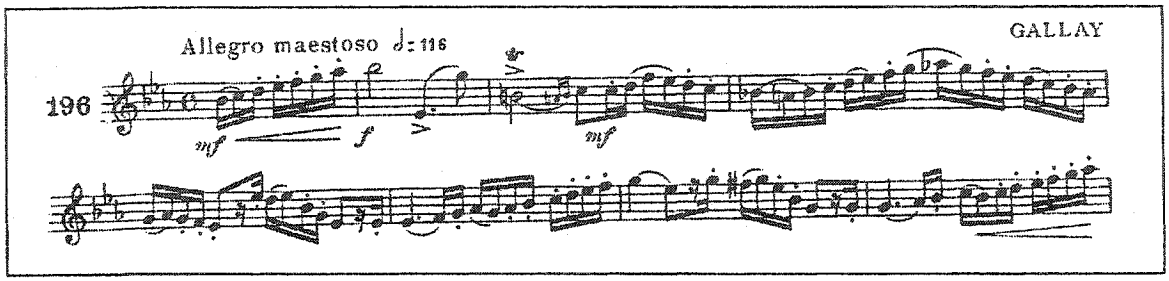
(RM) As with many of these etudes, #190 demands that the performer be in control of all aspects of their playing. Each note must maintain the identical sound and the rhythmic element must remain solid throughout. The performer can choose to leave notes out to obtain a replenishment breath (as indicated).



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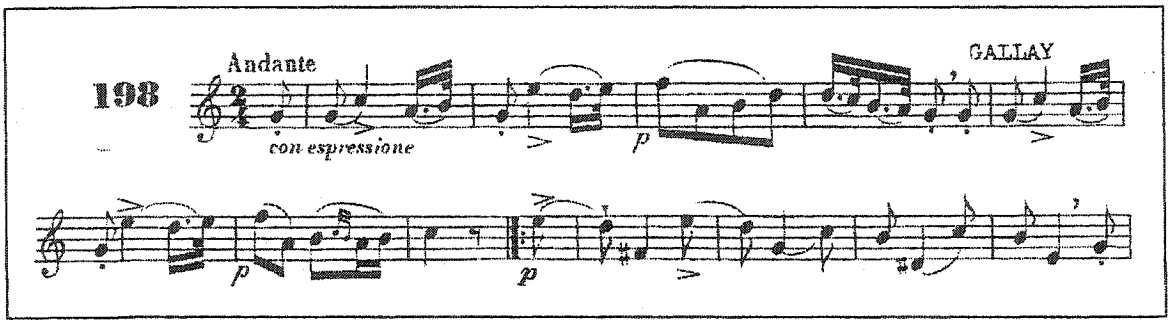
Gallay Etude #196

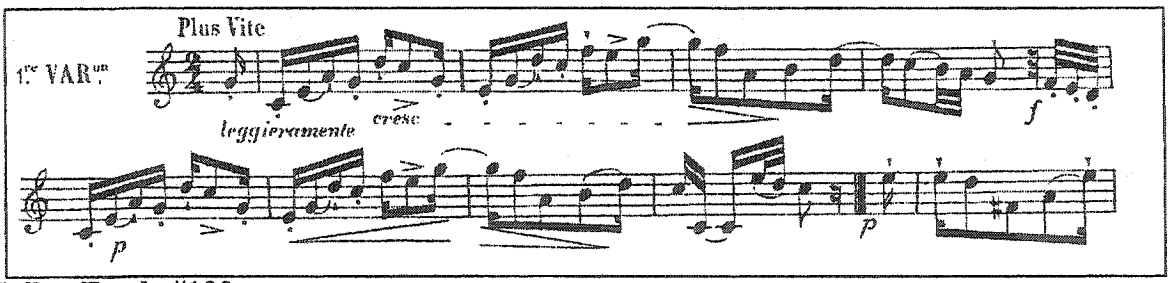
(RM) This etude is excellent for the development of expression, technique, and the application of great tone throughout all ranges.



Gallay Etude #198: Theme and Variations

(RM) This specific study was assigned to me to develop the ability to get the identical tone on every note, especially on the small notes. This also helped me to develop the ability to play lightly on the contrabass tuba without sacrificing tone, in a style that could blend easily with the woodwind instruments. This etude also demands a high level of interpretation and style to perform well.



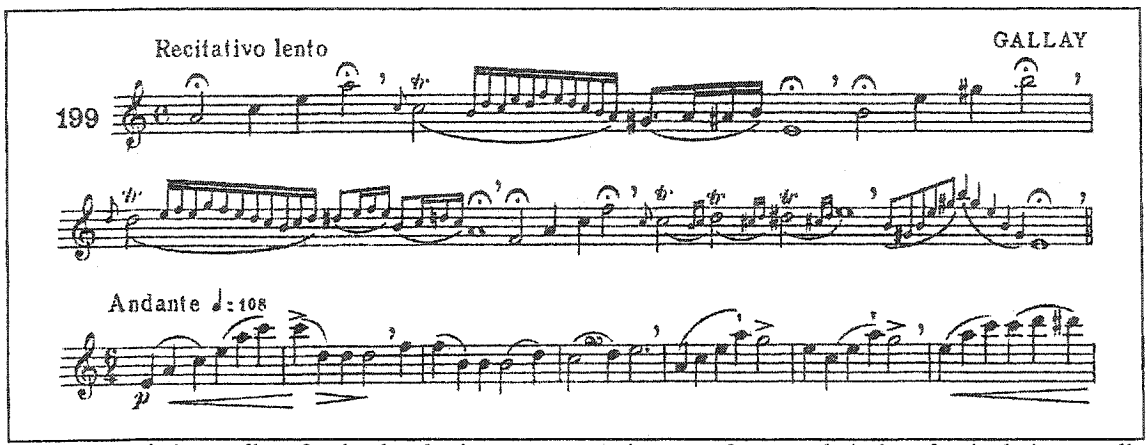


Gallay Etude #199

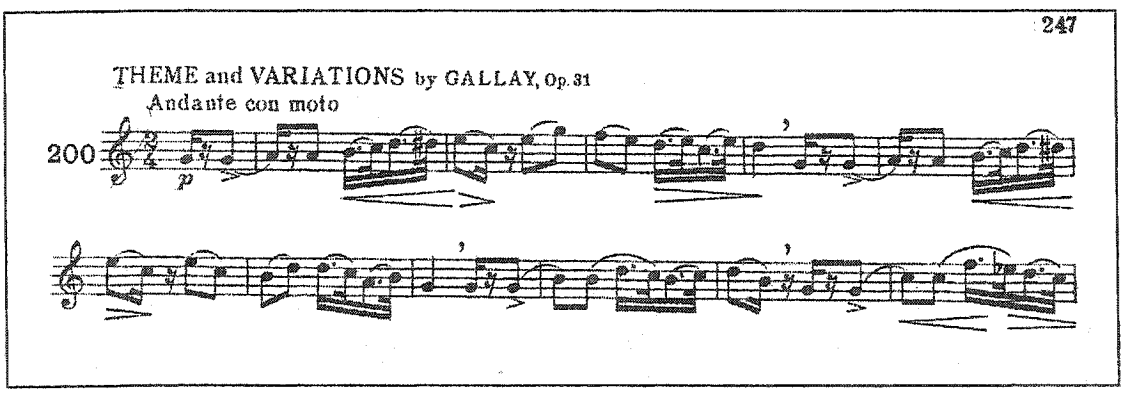
(DK) #199 requires of the performer to spend a great deal of time on the numerous details. The opening *Recitative* has enough material to keep the player busy for several hours. The focus must be given to playing with a great deal of expression and freedom, not making the etude seem contrived in any way. Since no dynamic markings are noted at the beginning, this gives the performer the liberty to experiment, basing all final choices on musical commonsense. The second part of this etude (Aria) is far more structured, but the performer should approach it in the same manner as the *Recitative*, as it will make for better a better transition from one section to the next.

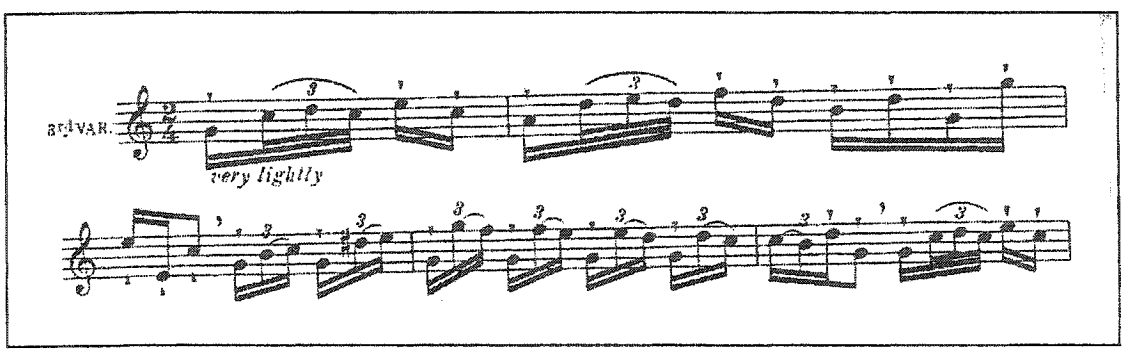
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Gallay Etude Op.31 #200: Theme and Variations



(RM) This etude is excellent for the developing a great consistency of tone and clarity of articulation on all notes while performing in a lighter style.





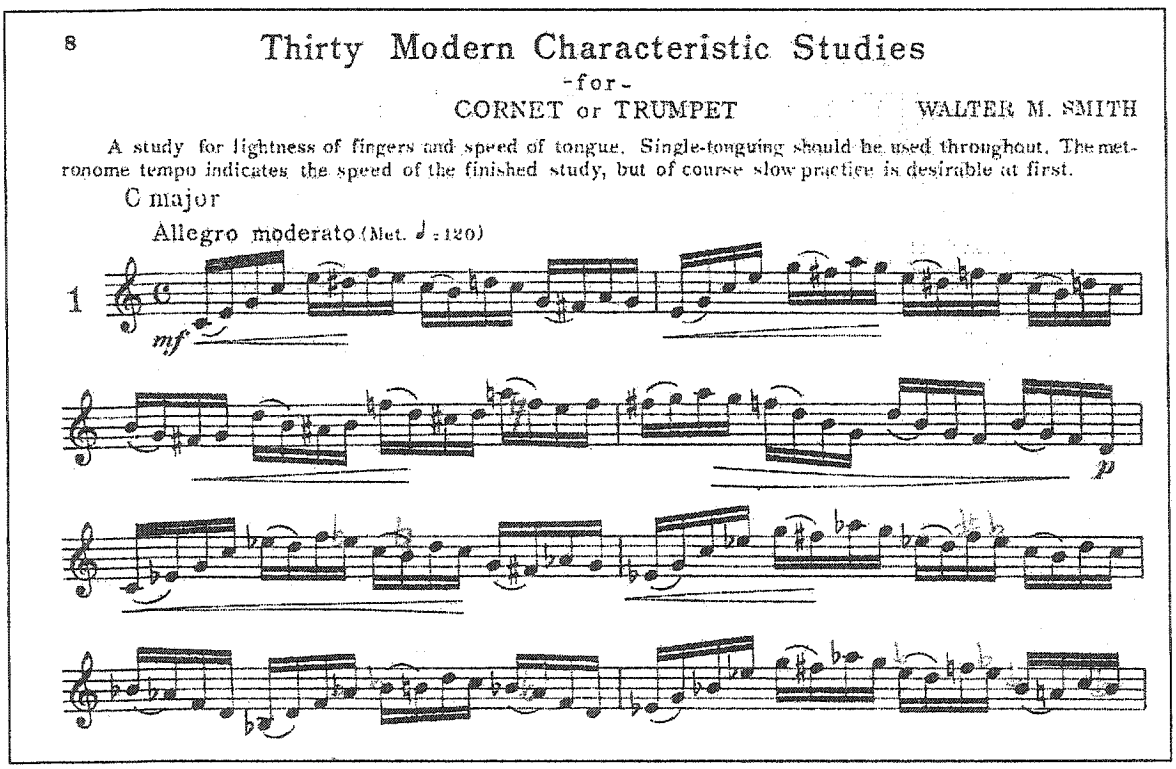
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Smith, Walter M. *Top Tones for the Trumpeter or Cornetist*;
Thirty modern etudes based on the technical problems involved in mastering the higher register and the acquisition of extra technique demanded at the present time. New York: Carl Fischer, 1936.

(DK) For each of the etudes, Walter Smith has provided a sensible approach to performing these studies with the maximal efficiency. In the Preface, Smith notes that these studies have been written with the intention of providing the "ambitious student" a venue to further their abilities beyond existing method books such as the Arban's and St. Jacome. He presents studies in every key area, "not even omitting G#, D#, and A# minor," so that the student can overcome these difficulties before entering the professional arena. Each of these etudes presents the challenge of range, dynamics, style, facility, all while having one intrinsic value; they are all tuneful. Several students responded that Jacobs enjoyed performing these etudes and encouraged each of them to study them for a long period of time so they could perform them up to their finest level.

Each of these etudes should be practiced slowly and as accurate as possible before attempting to increase tempo. Each note should be clearly played in terms of articulation and tone, and the most complicated of passages should be given extra attention in the earliest stages to ensure proper learning. The tubist should strive to achieve a stylistic conception as if he or she were playing these etudes on a trumpet.

#1: C Major



8

Thirty Modern Characteristic Studies

-for-

CORNET or TRUMPET

WALTER M. SMITH

A study for lightness of fingers and speed of tongue. Single-tonguing should be used throughout. The metronome tempo indicates the speed of the finished study, but of course slow practice is desirable at first.

C major

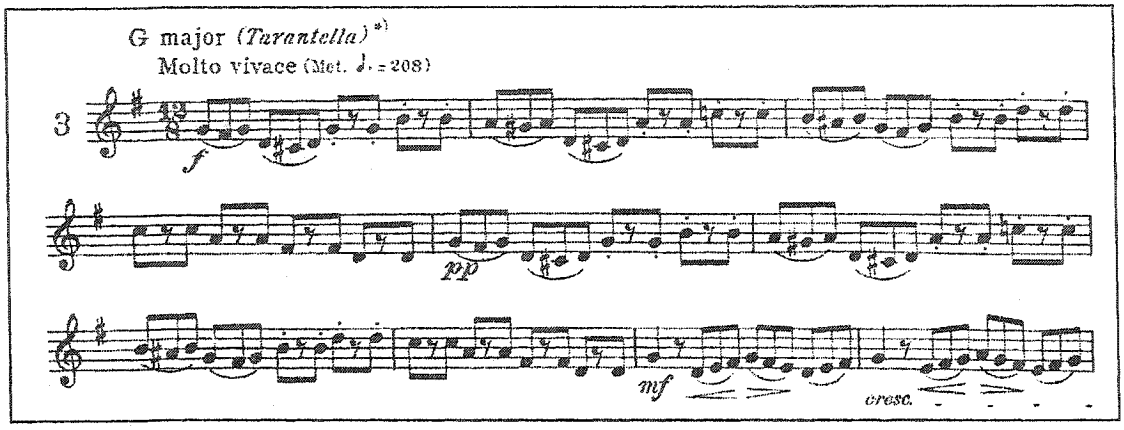
Allegro moderato (Met. ♩ = 120)

1

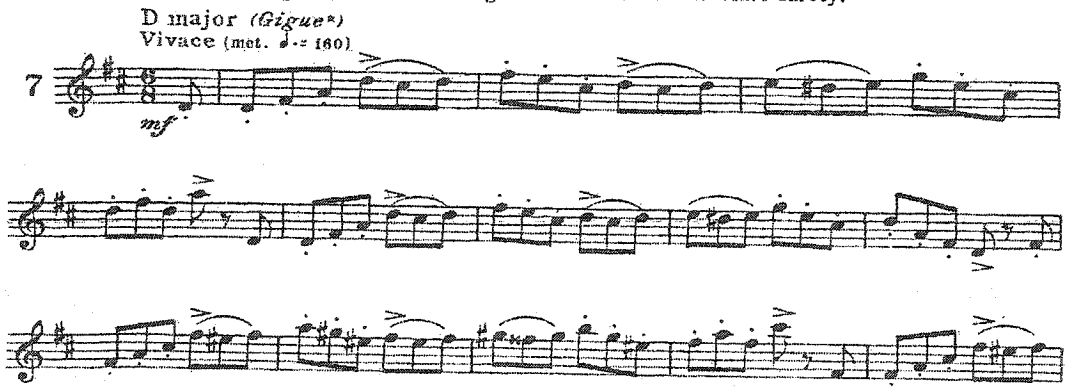
mf

p

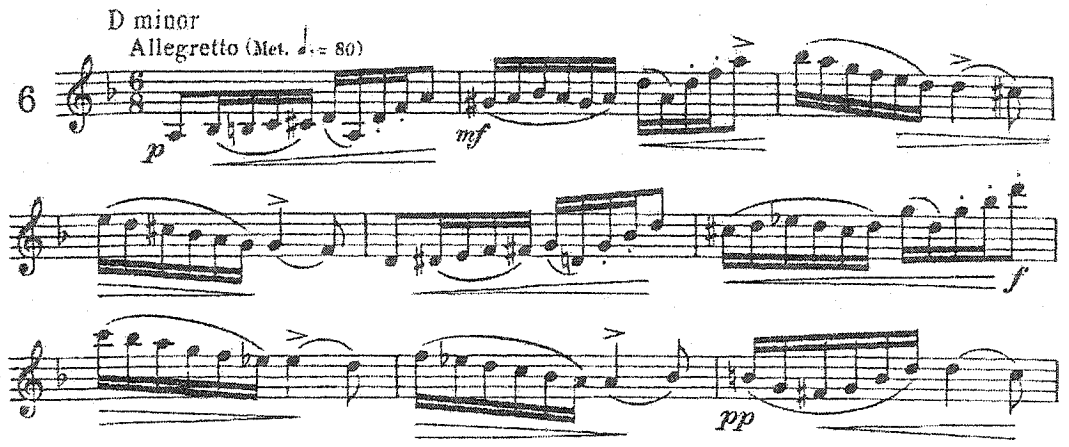
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20
This little jig tune will be found pleasant to practice. Note the legato and *pp* at Ⓐ, the forte at Ⓑ, and the sudden inversion of the slurs at Ⓓ. Try to reach the high D at the end with absolute surety.

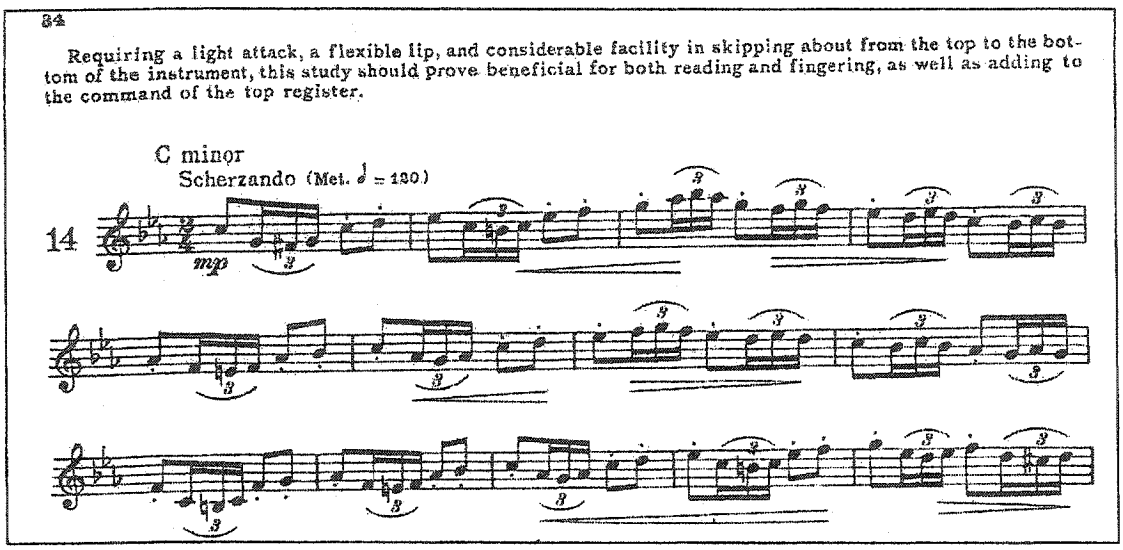


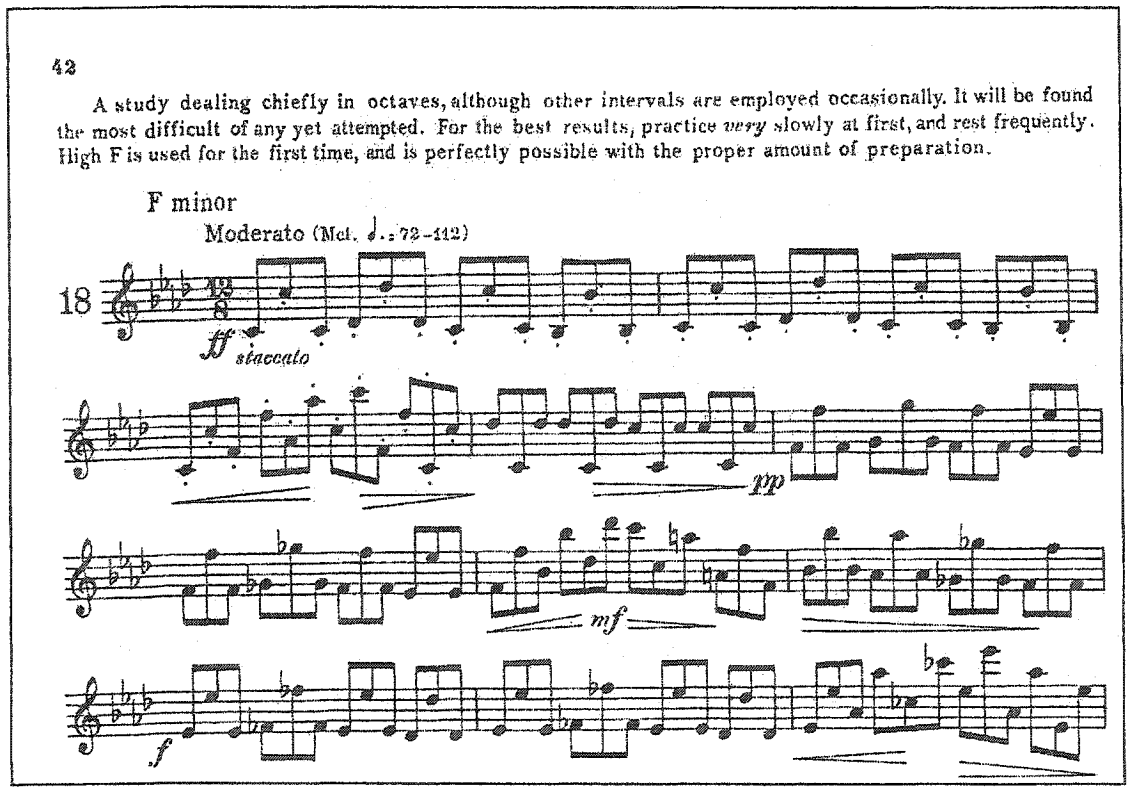
A light and dainty study. Do not tire the lips unnecessarily by too much work on the high D's. Work the fingering out separately, if necessary. Watch the intonation on the low C♯ at letter Ⓐ. It is difficult to play in tune.



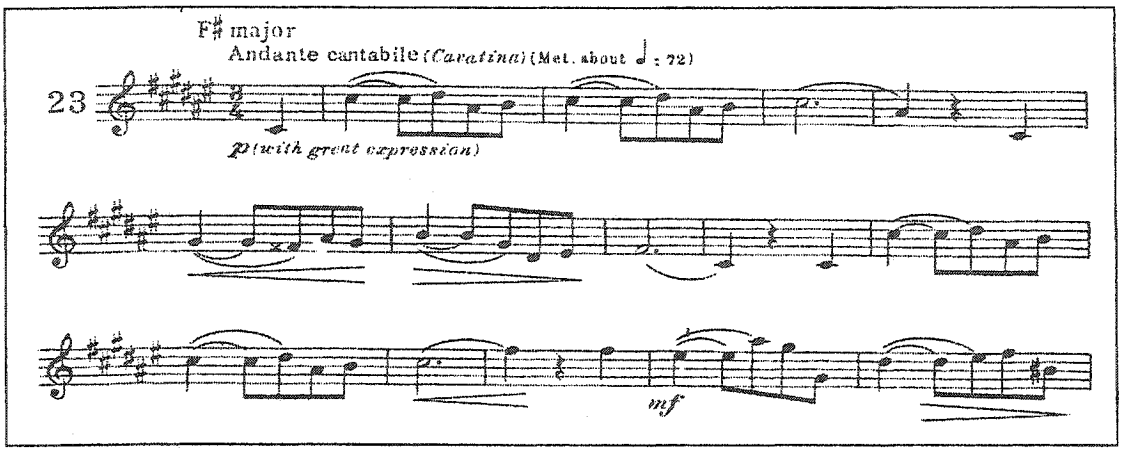
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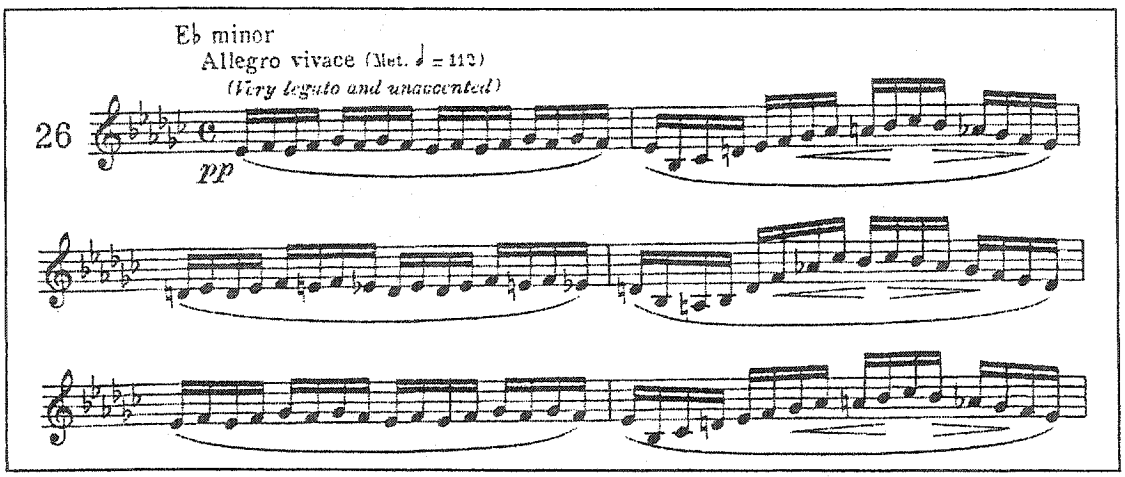
(NA) A lot of his students, myself included, thought they had pretty good technique until they met Mr. Jacobs. He used to drive me mad. He introduced me to Walter Smith's book, *Top Tones for the Trumpeter*. We spent time on numbers 1, 2, 3, 6, 7, 14, 18 and 23 and he encouraged me to look at the rest. The first time I saw the book he asked me to play #23, which is in 6 sharps and treble clef, of course. I thought I was sight- reading it quite well under the circumstances but he harangued me about the wrong notes and lack of musicality. Every note had to be clear and musical. The other studies we did are not easy either, but he was just as fussy with them. He certainly raised the level of what I thought good playing was. I have to say he put his money where his mouth was too. He could certainly play them with style and clarity.





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Kopprasch, Georg. *Soixante Etudes*, Op. 6. Leipzig: Breitkopf & Härtel,1832/33. Reprinted as C. Kopprasch 60 Selected Studies for BB flat tuba (Music for Brass No.2006) North Easton, MA: Robert King Music Company, n.d.

(DK) The Kopprasch etudes appeared to be one of the most consistently used by Jacobs, other than the Arban's and Pottag books. When Jacobs compiled his "Special Studies for the Tuba" in the Hal Leonard Advanced Band Method, he chose a number of the Kopprasch etudes. The sixty etudes (originally written for horn) present a variety of musical challenges for the performer including scale work, intervallic studies and interpretive theme and variation studies. The following three studies were noted by a large majority of the respondents. These studies are excellent for developing the ability of the performer to control the tone quality throughout the range of the instrument. The music also poses dynamic challenges for the performer. Each of these studies is to be played slowly (as written) with a metronome to ensure accurate rhythm throughout.

#6, 10, 15



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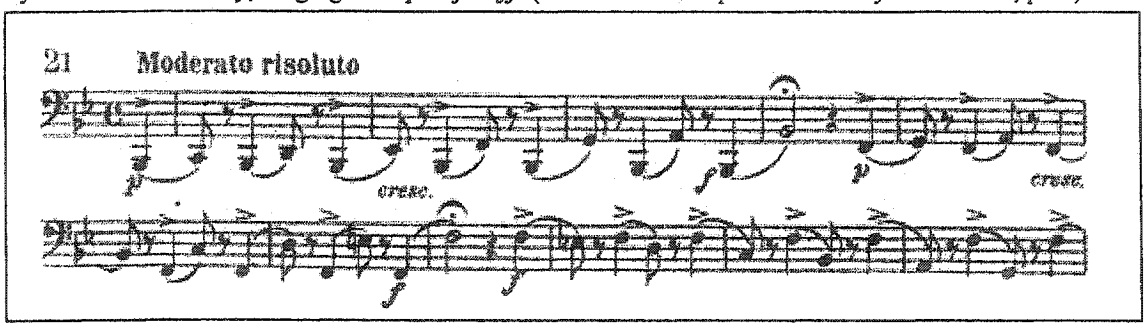
#20 Appears in the "Special Studies for the Tuba"(#8, p.54) and in the *Selected Melodious, Progressive, and Technical Studies for the French Horn (#29, p.37)by Max Pottag (Blue Book).*

This etude is one of the best for bringing about good form to the embouchure. In its early development, speed is not important nor, is the attack to be evaluated. We do want good attack and good sound with increasing proficiency. This study can be played faster. I recommend a variety of articulations and dynamics for this study. This etude should also be practiced *legato*. (Arnold Jacobs: *Special Studies for the Tuba*, p.54)



#21 Appears in "Special Studies for the Tuba,"(#7, p.53)

This etude is of benefit in developing a good entrance of tone over a large range. It is of particular value in the lower range. In practicing this etude great care must be used to develop an even tone, and a consistently good quality of sound in all registers. I recommend that the student use a wide variety of dynamics for the study, ranging from *p* to *f* or *ff*. (Arnold Jacobs: *Special Studies for the Tuba*, p.53)



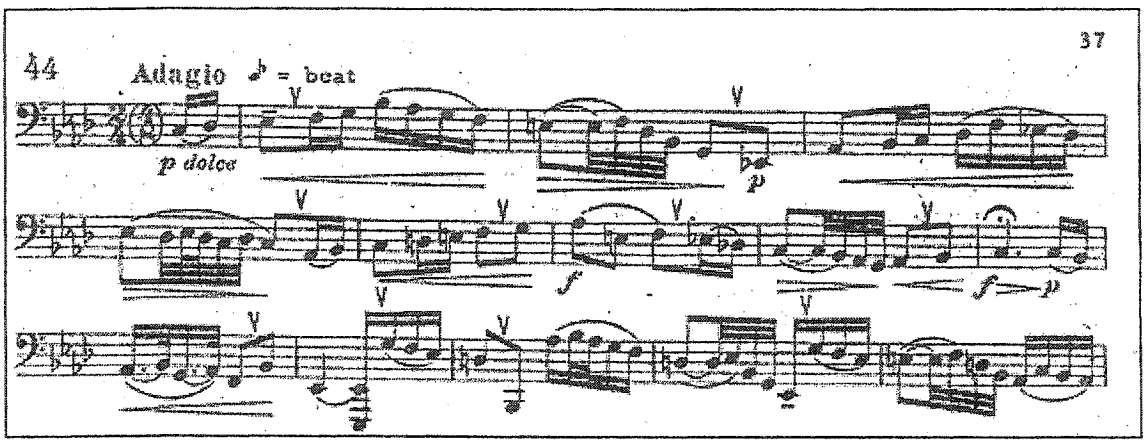
#25 Appears in the "Special Studies for the Tuba" (#11, p.58)

The following etude should be practiced slowly, metronome set at 60. It should be motivated as a tone building Etude for middle and low range. In this study, I prefer that the student breathe on the bar line, if possible, being very sure to fill the lungs and use air freely to produce a considerable resonance in his playing, about *f*. Great awareness is demanded on the part of the player that his tone is always pleasing and has great clarity regardless of range. (Arnold Jacobs: *Special Studies for the Tuba*, p.58.)

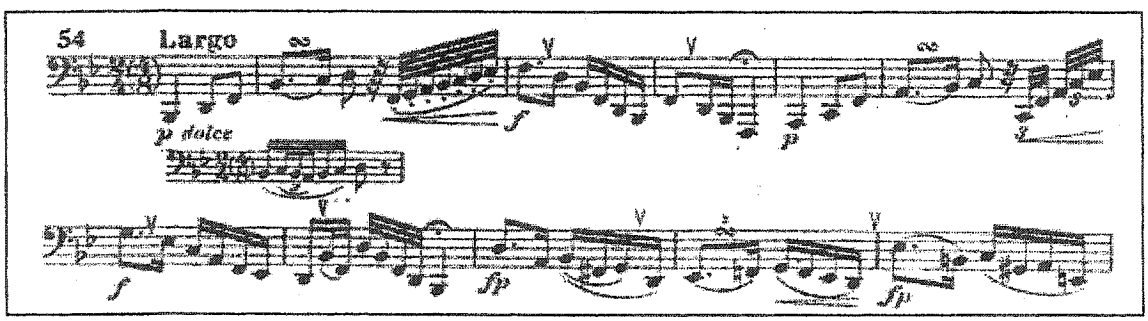


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(DK) The following three etudes present the performer with true musical challenges. Written in a *Bel Canto* style, each etude covers a large range, works through several key areas, and has enough rhythmic complexity to challenge the best of player. Several of the respondents agreed that this etude was used to develop the ability to control the quality of tone over a large range, and learn to play expressively.



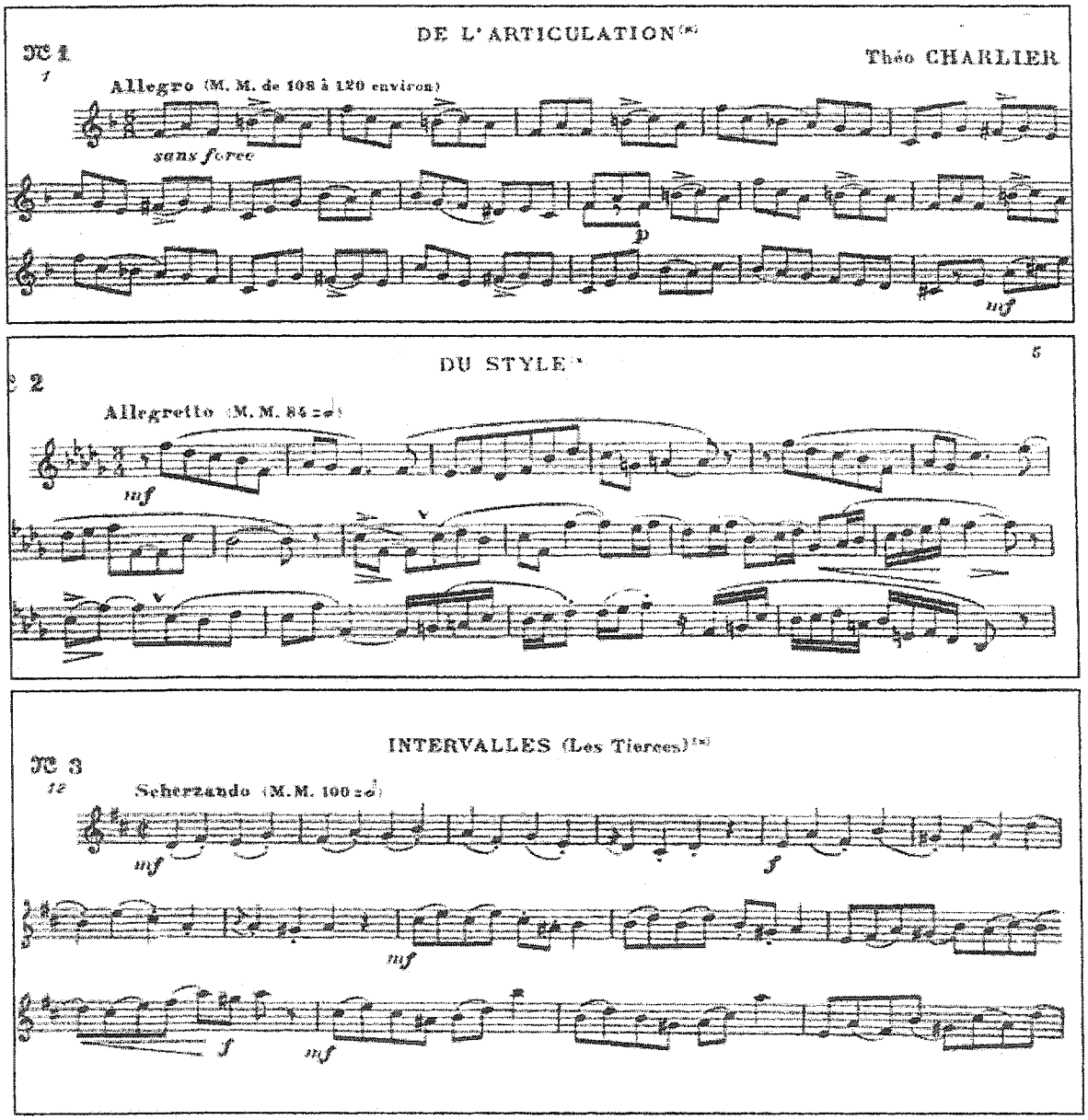




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Theo Charlier. *Trente-Six Études Transcendantes pour Trompette, Cornet à Pistons ou Bugle* (Nouvelle edition) Paris: Alphonse Leduc, 1946.

(DK) The Charlier method is considered one of the staples of any trumpet studio curriculum. Each of the etudes focuses on one specific aspect of technique: articulation, style, scales, etc. It is not surprising that Jacobs used this book, as it is known that Bud Herseth used this book extensively in his practice (as well as Clarke's *Top Tones for the Trumpeter*). Each study should be first practiced slowly to ensure a quality tone and accurate rhythm throughout.

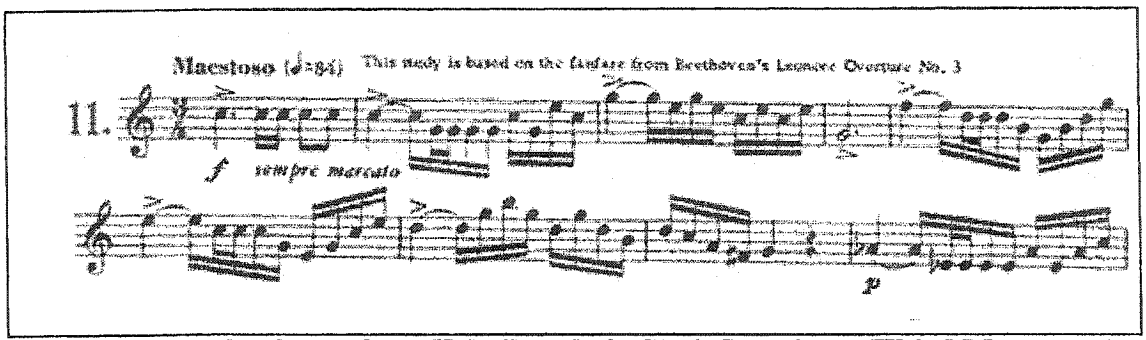


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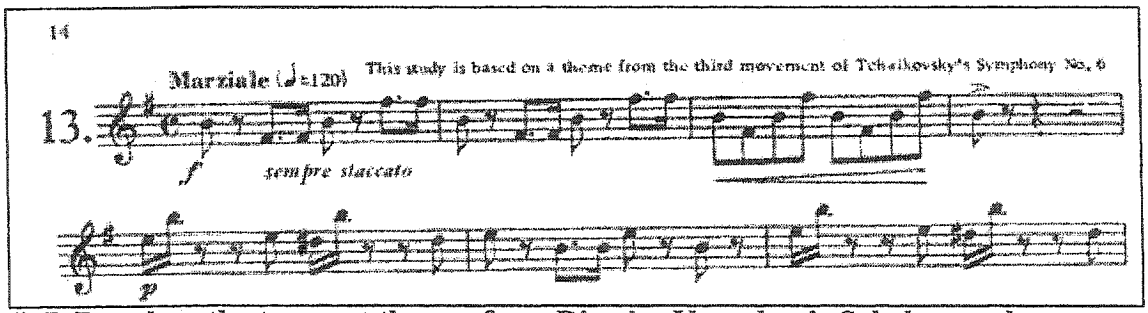
Brandt, Vassily. *34 Studies for Trumpet.*
Edited by Robert Nagel. New York: International Music Company, 1956.

(DK) The Brandt is one of the method books that was mentioned only by a small number of the respondents. The subjects who recalled working out of this book did remember that Jacobs' favorite etudes concentrated on interpreting music that was familiar. Each of the three etudes below, present a study based on a famous orchestral work. The performer must be well acquainted with the style of each before having maximal success. The primary focus of these etudes is to achieve a high level of interpretation, while maintaining a quality tone and clear articulations throughout.

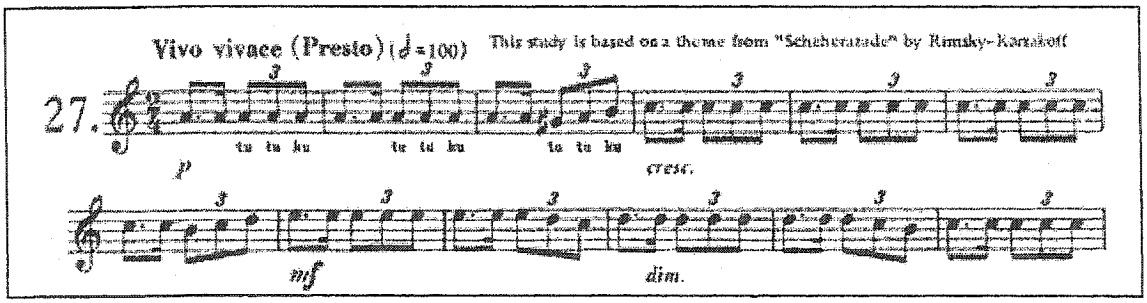
#11 Study is based on the fanfare from Beethoven's *Leonore Overture No.3.*



#13. Based on the theme from Tchaikovsky's *Sixth Symphony* (Third Movement)



#27. Based on the trumpet themes from Rimsky-Korsakov's Scheherazade.



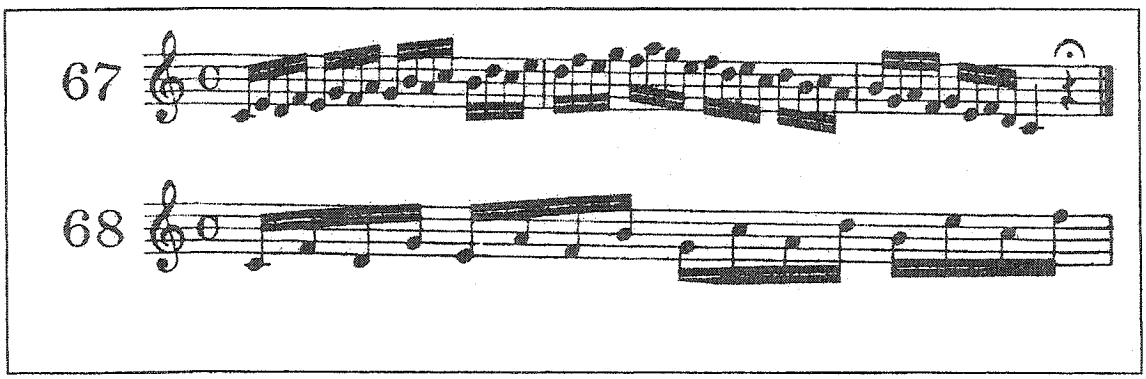
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Bona, Pasquale *Complete Method for Rhythmical Articulation.*
Translated from the fourth Italian edition, revised and augmented by the author, by Gustav Saenger. New York: Carl Fischer, 1900.

(DK) The Preface of this method outlines its intent as "to impart to beginners and young pupils…a correct and practical method which will teach the correct rhythmical proportionment (sic) of the single notes composing the beats of a musical theme, the recognition of their respective time values, and…its inter-relations with the rest.… As the student progresses through the method, the difficulty of each of the three sections becomes increasingly more challenging musically and technically, and the student is encouraged to study these with patience and accuracy throughout. Section I presents the fundamental issues of note lengths and interval relationships. Dynamics are not noted throughout and the student should begin study at a conservative volume to ensure quality of tone throughout. As discussed in the body of this document, Jacobs' approach to teaching a student was based on a hierarchical strategy, similar to the philosophy of this method book. He should begin with working to establish a solid fundamental tone in the player using simple materials, then progress slowly to more complicated and challenging music. At this point when the student had progressed well enough, Jacobs would always insist that the performer's quality of tone not degenerate as the music became more difficult.

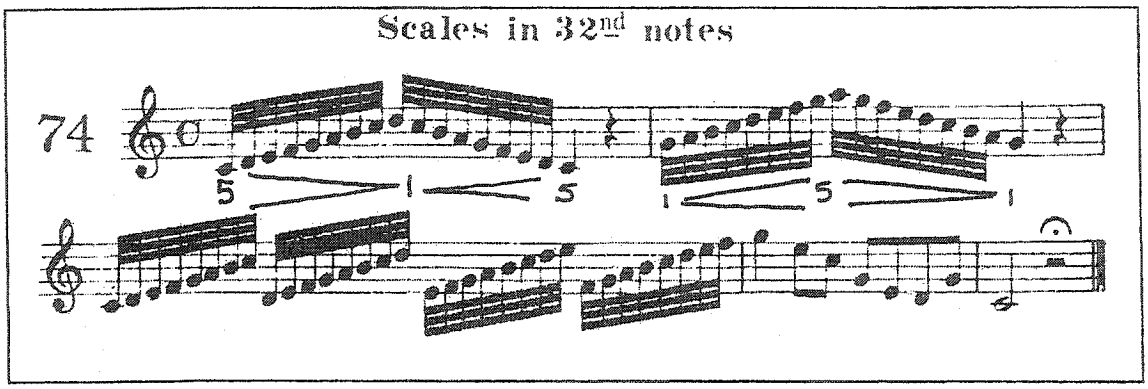


(RA) I remember working on these, #66,67,68, and again he was trying to deal with you as a musician and assign you music that incorporated a certain style, a certain character. You don't want to play this in a very strict and square style—you would play it in a lighter, lilting style to impart the character—to try and find the character that lies in the notes themselves.

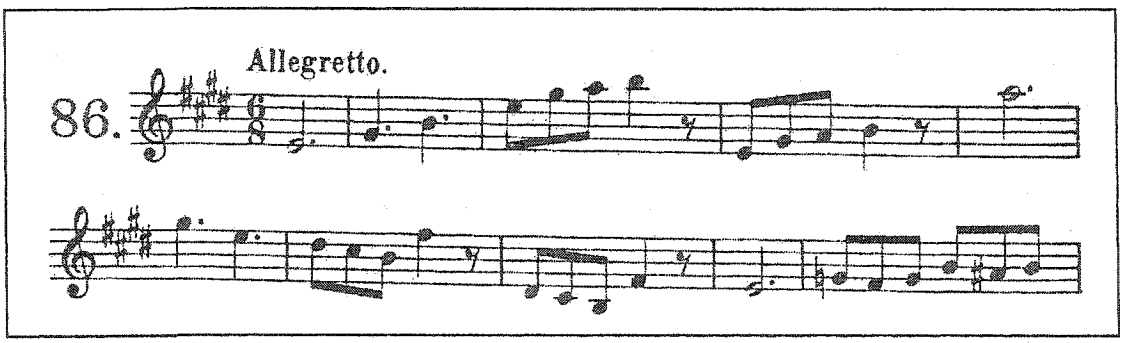


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(RA) In #74 we would work on massive crescendos and decrescendos. He would have me put numbers on the line such as "5" at the beginning, and "1" at the top. This would be the dynamic, the intensity. Then we would reverse it.

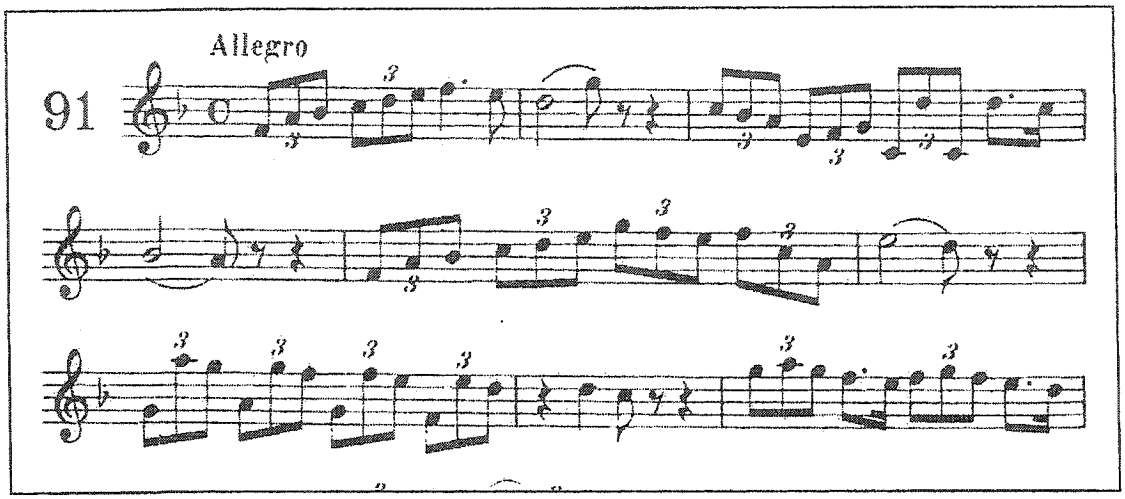


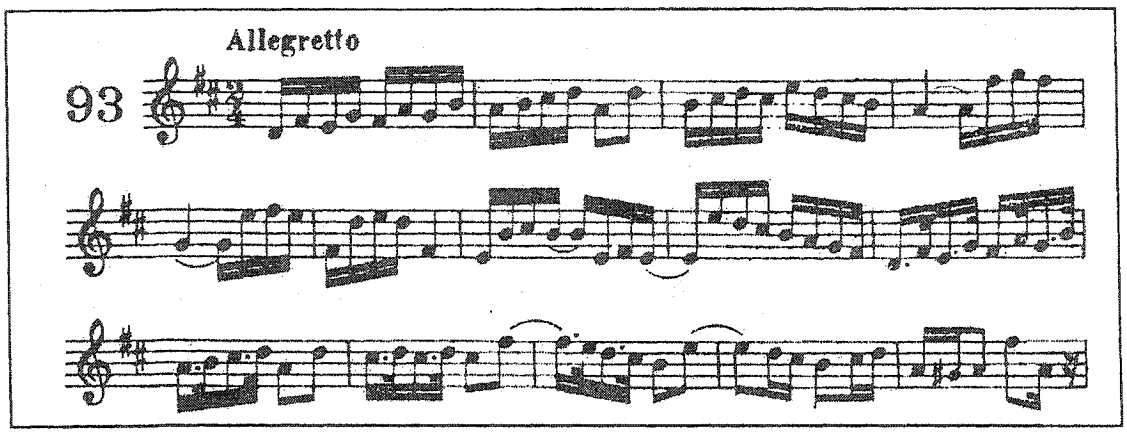
(DK) Section II presents melodious etudes in a variety of time measurements and keys. Each of these should be performed in a variety of styles and tempi to achieve the best results. It appears as though Jacobs did not work past this section (into section III) with any of the respondents.





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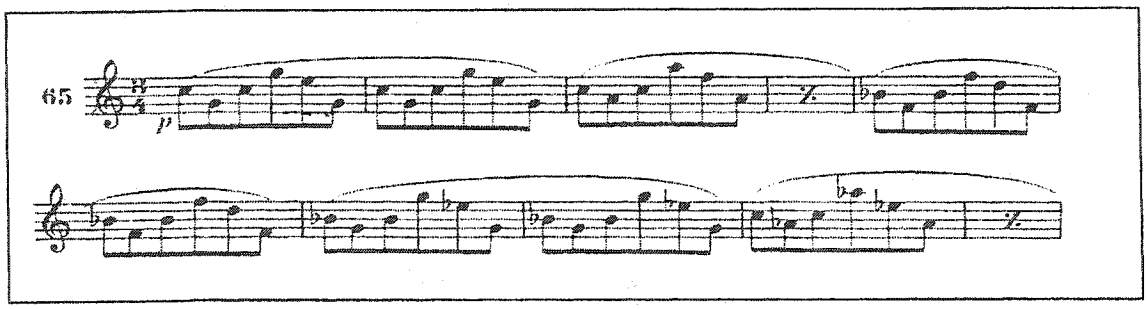




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Colin, Charles and Mel Broiles.
The Art of Trumpet Playing. New York: Charles Colin, 1967.

(DK) The *Art of Trumpet Playing* presents numerous etudes that focus on the technical elements of playing. There is a wealth of studies dedicated to scales, slurring, dynamic control, and range building. Very few of the respondents mentioned this text, but it is worth noting as many of the etudes resemble etudes found in other methods such as the Kopprasch and Arban's. These etudes may have provided a certain amount of variety for the long time student.



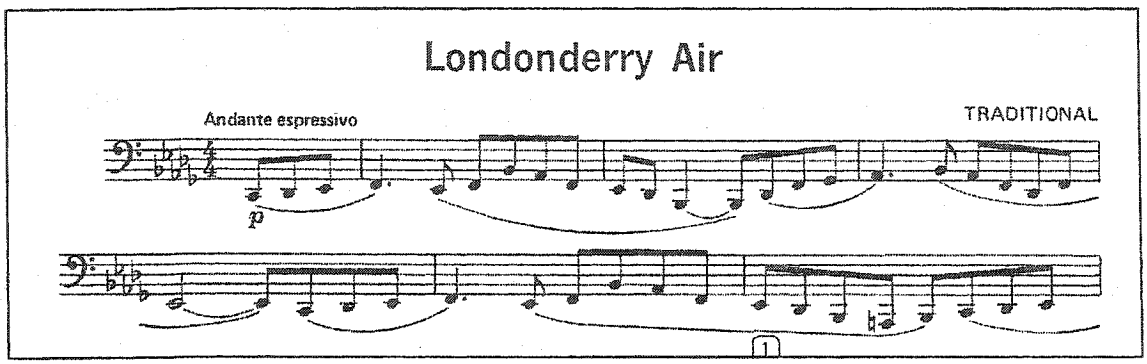
#66, 71, 75 (with Arnold Jacobs' original circle markings)

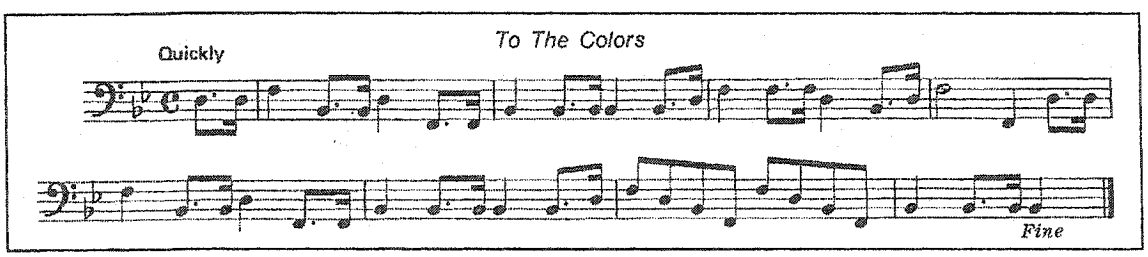


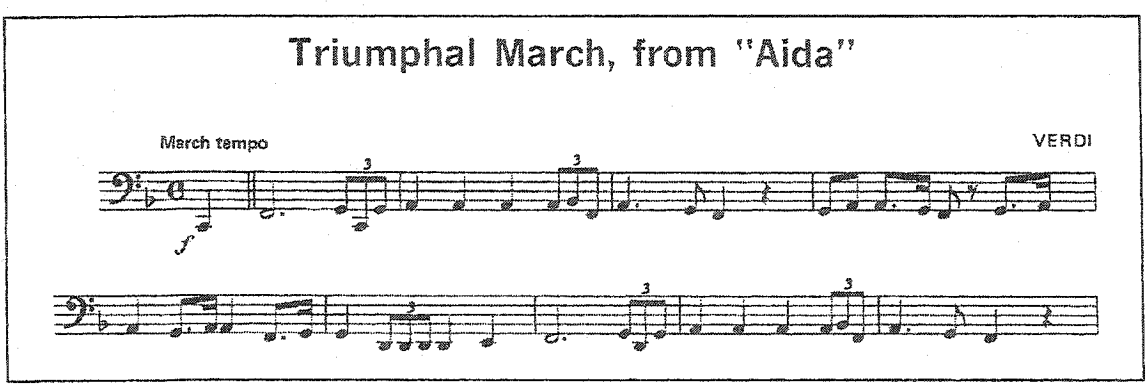
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Swanson, Kenneth and James Ployhar.
Tunes for Tuba (Bass) Technic. Level Three. Miami: Belwin Mills, 1971.

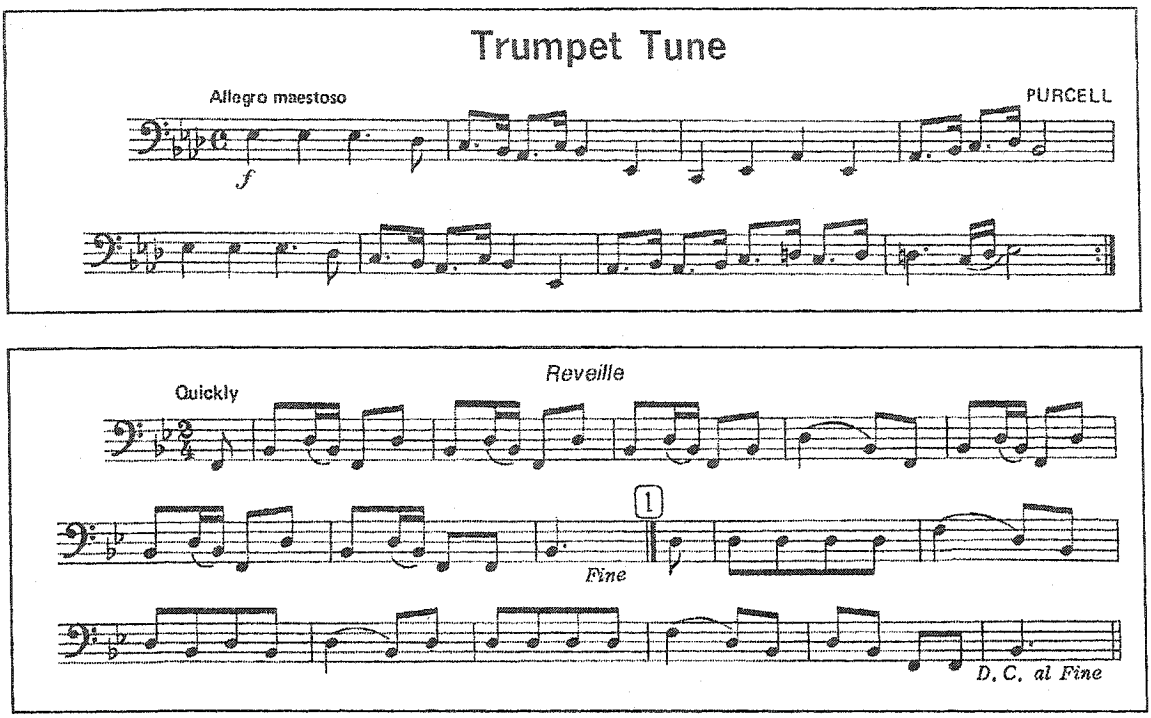
(DK) The following melodies are an example of some of the materials that Jacobs would encourage his students to play when learning his approach. The melodies are (often) familiar and are simple in their construction. These also lend themselves to a variety of transpositions, octave transfer, and so forth. For the student that was from a different country and was not experienced in the melodies of North America, he would assign melodies from the Swanson and other similar books. This specific method book contains several of the fanfares that Jacobs often alluded to in his master class lectures.







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CONCLUSIONS OF THE STUDY

To conclude an endeavor such as this document I have chosen to first offer three quotations from Arnold Jacobs' former students and colleagues. These were extracted from the December 17, 1998 tribute in honor of him at Chicago's Orchestra Hall.

Harvey Phillips, Master Pedagogue, Soloist, Professor Emeritus, Indiana University

> As a master teacher, I believe it can be said that, "Arnold Jacobs never met a musician he couldn't improve." His teaching and personal example inspired a better understanding of themselves, their art, and their instrument. He provided logical comprehension and artistic application of his 'wind and song' philosophy and pedagogy. But, oftentimes, his greatest and most lasting gifts to friends, colleagues and students, were positive changes in attitude and commitment. With knowledge, wisdom, patience, love and understanding, Arnold Jacobs infused desire for self improvement, purpose, and fulfillment into the lives of all who sought his counsel," Through his many devoted students and new ones they will inspire, Arnold Jacobs will live forever.

Eugene "Gene" Pokorny, Principal Tuba, Chicago Symphony Orchestra

> A little over 54 years ago, a young man walked onto this very stage and along with his colleagues here, began to forge an orchestral brass section that, at least in terms of reputation, was to have no equal anywhere at any other time. To have been an original member, as well as the foundation of such an august team, would have been quite a career in itself. To have concurrently been a music teacher who revolutionized the concepts and application of wind instrument playing and instruction would have been another worthy career. Between these two roles that he alone effectively mastered, he positively affected millions of people. This is testament to the difference one person can make. It was an overflowing, ever-flowing life.
>
> These extraordinary accomplishments of Arnold Jacobs, however, are all secondary to something else. The way he chose to lead his life is, for me, most worth studying and emulating. He had the intelligence. He had the talent. As a young person, he seemed to have the emotional and financial support of his parents, especially through the hard times of the Depression. All of these positive influences would not have made him a success unless he chose to strive to develop that

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intelligence... that he chose to develop that talent... that he chose to act on the curiosity he had for the production of sounds on wind instruments. In the end, that he chose to make a difference.

If we are to celebrate Arnold Jacobs life, I suggest that there are things we can remember about the decisions he made in his life that, if we choose to, may make a difference in the lives we lead and the lives we influence as performers, music teachers, human beings and family members. In his journey through life, he believed in eliminating complexity by keeping things simple and child-like. His curiosity in the process of wind playing led him to choose to study the subject soon after he, Gizella and Dallas moved to Chicago. He took up the subject with zest and eventually discovered some basic tenets of wind playing that were very simple concepts. Jake did not choose to disrupt outmoded playing concepts or to bring undo attention to himself. The only thing he chose to do was to act on his curiosity.

The way he chose to teach this material is also worth examining. Although he would teach the subject through instruction and by example, he never forgot that he was not so much teaching the subject as he was teaching the student. To this degree I do not know if he realized how much of a "surrogate parent" he was to players who came to see him. I get the feeling that some people came to him with their playing problems because he would be the only person who would believe in them and give them the instructions needed but, most importantly, the hope they needed to solve problems. If as teachers we could give students hope along with the solutions for problems, how much more affirming to the human spirit that would be. The old adage "I don't care how much you know until I know how much you care" is an apt one.

With the myriad of good opportunities that came to him, he chose to say "no" to some very good things so he could say "yes" to the best ones. He may have chosen to not attend an after-concert reception so that he could help a trombone player with high range difficulties. He may have chosen to not be in attendance at an orchestra members meeting so he could walk down the street to his studio in the Fine Arts Building to help a young Swedish trumpet player from losing his job due to a debilitating playing problem. He may have chosen to not answer many letters, or write down his theories regarding wind playing, or even take an afternoon nap on a difficult tour, but it always seemed to be because he chose to do something else that was going to make a more positive difference to another player, another friend, another colleague or, most importantly, his family.

Probably the most important lesson he taught me was how much he loved doing exactly what he was doing at the moment. When he was on stage, he loved to perform. When he was teaching, he was with the student the entire distance. The slides you will soon be viewing reflect a person who was seemingly at peace with himself; simply enjoying life as it unfolded. When you see him as a child or as a young man or even early on in his career, the twinkle in his eyes was not for knowing what he was going to discover or the bounds he would break with those discoveries; it was for knowing that something exciting and positive was going to happen. Even towards the end when his eyes were failing him and his legs were refusing to walk,

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his attitude was always positive. No matter what he was struggling with physically, he always seemed to be able to smile...And nobody did that better.

Dean Bernard J. Dobroski, Northwestern University School of Music. Former student of Arnold Jacobs

Jake taught his students that the tuba was just a cold, chunk of metal. It has no brain, it has no spirit, it has no soul, it has no feeling . . . it was our responsibility to bring it to life, and through that ideal sound -- that Jake sound -- we would learn to embrace it in our inner ear and nurture it in our inner-soul, and with that sound, constantly strive to awaken in others that special magic that music had touched in our own lives.

First and foremost, Jake was a teacher-- not a tuba teacher -- but the consummate educator. "The meaning of life is to be found in our passions, or it can be found nowhere." Jake's passions were his family, his music, his teaching and his students. As one of his colleagues recently noted: "This man was a great natural teacher who could have probably taught anything, but who just happened to be a wind specialist. He's the kind of legendary teacher that Liszt was for pianists of the 19th century." His worldwide sphere of activity brought him a wealth of pupils and an ever-growing international reputation. His precepts became circulated throughout the classical music world. The relationship between the brain, the body, and the systems of nerves were emphasized, as was the necessity for maintaining a lyrical sound. But those of us who knew Jake, realized that all of these were secondary to his desire to help us develop as fully functioning human beings. Yes our chops were important, and Jake's techniques to improve our breathing and air flow efficiency were legendary, but when you studied with Jake you finally realized that through his weekly assignments of etudes, solos, and excerpts that helped develop our musicianship and artistry, he was also helping to develop our souls, our spirits, and our intellects.[1]

[1] Extracted from transcripts of 1998 Tribute Concert in honor of Arnold M. Jacobs, from Windsongpress, www.windsongpress.com, with permission.

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Arnold Jacobs was a master pedagogue in every respect of the word. He was able to combine his talent as a musician with his curiosity and enthusiasm for science into a method that has changed many of the concepts of playing wind instruments. Jacobs had never set out to investigate physiology and psychology in how it related to playing the tuba; he was led in this direction due to a series of personal circumstances. Jacobs had gained such insight from these studies that he was able to repudiate old concepts concerning pedagogy and present a simple solution: Song and Wind. His approach was simple yet at the same time, quite methodical. He worked with the students to help them understand his approach to playing by giving them simple directions, always insisting on great musicianship. If his initial directions would not offer assistance, Jacobs was able to rephrase his concepts in countless ways: illustrating with a word, a piece of equipment, or by setting an example by playing for the student. This is what students seem to remember the most about Jacobs; his sound.

Jacobs began his studies at home with his mother whom can be considered one of the most important influences on Jacobs in both playing and teaching. In a manner comparable to the Suzuki method, Jacobs' mother encouraged Arnold to experiment with his new instruments, the bugle, trumpet, trombone, and the tuba, and learn to play music that was both challenging and enjoyable. In the earliest years, she would spend time with Arnold playing the bugle calls on the piano and have him repeat back to her. Once he was became more advanced the two of them would play music together. Often this music was written for the violin or voice, and Arnold became educated without any presumption of limitations on his instruments. When he turned fifteen years of age, Jacobs was offered a scholarship to the Curtis Institute of Music in Philadelphia. His years at the Institute provided him with the opportunity to work with teachers who gave him both the discipline, and musical direction that he needed and desired. Records from the Institute note that Jacobs' studies at the Institute were focused on performance, working with such important figures as Marcel Tabuteau, and Fritz Reiner. We have also seen that other teachers such as Renée Miquelle-Longy were also quite influential on the way he thought

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about music. It is clear that he had a insightful outlook where it concerned pedagogy, and these formative years contributed many important aspects to his understanding of music and pedagogy.

In his spare time, Jacobs performed in numerous venues on the tuba, as a singer, and on double bass in Dixieland and jazz groups to earn some extra money. After Jacobs completed his studies at the Institute, he began his career as a professional tubist; performing in Pittsburgh, Indianapolis, and eventually Chicago where he concluded his career as a performer.

In the post-Curtis years, Jacobs' health had become an issue and this led him to studying the rudiments of physiology. Through the assistance of a family physician, Jacobs was guided toward readings that would illustrate the structure and function of the human body. After several years of personal study in this area, Jacobs found the understanding of physiology to be limiting where it concerned performing a musical instrument. It was here that he made an ideological shift towards examining the sources for difficulties when playing an instrument. The numerous textbooks that he studied over the years gave him an indication of where he should be placing his energy when teaching his students. One such text was written by Percy Buck, *The Psychology of Music*. This book outlines the relationship between the processes of the brain and the functions of the body. It seems clear that Jacobs adopted many of the ideas from this book as a cornerstone of his Song and Wind philosophy. Initially, Jacobs' approach to teaching the student to develop as a player by focusing on the stimuli entering the mind was considered somewhat abstract. Because the tradition of pedagogy over several generations had only alluded to the idea of focusing on the thought processes, this "school of thought" was considerably innovative. Over the years, Jacobs increasingly simplified the descriptions of his approach, resulting in the final distillation of Song and Wind.

The objective of the Song and Wind philosophy is to have the student focus on the simplicity of what they wished to sound like then let this concept direct how he or she would play. If Jacobs could have the student thinking about the goal: the sound, the

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articulation, the style, etc., before they played, the student would most often be able to bypass any difficulties that he or she was encountering. Jacobs was able to achieve this primarily through having the student sing the music; having them become more extroverted with their musical thoughts. He would also break into their established habits through various musical exercises and with the use of some of his equipment. Most of these tools were modeled after expensive medical equipment that he used at the University of Chicago. Jacobs was able to replicate similar versions that would be useful for musical instruction for considerably less money. The primary function of the equipment was to motivate the student to accomplish a task that was essentially non-musical. As an example: in having the student fill an anesthesia bag, move the needle on a pressure gauge, or raise a ping-pong ball in a tube, the student's focus is diverted away from their conditioned habits. These tools were used primarily because of their unfamiliarity to the students and their multi-sensory capabilities. Jacobs stated on many occasions that "strangeness permits change," and by using these tools in the studio, he could alter the motivations of the student with much less effort, and much more success. The student could feel and see the results of their efforts with this equipment, and this would lead to understanding the phenomenon that was required for healthy playing habits.

Jacobs' approach countered the normative ideas of how to play a brass instrument. His scrutinizing of a century of pedagogy led him to understanding where many of the ideas were developed regarding breathing, articulation, and tone production. Armed with this information, he developed experiments that he completed at the University of Chicago, confirming his beliefs, and providing further empirical evidence. These studies are seemingly derivative of similar studies conducted by researchers such as the Dutch born Arend Bouhuys and other scientists. Bouhuys' studies provided verification regarding the functions of the respiratory system during the playing of a musical instrument, and also provided an outline of the differences in pressures in the respiratory muscles between the different instruments. This type of information would lend itself to Jacobs' approach of providing the student with the correct information

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regarding respiration. One further text that appears to have had some influence on Jacobs' diagnosis skills was the *Atlas of Men* by William Sheldon. This text provides analysis and photographic evidence of the various somatotypes, and seemingly provided Jacobs with further understanding of the student based on their body type. Jacobs found that many students were overextending themselves when performing their phrases, and it seems as though Jacobs' study of body typing gave him insight into evaluating the student's breathing potentials. His descriptions of *Vital Capacity* and the *Negative Pressure Zone* provided the student with an image of their individual abilities where it concerned respiration. In quantifying the student's vital capacity, Jacobs would encourage the student to breathe where they felt it necessary, and avoid playing too far into the phrase where it would become difficult to take their next breath.

Private lessons with Jacobs would be comprised of playing, the use of and/or experimentation with some of the equipment, and some explanation of his pedagogy. Many of the subjects recall that they were in a state of "sensory overload" at the end of this lesson and they were not able to understand everything for some time after. The first lesson appears to have served both as an introduction to Jacobs for the student, and an evaluation session for Jacobs. His thoughts regarding assessment of the student is revealed in the article written by Paul Haugen. Jacobs note that he had several points to consider with each student during each lesson: First were the initial observations of the student; how was the student approaching the instrument? Secondly there was some concentration on the fundamentals of playing; tone production, articulation, and respiration. Lastly were the elements of musicality; helping the student to empower their imagination, and focus on the Song in the brain. One final point was that he would present the student with healthy techniques for practicing; insisting that the interpretation of music must be the dominant factor when practicing; and that scales and "road-work" should not become the central focus of the practice session.

This gives us a clear overview of what Jacobs' main focus was in the first lesson, but it also appears as though this was the process he adhered to in the lessons that followed. Each of the subjects noted that Jacobs' primary focus was on music. His

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method of approaching a difficulty was generally to provide the student with a musical challenges that would bring about the change that the student desired, usually without their awareness. This was often referred to by Jacobs as, "coming around the back-door on problems."

Most of the subjects commented that Jacobs' approach is often misinterpreted as being centered on respiration. This pervasive idea that Jacobs taught only respiration to his students may have been a result of his incredibly detailed lectures and discussions on the topic and his insistence that his students have the correct information. This may have also been supported by the people who only attended his master class lectures where he would dedicate an entire segment of his lectures to the functions of respiration and discuss openly the misconceptions that people possess. This appeared to be Jacobs' way of ensuring that the students that came to work with him during the master classes, or in subsequent private lessons, understood these concepts clearly based on the correct information. Once Jacobs concluded with his discussion of respiration and function, it seems as he attempted to only talk about musical issues unless the subject was once again raised.

Several of the subjects noted that Jacobs did not follow a set curriculum, and this supports the notion that he taught individualized lessons. These subjects also noted that Jacobs would often move through an etude book non-sequentially. They explained that they believe Jacobs would select an etude or piece based on how the student was playing at that moment, and rarely did an etude book ever have the same sequence of advancement that the student did. The same can be said of his approach to the master class lecture. Frederiksen noted that "Jacobs just got up in front of everyone and began to talk." To many, that may have appeared to be true, but it appears as though Jacobs had more of an outline than believed. The lecture segment of the master class generally focused on the same materials year after year: the fundamental aspects of respiration, communication, scientific support of concepts, and so forth. It was in the teaching of the individual student where Jacobs' master classes would be the most diverse. He addressed

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the problems that were presented at the time with the student, and he seemed mindful to inform the audience how his approach related to the ideas he had lectured on earlier.

The musical materials that Jacobs used in his studio were quite varied, and although there appears to be a core of texts that he employed, it is now believed that he would work with any method book available to him. Jacobs had a certain hierarchy of process that he would follow with any student: First work to establish a good fundamental tone; then transfer that good tone to more complex materials; and finally, have the student interpret music that challenged them on a variety of levels, maintaining a high level of quality in their tone and musicianship.

The method books that he seemed to prefer were those written for the trumpet, French horn, flute, oboe, vocal, bassoon, but rarely did he use those written specifically for the tuba. Jacobs related to several students that he felt that the music that was in the books for tuba was limited musically and therefore would create a limited musician. He encouraged all of his non treble-clef reading students to learn to read treble clef so that they may have the opportunity to play excellent music written by composers such as Bach, Mozart, and Saint-Saens. From the interviews and readings, it has become apparent that the three most important etudes Jacobs used were the Arban's Method for trumpet, the Pottag Studies for French Horn, and the Kopprasch Studies (originally for French horn). He also employed several other etude books in his teaching such as the Schlossberg, Smith's *Top Tones*, Charlier, and the Brandt studies. Each of these methods provided the student a collection of material from which to develop their skills with. Although a variety of solo material and orchestral excerpts was studied with Jacobs in the lesson, these appear to not be the focus of any lesson. The subjects recall that after having played a solo or an orchestral excerpt, Jacobs would return the student to an exercise that targeted a fundamental skill that would make the music better. After working with the student for a length of time, the student would again perform the music, usually with a much higher level of success. Several of the subjects also recall that Jacobs did not know a great deal of the solo literature for the tuba, as he much preferred the music for other instruments and voice. This does not to assert that Jacobs was not skilled

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at addressing the musical issues in these other works. On the contrary, most of the subjects noted that his skill as an interpreter of all music was exceptional.

Considering that Jacobs' studies involved a great deal of investigation into the sciences, none of the subjects recalled Jacobs ever suggesting to them that they study this material. In addition, the subjects stated that they never recalled Jacobs ever recommending a book to them regarding any of these topics; and this appears to be intentional. Jacobs focus was to teach the students to play better, not to learn how to acquire more information. Any detailed knowledge of the physical processes would only be counterproductive to his approach. The students recalled that Jacobs never spoke of any textbooks regarding mental focus as well, however, agreed that he was employing some of the ideas found in books such as *The Inner Game of Tennis* by Timothy Gallway and *A Soprano on her Head* by Eloise Ristad, both of which Jacobs owned. Jacobs articulated his thoughts on education on several occasions, noting that "if he had his way," he would teach the student to become focused on communication; imparting a musical message, rather than stressing the acquisition of information. This appears as an implicit understanding that they way students learn to play music conflicts somewhat with his approach. He stressed that students should get good grades, but he also insisted that the student learn to "wear two hats." The one hat is for the collection of information from the senses; beneficial for a student or a teacher, and the other hat was for the performer, useful for imparting of the ideas to an audience.

If there was one central purpose to Jacobs' approach, it was that he enabled the student to learn to play the music that was in their mind much easier, by simplifying the process of music making and working to help them avoid examination of the procedures that brought the music into being. His approach necessitated that the students actively use their imaginations and learn to approach playing with simplicity. The intrusion of the intellect [left brain= analytical] on the creative impulses [right brain=creative] was something that Jacobs dealt with by removing the student from their established habits. In providing new foundations for the student to work upon, Jacobs was able to initiate the necessary changes to bring about healthier function. From this stage, the student would

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have the tools and motivation to make better musical choices. Finally, Jacobs was a consummate musician who had the respect of his colleagues and musicians throughout the world. Jacobs was able to teach students through the example that he provided every week with the Chicago Symphony Orchestra. This may have been the most powerful teaching tool of all.

Arnold Jacobs was able to contribute to the betterment of future generations of wind-instrumentalists by presenting a "guide" for learning to play with more efficiency, more quality, and much more enthusiasm for the art form of music. Dale Clevenger, principal horn player with the Chicago Symphony [and Jacobs' colleague] stated in 1985 that "nearly every brass player in America has studied with Arnold Jacobs, whether they know it or not," and this cannot be further from the truth. Even though Jacobs did not write down his ideas into a format that could be described as a "method", his concepts exist in the students that he taught, and the application of these ideas can be heard on the recordings that he made over the years. Never will one simple explanation of Jacobs' approach ever suffice because as we have discovered, Jacobs' approach, although universal in many respects, reflected his interest in the student that he was working with at the time. The best description that substantiates all of the endless variations of his methods may be best described as "Song and Wind."

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APPENDIX 1

THE ARNOLD AND GIZELLA JACOBS COLLECTION[1]

[1] This collection is currently housed at the residence of Brian Frederiksen. This collection although extensive, does not represent any of Jacobs' etude books, methods and similar materials. These books are in the process of being catalogued. Assembled by Kristian Steenstrup and David Kutz.

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APPENDIX 2

Estimated Vital Capacities (Males)[1]

	20	25	30	35	40	45	50	55	60	65	70	75	80
4' 6"	2.7	2.6	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.5
4' 7"	2.8	2.7	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.7	1.6
4' 8"	2.9	2.8	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	1.9	1.8	1.7
4' 9"	3.0	2.9	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.1	2.0	1.9	1.7
4' 10"	3.1	3.0	3.0	2.9	2.8	2.7	2.6	2.5	2.3	2.2	2.1	1.9	1.8
4' 11"	3.2	3.1	3.1	3.0	2.9	2.8	2.7	2.5	2.4	2.3	2.1	2.0	1.8
5'	3.3	3.3	3.2	3.1	3.0	2.9	2.8	2.6	2.5	2.4	2.2	2.1	1.9
5' 1"	3.4	3.4	3.3	3.2	3.1	3.0	2.8	2.7	2.6	2.4	2.3	2.1	2.0
5' 2"	3.6	3.5	3.4	3.3	3.2	3.1	2.9	2.8	2.7	2.5	2.4	2.2	2.0
5' 3"	3.7	3.6	3.5	3.4	3.3	3.2	3.0	2.9	2.8	2.6	2.4	2.3	2.1
5' 4"	3.8	3.7	3.6	3.5	3.4	3.3	3.1	3.0	2.8	2.7	2.5	2.4	2.2
5' 5"	3.9	3.8	3.7	3.6	3.5	3.4	3.2	3.1	2.9	2.8	2.6	2.4	2.2
5' 6"	4.0	3.9	3.8	3.7	3.6	3.5	3.3	3.2	3.0	2.9	2.7	2.5	2.3
5' 7"	4.2	4.1	4.0	3.8	3.7	3.6	3.4	3.3	3.1	2.9	2.8	2.6	2.4
5' 8"	4.3	4.2	4.1	3.9	3.8	3.7	3.5	3.4	3.2	3.0	2.9	2.7	2.5
5' 9"	4.4	4.3	4.2	4.1	3.9	3.8	3.6	3.5	3.3	3.1	2.9	2.7	2.5
5' 10"	4.5	4.4	4.3	4.2	4.0	3.9	3.7	3.6	3.4	3.2	3.0	2.8	2.6
5' 11"	4.7	4.6	4.4	4.3	4.2	4.0	3.9	3.7	3.5	3.3	3.1	2.9	2.7
6'	4.8	4.7	4.6	4.4	4.3	4.1	4.0	3.8	3.6	3.4	3.2	3.0	2.8
6' 1"	4.9	4.8	4.7	4.6	4.4	4.2	4.1	3.9	3.7	3.5	3.3	3.1	2.8
6' 2"	5.1	5.0	4.8	4.7	4.5	4.4	4.2	4.0	3.8	3.6	3.4	3.1	2.9
6' 3"	5.2	5.1	4.9	4.8	4.6	4.5	4.3	4.1	3.9	3.7	3.5	3.2	3.0
6' 4"	5.3	5.2	5.1	4.9	4.8	4.6	4.4	4.2	4.0	3.8	3.6	3.3	3.1
6' 5"	5.5	5.4	5.2	5.1	4.9	4.7	4.5	4.3	4.1	3.9	3.7	3.4	3.1
6' 6"	5.6	5.5	5.4	5.2	5.0	4.8	4.6	4.4	4.2	4.0	3.8	3.5	3.2
6' 7"	5.8	5.6	5.5	5.3	5.2	5.0	4.8	4.6	4.3	4.1	3.8	3.6	3.3
6' 8"	5.9	5.8	5.6	5.5	5.3	5.1	4.9	4.7	4.4	4.2	3.9	3.7	3.4
6' 9"	6.1	5.9	5.8	5.6	5.4	5.2	5.0	4.8	4.6	4.3	4.0	3.8	3.5
6' 10"	6.2	6.1	5.9	5.7	5.6	5.4	5.1	4.9	4.7	4.4	4.1	3.9	3.6
6' 11"	6.4	6.2	6.1	5.9	5.7	5.5	5.3	5.0	4.8	4.5	4.2	4.0	3.7

[1] Appendix 2 extracted from WindSong Press:www.windsongpress.com, used with permission.

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Estimated Vital Capacities (Females)

20	25	30	35	40	45	50	55	60	65	70	75	80	
4' 6"	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
4' 7"	2.4	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.2
4' 8"	2.5	2.4	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.6	1.5	1.4	1.2
4' 9"	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.4	1.3
4' 10"	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.6	1.5	1.3
4' 11"	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	1.9	1.8	1.7	1.5	1.4
5'	2.8	2.8	2.7	2.6	2.5	2.4	2.3	2.1	2.0	1.9	1.7	1.6	1.4
5' 1"	2.9	2.9	2.8	2.7	2.6	2.5	2.3	2.2	2.1	1.9	1.8	1.6	1.5
5' 2"	3.0	3.0	2.9	2.8	2.7	2.5	2.4	2.3	2.2	2.0	1.9	1.7	1.5
5' 3"	3.1	3.1	3.0	2.9	2.7	2.6	2.5	2.4	2.2	2.1	1.9	1.7	1.6
5' 4"	3.2	3.2	3.1	2.9	2.8	2.7	2.6	2.4	2.3	2.1	2.0	1.8	1.6
5' 5"	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.5	2.4	2.2	2.0	1.9	1.7
5' 6"	3.4	3.4	3.2	3.1	3.0	2.9	2.7	2.6	2.4	2.3	2.1	1.9	1.7
5' 7"	3.6	3.5	3.3	3.2	3.1	3.0	2.8	2.7	2.5	2.3	2.2	2.0	1.8
5' 8"	3.7	3.6	3.4	3.3	3.2	3.1	2.9	2.8	2.6	2.4	2.2	2.0	1.8
5' 9"	3.8	3.7	3.5	3.4	3.3	3.1	3.0	2.8	2.7	2.5	2.3	2.1	1.9
5' 10"	3.9	3.8	3.7	3.5	3.4	3.2	3.1	2.9	2.7	2.6	2.4	2.2	1.9
5' 11"	4.0	3.9	3.8	3.6	3.5	3.3	3.2	3.0	2.8	2.6	2.4	2.2	2.0
6' 4.1	4.0	3.9	3.7	3.6	3.4	3.3	3.1	2.9	2.7	2.5	2.3	2.1	
6' 1"	4.2	4.1	4.0	3.8	3.7	3.5	3.4	3.2	3.0	2.8	2.6	2.3	2.1
6' 2"	4.3	4.2	4.1	3.9	3.8	3.6	3.4	3.3	3.1	2.9	2.6	2.4	2.2
6' 3"	4.5	4.3	4.2	4.0	3.9	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.2
6' 4"	4.6	4.4	4.3	4.2	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.5	2.3
6' 5"	4.7	4.6	4.4	4.3	4.1	3.9	3.7	3.5	3.3	3.1	2.9	2.6	2.3
6' 6"	4.8	4.7	4.5	4.4	4.2	4.0	3.8	3.6	3.4	3.2	2.9	2.7	2.4
6' 7"	4.9	4.8	4.7	4.5	4.3	4.1	3.9	3.7	3.5	3.3	3.0	2.7	2.5
6' 8"	5.1	4.9	4.8	4.6	4.4	4.2	4.0	3.8	3.6	3.3	3.1	2.8	2.5
6' 9"	5.2	5.0	4.9	4.7	4.5	4.3	4.1	3.9	3.7	3.4	3.2	2.9	2.6
6' 10"	5.3	5.2	5.0	4.8	4.6	4.4	4.2	4.0	3.8	3.5	3.2	3.0	2.7
6' 11"	5.5	5.3	5.1	5.0	4.8	4.6	4.3	4.1	3.9	3.6	3.3	3.0	2.7

Estimated vital capacities for females in liters. Follow height (in left column) and age (at top, in five year increments).

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APPENDIX 3

Arnold Jacobs Master Class Lecture
1973 International Tuba and Euphonium Conference, Bloomington, Indiana
Hosted by Harvey Phillips
Transcribed and edited by David Kutz from www.chisham.com/tips/index.html.
Subject headings added by David Kutz

I assume that the bulk of the group are tuba players, am I right? I see that they let in a treble clef player! He's a friend so that's all right! We have two short clinics to do, and I will try to be of some use so that you folks can get something out of this, I am going to keep this informal. I want you to feel free to raise your hand, interrupt anything that I say. I want to start out-- usually, when I am doing a clinic with younger groups, and so forth-- I find that I have to do a rather elementary type of clinic and go to the basic grounding of tone production. I am not sure that this is required of a more advanced group, but I am going to bring my horn out. I found that it is really easier to play than it is to talk anyways! You know, we do so much of it and it's a good way to get started, and as I say, I haven't played yet today so-- we'll just make this a test. It'll be A, B, C or you can flunk me! I'll be right with you. [Jacobs goes to get horn]

Warming-Up

I am not going to use music at this point-- I'll just start by warming up as I haven't played yet today. I don't know which mouthpiece I will use; I've got about six or seven of them here. You see, this is what happens when I am at home and I start to practice. I think that this type of approach is not a complete waste of time because you actually are in an art form--you have to communicate and you communicate with sound. I am communicating with words, but my art form is primarily one with sounds. Now, we talk about warm-up. Actually, my wife was a ballet dancer-- in fact I used to work her

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act and that's how I met her originally-- I used to watch her warm-up, it was very interesting. She would go up to a wall, put one leg up to the top of the wall and the other leg she would still be standing on the floor-- she would just press right up close. This is very important for ballet dancers to do, but for tubas, I could not achieve anything like that! [laughs] I wanted to say that warm-up for us, the words warm-up in a physiological sense are very interesting because if you take an actual temperature sensing device, you take an athlete before he starts to warm up and put a sensor on the knee-- you'll find that as this gentleman does his warm-up exercises, the blood supply is increasing in the region the tissues become flexible so he is not going to be as apt to tear fibers with a large blood supply in the knee or the other parts of him. It is very important [for him to warm-up] because he can create the physical damage if he fails to warm-up. Now on a brass instrument, a warm-up is extremely important also, but for different reasons. In other words, the lips actually-- these beautiful red-lips, mine are not so beautiful-- but when you meet certain people you'll admire the nice red lips-- usually they are red because they have a very thin membrane covering them. There is a marvelous blood supply in the lip and as a result, if you were to use temperature-sensing devices on the lip, you will find very little difference before and after warm-up. What I am trying to indicate is that we do warm up we couple ourselves to the instrument for music making. Those of us in the professional sense rarely cool off enough that we would require a massive stage of warm up. In other words, we had a difficult program to play last night, and I am sure that I can be functional on the instrument when I start out right now, more or less. Now, I will just play a moment. Hmm, the valves don't work; we should really do something about that! Well, we will play open notes then.

[Jacobs warms-up]

No--I don't think I will use that mouthpiece, I think I will se a different one. That's my regular one, let's try something else.

[Plays *Greensleeves*]

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Three Variables in Playing

I suppose you might have noticed a great difference in tone when I switched mouthpieces. Actually, the one I am using now is a rather bowl shaped--oh you might say, a cup similar to what the trumpets use but in a greatly enlarged sense. In other words; it is a mouthpiece that has a very definite cup shape, a small throat, and a fast tapering backbore. With a large horn of this type, it gives it a little more response. It moves it somewhat in the direction of the smaller tuba and in, you might say characteristic works of the French school. If I don't oil this valve, I don't think I can play fast enough to do anything anyway.

[Plays]

There is a much faster response. You can get much the same think on the cone shaped cup--but with the contrabass tuba, in other words, if we wanted to bring out the fundamental in the tone, we would be using more of the cone shaped mouthpiece and a rather large one. What I am trying to indicate to those who are playing in the audience is that you have three variables: You have the variable of the horn, you have the variable of the mouthpiece, and you have the very large variable of the player. I am trying to indicate some of the more mechanical variables before I get to the player. If I could have someone would bring a nice shiny baritone--instead of a baritone I will call it a piccolo tuba, and demonstrate a little on that. With a special mouthpiece which has the tuba rim--but in the relation to what we do on the contrabass tuba, you might liken it to what the trumpet player would normally do with his normal Bb, or C trumpet and his trumpet an octave higher, his piccolo trumpet. We do very much the same thing with the tuba and the terminology sometimes gets a little out of hand so-- we'll call it a baritone or whatever you choose. What I want to indicate is that those of you who are playing in ensembles will say that if you happen to have a very large tuba and you need to lighten the tone-- of course an excellent means is to use different mouthpieces.

I have here a little F tuba mouthpiece, which fortunately fits into this. Let's hear what it sounds like when it is played in a big tuba.

[Plays Puccini: *Un bel di]*

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I suppose most of you would recognize that from Madame Butterfly, a nice little soprano lady sings that, but that doesn't mean we can't play it on the tuba. If we happen to like it, we can go home and play it in our studio. I think you can hear that the introduction of the variability of the mouthpiece right away is altering the tonal characteristic of the instrument very much

[Plays *Greensleeves*]

That makes a nice little test piece for mouthpieces. Instead of running out and-- my friends from the instrument manufacturers are not going to like what I am about to say-- but instead of writing out a very large fat check sometimes for a new tuba, many a time you can merely take your rim--it's advisable to keep the same rim if possible so that the musculatures remain the same-- and then by using an altered cup, you can very definitely increase the strength of the overtones and decrease the strength of the fundamental. If you use wave analysis on one of these instruments at the time I am using this mouthpiece, you would find that the fundamental has lessened dramatically and the overtones have increased. Now, this is an F tuba mouthpiece designed primarily for the F tuba. The one I used, the second one, is an adjustable cup-- I can adjust the length to anything I want except I dropped it and its jammed so I can't budge it-- but when it works, you can adjust it for maybe a ½ inch and there is then a considerable change in tone quality.

Now, those who are using very small instruments can do the opposite. In other words, by going to a larger mouthpiece, you will introduce stronger fundamental and immediately begin to lessen the overtones. Sometimes the bandmasters will be very happy because at that time you will be simulating the sound of the larger contrabass tuba and you are using the variability of the mouthpiece that costs far less than the variability of the other tuba. I haven't gotten into the variability of the player because that is a can of worms--we have to take a lot of time when we go into this one; but again, lets see, I have all sorts of them here....Mr. Phillips would be interested in this one because it is a Conn #2 but, we changed it. Again, if I had the normal Conn #2, I'd like to hear the

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difference in this. Dr. Fred Young-- he is a tuba player in Pittsburgh and he is a physicist; a very brilliant man and a very fine tuba player. He does not play professionally but sometimes his insight is to the challenge he has to meet, in the concert band that he plays with, or in the work he is doing personally with the tuba. Sometimes it doesn't quite follow that this would be a satisfactory answer for the professional musician. Just recently came to see me in Chicago and he said "Jake, what do you need a backbore in a mouthpiece for?" I couldn't answer him--I don't know what we need it for. Through empirical observations I've always had a backbore, a throat and a taper and we've always used that. So he had a mouthpiece with him and had drilled out the backbore and just had a cylindrical pipe. I sent this Conn #2 to Pittsburgh and it came back with a hole I could stick my head in! I think because it's he same size in the throat, in the cup of the mouthpiece as it is at the tip, we have quite a change in quality. I felt that this mouthpiece tends to bring out the overtones—the overtones tend to be emphasized and the fundamental is de-emphasized. These mouthpiece's-- I am using a Conn-Helleberg, and the Conn #2, they are both practically the same so you will hear again the difference the mouthpiece can make....

[Plays theme from Richard Strauss' *Don Juan*]

Now I will take the cylindrical throat. It is so strange that when I look at it I have to pause because I can hardly believe it. You think it wouldn't play at all.

[Repeats excerpt]

Very definite change don't you think Harvey? Whether it is good or bad I wouldn't say but it is a very comfortable mouthpiece to play-- it bears investigation and since this is a University I thought I would bring it up. There are certain characteristics in playing that are very interesting. I think that tone production is somewhat easier with the large throat, and by removing the backbore, I think we loose a certain amount of the character in the

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sound that we are used to with the smaller throat and the large taper. Intonation holds well but goes to a different level. It does change the intonation, but within itself it is quite good. Now as I say, mouthpiece as a variable is something very good to consider.

Playing by Feel

Now there are people who will not alter a mouthpiece or change a mouthpiece, they have a statement: "It doesn't feel right." If you play by feel--and there is a basic aspect of feel when playing--in other words, recognition by feel-- you can not change anything. If you are going along fairly well, hopefully you are going to remain in good shape in playing because the feel phenomenon will be the same. Unfortunately, I think this is a very poor way to be; you cannot play by feel.

The feel phenomenon is really a very inadequate way of telling you when things are right or wrong, it's much better if you go by the sound and keep the artform of communication dominant so you are actually talking to your audience with your instrument; not talking to yourself. So what I am trying to indicate is that if you were to alter the cup of a mouthpiece, there is going to be an altered feel and some altered intonation. I assume most of you are advanced on your instruments--as soon as you alter a mouthpiece in depth or in contour, you will alter intonation. As you practice on that mouthpiece you have to very quickly search out the direction of alteration. In other words, you do this by finding the quality of tone, not the exact intonation-- you have to find out where it went and where it changed. You will find out where the qualities in the note that match are so that the qualities of the tone are even on the instrument; you raise or lower pitch from that point after you have established where you have the correct sound. In other words... matching qualities of tone. If you try for the intonation before that, you will never know if the horn's sharp and you're lipping it down and vice versa. You have to find where the instrument will have proper resonance. Once you do that, you will find a freedom in changing cups. It's not a terribly important factor.

When you take players as old as I am, and as old as most of the players in the Chicago Symphony Brass section, we get so bored that we deliberately walk on the stage

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with different mouthpieces. You've got to do something you know-- when you are playing Tchaikovsky's 5th; how often can you play that and still keep inspiration at a high level? So, you see Mr. Herseth come out with a strange looking trumpet sometimes and, strange mouthpieces--and I do the same thing. I will come out with altered cups, variable cups. Once in a while we put them away and reach for the old one when there's a disaster--but most of the time things go well. Now, when you alter a mouthpiece, it should be not for the personal comfort but for your ability to express yourself. In other words if you are looking for specific qualities in tone--when I play, oh I'll say a work that requires a little more the French type of playing...

[Plays Berlioz: *Hungarian March* theme]
This type of articulation is not quite as good when you do it on the large mouthpiece.
[Plays again with a larger mouthpiece]

Sometimes its better! Actually, there is a difference. What I am trying to indicate is that as you sense the need for altered qualities of tone: you can do it by alterations in your own embouchure, you can do it by mouthpiece, and of course you can do it by instrumental change-- and more frequently would be the proper thing to do. But what I am trying to indicate is that there are other methods.

Variability of Instrument

Now I want to, I can't show the variability of the instruments, I only have the one on the stage--oh, you have the baritone? Good, let's try this. We won't call it a baritone, that's poor terminology--the Piccolo tuba! First thing we do is take this mouthpiece out. As I say, If you don't play by feel it is amazing what you can do—you can play other instruments, other mouthpieces--but you have to play by song.
[Jacobs warms up on Baritone playing theme from Bolero by Ravel]
That gets the trombone players sore!!!! (Laugh and applause)
[Plays Greensleeves]

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I keep going back to that old warhorse but you know-- you need something stable that you can test the horn on, and I like to do that. Now-- one of the things that I do like to suggest to a student when I teach, which is a great deal-- I find player after player coming to me all hung up because of the constant search for high notes on the tuba. If I had to pick any single phenomenon I would want to do combat with, it's the tremendous tendency to extend the upper range-- upward and upward and upward. I see the same thing you see in the young bass fiddlers; they are all playing down here [in the high range]. We tell them--get down into the money range, get back here, ya' know?

What I am trying to indicate is that a person playing a brass instrument-- there are certain things that have to be taken care of as you develop the ability to express yourself musically with the instrument. I think if you were to take an Arban's trumpet book or any of the simple trumpet methods, you'd almost find the key [answer] for the tuba. I am speaking now of the elementary stage, where we don't want a great range to be established immediately. I have a reason for it in the sense that most of us who have learned to play on the tuba learn without very much instruction. I grew up in a little desert town in California and started out as a bugler. I switched to trumpet then finally trombone. I lost the trombone, and some bandmaster took advantage of the loss and handed me a tuba, so I was kind of stuck with it--but I did primarily learn to play without instruction. Now, I learned the tuba by just repeating what I had done on the trumpet and the trombone. There's an orderly development about that which has to do with the lip musculature, which has to do with the physical functions of playing where actually-- great range does not have to become a great hazard because of the amount of time that was spent in the normal activities on the instrument in the mid-range, and then the lower mid-range, and then the low range.

Now I have player after player that comes to me with hang-ups and a sense of malfunctioning embouchure-- malfunctions in the breath, and they are always trying to play the Vaughan Williams Concerto on their B Flat tubas, and many of them can do it!

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Also, many of them begin to loose the mid-range. There will be segmentation in the embouchure, a rattle in the tones; this is the way it will make itself noticed. I would like to suggest that along with the contrabass tuba, the player should consider actually getting a mouthpiece--I don't think that there is a commercial mouthpiece made--Schilke made mine for me. He merely copied the Helleberg rim and made a special cup that would fit into a Baritone and was contoured more for the Baritone-- it gives the Baritone a very nice round quality of tone. But musically, it is very acceptable to the player. In other words, it sounds quite good when you play a simple B Flat scale...

[Plays a B Flat scale]

Of course that scale would be an octave higher on the large tuba in relationship to it. The embouchure form-- in other words, the positioning of the embouchure or what would be the proper terminology: the hypertrophy and enlargement of various small fibers would have to do with the shaping--the strengthening comes in a situation where music is more compatible with the Baritone, and can be transferred back to the big tuba. I always insist that whatever is learned on the small instrument is transferred back. I do this when I work with trumpet players frequently. If I see a struggle going on in the B Flat trumpet, the normal large trumpet, I might ask for the piccolo trumpet and start a musical development on the piccolo. Everything that is done on the piccolo, I always ask that it is re-done on the big trumpet so that we don't have the phenomena of high notes on one instrument and low notes on a different instrument.

Now, I am suggesting this only because I think this is a marvelous--bypassing some of the distortions that come with playing very high notes on some of these large tubas. The smaller ones aren't so bad but these monsters go flat in the high range-- some of them will go sharp, but the youngster is trying to play it in tune so he's lipping the notes around-- he's establishing all sorts of efforts which really do not belong, and I would think that by working on in conjunction with an instrument of this type, it would be more compatible, and they would enjoy it more and I think the instructor would enjoy it more, because they would make much faster progress.

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I am going to get into the heart of the clinic I suppose. I have to, rather than work with a composer; I have to work with the person who plays the tuba, which is so much of what I think I was actually brought here for. [Person hands him a Besson F tuba] The trouble with the Besson F-- I know this horn is pretty nice a he may never get this back!

[Plays Siegfried's horn call (Wagner) and Berlioz: *Romeo and Juliet* excerpt]

This is quite a substantial tone for a tiny little horn of this type. I will put the F tuba mouthpiece in it-- I use the large mouthpiece deliberately to enlarge that tone.
[Plays the Berlioz excerpt again]

What I am playing is of course from Berlioz' *Romeo and Juliet*, the opening recitative for brass. I don't know the number of our recording but if you want to go out and buy it, why, fine and dandy! It is typical writing for the F tuba, and you get the same range on the C tuba -- it's just as easy to play up there but the sound characteristic is of course not what it should be; in fact it is not at all proper--it's too wide, to thick of a tone, too much fundamental for this style of writing. All we do is go up to the extreme upper range of the contrabass tuba.

The Variable of the individual: Commumication

Now what we are dealing with of course is a human being, a person: a man or a woman, who wants to play a brass instrument. Now, where I go into this, I always feel that we are talking about the tuba player, the trumpet player. We should be talking about the man who plays the trumpet, the man who plays tuba; the man who is in an art form where he has to communicate to others. All art forms have certain basic characteristics; otherwise they would not be an art form. It is the ability to express yourself through the media of your choice. I could be a paintbrush and a canvass, an actor or an actress on the stage. It's obvious how they [the actor] express themselves; they interpret other parts, other person's lives, but they do it and they become very believable. In a sad scene you

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might go away crying or in a happy one you'll smile or laugh if it is funny, but all art forms are forms of communication. Now basically they must be to somebody else, not to yourself. It is so very important that this is understood because it establishes a pattern that should be there from the time a person enters it. I dare say that the very successful tuba player, I am now thinking of Harvey, and I am thinking of many other young tuba players; I am thinking of myself as a child; we loved sound. I can remember myself as a youngster playing the bugle, I got into trouble--I would go from my Scout meeting playing my bugle at nine in the evening, playing the bugle all the way home. The neighbors would complain, people would come out and tell me to be quiet, but there was a tremendous extroversion there. I was communicating, but in a sort of nasty sort of way. But what I want to indicate here is that from the time you start playing the instrument, I always consider the most elementary player the most elementary performer. I didn't know why I felt this way until the middle 1940s when I started to study biology. After I had gone through structure and function and stayed with human biology I found many interesting things after the fact such as what people do and why we do things as motivation and what their physical meanings will be. Some very interesting things I think; insights came out of this type of study-- one of course is the habits of thought that are very strong in each individual; the way we tend to think-- Now what we are dealing with in playing a brass instrument, we are dealing with an acoustical device set up by a factory. This device has basically three valves you can add a fourth as an extension valve for intonation, additional range; you can even add a fifth, but it's still basically a three-valve instrument. Any fine player can play three octaves easily on his instrument, some will do four, and some will do more than that. It is obvious that the three valves on the horn is not giving us the pitch. In other words it is not like with a piano where our cat sometimes runs down the keyboard and it plays; it's not very good music but I hear it. On that basis, I want to indicate that with a brass instrument we have something quite different than the woodwind player, the percussionist, or the pianist.

Now, let me establish one thing right from the beginning: when I talk about a pianist, I am talking about an extremely difficult instrument to play. I am speaking about

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a brain that has to be extremely adept in the art form of communication. In other words, they have challenges that are far beyond what we will ever have on an instrument like the tuba. I respect the pianist as I come from a family where the piano was dominant--I was the black sheep of the family playing a brass instrument. What I want to indicate right away is that when I say that when the pianist has a tactile sense; in other words when he touches, he feels. He is getting his feedback through his fingers, he is getting an awareness of function and a connection with the keyboard where he can express himself in his art form, and a very complex one at that. But, he has a sense, an extra sense that we do not have on the brass instrument. Now what I am trying to indicate here is that I studied voice for 12 years, giving me a little insight into this, also having studied anatomy, structure, and function. I find the similarities with the brass instrument are just as enormous in many respects--the applications are somewhat different but there are basic similarities.

Avoiding analysis: We Play by Song

One thing is that we never know what we are doing. Now, we have to know what we are doing as musicians, but we will never know what we are doing in the sense of physical structures at work. We can only get signals from a small number of muscles that are functioning, missing all sorts of signals from other muscles that we cannot know about; we just don't have the appropriate receptors. We don't have a nerve in many of the muscles that are going to feed to the thinking part of the brain; it will feed to the brain but to other levels. The part that we are conscious with will not be able to perceive in a physical sense what we are doing. In other words, some aesthetic analysis would be the term that we use. Now, we are not going to know what we are doing--I think this is so important that people realize that in this art form, we do not have to know what we are doing. We have to know what our message is going to be, we have to have fuel (air), we have to use it, but we don't play by air. I am here to give a clinic which will probably be dominant on respiratory activity, but I have to indicate even before we get started; that we never play a brass instrument by air, we play by Song. We use air, but we don't play by

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air, we play by Song. In other words we go by the complete product, the message, not by air.

By blowing breath, our embouchure does not have to respond [blows]--you can do that all day and not have a sound; there has to be another element added for the embouchure to function. When we do add this message, the breath becomes fuel. It is a very important phenomenon, but it is not the end product; it is not the art form that we are working with, it is only a segmented part of it. So, I want to stress right away that the relationship of the clarinetist, his connection to his instrument in terms of phrase dynamics and so-forth, is through his breath. Now, he has a wooden reed, his embouchure helps the ligaturing aspect of the reed--my friends tell me this, I am not a clarinetist but I work with good ones and they gave me this information. Their embouchure has to do with certain aspects of the reinforcing of the ligature aspect of the reed. He uses his breath as the motor force in order to vibrate the reed-- the instrument has to do with the resonance of that vibrating reed. Now part of that is sympathetic-- part of it is forced, it's primarily a forced resonance compared to the brass instrument, which is primarily sympathetic. Now what I want to get into is a recognition that the woodwind player, in the aesthetics of the art form; he can be very much alerted to the use of breath and speak about the breath. You cannot do that as a singer, in other words you must be altered to the song. You must be alerted to the communication to your audience-- though it is not just a sound it is also how you express yourself; the facial activities, gestures, body language in other words, it's all involved. On a brass instrument where our reed is flesh and blood, we have to be aware that we do not play by breath. At the same time we cannot neglect the breath, but we can play by sound, we play by Song-- I much prefer to put it to you that way.

Our embouchures do not have to respond to a flow of air. If you stand in front of the mirror and you make funny faces in front of the mirror, you will find that you can take your lips and twist them all around. In other words, we have various muscles that will pull the lips inward, protract them outwards, elevate them, and depress them. They are very complex structures and these complex structures form, as I like to say it, vocal

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chords for the instrument.... Now, what's involved here is that in a human being-- the part of the brain that you do volitional thinking with is not in charge of what your functions are. It's in charge of what you do with your body to influence the external environment, but it is not in charge in direct wiring hookups to the internal environment. It goes through emotions; it goes through all sorts of other states to influence the internal activities. What I want to indicate very strongly is that I have many students that come to see me that are very much involved in self-analysis. Now the part of the brain that we think with is the part that permits us to ask questions or to issue statements, but it does not permit us in itself to allow my arm to raise it up. It has to signal that says I want my arm up in the upper position and then the many muscles throughout the body go to work. In other words, my Scapula has to fix back there: the arm in this position has altered gravitational factors; the electromiographical readings all over the body would show activity. In other words, a simple maneuver is enormously complex from the machine aspect of the human body and function and yet, it is very simple if I throw up a ball to catch it. It is very simple to do that, but I have to throw the ball up and I have to catch it. As soon as I go by the chain of command that allows my arm to be in a position, I am going to spoil it. I have to get the hand under the ball and I've got it. As soon as I go to the procedure to get it there, we are in the way and we are in all sorts of trouble. What I am trying to indicate very strongly is that the part of the brain that asks the questions is also the part of the brain that issues the statements. Now we have other levels of the brain that have to do with firing up the muscles, giving us the coordinate phenomenon. I know this is not a simple subject for musicians, but I am trying to give the proper analogous situation where it will make some sense to you.

When I speak to you, I have something to say. In order for me to say it, I am using articulation; I am using tongue, lips, laryngeal activity, respiratory activity , and body language....Many parts of me are working based on conditioned response to stimuli. Now, the very fact that I have something to say is making it very easy for me to me to do it; I merely present my pitch to you. I will very frequently take a student who is turning inwards and I will ask him to give me a very complex discourse on any subject--

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but a complex one, and analyze his respiration, phonation. In other words, question him as he is making the speech. Very frequently he has nothing to say, but I have people on brass instruments doing this all the time. Well, you can't do that. In other words, you influence the phenomenon, even the things that are wrong, you don't make them right--you abandon them.

Habits and Nerve Pathways

You substitute new habits for new ones; in other words you don't fight old habits to correct them, you substitute new habits for the old ones. The new neuropathways form, and the old one, through the lack of stimulation, will finally quiet down as the new one develops.

In order to make this thing a little more sensible to you, I want to say that we have two types of nerves. We have *motor nerves* and we have *sensory nerves*. You all know the sensors; when I talk, you hear, that's an auditory nerve, that's a sensory nerve. You want to feel whether the water is hot or cold, you put your finger underneath the water, there you have a sense of temperature; you have the tactile sense. You have the various senses that carry the senses inward. Motor nerves are quite different. A nerve in a human body is a one-way street. A motor nerve carries a message from the brain to the effectors; to the muscle which is going to contract. A sensor carries the message in the opposite direction. In electronics we use a wiring hookup where we can send a message along a wire either way; you cannot do that with the human nerve. In other words, it goes only one-way. Now, we play through the motor systems, not the sensors. The sensors are important-- I am not putting them down, but the emphasis in the musician must be always on the art of communication so that one part of the brain is acting like a piano player roll; the keyboards are stimulated into their proper function. We don't go to the corrections of the keyboards we go to the correction of the controls. It's like the study of machine systems. All machine systems have controls, and all controls have to be programmed. When there is a malfunctioning embouchure, first you have to go to the brain which is controlling the embouchure, you don't correct the shape of the lip as the

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dominating factor-- you make sure that there is a musical message that's supposed to come out of the lip so we will have something for the lip to say. Now, that doesn't mean that the lip shouldn't be in a proper form. It's simply that the proper form in itself is not the end product. In other words, proper form--if you take for granted that the music student has a musical thought then-- he will function with proper form. Many students at that time do not have a proper thought, they are going by the feel and the shape of the lip and they have nothing. You must make sure that there is always a sound in the head that instead of registering on vocal chords here in sound, they register here [lips] as vocal chords in sound.

[Jacobs sings a trumpet fanfare (*Reverie*) and then buzzes it]....

Now, for the lip to have something to say, the [idea] must always be in the brain to be in the lip. You cannot take that for granted for those who teach or those of you that play, that it's in the lip because you might have thought of it a minute before you started playing. As you play, you have to sing. You do not sing with the vocal chords, you sing with the lips; but you do sing. That's the closest analogous situation that I can think of. I have seen this writing from many fine brass players before my time. They would say 'learn to sing', not as a physical application of going onto the stage with the human voice, but to sing on your instrument. As someone who is well versed in structure and function, there are physical reasons why this is valid. In other words, we must consider the piano player roll so we can have the keyboard activity; or you could liken it to the punch card for the computer, but we must have the message so that the physical activities can function.

The subject is complex and I would like a lot of questions from you on this because this should be clarified for you to get any benefit out of it. I like to teach it as a simple subject and I will very frequently ask my students to sing a part, and then play it. Now many times they will sing it and when they go to play it, the mind blanks out. They've sung it a moment before but they are not singing in the brain at the moment they

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are playing it and as a result there is still improper guidance. At that time, I will make up words, in other words, if they are playing I will:

[Jacobs Buzzes a tune and sings the words "*How dry I am...*"]

Then I will have them actually concentrate on the words and pitch--invariably it begins to come with greater ease and comfort and they will find entrances that they couldn't get a moment before. They come quite easily when they stop trying to develop the attack as a formalized procedure, but substitute the pronunciation of a word, the whole psychology of it changes, and the organization of it cerebrally alters.

I hesitate to go into how complex we are in structure and function. You have no idea unless you have studied years of--you can't just study anatomy. You have to go into the physiological concepts, the chemical aspects. You have to go into enormous study to get the concept of truly how complex the human machine is, and then when you do you realize that, the only hope of success is to keep it simple. Now I always played in my own life, I learned to play by ear when I was a youngster because I didn't have a teacher or an instruction book. My first trumpet my father bought me was a little Wurlitzer trumpet but he forgot to buy an instruction book so, all I had was the trumpet. Since I had played bugle before, I learned to play by ear. I played a solo in our school in California with my sister accompanying me on piano-- I hadn't played a year on the trumpet when I did this solo. I remember after I started studying the trumpet I couldn't play that solo anymore. Well, it wasn't the fault of the teacher or anything; it was simply that I had let go of this certain aspect of playing. What I want to indicate is that learning to play by ear means that a region of the brain is becoming very adept at recognition and recall.

Now recognition and recall is going to have a great deal to do with what you have to say as an instrumentalist. Now, the physical factors demand that you do not play by segmented parts. The breath, tongue, embouchure, are the various segmented parts; you play by Song. Now after the fact, you can analyze all the separate parts and segment them, but to integrate them into proper function, you have to do it based on having a

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message. Now, if I had to pick any particular fault I have found with many young players, I would say that only one out of ten has a musical inspiration. Usually they come to see me because they are in trouble. In other words, they will come the long distances and so as a result; a person in trouble worries. With worry, you tend to become hypersensitive to incoming stimuli. Usually with inspiration you would have a message to deliver and things go somewhat better. So often I would get people coming to see me who are in a rather worried or harassed state. I have to turn that young mind around and make a storyteller out of them right away; it is so important that I can't stress it too much. I like to phrase it as "You have a tuba in the hand and you have a tuba in the head" The tuba in the head has no valves and no embouchure. This is the one you concentrate on. You allow the one in the hand to become a mirror. In other words, it is the media in which you express yourself. Now I find that many players will use lip service to this type of thought, but when the horn is in the hands they don't do it; they don't have a message. They play by air, by fingers and by resistance; the various feel phenomena. I have to somehow break into that. I use the technique of Song, in other words; I may establish words.

I stood outside Remington's studio at Eastman one time when we were playing with the Chicago Symphony; the first thing I hear is that he's singing with his student; his voice sounded constantly. Well, the indication here is that you program the physical structures; you program yourself by two thoughts of thought processes. One is the imitative act-- the other is the creative; but one or the other should be in constant use. If I were to play the Stars and Stripes forever and ask a student to do it, we'll say on the mouthpiece without a horn, he can usually imitate very readily. He starts copying my voice right away. I will give him a few trick rhythms--very quickly, they are doing it on the mouthpiece. The imitative act is feeding signals along one level of the brain, programming other cortical levels where the physical structures are being responsive. I bring that into being very early because this is one of the chief tools that we use in an art form. The creative aspect is the ability to have something to say.

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If I have a player, let's say he's a trumpet player-- I have him listen to someone like Bud Herseth and I ask him to play something simple. How would Bud sound liken on this? Think a moment. What would Bud sound like? Demonstrate what you would think he would sound like on this phrase. The player will play way over his head. He begins to sound like Herseth because he is thinking of sounding like him; but you can see what I am talking about right away. Psychomotor activity, the programming of a motor system, is through the psyche and what we have to establish here are concepts of playing. Now that doesn't mean we neglect our other aspects of playing, but we keep a dominance of being performers, of having something to say to somebody else. Like the actor on a stage; you read a set of lines-- you read it with the idea that you are going to re-interpret it. If you want to express hate ("I HATE THAT!"), I can think of some conductors, I can turn that on like that! I love; yes I can do that too. Laughter and so on. You will find that when you think about a thought that brings about an emotional state, you've also brought about all sorts of physical response associated with it. I am trying to indicate the same thing when we play our instruments. It's not to have a question in the brain, but a statement. The statement should not be of the physical procedure but of the sound phenomenon. What we are dealing with is the conditioned response to a specific stimulus.

The stimulus should not be the spoken word; it should be sound. If we use the word Song, then we use the word Wind with sound-- it must be sound that will excite the embouchure into pitch (and) coordinate the various physical functions. We go right back into the art form where we belong. I have studied this subject for so many years and I cannot use measurement phenomenon in my own playing. In other words, I do not play by my knowledge of structure and function; I play as a storyteller with a tuba. Just like Harvey does, a great artist with his tuba. Any great brass player, any great musician--we are storytellers only we don't use words we use sounds, but we do bring in our physical structures then and in a proper manner.

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Q: *You are saying that if you have an image, and theoretically it should come out of the axe, what usually gets in the way of the tuba in the head and the tuba in the hand?*

The first thing that you go to is the fact that the image in time may not be there as you do the physical maneuver of playing. In other words, the man with the poor attack-- if he had to play [sings *Ta* and then buzzes], he may have the idea in his mind before but when he sets up the embouchure and breath, it blanks out here at the instant it is needed; it's gone. Then I may ask for a word, or I may use the illustration of a bell and a hammer so it's synchronized; usually the note is right there. But I am working again with the brain rather than the structures because I permit a wide range of bad embouchures and bad physical techniques until we have the musical dominance, and then on through the musical challenges we correct many of the physical structures. Did that answer the question? Now would you like me to clarify any of this? Yes sir...

Q: *Do you vocalize every day?*

I haven't vocalized seriously in 30 years. I am giving my age away now. I do vocalize, I teach voice to a certain extent. Occasionally I have brass players for instance who-- after all in singing you have to have an open palette at times and so forth-- on Brass, if you had an open palette, the air would be coming out of the nose. So, we do run into some problems. Every now and then I will work with a vocal student and then of course, I will vocalize quite a bit just to get into shape. I do solfège quite a bit every day, but I don't do what I did when I was a vocal student. You know, extensive work for the stage or anything of that type. Although if I only had time, I would, I love it. Yes sir?

Q: *Thinking about concept...how does one think about concept when one is drawing from one's own experience?*

You can draw from other's experiences that become yours.

Q: *That's what I thought. One must become exposed to so many, (inaudible)*

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This is the thing you know-- Imagination is a very important tool. Mike Russell right? I thought I recognized you there in the distance. Mike-- what we are dealing with here, it's always nice to hear a player in other words, go to concerts hear as many players as you can, but a tuba player can imitate a trumpet player and get marvelous results, you can imitate a violinist and get marvelous results. It does not have to be tuba; it has to be music. But, what I am indicating here is the imitative act for instance--when I am around the orchestra a lot with Beethoven and sometimes I have nothing to play I'll fool around, here's just a little passage.

[Plays Rimsky-Korsakov: Scheherezade theme]

And so forth and so on. I hear my colleagues do a thing so I go home and in the privacy of my studio I do them-- you can see right away that is programming the brain. Now with records, you can do the same thing-- you listen to other players. It doesn't come out of a vacuum in other words. I really feel that this is one of our big problems. I'll get to the composers that are here; one of our big problems is that in the past, the tuba has been assigned a very limited type of music to interpret. Of course Oompah's, we're all F clef here so; we know what that means you know! But we can also see that a limited musical challenge is going to create a limited musician. Now we have to of course, get out of that period and thanks to Harvey and Bill Bell before him, that much of that phase is behind us--but for many years the talented young tuba player had to imitate the trumpet-- he had to go to the school of trumpet horn or violin, but he could do nothing with the tuba. In other words, the actual taking home of tuba music, there was nothing there to challenge him that would really give him the ladder where he could he could climb to be an excellent interpreter of music and, as a person, we are not tuba players, we are people. To develop our brains and our abilities, we must be given the type of challenge that will give us the development. In the past, from my period, I primarily went to the school of French horn, school of violin, school of voice but I did very little with the tuba music.

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Otto Lange, I will tell you a story about that. Do I have time Harvey? I had the Otto Lange method book when we lost my trombone while we were traveling in Texas. In those days in the 20s, we had running boards on cars. My horn was tied to the running board and it disappeared. At the time I was living in Santa Monica California, and the bandmaster gave me a trombone so of course I had to fool around with the trombone for quite a while...What was my topic? I was going to tell them a story about -- Oh, Otto Lange. Well, what happened there--it was so long ago, Otto Lange is so foreign to my thinking. At that time, they gave me the tuba book, the Otto Lange method for tuba and a big King Sousaphone. It said the low range of the tuba goes down to a low E and goes up to a high B Flat. So I had a ball with the tuba you know-- they put me in the *News Boys* Band right away. I was principal tuba because I had the technique you now from the trumpet, and trombone and range; it was great. They sent me to the Curtis Institute after a year for an audition. I had the Arban *Carnival of Venice* worked up-- I did the whole thing, as well as Herbert Clarke's *Stars in the Velvety Sky*, I had that worked up for my audition. I couldn't use a sousaphone so I had a little E Flat tuba with a fourth valve tied down and slides pulled out so I could use it as a B Flat tuba. I went up for this audition and I had-- the younger ones won't remember, Josef Hoffmann, he was a famous pianist of a different era and Marcel Tabuteau, the old first oboist of the Philadelphia orchestra, we had a very distinguished faculty there auditioning. I came out with this horn tied together with string and taped down. I started out with my solos; they let me play through them. And then they brought out the Flying Dutchman overture. Now the Flying Dutchman (he sings) goes up to I think a high C. I missed the high C and they said try it again and I said that I could only go to a high B Flat on this tuba-- they laughed. They said try it again.... I was given the scholarship and that was fine but the instruction book had put a handicap in my way by not indicating that there is range beyond high B Flat and low E; it said that's your range for the B Flat tuba.

In my second year at the Curtis Institute of Music I was studying *Benvenuto Cellini*, which goes to a G above our high C. I was having a terrible time playing that note. Mr. Donatelli, my instructor, a fine tuba player, but he rarely played for me, but I

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asked if he would play this part for me? So he took my tuba and he played it very well. But I noticed that right before he went to the high G, he shifted his embouchure on the mouthpiece. He moved down lower on the mouthpiece and a bell, a light went on in my head. I said aha! you broke a rule. He shifted on the mouthpiece there but he got the high G and it sounded good. I was a former trumpet player, as soon as I saw that and I broke the rules, I not only had high G, but I had G above high G...I haven't had a bad time with high notes since. But the Otto Lange method with its high Bb and its low E had me stymied for a while.

What I want to indicate of course by this is for a brass player; if the music is the dominant phenomena, and the procedure is a minor and you go for the art form of communication to others, and you don't set rules for procedure but you set rules of result; I think you will find a very happy situation develops. If you set rules of procedure, it fits a certain group and bypasses others. Now we read out all sorts of favorable things from the advanced player, but the person that has to learn it very frequently will be handicapped if he is taught to follow a certain procedure. For instance, if you do not allow a change of embouchure as conceived maybe a stabilized embouchure today, I don't have to make the changes that I did today that I did when I was fifteen years old, but until the musculatures go into hypertrophy and learn their tasks and so forth through the act of playing, then many growths and crude just like in athletics. The refinements come with experience and skill; they do not come until you have acquired the skill. And in any physical structure you have to let this period of development but if you set rules as to procedure, many players are going to be handicapped. If you set rules that the mouthpiece must fit a certain way on your lips--this is fine for the person with the neuromuscular pattern similar to the teacher and poison to the one with dissimilar neuromuscular patterns. In other words, the location of the nerve, the excellence of some of the tissues and so forth, it may be quite different. Jaw structure may be quite different. Allowed to find his own way, you might get an excellent result, but if he has to do it in a formalized way he may wind up in the insurance business or some other field, because she will be unable to cope with the problem but, I am trying to say is by

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formalizing the art form, I really feel the player moves ahead very fast and I am making my little speech because so many players will come to me without actually being interpreters of music. They talk about music-- they write-- they use physical aspects of music, but they don't think in the art form of music, and I really feel that this has to be stressed. I guess I must be running out of time because I see something out of the corner of my eye.

(End of session 1)

Part 2

Respiration

I think in this second session I am going to bore you all with respiratory activity and a certain amount of anatomy-- and believe me, it's a dreary subject, I love it but I leave most of my audience when I go into it. It's interesting when you are dealing with a human being, if you had to construct a human being; it would be quite a task. You know, if you were to construct a tuba player-- that's quite a thought isn't it? You'd have to study an awful lot of physics, and you'd have to study many things-- but, Boyles Law would be involved. I don't know how many here are familiar with *Boyle's Law*. That has to do with gas dynamics and what happens with air under pressure.

What we are dealing with is the human being who is born to survive on this planet One of the things that we must have is air. Now there is a great simplicity about this subject, or we can go into great complications; let's take it from both aspects. Could I have a young man come up, a volunteer? Somebody who might be interested in making a display of himself? I might even have him strip down to the waist; you never know....I met this young man outside the academy of music in Philadelphia. He's from the Curtis Institute of music right? Larry is going to be a very good subject when I get to him. Larry, make yourself comfortable, I don't know when you will be in use, but hang around. What we are dealing with of course as I say, is a person who is born into this planet without any knowledge of tubas, tuba playing, or anything about it but he has to breathe. What I am going to deal with on this subject, I am going to need to go to my

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equipment and pull out some charts and I might have to draw a little. I want to go into certain aspects of respiration and how we apply it to brass instruments and particularly to the tuba. So excuse me for a moment while I fumble around with my equipment here.

I had thought that if I had permission from the orchestra to spend the four days here with you which I had originally hoped, I would have brought my equipment here with me to analyze and each day have a period where I could have some of you come in and work with you as individuals. Unfortunately due to the pressure of the season; this was impossible. Maybe at some later date I could do it. The next best thing is for me to try to indicate some of the aspects of respiration.

We have what we call VITAL CAPACITY. This has to do with a quantity of air each of us has as an individual that could be used in tuba playing or anything that we want in life. This particular phenomenon-- each of us is blessed by nature with a certain potential, we don't always use it; but we do have it as individuals. Now in a young man of this type, if I had the equipment here I would measure-- but I can almost tell by looking at him about what he would have. We use the term liters; I am going to convert it to quarts instead. In the average individual, about the age of 20, a young man of this type would have a lung capacity of--how tall are you? 5' 81/2''--what do you weigh? And how old are you?--So you at the age of 20 would have an expected vital capacity of about 4800 cubic centimeters of air. In other words he would have approximately 5 quarts of air that he would be able to take in if he first blew all the air out of his lungs that he could, and then after a pause, take a maximum inflation --a non-musical breath. All the air he could take in, he would have approximately, we would expect, about 4800 ml; 5 liters of air, somewhere in that range, plus or minus 20%. We can just about predict from his body size and the somatotype of the individual. Now, what I am indicating here that is tuba is what we call a high flow rate instrument.

I did several tests at the University of Chicago Medical School where I was hooked up to spirometric and analyzing equipment. They analyzed the flow rate of air that I would use from my lungs to excite the embouchure into vibration, and my vital capacity, unfortunately, is quite small. Short, fat people rarely have very large lung

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capacities. As you get older, your capacity gets smaller and smaller. Unfortunately, it is part of the aging process and if you happen to have asthma with it, it still becomes more and more unusable. I qualify in all the negative aspects of it, but anyway, I still function so; it's a short bow, and I change it often and I get by.

What I am trying to indicate to you is that at the age of twenty or so, a person will have their maximum potential in terms of quantity of air as a potential, and it gradually reduces for the rest of his life. By the time that he's in his fifties, he will have considerably less. In fact, most of the people that come to me with embouchure problems are people in their forties and early fifties who have qualified in this respiratory reduction and as a result, are having reflex change on the upper end and it affects the embouchure. Were you going to ask a question young man?
(Any way of diminishing these effects?)

Well, you can cooperate with nature to the extent that you can minimize the amount of change, but you are still going to go down. You can by using, you might say, a quantitative type of inhalation-- you can ward off the undesirable effects and play until you are 100 if you want to. It's just that your bow gets shorter and shorter and as I say, if you change it often, there is no problem. If you try to make it [the phrase] exactly what it did when it was a longer bow, then you are going to be in a little problem here. Now what I wanted to indicate is; a variety of vital capacities that come with age and with size and with body type that come with the individual. I have a few papers here of vital capacities that I have taken from individuals. Now, I don't think this is all going to be visible when I hold it up in front of an audience. I just wonder if this line here starting at the top of the page and going all the way to the bottom is at all visible to anybody.... I will use one from Chester Schmitz from the Boston Symphony, that would be this vital capacity test here this line.... There's one by Arnold Jacobs, which I am ashamed of but you might project that and along side that is one by Roger Bobo, he likes it...I don't. Now, those are indicated. Now here we have a youngster and I want to put this on the screen also....This young man whose vital capacity I have tested, we have a piece of

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equipment where if a person, some of you have experienced this and know what I am talking about, but it is a breath measuring device; a Spirometer. *Spiro* to do with breath, a breath meter. When you take a huge volume of air into the lungs, as much as you can hold, blow up like a big frog. You put a tube into your mouth and then blow out and empty the lungs as fully and as completely as possible--do this into a piece of tubing and a can moves up, a pen then moves up on the other side. There is a revolving drum that measures how much air you have moved out and how fast you have moved it out. Now the young man which I had on the first chart, if we were to make the chart--this young man in taking a full breath and blowing it out as fast as he could. These charts that I am using measure seven quarts, seven liters, and overshoots we can measure much more of course. But we are measuring a specific quantity. Now this young man had huge lungs, he could fill the entire chart. He's blowing his breath as rapidly as he can into the equipment to be measured. Now in all human beings regardless of the state of health, as you take a huge volume of air into the lungs and you move it out as fast as you can, you are going to find the velocity of the air out of the lungs is at a constant change. You move out very rapidly at the start, and as you get to the last 20-25% of volume that are usable on a brass instrument, there is a considerable slowing up, no matter what strength you may use to try and send it out, it will not come out faster. There are physiological phenomena involved. Actually, we are running into a problem where air, near the end of the breath, becomes very difficult to use in a high flow instrument. It can be used in an oboe which is a very low flow rate, but would not be practical on a high flow instrument like the bass trombone or tuba. Now, I want to indicate, if this were the seven liters that this young man had--you can see at the top of the page and the curve going down and down and down.

This young player was the former first trumpet player with the Minneapolis Symphony, a man who is all chest; short legs, long torso, an enormous lung capacity. Could you put on one of the others now? Let me pick one, I want to show you a sharp contrast--this is one of my favorites.

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This is a twelve year old boy who is being taught by a professional trumpet teacher. This is the seven liters we'll say, and this is the 12-year-old boy or even less. In other words; the vital capacity on this youngster while it was normal for his years, his bow was extremely small. It becomes maximal at the age of 18 to 20 years in the individual. His teacher was giving him length of phrase similar to what he was doing, in other words proper musical phrasing. The youngster had run into severe difficulties in playing because he is trying to take a small quantity of fuel and stretch it out in time to do with what the large quantity of fuel that the teacher had to do. As a result, there was over activation of inspiratory musculature, over retention, the throat reflexes coming in-- severe problems developing in this young player who if he were taught quality of tone, sub-phrase within phrase so that the length of the phrase was not important because his bow is very short. At twelve years of age, it's going to be short in the small individual; it's going to be short unless their body type is rather unusual. But as an average, you can figure that a short person is going to have small lungs compared to the tall person. Now what we are dealing with, I want to go into this subject because it is very important.

There are two lines, one is a line of vital capacity of Arnold Jacobs, one is the line of vital capacity of Roger Bobo, the child like one is mine and the huge quantity is Roger's. At this time I was 4 liters-- today, it is considerably less. Overweight, and too old. They both enter into it, plus pollutants and other things. But what I am trying to indicate to you is a wide variety of fuel supplies for individuals. There's another giant, of course he fills the entire page, in other words, from the top to the bottom. These are people with enormous lung capacities. I always hate it when I see these big ones you know! It makes me very envious. Now I want to go into some of the ramifications of this. We have problems in respiration in individuals according to body type, according to age. We have musical requirements that we are supposed to fulfill as in my first clinic I stressed deliberately of always keeping a perspective within your art form regardless of how much fuel you have; we have to communicate. We don't necessarily have to have the same length of phrase. There is no reason why we cannot re-breathe when we are running out of breath. Many trombone players will be using the Rochut etudes which are

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simply the Bordogni vocalizes-- now the Bordogni vocalizes have certain phrasing indications. The tuba uses approximately twice the volume of air in a given time factor as the trombone, if he is playing one octave lower. As a result, he is going to be running out of breath twice as fast. If he is trying to compete against the trombonist, he is going to be stretching and stretching his air, over activating the inspiratory muscles--he is going to be running into problems which are avoidable if he would instead work for quality of tone with shorter phrases. If he is a giant, he'll compete, but if he is one of the little fellas', then he can be in very serious difficulty by trying to extend the phrase equivalent to what the trombone player would do for good tasty phrases. We can have sub-phrases which are just as musical and just as valid, but we must be permitted the freedom of using our in a manner comfortable for the individual.

I want to go into this subject now. This is going to get a little complicated and I will probably loose half of you, but bear with me anyways. First of all, we have the vital capacity. Teachers sometimes use residual air as a statement; residual air we can forget. This is air that cannot be taken out of the lungs by any voluntary effort that we have. In the old days, the forensic test for medicine in a sense the legal test to see if a child was born alive or dead, was to take the lungs out of a youngster that was just born, if there was a doubt. They remove the lungs, they put them in water, and if the lungs floated, legally that child had been born alive. Then there might be an insurance problem. If it dropped to the bottom of the water, it was heavier than water; he had not drawn his first breath. Residual air is involved in this. Once you take a first breath, some of the air remains in the lungs. Now you cannot get this air out of the lungs by anything you do on a voluntary effort--so you can forget about residual air if that subject does come up. In other words, it is not something that can be utilized in playing a wind instrument. It will be there and it protects you always so there is a certain amount of diffusion of gasses, even if you have blown all of the air out of the lungs. It is a protection to the individual.

Now I want to get into the subject of quantity before I get into the structures involved. The average individual at the age of twenty, you might say the average male, will be able to take five liters, five quarts of air by maximum inflation. Now half of this,

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less than half of this, is from the diaphragm alone. If you have ever had pleurisy[1] and had the chest wrapped, they immobilize the region to allow healing and remove the pain--you cannot move the ribs. If you are left by only the diaphragmatic activity alone, the diaphragm in the average individual is capable of moving about 45% of your usable vital capacity. Now this will vary in body types according to the individual. The somatotype is very important in analyzing this. By getting the average, we'll say 45% from empty to 45% filled can be done with immobilized ribs by diaphragmatic descent. 55% of that individual's vital capacity is there utilized by the expansion in the chest due to the rib activity. Now this will vary in certain individuals from 40% diaphragm to 60%, it can go 50-50, but it will be a variable. What I am trying to indicate is that the diaphragm in itself is only capable of moving half to a little less than half of your total usable lung volumes that we will call your vital capacity. The rest is due to the activity of the rib cage. Now, we don't have the skeletal charts here necessary and I am a rotten artist so I won't even attempt to draw it.

Over there in the upper right hand corner you will see a posterior, or rear approach to a skeletal structure. You'll note, I can't go over there or I will loose my voice. But if I were over there, I would point to the lower ribs and you will see that they are descending. --the angle of the curve from the spine is somewhat down. Now, this is a rather important point. In the left side you will see it even more clearly that there is a curving downward of the rib cage. Now in respiration--in taking a full breath, you will see that from a deflated position, I will never get small, there is just too much there As I take a large breath (inhales), you will see a considerable enlargement in the chest. If you were to analyze the sternal activity, you will find that that sternum has moved upwards. You will find that it is hinged at the very top and if you liken it to a pump handle, which

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[1] *Pleurisy (Pleuritis)* Inflammation of the pleura, usually producing an exudative pleural effusion and stabbing chest pain worsened by respiration and cough. Pleurisy may develop in the presence of bacterial lung infections, upper respiratory infections, tuberculosis, rheumatoid diseases, and lung neoplasms. The main symptom is pain over the chest wall at the site of the inflammation. The pain is increased by deep breathing, coughing, and chest movement. The normally smooth pleural surfaces, now roughened by inflammation, rub together with each breath and may produce a rough grating sound called a "friction rub" which can be heard with the stethoscope or an ear held against the chest.

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is so often used in anatomy what we use to express the sternal activity. The bottom of the sternum, in other words the breastbone, the little bone running down here, it's complicated, it is in three sections, but we will just call it sternum. This bone, when you breathe in, to a maximal inflation (breathes) has a pumping activity like the old farm pumps. In other words, up and down.... When we go to the lower rib cage, which is no longer present, but if it were you would find that the lower ribs, I am going now down to the 10^{th} rib. If you were interested and wanted to count down we would leave the 11^{th} and 12^{th} floating ribs, they are too low for the inspiratory activity-- they are fixed and they have to do with the expiratory states, not inspiratory. This lower 10^{th} is one of our key ribs. You will find that these ribs are bound in front by cartilaginous attachments, it's bound to the breast bone, it moves up through a cartilage and they are all attached and hooks right into the sternal region through cartilaginous attachments; they are not free floating ribs like the 11^{th} and 12^{th}. Now, these ribs come down from the spine in a curve-- now when you are out of breath, the lower ribs become a low inward activity, they become very short. I would love to be able to express this with pictures but let me see if I can get it across from you in some other way. If you can just visualize my arm as one of the lower ribs--if you measure the distance from front to back, in an upward state, there is a distance between the arms in these curves that are quite large. The distance from my body forward is quite large. Now as I lower these arms, the curve comes in and the front goes down, you can see the distance between is getting smaller. The distance between my body in the front of the ribs is getting considerably smaller also. If I raise them up, they get larger. The space between increases, the distance from back to front increases. If we take the pump handle on top-- if it moves down, the space becomes smaller; as it moves up and out, it becomes larger. We have a motion of this type in the rib cage. Now, I will have to address myself to this quite a bit and somehow try to get a biological phenomenon across to where you can understand it.

In order to take maximal breaths, all parts of the respiratory system must enlarge. Most of you know about the diaphragmatic descent. I am not so sure that most of you know about the ribcage ascent, which handles the major portion of the lung volumes.

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There's another point that follows, that's why it's important that we keep a sequence. We must recognize a follow through phenomenon that exists in nature wherever muscles are concerned anyways--we have to find what the potentials of minimum and maximum are. To understand respiration, we have to approach it-- if you want the mechanics of it by finding maximum as well as minimum. We cannot do it for finding just enough for instrumental playing.

This is the sternum [showing the skeletal model], the breastbone. These ribs are all bound by cartilaginous attachments. Under, we have two floating ribs, which I am canceling out temporarily because of their being too low for our activity. Now, when these rise up, you will find that they will have moved laterally quite a bit as well as up. In other words, the chest is in a higher position then when we are out of breath; it's low. We have enlargement in these various planes--we have increased the space in here as well as the diaphragm moving down. It is not just a diaphragmatic descent; it is a chest ascent. Now, so many people will think of it as a widening, but we must recognize for the chest to widen it must go to a higher plane. It does not widen by just pulling the ribs backwards--these are bounded. The 11^{th} and 12^{th} ribs can go laterally this way; they are too low to affect inspiratory activity. In the case of these, they must go up to widen. When you hear a person is taking a breath, the back must get wider, but you should also realize to get wider, you must also get higher. These ribs here-- I don't have a proper illustration of the back, but when they move into the spinal column, if you trace a rib here, it moves way up into the back. As we trace that back, these ribs attach to the vertebral column and rotate on a specific axis. Depending on the position of your spine at any given time, they rotate on an axis. They are now free to do all sorts of things. When you take a large breath, they come up and enlarge the thoracic cavity. As they come up, they rotate outwards; they do not rotate outward in a low position. It is very frequently taught that way, but anatomically that is not correct. They must come up to rotate and give you the increased dimension that is necessary for respiration. You can again see the curve of these ribs downwards. Now in inflation, this curve would have moved up--as it moves up it would have increased the width on both sides. We have a

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tremendous enlargement potential. If you see anybody working for huge lung volumes, you will see enormous change. Now, I am not speaking in applied terms for any specific instrument, I am speaking of taking large, large breaths to capacity for measurement. Not as an application, I am going to get to that. But we have complications that come into this.

I want to indicate another step. If this line were drawn properly, it would be almost straight with a moderate curve. In other words; a healthy young man blowing his breath out as fast as he can, will have a maximum speed at the start and a gradual slowing up as he begins to run out of breath. It can become quite dramatic. In fact, in this one instance, here is a gentleman in one of the major orchestras--you can see a line starting here.... It's specific in its time but he is blowing as fast as he can and yet you can see a line curving and curving. In this example, this young man is a woodwind player in one of the major symphonies, I won't mention the name, but he has emphysema. Now a good portion of his breath is still usable which can keep him in his professional status but he cannot use the end of his breath. In other words, he has to be able to take a full breath and from full, he has to go down to half full and re-breathe or he would be out of his profession because the rest of the air is coming out too slow for use. Now, this is an abnormal state, it has to do with illness, so we don't have to consider this too much, but I do want to explain certain factors that do occur with all of us.

Now as I said, our respiratory functions are maximal between the ages of 18 and 20; there is a downward deterioration from that time on. It seems strange when you take a man 30 years old and say well, you are not what you were ten years ago! But this is true in respiration; there is this very moderate reduction. We have what is called a pressure-relaxation curve which I want to explain to you that ties all of this in, and will explain certain problems that will occur in playing as we get into it. I am drawing a curve very similar to an "S". Now, if a person has taken in as much air as he can hold--so we have Vital Capacity full lungs in this region, and we will have minimal or might say empty lungs as far as you can use it here. At about this point [midpoint-equilibrium] we have the rest position at night when you are sound asleep. The way that you all are right now, all

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of you could blow out your air. If you suddenly had to cough, you wouldn't have to inhale. You would have enough air that you would be able to cough right now without first inhaling. That would be from this region towards empty. Now, we can call this a plus (+) and we can call this a minus (-). We have a factor due to the elasticity of lung tissue and muscle fibers, many of the tissues involved in respiration; we have a work potential without muscle contraction. In other words; if you take a deep yawn then sigh, and we use a water manometer or something very sensitive to pick up the movements of air, you will find that the beginning of that sigh for a man that, we'll say a young man with a five liter capacity, he will have started that sigh with about a ½ lb of expiratory pressure, and in some of the bigger people it could be easily ¾ of a lb. This is without ever having contracted a blowing muscle, an expiratory muscle; merely by the letting go of what was taken in. Now, it never stays still--there is a constant curve so that this ½ lb is in a constant varying state until he is down to zero in this region then, he has the exact opposite happening; he runs into a negative pressure. In this negative pressure, from the rest position on out, the relaxation of tissue would suck air in not move air out. Now in this region, a number of undesirable things happen. It takes much more air pressure to get it out of the lungs. In other words the intra-thoracic pressure, the pressure within the thoracic cavity, has to be vastly increased to try and force air out of the lungs at that time. As you begin to increase the pressure to force it out, you begin to collapse the small tubules in the lungs. You create a condition where it is very hard to take the second breath in. As you are forcing that air out, in the effort you will find the capillary beds begin to fill with blood. You have excessive quantities of blood in the tissues at this time; you have over-contraction of the expiratory muscles at this time. You handicap the ability to take the second breath. In other words, it becomes very difficult to really un-do some of the contraction states necessary to force this air out. Now as a person gets older, usually due to ill health or certain body conditions, this midpoint line begins to move up. Instead of down here, it may be up here. We have increasing negative pressure, decreasing positive pressure that can be used very readily in playing.

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What we are dealing with here is a biological condition that is not very well known amongst musicians, but it indicates very strongly that you cannot play a high flow-rate instrument with shallow breaths. I like to always teach that you play for the end of the phrase, not the beginning. You must be comfortable at the end so you can replace your breath for the next breath unless you have plenty of time and in a high flow instrument like tuba or trombone, especially bass trombone where the flow rates can be easily 60-80 liters per minute and even higher, then it is very important that you have plenty of air in the lungs or you can't get it out. Now, I am going to open this for questions right away.

Q: *In the first session you were talking about warm up...then shouldn't you also warm up your lungs? Do, specific exercises?*

It's very wise; that is a good question. You don't warm up in the sense of increasing the blood supply or anything like that but by taking several very large inhalations and exhalations, this would be very wise and a very good thing to do in a practical sense. If I am permitted with time, I do want to get to some very practical applications, but I want you to understand that there are complications here and I wanted to get this in that. In the average individual, a young man, we expect 80% of his air to come out in one second blowing as fast as he can. 80% of his vital capacity should be able to come out and within three seconds he should be able to take the air in the negative curve out. Now, this varies greatly in individuals and with disease states and age that 80% can easily fall to 50% and instead of three seconds. I've had people with abnormal conditions; 19 seconds and they still haven't emptied their lungs. Obviously that slow air will have pressure, but cannot be used as flow in playing a brass instrument. In other words, if they go by pressure, they think that they are still working but they have no ability to move the air as flow and as a result, it is not a practical phenomenon. They can still play but they have to get into the air that can't be moved out. I can't spend too much time on this I see because of our schedule, but what I want to get into is certain practical

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aspects of respiration. In a warning, I would like very much to warn against the tuba player using only diaphragmatic inhalation. In other words; the diaphragm in health is just great, the diaphragm in function is great, but diaphragm isolated from the rest of your function is a 40-50% item. On the tuba with your high-flow, we cannot get by, in other words, flow rates of 40/50/60/80 and at times 120 liters per minute, you must always consider the end of the phrase, so we cannot be having the person beginning to struggle for quantities because he is going to have all sorts of problems with his tongue and throat, and then gradually the embouchure, because the air cannot come out fast enough. We have sensors in the lungs that indicate pressure to the brain, but if you are to have pressure of air, but there is no ability to move that air, your throat will close do to the activity of a part of the brain. If your throat doesn't close, your tongue will raise up-- but somewhere you will take the upper end of a cylinder and choke it off. It is done instinctively; it is not done by conscious thought at all. It will free up when you have the quantities of air that you can use freely in the lungs.

So, what I am trying to indicate is, I would say the tuba above any instrument, the average person never has to worry about over breathing. In other words, I would say the average tuba player would have approximately five liter lung capacity. I have only slightly in excess of three now and when I was a young man, I might have had only slightly less than five, but nevertheless, this is not large. We have some players with over seven. Now, what this means of course is that if you start out with four liters and you have five, you start out with a four and a half liter inhalation, and you end with two, you are still in business. In other words, that next breath will be quite comfortable. You can use your bow freely; if you start out with two and a half liters and you are going down to empty, you are entering this region of malfunction at the bottom of the curve. Now you will see the player at that time turn red-- he will be distressed you will see the veins popping out on his neck, you'll find all sorts of contraction states coming in the muscle; but the air is slowing up. This can be tested in a laboratory-- this is not guesswork; in other words this can be very easily corroborated. As they enter into this negative curve,

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they do run into problems in the upper end of the cylinder which we can like to anywhere in the larynx on up, and it will induce this.

Q: *Have you ever advised that the tuba is the wrong instrument?*

No. It's a matter of finding his true; you might say, a comfortably large breath so the synchronization of the entire respiratory system is established in a natural way. In other words, you can take your breath in a fraction of a second and then take it all in very easily [Jacobs does a breathing exercise. Blows out in eighth notes and then inhales quickly on one eighth]. I replaced my lung capacity without any problem whatsoever. If you do it by expansion of a specific part you will then take what that expansion potential calls for. But if you were to segment in any part of you, you will find that you have eliminated other parts of your vital capacity. Now, the key to it is to find the biological key to respiration and I have to explain this or it will be missed.

Nature has us protected in a way that, always in some part of us in the respiratory system, can take enough air to sustain life no matter what our posture is or what we are doing. Now, I am overweight. If I bend over to tie my shoelace and I am arched forward, the intra-abdominal pressure will increase to such a point that the diaphragmatic descent would be cancelled out. In other words, I would no longer have diaphragmatic activity, but I would have upper chest activity which doesn't take a great volume; but it is there. And all you need is a ½ liter to a liter every few seconds to sustain life. So nature has it so if I am bending over and all crowded up internally, I can still expand in the upper end. I have had many players come-- I had a horn player come and study with me whose horn was pushed into the right rib cage. As I analyzed the function, only the left lung was working. Due to the horn in the right rib cage, there was no expansion of the right rib cage. I palpated under the liver and there was no descent of the right lobes of the lung but the left side was functioning fine. That is still only a half of a breath no matter how you slice it. It could have been a whole breath by better posture and you might say, by allowing the freedom in the right lung. A very good friend of mine, a trombone player

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I was working with; I happened to go behind him when he was playing and after a long concert and his left elbow was digging into the left rib cage and he is tilted like this. When I was watching his inhalations, only the right lobes were being filled. The left lobes were being inactivated. Now, they could have easily been larger breaths if he felt that he needed it, but he would have had posture. We are structured in such a way that no matter what bodily position we are in, some part of us can pull air in to sustain life. If I am doing work around the house and my arms are way back like that, the chest is at right angles to the spine, only the diaphragmatic descent is possible. They are already expanded; there is no place for them to go. So, I have diaphragmatic activity, and that's fine to sustain life. Now what brings them into use is not the *Hatha Yoga* system of low breathing followed by mid-range breath, followed by the upper. In other words the problem with that is that the diaphragm descends first and creates a rather great enlargement here, you will have an increase in muscle tone. All of the muscles in this region are attached into the rib cage and they have a combined pull that is downward and inwards. That means the upward out movement of the ribs must go under a workload which normally it shouldn't have. There would already be pulled down and in. For health, it's great, but for the rapid replacement of breath, it's not good. What is actually involved in this is a very simple maneuver; you have to learn to suck. By that, the biological of suction without friction [breathes in] you can actually hear that I am sure. Now as soon as you do that, I use sensors at home, I use measuring devices you'll see, or if you palpate with the hand--as soon as you pull the air in here, if psychologically you pull air into the mouth, another region of the brain fires up the regions where it must go. If you go by the mechanical principals and try to enlarge them by the thinking part of the brain, you are bypassing the wonderful computer aspects of the brain and getting in your own way. If you simply suck the air into the mouth, it goes so fast and in so doing you will find that the diaphragmatic descent will occur, the rib-cage ascent, and so forth. It is the simplest thing in the world to do but as I say, the key is to work with the air and pull it into the mouth but avoid the apparatus aspect that pulls it in.

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We all tend to go to the machine study and by-pass the regions of the brain that would be competent to give it to us. In other words we have to stop controlling the systems by the muscles involved and instead go to the signals and life that control these. If you want to take a huge volume of air into the mouth; you merely draw it into the mouth [demonstrates], it goes somewhere. You will find that you will have the expansion. All you have to do is suck that air into the mouth with soft muscles. It will have enlarged and you will have it so easily that very frequently I will put a tube into a student's mouth. This upsets the old pattern of breathing habits. With the altered stimuli, I ask him to take in a large volume of air through the tube, they take it in and have everything I have asked for without ever knowing what they are doing. I am always against you knowing what you are doing where it comes to the interior of your body because there is no way we can know what we are doing. I examine other bodies to find it out: in dissections you get answers, observations, but you cannot get it through your own sensors. Long after it is right, you will get some awareness of what is happening based on a generalized concept. There are no details; you have no tools for analyzing. What I am trying to indicate now very strongly, is the psychology of respiration versus the mechanics of respiration. The mechanics, according to Boyle's Law--you would enlarge the various regions and in enlarging you would have lowered the pressure of the air below atmospheric, the air within the structures would be lower than the outside air, and it would rush in. Now theoretically this is great--and if you could do it this way, then great. Blowing out in reduction, you would have the same thing. But [by just moving the body in a similar manner], but I am not moving any air. In other words, any one of these can be simulated without function. This can be simulated without function, with partial function, the substitution of stretch phenomenon; the valid signal needs to be sought. The valid signal, you need to go to air, not the air apparatus. When you study a cadaver on a table you put a spirometer on the face, push on the chest and abdomen area, the air moves out of the lungs, if it is fresh. Enlarge him, air will move in. With a live person, you never do that. You always signal the brain what you want. You want to inhale, take the

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air in. It's that simple, we have to find the simple answer and you must permit the enlargement that would come with the extreme.

In other words, many students come to me and say, "you must never elevate the sternum". They don't use that word; they say, "Never raise your shoulders." Clavicular breathing would be wrong. In other words, this is clavicular breathing [demonstrates by lifting shoulders up] This is of course a phenomenon which, it is not for the respiratory activity. However, if you watch a person who is ill with a respiratory problem, he cannot stay still lying on his back; he has got to sit up. In severe distress he will get up and fix his hands on a table or a chair so that the shoulder girdle will be elevated and the muscles will be in a higher position, better position to influence the upper lobes. I am not recommending this for the brass player you understand, but I am saying that even here there are certain elements that should be taken into consideration; this is just not a ridiculous phenomenon. But clavicular breathing in itself is something that we don't concern ourselves with. In full capacity breathing, there is enlargement of the sternum; there is enlargement of the rib-cage and lowering of the diaphragm.

Now, we know that there is a problem nearing the end of the breath. Our vocal people have resolved much of this by taking the large volume of air-- not so much the large volume as the expanded position of volume--the enlarged chest. Now if I talk like this [Jacobs speaks in a dark bellowing voice], going along talking with resonance and so forth, the diaphragm has already returned up, but the chest is still in the enlarged position. I have never entered the negative curve of respiration. In other words, by starting in the simulated full position of air, I am actually using quite a bit of air. There is a considerable amount of air in the lungs and due to the fact that I did not allow this deflation, I have also not entered this negative curve that would have influenced the larynx in a negative way. This is one of the techniques that many good vocal teachers use. However, that takes certain people-- I worked with a young lady, a singer who had a tiny little 2800ml capacity and was being taught singing by a large male, and she couldn't complete her phrases. This man probably had in excess of a six liter lung capacity, and

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this little girl with here 2800 ml (2.8 liter), her fraction of air that she could use would be less than half....

Now, if I just talk and I allow my diaphragm to raise up-- in other words I am withdrawing the abdominal wall, I would be out now but I could still keep going as long as I lower the chest, then gradually as I hit this curve, I am in trouble. I could have gained another second or two depending on how fast I was using it permitting deflation so that all parts of you that expand in inhalation deflate or reduce in exhalation. The muscle activity is different, but what you see in enlargement actually is a return back due to muscles, but they definitely return back to their reduced state. Now any point that has enlarged should be considered potentially a region that can reduce in exhalation. I don't favor this type of teaching; I am discussing this because of a need for understanding. I like to always teach the art form of music and when you need air, take it. Take it in good taste-- become alerted to air as a phenomenon of motion, not the body. But to understand why you must do it that way, you have to realize that there are complications in the bodily activity and the ability of the body to lie is simply enormous....

Q: *What I would like to know then is what would the conscious process be of taking a breath in?*

As I say it is a matter of suction. I have the equipment but I don't have the time to demonstrate it here, but if you use sensitive devices near the mouth, you can actually see the air going in as you inhale so that you work for the air as you experience it external to the body moving inward. So as I say; suction without friction, we don't have the sound [a hissing inhalation] the sound of a fricative, but the sound of wind. If you blow out and you create a certain sound, that was too much, the sound in reverse would be very similar; it is a wind sound. When you become engrossed in the sound of the breath you will also find that you have the breath.

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Q: *What about circular breathing?*

Circular breathing requires a big mouth. [laughing]. I am not saying this in a facetious way exactly, but what is involved is putting enough air in the mouth to where through the palate activity. You can close off the pharynx; in other words breathe through the nose for an instant while you are compressing the cheeks and elevating the tongue to continue the movement of air which would be momentary, while you would inhale through the nose and replace. It can be done in *pianissimo*-- I think Chester Schmitz does it quite a bit in Boston. I fooled around with it but I have a lot of friction in the nose. I am always having problems and I can't get enough air through it. I am not particularly enamored with it either.

Q: *Do you not go quite up to full capacity when you take a full breath?*

For playing, you would rarely go up to 100%, but 85%, 90% should be quite comfortable and you should rarely get down to within 20% of your minimum of air. In other words you stop when you are somewhat still functional so you don't confuse air pressure with airflow. There has to be a freedom of air movement with the air otherwise the wheezing phenomenon comes in.

Q: *Can you explain the relationship of pitch to pressure and how it works?*

Pitch and pressure are really not related in the way people tend to think. In other words if there is insufficient pressure, you will have pitch that is much softer but you can conceive that to go to a higher note will require more air pressure than a lower note. If you don't have the pressure, you will play a higher note softer. Pitch is primarily a phenomenon of embouchure and the little shaping musculatures, but there are requirements. In other words you could apply all sorts of pressure and never change pitch; it is not an end product. It is part of an overall system and as a result I don't quite approve of changing pitch by pressure I choose-- I like to change pitch by changing pitch, just like a song, and if that involves something else then fine and dandy, but don't fixate on it. If you can find what you might do, you might apply pressure and not change pitch,

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then it is really not a valid—it is an immediate component, but it is part of a system in the sense that to retain a given volume between a low C and a C two octaves above. You are going to find increased air pressure and decreased flow. You see, you could actually have the same pressure and you would find that you are merely playing much softer up there. But pitch is an embouchure function.

Q: *Raising your shoulders, is that just because of the pressure of your lungs?*

It has to do with the accessory groups of muscles; it has to do with filling the lungs for your vital capacity. Now we have the ability to raise the shoulders without respiration. Every one of the respiratory muscles in life has other things to do than just respiration; there are other functions. The shoulder girdle is free to raise and lower and it is not really necessary in any normal breathing patterns. In maximal inhalation there is a very moderate use which should be minimized in the shoulder girdle. In other words; elevation of the sternum-- even that does not require the shoulder girdle. In maximal things, in terms of disease states and so forth, air hunger-- there can be a certain amount of this brought in, we don't recommend it for musical purposes at all.
I think I have to stop now or Mr. Phillips will have to run me off the stage!

Thank you very much; I wish I could have proceeded further. I brought all sorts of little gadgets and I can't even begin to explain them all today but-- a bunch of my students are in the audience, they will tell you. Thank you.

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APPENDIX 4

Arnold Jacobs Masterclass to the International Trumpet Guild, University of Wisconsin, 1978

Note - The following transcript was done by an unidentified source and edited by Brian Frederiksen. While there is no identification of when this master class was given, it has been identified to be from the International Trumpet Guild, University of Wisconsin, in 1978. Graphs inserted are from Arnold Jacobs: Song and Wind. Subject headings have been added for convenience. This has been copyrighted to protect the usage content. - Brian Frederiksen

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I see many familiar faces out there and I am just wondering how I should conduct this clinic. A good portion of you have been in my studio at sometime or other. All those who have-- will you just raise your hand? Thank you.

Usually I start a clinic with a question and answer series. I know that there is a trumpet symposium here and the focus should be dominant on Brass playing. May I ask, are there any other brass players here? This is supposed to be an hour and a half get together and we are going into a topic which can be handled in several different ways.

When people talk about respiration and its application to brass instrument playing, they are primarily interested in practical application, something that might be helpful and maybe enlarge their understanding of what we do. As a teacher, I am frequently called on to explain a great deal about respiration which would include anatomy and also includes many types of topics which I do not think the average musician is really interested in or even able to understand without a diagram in a short period of time. I think that to be of some potential use to you folks I will kind of go a little bit easy on the potential aspects and see if we could govern the practical grounds as to how we apply these to trumpet playing and other brass instruments.

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Vibration: Woodwinds, Brass & Vocal

I want to initially explain something about the woodwind player. He has to take a breath; he has to have air. He acquires himself with his instrument and the pressures of the mouthpiece. I suspect the pressure has to do with some of the ligaturing aspect. I do not know these instruments well-- I am used to listening to them but I do not play them. I have to be a little vague about this but I note that pressure seems to go along with the ligaturing aspect of the reed or clarinet. It has to do with some of the pressure aspect for the oval-ness but mainly he blows to vibrate a wooden reed.

As brass players, we blow to vibrate the flesh and blood part of ourselves and there is really a definite and very important difference in the psychology in what you must do. As an illustration, we are similar to the vocalist in our musical application in a sense of physical application. The musicianship of the woodwinds has to be every bit as good (and in many cases they are probably much better) than that of a brass player. In a sense of someone who plays tuba versus somebody like Ray Still on the oboe, the potential is to acquire this first grade. What I am trying to indicate right at the start of this lecture, is that the woodwind player applies himself to his reed through his breath. He blows to vibrate a piece of wood, and if that reed is not responsive usually he will take a little knife out and shave it down and work with it a bit. If its no good then he throws it away. You can't very well do that with your embouchure, so there is a difference.

Now, the vocalist is another story. I did a study voice for many years myself. A vocalist has vocal chords, has various aspects of resonance, uses his breath and does it in very much of a subconscious manner in terms of air. The feedback mechanism to the brain will not deliver much in the way of awareness of actual breath, in the sense of certain pressures. Many elements can be sensed but even more cannot be sensed. The vocalist has thoughts in his brain that have to do with pitch, song, emotions, and a message to an audience-- and in this he will establish, based on psycho-motor activity, a thought process that will initiate at this co-response at a conscious level. He will bring about this response in his anatomy, but he can know nothing about in terms of

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consciousness. For this reason he may be functioning with the reason I stress. Therefore, the brass player actually is closer to the singer in terms of application of the thought process. The physical proficiencies are not the same, but very close; much more so than on the woodwind instrument. We have certain requirements to sum up: there has to always be a motor source, a vibrate source and a source of resonance.

In the brass instrument two of these belong: the source of vibration and pitch. The motor functions, the breath, are all part of the individual. I think you can see obviously that the woodwind player, and the string family-- the vibratory source is not part of their own anatomy directly controlled by their thought processes. Their neuro-muscular arrangements as a result are very great, but their problems are different than a brass player's. I want to stress this tremendously because in the brass player the breath becomes important; it is something to be used up. It has to be used in order to bring about the tonal result. Your lip does not have to respond merely because you blow; you can blow air from now to doomsday and not have an embouchure respond. You can have an embouchure that looks perfect and responds to all sorts of external measurements and can be completely unproductive, usually because it is not receiving a signal from the brain. Like the vocalist, the signal from the brain usually is what we must promote. It is an art form that demands communication from others. This means the brain has to have a message that you deliver to somebody else. This is very important for the motor systems of the body to have some stimuli.

Just like when I speak to you, I am using words; they are being formed by many parts of me that would also be establish my tuba playing functions. I am using vocal chords instead of an embouchure -- I am using respiration phenomena -- phonation is involved. Many complex things are happening that I know nothing about. I do know a great deal about my message. What we must understand is that it is a reflex response to stimuli. Some of our neurologists do not write the term *reflex* but prefer to say, general condition response to stimuli. These are the habit patterns that are involved with learning speech such as with a child's imitation. You have tools that you can express yourself with as the dominant factor in playing a brass instrument. When I go into the study of

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respiration, I want you to realize that we are dealing with a segmented aspect of a subject which really cannot be taken out of context or studied alone. The needs of the embouchure set up the requirement for the breath. You just do not blow for an embouchure, you have to sing, and the singing is with the lips. It is not done by knowledge of musculature or measurements; it's done very much by the knowledge of sound-- by the concept of tone.

There is a great deal of trial and error procedure involved with a student, but the main thing I am so afraid of is that when I discuss a subject of this kind, that a person becomes fascinated with the subject and then they start to work on the breath and forget about the message that they are trying to deliver --you can't do this. To be successful with a brass instrument, you must be very much like that singer; you must be in an art form of communication and it should be for somebody else and not yourself.

Brain and Nerves

The part of the brain that asks the question is the same part that issues the statements when we communicate to others. We have to make sure our thoughts are valid within the art form. If you get tied up into some specific analysis; the brain becomes concerned with the meaning for the body or the kinetics of the body. The brain at that time is asking you questions when it really should have been issuing statements. I just want to make sure that when I go into respiration that it's understood that air is a fuel; it is not a piece of gut, it is not a wooden reed, and as a result the prospective must not change. We still must be making music and we must do it without the wide knowledge of how we are doing it. You do not have a nervous system in an embouchure to carry proper messages that you can be aware of. You function through a motor nerve that is a cranial nerve -- it carries a message of function to the rest of the body. For example, if I want to scratch my head; my arm moves to my finger, touches my nose, but this is all done through a movement system that permits me to impose my external environment one way or another.

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Motor nerves are specific as they carry the messages in one direction only: they carry from within the brain, to the spinal cord, through the effectors, and to the muscles. They are going to start an activity. Sensory nerves are entirely different. Somebody touches you, you feel that through the sensory nerves. You hear with the auditory senses. You smell; you do all sorts of things with sensory nerves. In the sensory phenomena you are gathering information with the external environment one way or another. Speech is done through the motor nerves not the sensory nerves; these are facts and so forth and are on a subconscious level. I am giving you this to state it is very important that you stay within the art form.

Breathing and Vital Capacity

As we go into the study of the breath and recognize it for what it is: it is fuel and it can become quite complicated due to the function of the breath. At the same time you will not be able to overcome it by the study of the breath. There are physical differences between all of us. I am looking around the audience and I see that there are some people that I've not met before. I see some young ladies in the audience-- I see some very large people-- I see some rather short individuals. The fact is that there are physical differences between all of us; some similarities and some dissimilarity, and we need to find out just what that means to us in just a moment.

I have equipment at home for measuring the lungs and bodies of an individual, and this is an important because the use of the breath, the ease of emission of the breath, is not the same. [Jacobs shows a graph] This is a report from a spirometer of a youngster of about twelve years of age. This young man was sent to me because he was having trouble in tone production and one of the first things I do with any new student is to measure the lung volumes. In this particular instance, the young man was in trouble because the teacher would play a phrase and the youngster would try to duplicate that phrase. The amount of air this youngster had was 2-1/3 liters and he was competing with a teacher who actually had 6-2/3 liters of air. Using a spirometer, you put a tube in the

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mouth and blow your breath as rapidly and as completely as you can. The spirometer has a revolving drum and as you blow, the interior of this unit raises up due to the air pressure going into the machine. The pen moves up and moves down and writes on the revolving drum so we can measure the quantity and the velocity of the air. The velocity is recorded to show the state of the airways and how much air could be used in playing the instrument; particularly the high flow instruments like the trombone and tuba, and moderately for the trumpet.

Anyway, here is a little fellow with a tiny lung capacity taught by a teacher with a huge lung capacity. This youngster could not begin to sustain like the teacher because he was not old enough -- it would be a physical impossibility. If this youngster were taught to play with the same qualities of tone but with shorter phrases (he has a smaller fuel tank and he can refill his tank instead of trying to make it last) it would be a very healthy situation even at an early age. He can create a fine quality of tone, but he just cannot make it last very long. He should be taught phrasing, but he should not be required to perform the complete phrase of the adult because he does not have a large fuel tank of air; he has a very tiny one.

I have students here from all over. There is one, the former first trumpet player of the Minneapolis Symphony, Steven Chenette, who has 7 liters of air. I couldn't measure all of his vital capacity -- actually, it was beyond the equipment I was using!

This is an important subject for one reason and one reason only. I want to explain that when you inhale, there is always an enlargement -- it's like a bellows. It is a rather simple process when you think of it in terms of human effort. When you yawn, you are just simply taking in large volumes of air. Nature is wonderful-- it is just a fabulous thing in a sense that we have parts of our body that can expand no matter what position we are in. It causes trouble for brass players occasionally.

I had one student on French horn that came to me with a respiratory problem. This student was putting the horn tight into the rib cage and the bell against the ribs. I found one lung functioning and the other not functioning. Who on earth can play with just the one lung? As a result, there was an inadequate ventilation of the lung and there was an

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inadequate fuel supply because the ribs could not rise up and enlarge. The diaphragm already had a very considerable pressure in this alignment -- a tilt to the right and a rib being stuck to the bell in the ribs with the respiratory activity all on one side. This is a very severe problem in a small individual. A very large person with six liters could get by; a small one with 4 to 5-1/2 liters would not get by because it would be half of that figure.

I have another very good friend, a trombone player -- and in playing a trombone I see this most frequently, not so much in trumpets-- but the weight of the trombone becomes a factor. The first thing is the left elbow is digging into the side. You watch the inhalation on one side and there is no movement; nothing is happening. One side there is considerable ventilation of the lung, but again this student was throwing away maybe 40% of his usable lungpower capacity merely because of crowding of the rib cage. The tilting upsets the diaphragmatic activity, a malfunction caused primarily by postural defects. If there are short phrases that do not require great amount of lung volume, it makes no difference-- you'll get by very nicely, but if you had to tax yourself then you might really miss that extra 40% of lung volume that you would have had. We are structured so that no matter what position we are in we can take enough air to survive.

[Mr. Jacobs asks for a person to lie flat on their back as an illustration for the development of diaphragmatic breathing]

At the time where there is a pressure on the back of the ribs, on a hard surface for instance, you will find that the ribs actually are not very maneuverable; they are already in the expanded position. They are already in a somewhat enlarged position as you lie on the back and about the only reason that you have respiration is because of the diaphragm. As the diaphragm descends you will always see the abdomen rising -- there is maximum of efficiency. If you immobilize the ribs, the average individual will move about 45% of his total lung volume of usable air. That leaves 55 % of which he is not using which could be activated with the use of the rib cage.

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I like to use the illustration of diaphragmatic breathing for the newborn child. When the child is first born, he is born at right angles to the spine. He is born with his chest in the enlarged position and all he has to breathe with is his diaphragm; nothing else. It is a small breath compared to the full. As a child assumes the upright position by the age of two or three, the ribs begin to move down and begin to have the mobility, but the first year they do not have it; it is diaphragmatic breathing only. The diaphragm is responsible for 45% of the breath in some individuals, 40% in others, and can be as high as 50% depending on the body type of that individual. If you are standing up, let's say you are reaching back and your chest is expanded. In stretching upward you must breathe with the diaphragm in that position because your chest is already enlarged; it cannot move. You will still have enough air to sustain life. If you bent way over to the right, you still have mobility of function on the left side. You can take air to sustain life as you really only need a half of liter to a liter of air in what we call *residual air* breathing. This breathing is good for whatever you are doing as long as it is not massive physical labor. But, anytime you maneuver you are cutting out part of the respiratory system to bring air in. In the upright position you can utilize facets of your lung volume because there are always some parts of you that will expand for the taking of breath. To take in quantitative breath, you must be in the upright position to take the full potential that we would measure in this type of testing that I am doing with the spirograph.

The reason that I think it is terribly important is that so many of you have been involved in sports. Those of you that are trained well in sports will realize that there is a phenomenon for "following through." In bowling, which I do very poorly, you just do not throw the ball at the pins; you bring your hands out in a certain position. I talked to many golfers; they must know what their clubs are, they know where the ball is, and they also know what happens after they hit the ball; what happens when they follow through with the club. The follow through is very important. With the organization of the body, we go to the fact of the motor involvement to bring in the efficiency of the motor systems in the body; we need to study the follow through. You have the same thing in the respiratory activity -- from full, to empty, and then back to full. What it involved is the brain level

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below the level of consciousness [where you would begin to try to control the segmented parts of you], that you bring it into a unit activity by merely taking in a massive yawn. It is one of the simplest motions and if you get out of the way, it is done not by how you expand but by the needs of the embouchure.

This is one level I will not go into. It is a very complex subject, but it has very much to do with what happens in the organizing of the body to carry out any order you wish to give. It permits you to stand, play, golf, run, or jump. It is like a marvelous computer system, and it gives wonderful results if you get out of its way. You must motivate what you are trying to accomplish. In respiration, the ability to take a breath in is a very simple thing. There is a sound phenomenon which is so important to understand because it becomes the way you order the body to give you what you want. If you take a breath that is noisy and has a sense of friction, you might hear that.

[Jacobs illustrates by taking a breath of this type. He inhales with a small opening to the mouth].

I do not know if many of you have experienced it, but that is a sound of friction. There is very little product in the way of fuel. You take a breath, and wherever there is a reduced part [hiss], we have a lot of friction. When I set up equipment for measuring it, we find a very small amount of air. It is enough for low flow rates, but not much quantity -- just enough for the oboist. A comfortable breath of course is a yawn. There is a procedure here, which I want to indicate to you as you inhale. There is very little sound up close that we will hear; this type of sound is the sound of wind, not the sound of friction. A large volume of air like formulating a mathematical equation. If you can produce enough air moving at a given velocity through a given space, you will have a given sound. A sound of that type, most of you that are close by can hear, would be a large volume of air. I am adding that by not any awareness of my body, but by tremendous awareness of the breath; not as air effort but actual air in terms of quantity.

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We have various senses that can tell when we have large volumes of air going to the lungs; there are stretch receptors in the lungs. We have the tools, but they are basically subconscious. They are not tools that you can understand with the use of meters, although we can do it on that level with other equipment. The reason I mention this is that no matter what your body type is, whether you are small and have a small capacity, or large with large capacity; there are potentials of very usable air that can be applied to your instrumental playing that can look very different to the teacher in relation to the student.

There may be startling differences and yet, there might be very valid functional aspects to the breath depending on body type. I'm going to have this young man stand up. This young man has enormous lung capacity. He has a very long torso, a very long rib cage, and he is very narrow. The rate of expansion, the entire potential is very good. He is a very long person -- you are never going to see much diaphragmatic expansion. I will tell you part of my problem; I am overweight. The diaphragm, with the liver attached to the underside of the stomach and attached to the underside of the diaphragm-- when it moves down it crowds the internal parts, the intestines, etc; you will get a massive protrusion. You can see that I have a short rib cage. At the end of my rib cage are the 10^{th}, $11^{th,}$ and 12^{th} ribs. You do not figure the 11^{th} and the 12^{th} in inspiratory activity. You figure them as part of the expiratory process. Figuring in the 10^{th} rib as part of my inspiratory system, you can see right away that there is quite a difference between his rib set-up and mine. He has 6-1/2 liters of air, and I have approximately 4 liters. I would like to transplant his lungs into mine! (laughter).

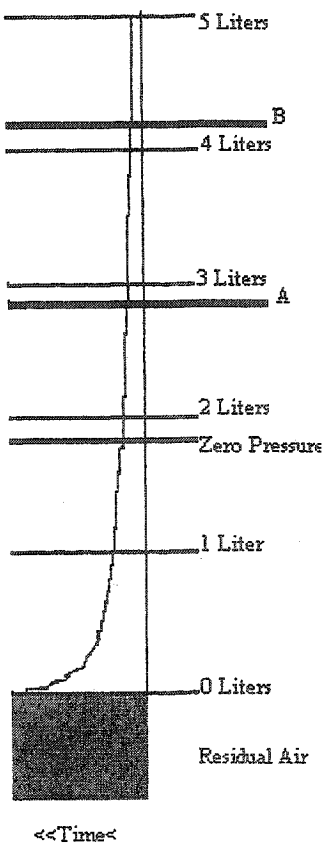
Generally speaking, once you are familiar with the subject, you can almost tell by looking at a person what the lung capacity will be. There are formulas you follow for the surface area; mathematically you compute it with the equipment. Anyway, this is one place where the teacher teaching diaphragmatic breathing would get into trouble very quickly because the diaphragm would move less than mine even though I have a much smaller lung capacity to begin with. But this gentleman will actually produce less movement of air with his enormous long chest. This is a very flexible chest -- there is

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huge enlargement, he has this enormous lung problem! (laughter). Now, in most cases a small individual will not have those. In other words, 6' 4" is one thing; 5' 4" is something else again.

In our orchestra, we have a trumpet player is only 5 ft 7 inches; he has the same lung capacity of a taller man. This gentleman has a long body -- that is what it takes -- and a very flexible rib cage. Very flexible musculatures and these potentials of enlargement are very important. It has to do with what happens when we take large volumes of air into the lungs. We actually have tissues that are stretched as we breathe in like rubber bands. There is a work potential and as you breathe in, you pull a rubber band out, then you let it go; it snaps back.

Relaxation Pressure Curve



We have a working potential in the tissue of our own musculature. As we expand, there is a gradual increasing resistance that comes in and it can cause a work potential in the relaxation state. I want to go into this -- I have to draw -- and my art work is not great. I'd much rather play the Tuba. *Spirometric test:* A person puts a tube in his mouth and blows into it as rapidly and completely as he can. It might take seven seconds to take the useable part of air out of the lungs. I say useable because we have residual air which cannot be removed from the lungs by anything you can do. I know there are teachers who teach residual air; their concepts are right, but their terminology is wrong. Residual air is the old legal test in medicine to find out whether a child was born alive or dead. If there is an insurance problem and a child is newly born and there is a doubt as to whether the child was born alive or dead.

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The doctors remove the lungs in the dead child and if the lungs sink to the bottom a bucket of water, that child has never drawn a breath; if they float he has drawn his first breath as there is always a certain amount of air that stays in the lungs that you cannot get out by blowing no matter how hard and completely you blow. In this test, you start blowing the air out at high velocity and no matter how hard you blow it starts to slow up. In some individuals it will slow up drastically. In the healthy young male you figure 80% of the air can be removed in one second and then three seconds later, he can remove the rest of the useable air.

As an example; I had a trumpet player come to see me in severe distress with his tonguing, which happens often, and did not think because of a tonguing problem that it necessarily will be what I am describing now. This man had a pulmonary disease and when he was blowing his breath out, he got about 4% -- about this much in one second and from there on he had would be blowing over 19 seconds later. I voided the test because he had to re-breathe as he was already developing so much carbon dioxide and discomfort that he had to stop the test to take air in, and he still had not emptied his lungs This was a medical case, and I sent him to a physician. In many of these professional players you will find that as a man grows older, his expiratory reserve begins to get a little smaller. I am going to designate this on a chart and this is not an easy subject for me to express to you or for you to understand. It is very important to describe this, which is the reason I am going to talk about it. It has a great deal to do with many of the problems of the brass player.

When a person sleeps at night, you have approximately five liters of lung capacity with full inflation down to the zero point. There is always some there; you could blow out without breathing in. At this point, we would have a *rest position* of the respiratory muscles that would be about roughly ¼ to ⅓ filled without taking a breath or blowing out. In a fresh cadaver you would have enough air that if you pushed down on the abdomen and chest, you could measure the air coming out. By taking the arms and moving them back, there would be a certain amount of air there regardless, unless you deliberately remove it at the rest position without active contractions of muscles. You

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will have anywhere from a ¼ to ⅓ of your vital capacity, which could be moved in or out in one breath.

One of the problems when you take a large breath is that you move further and further into this curve. As you go further, there is a constant increasing in the elasticity of the work effort. The elasticity in a large man like me may be as high as ¾ of a pound of air pressure with just a sigh. If we measure that sigh, we would start out anywhere from a ½ to ¾ of a pound of pressure and it would fall rapidly to the zero point, but it could easily be as high as ¾ of a pound of positive pressure. The graph falls gradually, but constantly all the way down to the zero, and now here we have the symptoms in reverse; the negative curve which is doing exactly the opposite. At this point, the elasticity here that is helping the air get out of the lungs, this elasticity is doing the very opposite. You have to overcome it in order to get air out of the lungs. It would help to get air in but makes it harder to get it out -- and during this negative curve we have some unpleasant things happening. One of them is the intra-thoracic pressure -- here you have to push much harder to get the air out.

There are certain other problems; but these could be applied in a positive way against whatever resistance you are doing. You have an internal resistance that must be overcome before you ever do anything with the lips. This constantly increases this curve -- it can get quite large. Unfortunately, as you grow older, this curve (negative) becomes larger and larger and this part of the curve (positive), becomes smaller and smaller. What I want to get across here is that there some unpleasant consequences of this; as you increase your pressure you begin to collapse the airways. You actually begin to collapse the small tubules in the lungs and it's a cycling phenomena; each thing tends to make it harder to get the air out and also to get the next breath. The problem is that with empty lungs, if you take a limited breath; we'll say you take a diaphragmatic breath with moderately low ribs, you take a 50% inhalation from empty, you start out in the plus curve very comfortably but within a matter of a couple of seconds, you are entering the negative curve. You may start out with half a breath and it takes you part way through the phrase very quickly, if you have any kind of a phrase at all. You are now entering a

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region where it gets harder and harder to get the air out of the lungs. You will not sense it in this way because the brain does not pickup these types of signals; you will feel it as a stiff lip, a sluggish tongue, a little throat involvement, and sometimes as an irritation in the larynx. You get many signals which can indicate this, but unless you are familiar with the subject, it might be a little difficult for the individual to find. I will find it very quickly because I am very used to it and I have the material to analyze it, and also the knowledge to analyze it.

This curve here is a source of great problems, but as I say, it comes near the end of the breath. There is another problem on an instrument like the trumpet. Many players pre-compress the air and then blow it out. If you have very full lungs you are pre-compressing the air, you already have all sorts of air pressure. It would be when you add your own pressure to that it could cause spasms of the throat; you could start choking and you could be very uncomfortable. There is a way of getting around which is very simple; it is like a study of a jar. When you take a large breath it is like having a big fruit jar or a gallon jug. You are full of air but the throat is open at atmospheric pressure internally and the same thing happens. Blow all you want: gently, powerfully, whatever you want, but you have to first find that zero a phenomenon which takes a little researching of yourself. One of the best ways to do this is to start counting "one", "two," "three," and using no air-- blow very simply. You are still in the plus curve and this energy is actually being applied to the breath when you need it-- a very definite sense of energy.

This curve is a constant variable. When you are sustaining a note, you will find that if you go into muscle psychology and into studies with electronic equipment, you will learn information which is unusable for brass playing. Let me put it as simply as I can; your body is reacting differently every instant of this curve. When an artist learns to hold a sustained note, it is like a computer. It is adjusting how many fibers have to contract in the body. As you are holding this sustained note, the body will show under investigation all sorts of change. If you play by feel, you cannot do it because feel phenomena is also a constant variable. If you crowd it out by just plain tension, then this is not a very productive thing and not productive for the movements of air. If you sustain

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and learn your phrase in terms of quality of tone, these are handled through a level of the brain alone. The brain stem is fairly new knowledge, but nevertheless we have a marvelously efficient portion of the brain that will fire up the mechanism as needed. When you get out of its way you do it by studying music - you do not do it by studying body. You can study breathing, but not the breathing apparatus. You may find that you have substituted all sorts of stretch, shape, and change but you have not taken the breath at all.

The reason that I stress this curve is because it is truly one of the important reasons you must stick to the art form. You cannot handle the bellows systems as if you were handling them by hand, only as some unit that you could have sensory feed back during awareness. It is one constant variable.

As a teacher, one of my big problems is that as a person gets older there is always a change in the vital capacity; there is a lowering of it with age, and no matter what you do, this still takes place. By the time you are in your forties to fifties, it becomes quite apparent that the six liter capacity of a 20 year old man (the capacity is usually maximum at age 21 and begins to taper off), and by the time you are in your forties, the six liters may be down to five. In the case of a person with four liters, it may be down closer to three. Capacity begins to decrease and your habits do not change just because you have less lung compliance and lung volumes to work with. Then the throat becomes more and more involved. Because of this there is then much more strain in the playing. Some might recognize it, if you are old enough, and some won't. It can be overcome if you can go far enough in this curve. To me, a healthy way of playing any instrument is not to go to the extreme capacities, it is not good; but play comfortably into the large plus sign and only moderately into the negative.

I run so often into the very opposite where a player sets just a little air and then goes toward empty; there is always in a great state of tension. One of the biggest things I had to combat is isometric contraction of the entire respiratory system. I use an instrument in my work to analyze this. I may find a player playing moving out air and his bellows is getting smaller and smaller as he is moving it out and depending on the flow

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rate; he gets smaller whenever he uses air. I have a student who swears he is blowing; you see a bulging neck, but the air could be behind the tongue, it could be behind the larynx; it could be a breath that could be so minimal and based on the internal pressures rather than the flow of air. It is interesting to try to get the air out in this negative curve.

Air Pressure/Vowels

Having taught many people, in the various parts of the country, many of them who are in this room; working with many trumpeters, tuba players, and trombonists; one of my big problems is simply that for the professional musician, usually the art form is there, the thoughts of communication are there, but frequently we run into a problem where they will block the air from the lips and not know it. They are taught "Tee" as the mediare form moving from a lower to a higher note. Now, with "tee", these vowels are fine, a pure "ee" and "ah." But a student will very frequently, move to the sibilant "S."

Now, "S" is very frequently substituted for "ee" in the mind of the student without consciousness of it, he then creates a reduced airway. When you go too far into this reduced airway, you rob the embouchure of air--robbing the embouchure of the fuel it needs; unfortunately, the student will feel it as resistance in the lips. Neurologically, it is like taking pins and putting them in the back where the nerves are separated. You may stick two pins in and only feel one because of the separation of the nerve ending. You will not isolate the sense of resistance of the air at the tongue; it will be at the lip. "ee" will not do that; a consonant "ee." There is sufficient volume of air in the high register that can move. But the sibilant "ss," (there - if you could hear that in the back of the throat.) Again with the pure "ee," there is an airway that can be utilized by the player as far as the movements of air but we run into Boyle's law that has to do with what happens to air under pressure.

Air under pressure is stored in a smaller volume of space. Boyle's Law has to do with pressures under given temperatures but because it is internal, we can forget about its moisture saturation of the air, and we can forget about the temperature and just say what

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happens to it under pressure. Do not think for a moment that because you have air under pressure that it has to move, it does not. Air pressure is used in childbirth, in the study of pelvic pressure, and bowel movements, etc. It is a reinforcement phenomenon for activities within the body, and the brain is fully adjusted to it. It is a reinforcement phenomenon, like a hiccup. There is air pressure and many of the inspiratory and expiratory muscles are in isometric conflict. The potential for movement is not there unless some muscles let go-- you do not use dimension, it is that simple. This can happen easily if you trigger the biological phenomena that control the body. Our bodies are not made for trumpet playing or tuba playing, they are made for survival on this planet and there are syndromes that involve respiration. One has to do with the supportive phenomena, the pelvic pressure syndrome, the other has to do with the supportive phenomena that stabilizes the abdominal wall in combat, so do not injure yourself. You have the stabilization of the ribs so when you do chin-ups; you pull towards the muscles attached to the shoulder girdles. They are pulled to the ribs, not the ribs to the shoulder, so we always have biological factors. You do not have to consider that there will be pressure: we can measure pressure, but if you work for pressure, you may not have movement. Do you see what I am driving at? The psychology of it is very simple; you have to blow, but a person who works hard is not necessarily blowing-- he is tapped into one of the other syndromes and he will be working too hard.

When you blow a trumpet very loud you are going to feel a legitimate work effort, but it is resistance against the embouchure. It is resistance against the vibrating source. You could have the same feeling of resistance without any movement of air, just like if I pick up a weight, you will feel a very definite contraction in the biceps. The triceps will be relaxed but if I want to simulate it; feel the biceps, you contract the biceps and they are both contract. One of my problems as a teacher is that I constantly run into the state of massive contraction simultaneously with the movement of air to the point where we have isometrics. These people invariably can only play two or three seconds, then they start having tongue or choking problems. All sorts of problems that register in this area are simply because the bellows cannot reduce. Again, the psychology of it is to blow out.

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Blow through the instrument-- you can use all sorts of psychological motivations. You have a match-- you pretend to blow out the match. As you blow, you have to sing the tune (mentally of course), so the end product of air is outside the body not in any body cavity. If the air is in a body cavity, the brain can interpret it as pressure. Psychologically you are moving it out from some phenomena of life. This is sort of a bridging type of thought, just to merely get it going.

If you blow up a balloon, a match, or whatever, it is what you blow through outside the body that you have movement. If something gets in the way, you still have the imagination that you are trying to blow; the danger is that you set up the syndrome that the brain will know full well. [Jacobs demonstrates] Now, that air is not going anywhere and if I keep talking-- I can continue talking because there is no further reduction-- it is a simple physical principal. To have movement there must be movement in the complex bellow system. The make change in the trumpet, which is a high flow rate instrument compared to a tuba, there must be movement the stabilization in the lower abdominal tract. You can have all sorts of movement without blowing. I am not blowing, not breathing, not doing anything, but when I blow it all works. I can also have the same movements it without blowing. I can have a simulation because the ability of the body to lie to you is immense through enormous though the stretch phenomena. However, there is a very simple approach; if you want to take a breath, you breathe-- there will be a resultant change. If you want to blow; you blow-- there will be a resultant change. When you study human engineering, you find that through enlargement you lower the pressure internally. According to Boyle's law, as you get larger, you take the air in through lowered pressure. We expand and this is inhalation, you reduce and decrease the pressure to an open airway and move it out. This is 100% correct in engineering but it is 100% wrong for the live person.

You cannot bypass your brain. According to the brain, you expand for the air itself instead of expanding to breathe, you breathe to expand. I know that it is taught the other way because it is absolutely right if you are going to make a model of a human being, then you go to the engineering principal. But because you are alive and various

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levels of your cortex have already learned the laws that govern stimuli and conditioned response; they are a natural reflex. There are various duties already assigned by the brain and you have to tap into these. Then you will have this wonderful efficiency. But the simplicity of taking a breath is the study the sounds of air as you inhale. If you want to blow-- you blow. You want to work your body-- you take in a breath. How would you know which you are doing? How would you know? You might or might not be doing it, or possibly you substitute friction for breath.

[Pointing to the midriff region of the body] Here is a bony structure, now here is a flexible structure. The diaphragm lies in between which is a partition between the chest and abdominal cavities. It is a partition that is at rest in a high position and contracts down to the low position. When you are dealing in high pressure you have to be able to stabilize; in a sense, to have air come off the top. The ability to create pressure is as simply explained as being: any part of you that has enlarged must get smaller. If you did not have a massive contraction, in other words one of the techniques would be by moving the abdominal wall in. You move the diaphragm to a higher position and due to a moderate contraction of the diaphragm, and with this contraction of the abdominal wall, you would have increased the pressure within the abdomen.

It is like a hydrostatic principal; you would have created higher pressure in the abdomen so that, as emptied, further pressure is applied from the sternum and upper ribs and the air would be moving out this way. If you did not have this firmness, the pressure would be greater than the resistance at the diaphragm and would merely push the diaphragm downward. The faulty aspect of this is whenever you push out, the only way is to lower the diaphragm. Anytime you lower the diaphragm, any air that was taken in can come out again. This becomes a completely unusable part of your respiratory system that causes additional change on the upper respiratory tract.

If the player has not ruptured through that, then he is good for two or three seconds of playing and that is all he can play. It may be a couple of "screech" notes under great pressure and then he must stop because he has either got to get smaller or he cannot finish the fuel that was taken in. The principal of it is simply that to get these great

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pressures, you either stabilize here [abdomen] or have a change in the upper respiratory tract. I see this frequently using the equipment that I have. You will find that under great pressure, the body will stabilize and change. In order to do that they must have first taken air in--if they do not then very quickly they have a throat problem and tongue problem. It could be done in a different way: you could have a nice breath and through reduction wherever you enlarged, you reduce on a general basis. You will overcome it in a different way.

I measured the first trumpet player in the Chicago Orchestra playing an F above high C, *fortissimo*. I measured out a specific decibel reading while measuring the intra-oral pressure as he played. This note at a given decibel reading was 114 millimeters of mercury, which is slightly in excess of 2-1/8 lbs. I also had a trumpet player come in from a dance band. He played the same note at the same level and registered 170 millimeters of mercury. The efficiency was not there; some of it was fighting to get past his tongue.

The fact was; with the second player, the embouchure was resisting and it took a much greater amount of fuel to get the vibration going compared to the first trumpet player. In both cases there was one thing I noted; at these pressures the first player pulled in his lower abdomen and then stabilized, there was considerable reduction. The other man did not pull in, he just stabilized and blew like hell--it was good, after all this other man was also a great artist. The difference would be that if a person did not first have the inhalation and attempted to blow without first inhaling, he will have nothing to send out. There is air here, but the storage in the upper lobes of the lung is not great, it is not great at all. There is potential there, and there is air and it useable air but, under great pressure you will have to have a flexible interior.

You must always have greater pressure under than over; this is a rule now that can be achieved. One more thing that you do not do is just simply going into blind strength in the contraction because you are only dealing with two pounds of pressure to play the instrument, and yet you go into pressure where it could be measured as much as 150 pounds. Many of you have seen in my classes a man who lies flat on their back and

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another man will stand on their chest and abdomen. That is the respiratory muscles in isometric contraction supporting the 150 pounds. With sitting up or using bar bells, the expiratory group permits the sit-ups. The massive contraction for strength sake is only going to give you a hernia or some hemorrhoids. It doesn't make any sense -- it is not applied to what you have to do. The average trumpeter will be playing with ½ pound of pressure up to hardly over two pounds--once in a while in the "screech" it could go up to three pounds but, the average individual can't blow more than five pounds. If one of you believes he can blow hard wants to come up and see what his pressure is, I have all sorts of equipment I have brought out to use - I will gladly run a test on it.

[A person comes up]

I gave him this tube to blow in. You blow as hard as you can, do not let those people out there slow you down.

Have you hernia?

No.

Give it everything you have.
You reached the top 110 millimeters slightly over two pounds blowing very hard.

Let's start again -- Now that's more like it-- 220 millimeters, very massive, this is unusually high. Some of it was the oral pressure, this is very good. If he is playing a note that involves a 150 millimeter of pressure, we will say that orally he certainly has it. I have people that come to see me; one of these men was a big man of muscle. I gave him this tube to blow in; he actually got to 1 ½ lbs. pressure. I expected him to ruin the equipment! He blew as hard as he could and it went up to 80 millimeters, about 1 ½ pounds. I have little girls who went up to 110 mm! What he was doing was isometric

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contraction. How much weight could you lift if you merely contracted your arm to isometric contraction?

Many players I give this test to sometimes substitute isometrics for blowing function, and for that reason I give them this test. I want to get an insight into what they are like because everyone of us you see is in normal health. When you cough, you create a condition of spasm where you could easily generate six or seven pounds of pressure. In a severe coughing spell, it is done as spasm at the subconscious level. But, using the identical musculatures but in nature's own way, which is a direct application through pressure and removing all respiratory aspects, suddenly and you get this massive generation of power. If you could use that power of the expiratory muscles to generate for breathing, you would kill yourself. If you could take these reduction phenomena and put them into their massive use, you have a reflex in each lung which will not permit that. When you call for a powerful contraction in order to blow powerfully, the brain immediately sends a signal to the lung. Due to a powerful contraction of the expiratory group of muscles, if they closed in on the lungs, you would be dead.

Range

Question: Range

Answer: As the embouchure gets smaller you have to let the lips go into amplitude of vibration. Tnd the resistance of course is going to increase tremendously. I am speaking about a *fortissimo* high note. I am not speaking about the baroque trumpeter. But in terms of volume; a very small embouchure can vibrate fast. There is a tension phenomena, a size phenomena, and it is also a small embouchure. As a result, the air packs up behind the lips and there has to be a vigorous maneuver of that air in order to give those tissues the amplitudes. It is all air and the higher you go, the smaller the embouchure becomes. You are going to find that in the normal dynamics it is not a severe proposition at all. In fact, if you develop a *pianissimo* in a high range and develop the musical characteristics and then later move to the *fortissimo*, it is a much healthier way of approaching it.

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In the normal sense, you never segment into any unit of air or anything. You sing so that the horn is a mirror to your habit pattern and the air is supposed to take over. You should be, when you are breathing in, not a musician, you are a person taking in air. You are only a musician when it goes out, in the sense of creating sound. That inhalation should be in sufficient quantity so you breathe for the ends of your phrases, to be comfortable at the end of a phrase unless it is impossible. You try to be comfortable at the end as well as the beginning, but particularly at the end because of the involvement of the negative curve. If you are undergoing a phenomenon where there has been a severe problem in tongue or throat, then very definitely there should be awareness. 30% of the intellect can be used as long as 70% remains the storyteller. I do not mind 30% awareness of any isolated function that you want to be aware of. I am always aware of air, but not as an air apparatus.

Asthma

I know I have asthma and I understand quite a bit about it. In the high flow rate instruments, it is actually beneficial. It's not going to harm the player because high flow always involves low pressure. It simulates some of the treatment used for asthma so it is not bad for persons to be playing brass instruments with this condition. It is never practical to play beyond the point where the air cannot come out at whatever velocity it has to come out, because then, the player's muscles will become involved. We'll say a baritone or a bass trombone player, if he has small lung volume and if he has only three liters of usable air, it may not be enough. He may need four or five to play, and therefore that person would be in considerable trouble. In fact you will find he is not able to play with a volume level that he should, and he won't be able to tongue as he should. His air will be slowing up and you will hear the difference in tone every time he does. They can treat this. As a rule there are various potential and you can get a certain amount of relief for a person playing that way. That is what I am doing in my teaching. There are also pollutants and so forth that are becoming a rather severe problem, and more and more

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people are coming to my studio with distress of this type. I wouldn't take them off of a brass instrument as long as they have enough to get by with, as this playing is actually good for them.

Question: Yes sir - air problem?
(How do you deal with the student who takes shallow breaths?)

Capacity and Phrase

I have them do a certain amount of work away from the instrument each day where they do take a deep breath.

Question: Depending on the length of the phrase?

Answer: Very much, If the man has a small lung capacity, he has to be taking a full breath most of the time. If he has 6 ½ liters, then obviously he doesn't need the full breath all the time, but he should not go too far into this negative curve no matter what he does. The negative curve is where the air is slowing up. You have to make sure he is moderately comfortable at the end of his phrase. If it is an emergency situation and you have to go on, there should be a slightly increased time for inhalation so that he does not carry this tension into the inhalation. We do not want a conflict no matter how tightened up you are at the end of expiration as you should immediately let go so the inspiration remains free.

It is a wonderful thing the way the brain works with our bodies. There is a positive movement in one direction and then a negative in the other. The brain is an amazing study in neurology, but you have inner relation to move the arm this way. When it flexes, because it extends, you will have a cancellation of the innovation, where the signal even flounders and disappears from the opposite function. This is the key in respiration. There is training you have to go through, but there is a release if you find it. It is so easy to take your breath if you remain still, but the key to taking it in is very simple.

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There are little studies that a person should do in a practical sense. To start off you may take three breaths as smoothly as you can. Let me see one of my tubes I will demonstrate...

If you are a teacher and you have a student where they can't practice, usually what you see is a person with habits. Where they have habits, these habits reside in the level of the brain where the student cannot possibly be aware of the conditioning and the automatic response.... When you play a brass instrument, it is very much the same; many physical phenomena will be involved in playing but not at the conscious level. They have reached the state where you must alter the stimuli. If you want to alter the response pattern, introduce of a tube of this type, you will find breath flow and all the rest. Suddenly just put the tube into the mouth and breathe into it. Your student was trying all sorts of muscular and stretch phenomena, trying so hard to cooperate with the instructions, you merely put a tube in his mouth and have him breathe through it and it is amazing how quickly you find he is breathing freely and comfortably.

With this simple procedure, you take three big breaths and blow into the tube. You do not set rules-- allow the shoulders to move, allow anything. The feel will come later, you might say, we reserve the finished product for later. Let them do what they want: get the air in and out, increase the sense you might say of mobility, almost the sense of weakness, so that we get away from the potentials of strength. Like a bull, you have a powerful strength for weight lifting or doing push-ups. You do not want that kind of power for the movement of the breath; we are not dealing with a workhorse, we must get rid of the work of the contractions; we must get rid of strength. We have come down to ounces, not pounds of energy. We learn about air and air movement primarily by these phenomena.

You should focus the mind on the air itself frequently. I use a bag and instead of buying a spirometer, you can get a paper bag and do the same thing. You can watch it get small or large as you take air out or blow air in. Hopefully you will not hyperventilate. If you take more than three big breaths and blow through the tube into the paper bag rapidly, you will actually lower the carbon dioxide level. As you lower the level, you are

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going to get symptoms: you are going to get dizzy, and possibly get a headache. These bags are respiration bags; actually this one is used for medical purposes with some and it holds 6 liters of air. I am going to let him blow this up and see if he can do it.

He is blowing it up - he blew six liters of air. If I gave it to a young lady (over here) you wouldn't see the bag change a great deal...

[Jacobs tried to fill the bag up and everyone laughed -- he only filled it up a little.]

You can see when I blew it up it didn't get very large. The bag has a capacity of six liters. I have a working breath of a little over three liters and a capacity breath of close to four liters maximum. You won't see much expansion in the bag. If you wanted to see it, I would merely roll up the bag quite a bit -- yea, I cheat a little that way! The main thing is with using a bag is that you have the psychological attitude of moving wind. You can step in front of a mirror and as you blow out, you can see the bag being enlarged. Obviously the lungs are empty when you have all the air in the bag, and when you are inhaling the air out of the bag, it gets smaller. At that point your chest and your thorax gets larger; you validate the respiratory maneuver by the use of equipment. In this way the training tends to remove the brain from trying to analyze the sensory nerves. The thoracic nerves are not going to give you any real information about your respiratory patterns. Nerves from the interior of your body do not carry messages to the brain like they give you when your arms are extended.

Exactly what is happening is in these musculatures is not known. You do not know about your heart-- you do not know what is going on inside your body. Your diaphragm has no sensory nerves other than pain groups that physician's can sense. None of these give you usable information, so when you try to be knowledgeable by the feel phenomena, you are only kidding yourself-- just like in the case of the embouchure. The cranial nerve carries very little information of what is going on in the embouchure to the brain. The *seventh cranial nerve* is the motor nerve carries a message to the lips just like vocal chords. The feel phenomenon only gives a generalized statement without the

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specific details, but with the use of equipment like these tools for the training of respiration functions is really practical. Some of these exercises can be done without a bag so that when you hear the sound, you sense the volumes of air in transit where it can be felt in the mouth. You cannot feel air above the larynx, and if you have an irritated region in the trachea, you will feel a temperature change; but you cannot feel the transit of air below the larynx.

If you want to know about air you work with, wok with the air where it can be felt as it enters the mouth. When you blow, it is very wise to do a little blowing away horn in your music practice. Blow against the hand, matches, a balloon, or through the horn. You always do it, not from where you send the air out, but where it comes in. You will find that as soon as you do this, the brain cooperates with you. It begins to control the antagonistic musculatures. The big hang-up in respiration is isometrics; breathing in when blowing out, and blowing out while breathing in. As soon as you begin the positive maneuvering of inhalation: taking in of air, blowing out of air, the brain always will cooperate. It is a wonderful thing because if you only learn to order your body right then you can do anything you want. But you have to learn the key, which is communication.

Air Blockage

This gentleman has a question? Blockage of Air?

Answer: As a teacher, one of the problems I often see closures in the strangest places in students. There are many areas in the body where you can provide friction for the air. One of them is where the larynx comes up under the epiglottis. If you are swallowing food, one of the principals to keep you alive is that the windpipe closes so the food pipe can receive the food. This is done automatically; you do not do it consciously. The larynx comes up under like a lid and it closes that region off, then the stomach receives the food. This is one of the problems that I face in people who do not have the reduction phenomena. They will block the air either with the front of the tongue. When we clear up

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the front, it moves to the back—when we clear up the back, it moves down to the larynx, then it moves to the glottis region. Each one gets a little harder to correct.

It is very simple to bypass the entire phenomena simply by blowing out. Even when you cannot get the air out, you have imagination. Imagination is one of the ways you program the brain for function. You merely create a situation where if the air were moving it would be affecting something external to the body, not internal. Do not sell imagination short; it is a wonderful tool for programming the brain. Whether it is in speech or it is in what you are going to do in sports. The ability to conceive is invaluable with this and that is how one level of the brain will influence other levels of the cortex.

Question: In what way?

The embouchure only sets up the need for air. Unlike the woodwind player, who blows to vibrate that reed a certain way, we have the lip; it is flesh and blood, it is different. I have measuring devices in my studio that I use with students to see if they are playing what they believe. Many times when they play loud, I see the sound getting softer. If they actually are playing louder there is going to be a much larger use of air, but it is based on getting a louder sound which is simply more amplitude in the vibrating source. The lip has to have more amplitude of vibrations to have a more resonance.

Question: What happens to the pressure inside the mouth?

As the pressure increases, we will say the pressure at six liters was about four ounces of intra-oral pressure; she would have reached about 16 ounces. The pressure was quite high, not like a high C or anything, but like you were playing comfortably in the mid range fairly loud. Pressure for a flow rate at that time was quite large. I have these figures with me somewhere; it will take time to look them up.

Question: Breathing exercise? For me, personally?

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Playing tuba is for me is a breathing exercise--it is all I need. I use breathing exercises as assignments because I recognize that, for example, when trumpet is in position there is a powerful stimuli for that brain gives all sorts of habits. One of the frustrating things a teacher has to tell a student is — "this is wrong, this should be right." The student cannot cooperate with this instruction because this is hostile approach and is causing an automatic reaction. The nervous system is still sending out a group of signals to the various systems that is in turn still sending out a group of signals to the various muscles. He may understand intellectually, but the body does not understand these commands of "Do, and Don't."

Buzzing and Exercises

I use tools such as mouthpiece playing without the instrument. The purpose is there are thoughts. You connect the thought and tissue in responds; in other words, it becomes a voice. The main purpose is the very strangeness of it. You are involving everything that is involved in playing a trumpet or a trombone, except the right hand and the acoustical law of the instrument. You are definitely involved in recalled concept tissue response isolation through the mouthpiece. Much of it remains and much of it is removed, but the strangeness of it challenges the student. I never let them play exercise on the mouthpiece. I challenge them immediately with music. I start off with silly things like "Pop Goes the Weasel" -- if I cannot think of anything else, I make them play the "Star Spangled Banner." Somewhere they have to have something in their mind and I make them play and entertain an audience psychologically with that equipment. As they do that, there is an immediate strangeness in the brain. As I challenge them as a musician, I keep the focus always in the musical aspect. Many things begin to change-- the student is not at all aware of the change, but I am aware of the things because I am hoping he will change because his intentions begin to alter. Sometimes the angle of the mouthpiece is changing on the lips, and that will be better for that individual. At this point and we go into rather advanced playing. We might have them play a concerto, some jazz, Dixieland or some

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very difficult things; but it is still an art form approach. I do not let him do it as buzzing as an experiment. I keep always programming, but with that strangeness. Within a few weeks it becomes fairly efficient. It is the closest thing I know of to a short cut in bringing those things about.

When you play and you go to take a breath you may have a "hic" because you have always had it. You cannot change this habit because I tell you what is right and what is should be. You cannot cooperate with that direction unless you are able to intervene with the part of the brain where you have your habits stored; however, it is a very simple thing for you change motivation. I always have a student work a few weeks on a given topic away from the instrument so there is no relation to the instrument at all. We may work with gauges, we may work in all sorts of apparatus, but we work with outward motivation; that is primary to us. We work with the specific movements of air but we give it a chance to grow to become a tradition in itself, and then we apply it back to the instrument. If you go right to the instrument you frustrate the student, and you also frustrate yourself.

Exercises like I mentioned a moment ago about simple inhalations are the start. If you want to learn to take a fast inhalation, you create situations that involve fast inhalations. Always insist that the student be aware of his motivations. We never motivate time in inhalation as the big factor. Time is not a biological stimulus that would organize the respiratory system. Quantity; whether it is small, middle, or large, it doesn't matter. Quantity is a biological communication for your tissues, time is not; it is a secondary factor.

We learn about quantity through the slow breath then we take a study of this type; maybe take a study in 5/4 time where I exhale for four counts and I replace the quantity I use in the fifth count. I am adding time, but the quantity is dominant. I must replace what was used within that time factor, but the quantity is the dominant factor. Time remains the secondary phenomena. Then I take the air in, maybe in a faster note, maybe $1/8^{th}$ note. Then again I am replacing whatever quantity was used within the time; this is the motivation. Time could be anything-- it has nothing to do with quantity, so the legitimate

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signal has to be quantity and the time is the secondary phenomena. But we must do this away from the instrument.

At first when we do this, the player will be able to go back to the instrument for a few moments and under certain conditions, translate it right through the horn, but he will lose it within a few moments. However if you do this over a period of time; you do it for several weeks and then you study it, maybe two or three times, in your practice. You stop and do that same particular maneuver, then you take a study out of method book and you mark where you are going to breathe. The main thing is that you do not surprise yourself. When you surprise yourself in breathing before you are trained, you find that your expiratory muscles are still blowing while the inspiratory ones are trying to take the breath in; all you do is get sort of a "hic" like a restriction in the throat.

If you mark where you know you are going to breathe and one instant before you get to this point you are ready psychologically to inhale. I like to tie it into a mental cue. I use the syllable "hoe" because "h" is an aspirate which opens the vocal holes, the "oe" shapes the pharyngeal region as well as the oral space. I think of "hoe" right before I breathe and everything opens up. This is as opposed to a "hic" where you get the effort instead of a volume of air.

Hyperventilation

Hyperventilation

I think hyperventilation on a trumpet is sometimes achieved. Most trumpet players when they think of hyperventilation are tending to confuse that with the symptoms that come from intra-thoracic pressure phenomenon. Are you thinking of high register?

I'm thinking of playing high and loud.

This is what I thought.

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You see, hyperventilation comes only with massive movements of air, but the trumpet player will sometimes confuse this as the symptoms are very similar. When you get excited and play high and loud, very frequently you will find the intra-thoracic pressure is exceeding the pressure of the circulatory system, and you are collapsing the vessels that have to return the blood from the brain. At that time you will find that a blackout can come on because of the lack of circulation in the brain-- and it comes to part of intra-thoracic pressures. *Hyperventilation* is another subject altogether. That comes from the large movements of air, not the pressure. The large movements which lower the carbon dioxide level in the blood stream. It is not the excess of oxygen that brings on the symptoms; it is too little carbon dioxide. When a person merely holds their breath, after a few moments the tissues are always throwing off carbon dioxide into the blood stream and the brain returns to the normal state very quickly.

Doubling

Can one double on trombone or trumpet?

I do not think that it hurts a bit; I think it is actually kind of good for you. I used to play the trumpet, trombone, and the tuba. I do think you should specialize in one. But for a person who has restriction in the breath and wants to experience a more massive maneuver, it is beneficial. There are other ways of going about it but you could have fun doing that.

Mouthpiece Pressure

How much tension should there be in the embouchure?

There is no such thing as a trumpet embouchure without having tension. In vibrating surfaces, you do not have vibration in relaxed surfaces. If you examine a brass player's face on any instrument you will invariably find contraction. We call it a "dead pan"

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expression, and this contraction state. I think you will find generally in most fine brass players. You have so many variables: you can have a puffed cheek (he points) and you can have a fine embouchure (points to lips). The muscles at the side of the face interdiagulate at the corners and there are several groups that crossover at this point; they are isolated. Most of them move into the lip area from the jaw and actually there is an isolation factor. It does not give us an embouchure when these are contracted, you wouldn't believe it, they can be held with no embouchure at that time.

It does immobilize some of the phenomena that exist in the external regions and it permits functions internally to take place. You can still have this same function even with an unorthodox looking appearance. If your embouchure is off center, you may not have the same appearance; you may have a contraction in the lip musculature under the mouthpiece rim. You are doing practically the same thing in addition to a moderate contraction. I think what you are describing is several things: one is a bulging of the neck as well as the tension in the facial musculatures. The bulging of the neck has to do with whether or not you are going to meet with the sibilant when you try to play loud. The requirement of movement, moving air between the lips, we will say is one pound. If you reduce the airways sufficiently behind it at whatever meter you choose, you may have to go to 2 ½ pounds of pressure to have one pound at the lips. You will drive harder and harder; that is how you get the broken connected tissue to where you may actually have a huge bulge as some trumpet players have. It is simply trying to drive air to pass an obstruction.

Actually, some people have a huge potential of pressure, but if the lip isn't getting it, your judgment is always based on what it takes to vibrate the lips. If an obstruction is put in the way, then you are going to blow awfully hard or you will not have any vibration. With a student, you have two choices: the quickest way I know of as a teacher of wide experience is to put the trumpet down and just take the mouthpiece and start making music on it. The strangeness of it is such that if you are musically motivated, you suddenly find you can play. You find that you have lost much of the bulge. It is very difficult to play on the mouthpiece compared to the trumpet. As you play on the

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mouthpiece you may find, particularly if you get up and walk around the room, which gets you away from the excessive pressure as you focus on the music. Slurring a great deal rather than tonguing to get the obstruction out of the way is also a good idea. I would go to the slur on the trumpet as a dominating factor for quite a while, and I would also go to the lower range quite a while. The region where the malfunction is greatest, I would temporarily abandon.

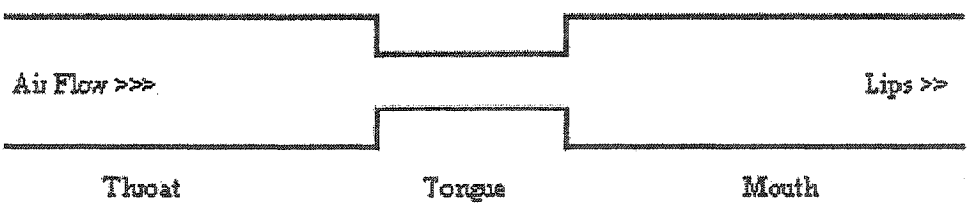
I have always believed in taking a problem that exists and finding the back door and not the front door; you sneak up on it. You find something good and you work on it and then transfer back rather than confronting it. It is just like learning to come in on a high C or any high note as an attack. I listen to players who just attack and attack these notes. They are trying to improve their attacks on their high notes. One part of the brain doesn't judge right from wrong; it judges repetition as learning how to give a very bad attack. While one part of the brain says, "I need this, I need that," another part just says, "well you are doing this all the time, it must be what you want."

There is a much better way and that is; simply no matter how bad the note starts you sustain it. As you sustain it, you put in the vibrato, you put in the ideas from of your heart. At first it may not be so great but you always do it from the sustained note, you do it from the slur, you learn how to come from sound into a successful sound. You do not just keep trying to start a note with an unsuccessful procedure. The repetition of it is very damaging. Then you find where the note sounds good. You hold it, you learn about the note and then you come back into it. You see what I am driving at? It is sort of a back door approach; you do not confront the problem head on. I would say if I had to pick the two most damaging phenomena that I know of for a brass player, the first is isometrics, the inadequate ventilation of the lungs and the inability to blow. The second is the reduction in the airway beyond a point. We run into a problem but I am going to draw something for you.

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I am going to have to use your imagination a little bit. I am going to draw some tubing.

Here is a pipe. Now I am going to draw a smaller pipe. Finally, I am going to draw a larger pipe. When I send a column of air in here, it must come out here. Now, we have two large areas, and one small area. A large area is part of a physical principal, but what is involved in this. I often ask my students where they would find the minimum pressure; in the large or the small pipe. They will often say the center pipe because it is small. But the maximum pressure is to be found in the large pipe because the air moving packs up and tries to get into the small pipe. There is a rather drastic drop in the small tube and a still further drop on this (second large) tube. If we think of this as the airway, we recognize this as being the tongue. If the tongue goes moderately into reduction there is no harm done, it could be beneficial. But, we will say, the embouchure on this end (second large pipe), if you put the lips here (small pipe), you have a massive build up of pressure (in the first large pipe). You are able to move a small volume of air on this side and there is going to be a differential pressure behind the embouchure (first large pipe). There is going to be a lack of air volume compared to what is behind the tongue with a sibilant "S."



This is what I am describing. What happens (first large pipe) is one of my big enemies as a teacher. I will so often find this; it can come from the tongue being too far forward, in the sibilant "S." If you go far enough forward no air can come out at all -- it stops. When you go to the sibilant "S", as if you say "yellow," then again the potential of reduction is quite extreme. If you go "eee" in the back, now pure "eee," there is plenty of room. Where it goes into almost closure, you have this massive drop on the other side of it. At that point the brain at the front of the tongue signals as a stiff lip. Invariably as a

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question, students all say the lip is stiff and will not respond. As I check, I have tools for checking these things, I find that there is no air; the lips have to have fuel no matter how you slice it. There has to be fuel to go between air packed up inside the mouth. It doesn't mean a thing. It is what is measured on this side that has done work. What you are sensing is in terms of air pressure in the mouth. It is nothing unless it is in motion--that is my enemy.

The other enemy is the bellows system where the muscles are working to enlarge and reduce at the same time and nothing is happening. With my students, with my special equipment, I find three areas that exhibit no change. The pressure which will permit a second or two of moderate maneuver and then nothing. You continue to watch a player and you see they gradually get smaller. If he doesn't get smaller he has a problem. Air has to come out. It doesn't come out by magic you know; it does by air pressure.

We are structured for survival on this planet, we are not structured for trumpet playing. We have syndromes that the brain knows full well and we utilize these into our art form. We cannot fight nature; we must go right along with it. One of the things involved is simply that first of all to play the trumpet, we have to have a trumpet in the head, and a trumpet in the hand. It is very important not to fight that piece of brass; you cannot win.

Now you must recognize the power of closure in the lips. If you close your lips, you cannot possibly squeeze any air out even with four pounds of pressure. It's an unequal contest--the power of the lips in closure compared the breath power in push. As soon as they begin to push powerfully, you will get all sorts of visual signs like we did in this young man. That was a beautiful test, I congratulate you, but obviously nobody should work that hard in an art form. What I am trying to indicate is that; if we signal the art of communication, there is the trial and error procedures through the programming of the young brain by listening to fine players just like a child learning to speak by listening to his parent — no one is teaching that child. He is listening, his little ears soaking it up like a sponge by imitation and so forth. One part of the brain is being programmed and

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the motor systems are beginning to carry it out and learn there fast. In music it is the same way.

I love to start an elementary trumpeter off by--I take a young boy who has never played before, and I will take the mouthpiece and I will play something silly on it, like "Pop Goes the Weasel" or a little song, something that I think he knows. I will say "take it home and buzz it for a while, do anything you want," and usually he comes back with some slight semblance of something. From that point on I work with his brain -- I do not work with his body, I work with his mind. I take his trumpet and his mouthpiece; the only variable is the player. I will play one note and I make him listen to that one note. I have him close his eyes and listen but I make him think about it and ask, "Can you hear that note?" We take that brain, just like he was learning language from his parents through imitation. I make him imitate. He wants to know how do I do this, how do I do that, he is always asking questions. You do not have to answer those questions. I tell him "Here is how you have to sound. When you go home to your daddy, when he listens to you play you think, Mr. Jacobs is playing" but you are going to fool him. I play with his mouthpiece and his trumpet. I am a lousy trumpet player but I am better than him. I had an experience with this one youngster. For this boy, I played a G as rotten as I could, which was very bad. Then I played it as good as I could and it was better than his, and so forth, something for him to shoot for. I made him aware of the difference and I put it into a little song. Anyway, I had his mind clearly focused on imitating a quality, not just pitch it; it was a very minimal requirement. It was only one note but I had him play three or four based on this same psychology.

I had him go home and the next week he came back. Those notes were not bad. We gradually extended range and his band master within three months called me end said, "I do not know what you have done with this boy but he sounds like a pro, he can't play very much, he can't read worth a darn, he has only an actual range but he said those notes sure sound good."

What is involved is he would not have to learn to take notes and later retrieve everything. Take the patterns already formed and try to substitute new ones. He was

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already on the right path so he could concentrate on music, not simple tone production. What I am trying to indicate very strongly is that you can you read about embouchure, you can read books on procedures regarding segmentation in the parts. I want to tell you quite frankly that most of the players who wrote the books never learned by the books. They listened to others play, they were required to play songs; lots of them were jobbing.

The written word, even when it is right, is not for the performing arts where you hear with a communication to others. It is like being an actor, if you want to learn to perform, that is fine, but if you try to learn in order to express range: what muscles must contract to express range, how do you raise your blood pressure, what do you do to do that, you'll never be an actor. You have to learn the emotions, the message, and in our art form we must let our minds with sound. We must recognize that we play with a condition response to stimuli, and our thoughts must go on to the stimuli. As we overcome the challenges of music we are learning the physical phenomena of the playing. If you try to learn to play the trumpet to learn to play music forget it, you learn to play music and as you learn the music you are learning the trumpet. I'll be happy to debate this with anyone.

Now with that belligerent note… I thank you; you have been a fine audience. I've enjoyed your questions.

Thank you.

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APPENDIX 5

Arnold Jacobs Master Class: AUGUST 1988 Notes

By Charles Lipp
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Follow the body's laws while adapting them to your instrument's requirements. Simply take air in and move it out. Great music may be made without the specific knowledge of body mechanics.

Functional breathing is used for everyday life. Specialized function (like music making) keeps and adapts the everyday function. Performers give only the most simple orders.

A knowledge of mechanics is not needed for specialized activity. The need is to give simple orders. Think like a child and use conditioned reflexes to provide specific stimuli.

Conditioning

Start with musical thought dominating, order excellence in the musical product. Work toward accomplishment as a goal. For example: Walking -- the goal of moving the legs. Music making -- the goal of moving the bow. Language communication -- the goal of moving the vocal cords. (If you were as preoccupied with the mechanics of walking as much as you are preoccupied with the mechanics of playing, how much distance would you cover?)

Great music may be made without the specific knowledge of the body.

Requirements for sound:

Motor force, vibration, resonance. The piano has both a vibration source and a fixed resonator. The trumpet is only a resonator (or collection of resonators selected by valves). For sound from the piano, motor force of any kind is needed on the keyboard. For sound from the trumpet, motor force (moving air) allows vibration (lips buzzing) to resonate in the tube. Mouthpiece's sound is amplified 20 decibels by the instrument.

The external environment is observed through sensory nerves and affected through motor nerves. When you act, the brain sends commands to the motor nerves for performance; when you observe, sensory nerves send raw data to the brain for evaluation.

Elementary students' best learn from imitation.

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Academic studies:

Take an acting class to study presentation and to play the role of the presenter. In musical studies, devote equal time for absorbing and imparting information.

Question: How can I get power in the trumpet's high register?

The small embouchure surface needed for high pitch and the big push needed for amplitude makes a delicate situation. Danger lies in pushing against resistance. Instead of hard blowing, move toward a bigger sound based on the buzz of the embouchure. Zero-in on the buzz of the lips in a lower octave then keeping the same feeling for buzz, play in the upper octave.

Question): What causes the embouchure instability and resultant tone color change in the descending scale?

The throat is discovered to be closing. When relaxed, the throat is open. Locate the closure by placing a finger on the throat just above the larynx. Say "key;" say "hoe." Feel the closed throat while saying "key." Use suction on inhalation with minimal friction. Use the lips (not the throat) to control the inward moving quantity of air. Be aware of the sound of moving air. Breathe to expand; don't artificially expand to breathe. The main physical unit used for inhalation is the diaphragm. Follow through brings other physical units in to play. Teach large inhalation, not regional movement. The product is the sound of moving air. A 6 liter air bag may be used to give visual cues for movement of air. Inhale, fill bag, take back air from bag, use the "old" to play. The bag gives a visually known quantity of air.

Strive for simple child-like communication between your art's desires and your body.

<u>A study of slow breath away from music:</u>

Inhale a slow breath for five beats at MM 42-48.
Visualize a ribbon of air entering the body through the mouth.
Exhale for five beats. Visualize the ribbon of air leaving the body. Sense the quantities of moving air.

<u>A study of slow breath in thirds:</u>
As above, move air in and out while imagining the quantity moving in thirds.

Move air in one third of total.
Pause (2 or 3 seconds) and reflect on quantity and bodily stretch.
Move air in a second third.
Pause and reflect.

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Move air in the final third.
Pause and reflect.

Move air out one third.
Pause and reflect, etc.....

Locate a large volume of air passing the lips.

Breathe in for 5 counts, Blow out for 5 counts
Breathe in for 3 counts, Blow out for 3 counts
Breathe in for 1 count, Blow out for 1 count
Breathe in subdivisions of thirds or fifths

Breathe in, hold breath – "be surprised", notice the sensation of expanded torso

Breathe as in 1), 2), or 3) and notice body expansion/relaxation from belt to rib cage -to the chest
Is the abdomen relaxed? Is the neck relaxed?
Is the mouth forming vowels? (O?)

Breathe as in 1), 2), or 3) and notice the sound of moving air
Use a piece of paper as a visual aid to see the air move
Notice the feeling of moving air at lips

5/4 time: blow out for counts 1-4, breathe in on count 5
4/4 time: blow out for 3 1/2 counts, breathe in for 1/2 count
7/4 time: breathe in on beat 7, out on beats 1 through 6

Although these studies will seem to be mastered in a week, a year of practice is necessary for the full integration into your playing.

Suck air through a straw, then two straws, then three, then four.... Be sensitive to the movement of air as the opening varies.

Challenge proceeds development. Be patient with development.

The body uses the respiratory system in three ways, and the brain has three blueprints of the respiratory system:

For respiration -- This mode is for breathing and wind playing.
For defecation and childbirth -- This uses pelvic pressure (closed-throat, downward pressure).

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For combat -- Tension in the abdominal wall protects vital organs and stabilizes large muscles groups for "fight or flight." Misapplication during playing may introduce unwanted pelvic pressure or abdominal tension.

Spirometer

(Problem -- habitual downward contraction by the abdominal wall keeps the lower ribs immobile.) Three or four breath cycles through the spirometer set (at maximum resistance) fatigues muscle groups and separates the groups needed for inhale from those needed for exhale. Fatigue sets in then training finds the easiest way to proceed. Gradually work toward minimal resistance. Use "minimal motors" to develop an ease which becomes the basis for performance activity.

Exaggerate for recognition. Start with crudity or gross exaggeration, then refine. Move areas of gray to black and white.
During respiration, the torso is like a bellows getting larger and smaller, so strive for a unified bellows effect. For example, all muscles shorten when functioning, so abdominals compress for exhale. The clavicle marks the top of lungs, so the clavicle will move up and down slightly on correct inhale and exhale.

Position of larynx (voice box) -- It moves down on a large inhalation or at a moment of surprise. It moves up when swallowing. The larynx is controlled subconsciously.

Observe what happens to the body in everyday life. Observe how these motions may be used for playing. Move from product to muscle, not from muscle to product. The great endeavor is sound. Find role models in the art form, and control what is to be the final product.

The psychological focus of blowing is wind as moving air. The idea is air as wind, not air as pressure. To move more wind requires more pressure. Problems arise when pressure increases without an increase of wind. A common problem is the inhale muscle group working against the exhale group. Visual cues (from the spirometer) turns the attention away from the inner body workings and helps separate muscle function.

The idea of "thick, fast air" includes more muscle groups all working at a light load. The hardest work is using the inhale muscles to fight the exhale muscles when blowing.

Watch the ease of the athlete. The term "ease of the athlete" means getting the job done using minimal motors. Minimal motors exclude extraneous muscles and isometrics. Minimal motors use only muscle groups needed.

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Although the muscles of the torso can support 125 pounds on the chest and abdomen, these muscles can only generate 3 pounds of static breath pressure. Sensors in the lungs protect the delicate tissue and prevent large pressures from being generated.

Control of the breath comes from the control of long tones, crescendos, and diminuendos. We start with the product and work backward.

Question: Don't additional problems arise when correcting bad habits?

Do not correct habits. Skirt them by adding another dimension to your playing. Adding and practicing a new habit can gradually replace an old one. For example: Start with wind as a physical skill, start with crudity, move areas of gray to areas of black and white. Develop a melodic sense in a "problem" register, don't develop power in a problem area. Practice the beauty of sound. The norm is lyric playing, the love song, or *bel canto*. This norm allows a fine tuning of the performance machine. Begin lyric playing with vibrato, then retain the lyric style without vibrato. Be able to play a love song with and without vibrato. Keep the lyric quality when adding articulation to the sound. Be the great player who maintains a lyric quality at all speeds.

Question: Describe the nerve damage to the throat of the trumpet player who had her tonsils removed.

Nerves were severed that controlled the region of the soft pallet. She was incapable of producing closure when playing. Air would escape through the nose.

Find the balance between breathing and blowing. Avoid self-analysis, issue statements.

Psychology is the study of the world around us, not the study of the world within us. Avoid self-analysis; it's passive. Instead, issue statements. Give orders, avoid self-analysis.

[Tuba, Frankfurt Radio Orchestra: Breathing predominantly low using the abdomen].

Jacobs notes good general breathing on "replacement" breaths. Large lung capacity; some constriction from allergies; using medication. Practice slow inhalation when raising arms, hold breath, drop arms, notice chest expansion. Cycles of inhale/exhale using visual cues from a spirometer allow a study of the breath, not a study of the breathing apparatus. A focus on where the air enters takes the attention away from the area of low breathing. Discover areas of unused expansion and work them into the activity of general breathing.

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Posture

Put your instrument aside. Stand comfortably tall; assume your best posture. Using your hand, feel your back's curve just above the belt. Sit down. Feel for, reform, and maintain the same curve. Now you're "standing" above the waist and sitting below the waist.

Breath pressure may be generated by elastic contraction of the body's tissues alone. See figure: 3/4 of a pound of positive pressure can be generated by relaxation pressure of tissue after a full inhalation. During exhale pressure decreases. On the "last half" of the breath, effort is expended to "get all the air out." During playing, learn to use the top half of the capacity for music making. All recovery breaths bring the level back to full. Often, incorrect playing is in the middle third of the breath, never refilling back to the top of the capacity.

Question: Should carbon dioxide levels be artificially manipulated?

Not necessary for brass (especially low brass) playing. A high flow rate keeps the oxygen/carbon dioxide ratio in balance. In situations where extreme log phrases are needed, slight hyper-ventilation by deep breathing several cycle before playing help. The tongue is an unruly organ. It gives very little feedback. It is best trained when your playing imitates spoken language. Make your playing speak with inflection.

Never substitute pressure for quantity. Diagram of air flowing through tubes of different sizes. How this may be similar a situation of the tongue being in the way.

[Trumpet from Washington, D.C. Pines of Rome, Promenade from Pictures at an Exhibition].
The embouchure uses whatever air is available, even when the air supply mechanism is inefficient. If the first full breath gives a poor attack, hear the tone quality with the inner ear, then play. To take in a "best" first breath -- suck in air. The main muscle of suction is the diaphragm in descent. Poor attack: Problems in the upper air way (at the tongue) usually are accompanied by problems in the lower air way (the abdominal wall). Work the expansion/contraction of the chest with a general bellows effect. Each replacement breath returns the capacity to the "first" breath level.

Exercise:
In a slow 5/4 meter, exhale the full breath during beats 1 through 4. Replace the breath on beat 5. Work toward ease of replacement breath.

Exercise:
In 4/4 meter, exhale the full breath during beats 1 through the first half of 4. Replace on the last half of 4. Or in 8/8 meter, exhale during 1 through 7, replace on 8.

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Music making is 90% story telling and 10% fuel.

Question: When a student plays and adds vocalization, how can the vocalization be eliminated?

If the problem is minor, ignore it and continue working toward ideas of communicating the artistic product. To assist the student, direct attention to large breaths and study of tone -- long tones, crescendo and diminuendo. We take air in like a bellows -- we enlarge lowering the internal air pressure and air enters -- we get smaller and air is expelled (Boyles' Law). We must have an awareness of the balance between the inner and outer pressures and only use the minimal effort to play. Take air in with the gesture of surprise. This feeling of surprise allows us to maintain size without adding pressure.
Exercise: (Eliminate pressurization)
Take a full breath with the gesture of surprise, with a resonate voice say ONE, pause while retaining the feeling of surprise, say TWO, pause retaining the surprise feeling, etc. On a full breath play isolated tones retaining the feeling of surprise between them.

Blowing is an active state, not an inactive one. The player psychology gives orders for results and by-passes the brain's blueprints of the body's mechanical functions. Although complex relations between nerves and tissues exist, the machine easily complies to simple orders.

An improper habit is the immobilization and/or static protruding of the abdomen. Employ the natural bellows-like tendency to get small as the exhale progresses. Controls of pressure are crude; they make hard work of an easy task. Work to eliminate the isometrics between the inhale and exhale groups.

Pelvic pressure (closed-throat, downward pressure) may be misapplied during playing and introduce unwanted pelvic pressure or abdominal tension. Air is wind, not pressure. To move more wind does require more pressure. When pressure increases without an increase of wind problems arise.

To directly control the larynx is harmful. A dynamic control can be approached by using the life form application of the larynx's movements. The larynx raises when swallowing and descends when inhaling.

Use an adult's outlook for studying the art form and the emotional content of the artistic matter to communicate. Use a child's outlook for simple physiological approaches.

The psychology of wind is to achieve an end outside the body. Blow out matches; watch a strip of paper move in the stream of the wind. Externalize the air movement. To blow a large quantity, use fast air.

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Question: How can stage fright be prevented?

Develop an ease in performing for an audience. Stage fright usually results in a high pulse rate and shallow breathing. Before performing, know the music. Then, in performance, prepare yourself by slow breathing (five count breathing), moving large quantities of air. Mentally rehearse the music using solfege or a text -- sing the music in your brain. Mentally replay your best performance. Flood the brain with positive examples of music making.

Question: How do you work with beginners?

The teacher plays a note on the student's mouthpiece and instrument. The teacher plays another and another. Plays bad sounds and compares them with good ones. Plays two, three notes or a short melody. The student observes and remembers the difference between good and bad. The student takes the instrument home and using large volumes of air attempts to match the notes of the teacher. The student works on products. Later, as the challenge of extremes enter, allow the students to find their own way to a "proper" embouchure.

Teach art. Set the rules for music; play down "how to play the instrument" or "how to control the meat." Playing is singing -- the strings replace the vocal chords. To get the mind off the instrument, play a simple tune while jogging around the studio or doing deep knee bends -- do "something strange" while you play to find out about your "minimal motors."
Inhale at the corners of the embouchure; don't inhale by dropping the jaw (and having to relocate the embouchure). Play simple material while looking in a mirror.

Embouchure

The lips are usually a healthy part of the body. The mouthpiece rim isolates the vibrating area according to requirements of the vibrations.

The mouthpiece is not the embouchure; the embouchure is where the lips vibrate and where pitch is read out.
When a note is missed, doesn't it cause a "chain reaction" of missed notes? When you miss a note, keep going with a positive attitude to improve the next notes. When you miss a note, flood the brain with models of best notes -- make the next notes even better than your norm.

[Flutist from Detroit: Complaints about too many required breaths and too noisy breathing]:

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A Breath Builder© (a visual aid product) needs 14 ounces of pressure to hold a ping-pong ball at the top of the column. Find the minimal function to keep the ball up. Look in the mirror for visual cues to keep the wind moving with ease. Find the full range of abdominal movement. Bring this range of expansion and contraction into use. Put both middle fingers on the navel. Spread the hands over the abdomen. Feel the bellows of the torso. As the diaphragm descends on inhalation, the lower respiratory area enlarges. The abdomen protrudes on a full breath. Don't fear being wrong -- when working with physical skills—exaggerate.

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[Hornist from Charleston, SC]:

Think of air flow as a quantity. A helpful image: the air as a fountain of water spurting up. The tone of the instrument as a ball riding at the top of the spurting water. For loud playing the ball (the tone) rides high on a tall jet of water (a large, fast moving stream of air). For soft playing, the ball rides low on a short jet of water. Breathe in while raising arms, hold breath, lower arms, notice the chest expansion. Strive for a visual "Dolly Parton-like" expansion when achieving a full breath. Play articulated material legato to obtain a "best" sound then have the articulation be the lightest addition of the tongue.

Think of the breath as the "balloon of words" above a comic strip character's head. When you take a big breath, suck in a big balloon of words that floats over your head.

Some of the tools used this week

Inspirex (incentive spirometer)

WPS (6 liter bag also available in 3, 4, and 5 liter sizes)

Windmill (for roughly measuring capacity) from Kinetics Measurement Corp

Voldyne (volumentric exerciser) from Cheesebrough Ponds, Inc.

Access (peak flow meter) from Healthscan, Inc.

See-through Human Anatomy (the "thin man" chart) from George Cram Corp.

Question: When a player uses too much mouthpiece pressure and abuses the embouchure tissue, what is the best cure?

In general, the lips have good circulation; under extreme conditions they can be bruised. The usual result of this mistreatment is a circulation problem. When a player holds the mouthpiece on the lips too long, swelling develops from fluid collection. If the swelling disrupts the embouchure, rest is the best cure. When that's not possible, use a slightly

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smaller dynamic range and avoid the very top notes of the instrument. The swelling from fluid accumulation will clear up with 24 to 48 hours of rest. The best procedure keeps the brain occupied with music keeping it from self-analysis and possible downward spiral.

Question: Can the embouchure be paralyzed?

If the face is distorted away from the instrument, seek an examination by a doctor. When there is no medical justification to the condition, go back to the easy part of playing and buzz the mouthpiece. Sing with the lips; air is the tool.

Question: What about pain in the joint of the jaw?

Perhaps this is a mild dislocation. See a dentist for a medical explanation. If the dentist finds nothing, keep a journal about possible cause-effect relationships. Take a rest, and buzz the mouthpiece.

Vibrato

Is a sine wave-like fluctuation of pitch, volume, or a combination of both. The physical relationships that produce vibrato are complex, so vibrato should be created in the brain as sound quality. It can be taught as a mellow, lyric sound. Teachers should demonstrate this sound to students. Start learning vibrato from the sound model as a crude mechanical maneuver using the sense of sight (play into a microphone connected to an oscilloscope or strobe). Exaggerate the physical maneuver of the jaw or hand. Look for a fluctuation on the scope. Learn vibrato as a connotation of lyricism, as a tool of your art. To refine vibrato, have large muscle groups work at a minimum load to produce the desired fluctuation. At times, the vibrato's pitch fluctuation can fool players into playing off the resonate center of their instrument. Playing off the resonate center (usually sharp) necessitates tuning compromises. The resonance center is blurred as a result, and the resonant amplifying power of the instrument is lost. Use vibrato search for the best, most resonant pitch center.

Question: How do you increase the available air supply?

Keep the focus on the buzz of the lips. Be concerned with the quality of the sound and with being a fine artist. Train yourself to take a full breath by playing long tones while watching the second hand of a watch. How long and how easily can a tone be held?

Mouthpieces

There are three performance variables
the player
the mouthpiece
the instrument

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Within the variable of the mouthpiece, the rim and cup are two variables. Don't lock yourself into one mouthpiece. Keep the same rim style and try different cups. Playing a small instrument using a deeper cup will strengthen the fundamental. Play as a storyteller. Play different roles using different equipment to fully explore your potential.

Start a conditioning program of playing (even simple music) for others.

[Trombonist]:
In hearing the playing there is a sense of thin air. The lower part of the respiration tract is immobile. Long, slow, deep breaths to improve flexibility. At the end of the breath add a little more air flow to compensate for dwindling air supply. Remember to breathe to expand not expand to breathe. Practice a bellows motion without breathing.

When performing, teach the audience how a beautiful first note should sound. Speak through the instrument, and deliver a message to the audience. Be a storyteller with friendly authority speaking word by word. Although the audience may hear long phrases; the artist creates phrases note by note.

Strive for flexibility by directing the air away from your body.

Your body

Form a pattern of performance physiology through visual memory. Whenever you play, see yourself performing. We've all seen awkward, ill at ease performers. In yourself, transform regions of stability into ones of change. Establish performance habits away from music, meet challenge first as a human being. Have a carelessness of technique but a sharp accuracy of your brain's musical image.

[Young trumpet student (15 years old)]:

For articulation: Rub tongue on the floor of the mouth. Say TA, LA, TALA, LATA.

Don't encourage mediocrity; play at your best; don't be second class in the head.

Memorize the sound, not the feel. Away from the instrument, guess at a pitch, and check yourself using a pitch pipe. Convert printed notes to sounds as quickly and surely as you convert printed words to ideas. The word run stands for the idea run. The printed note D stands for the sound D. Solfege develops the brain.
See the Kodaly *333 Singing Exercises* (Boosey and Hawkes) also the Pasquale Bona *Rhythmic Studies*.

fff----------half way----------*ppp*

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The point half way between dynamic extremes is the norm for general playing. Establish quality at the norm, and keep this quality while working toward the extremes.

The first half hour of playing each day -- play simply, and sound great. Play songs, Christmas carols, and slurred scales. In the next time block, be challenged, but remain free to make errors.

The oboe uses the least flow, highest pressure of the winds. To change the balance of oxygen and carbon dioxide, slightly hyper-ventilate. This is in preparation for any very long phrase for any instrument. Open the space in the oral cavity and lower the tongue. Increase the air quantity. Never sacrifice quality of tone when reaching for a larger size of sound. Get the most result for the least activity. For a buoyant sound: The tone of the instrument is a ball riding at the top of spurting water. For loud playing the ball (the tone) rides high on a tall jet of water (a large, fast moving stream of air). For soft playing, the ball rides low on a short jet of water. Work at the peak of ability (even in two bar phrases) then extend the goal. Use rhythmic breath drills as a preparation for a fast breath.

Balance air in performance. As we inhale and exhale, the atmospheric pressure outside the body and the air pressure inside the body is in balance. We inhale, expanding the torso, the air pressure inside the body drops and the higher atmospheric pressure outside the body rushes in. We exhale, collapsing the torso, the air pressure inside the body increases and the air under this slight pressure rushes out. We increase the pressure by 10 or 12 ounces to meet the demands of our instruments to successfully perform under most conditions.

Use air as needed for piano or forte without pressurization. Use minimal motors to eliminate all unneeded muscle tone or isometric contraction. Motion makes pressure.

Inspiration = enlargement. Expiration = reduction. Never lie to your body, communicate with tissue for a product oriented activity. It is not compatible to play and be static.

Study a slow breath with minimal motors to gauge the felling of air entering and leaving. This practice prepares you for the fast breath necessary in performance. Practice slow and fast breaths away from music. Meet the challenge of controlling the breath as a human being.

See the breath move a sheet of paper or blow out a match. Use visual aids to validate the blowing. Familiarize yourself with the effect of your blowing being outside your body.

Investigate suction using minimal friction. In addition to visual aids, be familiar with the sound of air moving across your lips.

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The hollow sound of blowing is the first sound to achieve and remember. Next, achieve the same sound while inhaling. In both cases, this is the sound of moving air. Suction in, blowing out -- both at the same velocity. Use arm motion of a bow arm moving from frog to tip to enhance the learning process of a slow breath. Keep the arm motion as the breathing practice becomes faster.

A fast replacement breath is impeded by "trying to relax." A quick change of direction (in this case changing from exhale to inhale) is a sufficient trigger to disable one set of muscles and enervate another.

Know the capabilities of your air supply: Measure the time (in seconds) of a one breath phrase of music. Play a long tone for the same number of seconds in various ranges. Become familiar with the flow rate to produce a given loudness in a given register for a specific length of time. Using minimal motors increases the efficiency of this exercise.

[Trumpet, London, Ontario]:

Exercises in blowing out matches help enliven the image of air working outside the body.

Move artistic goals to the foreground of playing. Play "by heart" for the first 30 minutes each day. Directly connect the song in the brain to the performance on the instrument. Improve the first note. Play the first three notes of a phrase: 1,2,3. Nest, play the notes in the order: 3,2,1. Is note 1 better on this second try? Learn how note 1 can sound best. Make each note worth $500, not $5. Practice scales playing them like they were passages in a concerto.

Make up words to the music you play; sing the words through your instrument.

Use a mirror to see what you look like during your best inhalation. Whether you are playing, doing breathing exercises, or working with visual cues, keep the vision of your "best" inhale as a model at all times.

Practice the lyric love song on the mouthpiece and on the instrument. Start with what's right, not with what's wrong, and then move into areas of challenge.

[Trumpet player from Mexico City]

Play by statement, not by feel. Do not use self-analysis; do not ask questions; rely on musical thought to give orders for making music.

Do three cycles of deep breaths for flexibility, and then play.

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It is better to breathe based on the lower part of the torso than one based on the upper part. Why decide? Use both areas at once.

When you play the right notes on the mouthpiece, you will play the right notes on the horn. Establish playing the mouthpiece as a challenge, just like playing the instrument.

[Hornist from Oklahoma: Mozart Concerto]:

Build a phrase note-by-note. Although we hear notes as phrases, we perform notes one at a time. Substitute words for notes, especially to assist entrances. Have the sound of a great performance dominant in the brain.

Have the proper pressure of the mouthpiece rim on your lips before playing.

To improve a pitch in a higher register, play the pitch an octave lower three times, then as written. (G, G, G, g) Also, play the note and depart scale-wise to notes below. For refining note "8". Play 8,7,8,6,8,5,8,4,8, etc. In both cases, have the lower notes "teach" the higher one. Remember a high note is just fast vibrations and a low note is slow vibrations.

Notes by Charles Lipp, bassoonist-composer, writer for a software company
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APPENDIX 6

Arnold Jacobs Master Class 1990

By Charles Lipp
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AUGUST 1990 Notes -- Monday

Arnold Jacobs' background in music
Music as only profession
Encouraged at home
Discovered that music may be looked at as an art form and as a science
Learned to play by ear, wrote own trumpet fingering chart
Flooded the brain with great examples (Herbert L. Clarke)
Playing by ear leads AJ to study brain's participation in making music.

Adoption of body to instrument lead AJ to realize the mechanics of body use -- although this knowledge is not needed for music making.

We must consider development of an individual as product of all experiences. In music today, too much emphasis is on instrumental skills and not enough on musicality.

Find what thoughts bring success? Simplicity, not complexity of knowledge provides the precise physical control needed to perform. Get mind off of research and allow mind to hand motor functions to lower brainstem. Find an order to thought processes for all direct musical development.

Be a story teller in sound. Express emotion in music. Play to feel better.

Divisions of the brain that are used for music making are simple. Learn to stay out of the body's way for direct music making.

What the brain hears determines the body's response, not what the body feels.

The embouchure is a "basket-weave" of muscle tissue. Direct commands can't separate individual function. The brain activates the areas needed to produce results.

The body's system of nerves is divided into two sub-systems: sensory and motor. Each sub-system of nerves is a "one-way street." Electrical impulses travel in one direction only. The sensory sub-system transmits to the brain impulses about our relationship to the

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external world. The motor sub-system broadcasts from the brain impulses to change our relationship to the external world.

The external environment is observed using sensory nerves and affected through motor nerves.

The feedback of listening to ourselves presents problems because of the independence of the sensory and motor sub-systems.

The teacher can show a beginning player the difference between observing and performing. The teachers take the student's instrument and mouthpiece (so only the player is the variable) and plays a single tone as the student observes (both watches and listens). After a long moment's wait, the teacher plays another tone and then another. This develops the student's ability to recall a sound. The student attempts to perform the same sound.

Performers have a sound in their head (recall of a model) and a sound in reality (how they utilize their instrument). The best start is by imitation of a great player. After using models of excellence then ask the question, "Do I sound the way I want to sound like?"

Trumpet example:

AJ begins talking about the lack of problems and urges "basket case" players to perform in class. Says this trumpet player has a well developed musical brain, tissue, and lung capacity.

Works with "breath builder" for directing attention to inspiratory function -- to get suction with minimal friction.

Out of crudities, develop skill. Find the minimal motors to move air with greater ease. Because muscles of our bodies are configured in pairs, there is a potential for stiffness. During the performance of an activity, un-needed muscles are often inhibitors.

The body uses the respiratory system in three ways

For respiration, a bellows system of enlargement and reduction -- This mode is for wind playing. Only about three pounds of pressure can be generated by this system.

For defecation and childbirth -- This uses pelvic pressure (closed-throat, downward pressure). Many pounds of downward pressure are generated.

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For combat -- Tension in the abdominal wall protects vital organs and stabilizes large muscle groups for "fight or flight." The muscle groups here can support weights of over one hundred pounds.

Players become involved in pressurization unwittingly. The direct ordering of muscles to provide air pressure rather than air flow leads to constriction of the air path.

Posture
The small inward curve in the lumbar area of the back is natural. Stay tall even when seated by maintaining this curve when either standing or sitting.

The Psychology of inhalation

Visualize the air as wind; move wind out and in

Breathe to expand, not expand to breathe -- Body expansion is the result not the cause of moving wind.

For specific development, alter stimulus to alter behavior.

Use less pressure but use more flow

Inhale/exhale with breather bag to observe air flow. With a short tube in the mouth, explore the sensation of air moving in and out. Constrict the flow in the tube and notice the difference.

Question: Does the diaphragm control the breath?

There is no system of nerves in the diaphragm to tell the brain what position the diaphragm is in. The diaphragm only has pain sensing nerves. Suck air in and the diaphragm will perform.

Many students equate air movement with air pressure. Order air as wind. Remember the contracted torso can support 100 pounds; only three pounds are needed for air flow.

Trombone example:

Several styles used during warm-up (very good!). A multi-style approach is important but neglected by "trained" performers.

Players are often too used to reading notes and don't rely on memory for generating music.

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A crowded oral cavity with tongue and tonsils can constrict air flow. Say *"tee, yee, tee, yee"* to experience a constricted air flow. Say *ah, oh, oo* to experience an open airway.

The tongue is an unruly muscle. Even though its nerves have four times the fire power compared to the biceps, the nerves provide very little information to the brain.

Learn the dimensions of the tongue and the oral cavity from spoken language. Language is learned so early that it serves as an excellent model.

Exercise:
In a regular pulse, say *"ah, oh, oo, oh, ah, oh"* then inhale. (Inhale in time.) Discover the sensation of inhale through a large oral cavity. For recognition, move activities to extremes.

Don't stop air before starting sound. Achieve a smooth "up-bow, down-bow" quality to inhalation/exhalation.

Balance the breath/embouchure connection.

The word "who" is an example of a blown attack. The word "too" is an articulated attack. Practice the different attacks away from your horn. Say "who, too, who, too" and balance the air flow. Check the air flow by "articulating" on the back of your hand. Use the same air flow but with only the addition of the "t" for "too."

With your instrument, practice sequences of five blown attacks with no stopping the tone between attacks. Five quarter notes, no gaps, only blown attacks.

Think like a child so simplicity comes through.

Rely on mental sound pictures.

Don't practice as a teacher teaching yourself.

Question:
Will different language backgrounds produce different articulation skills?

A much qualified yes -- At first, ingrained language training set the norm, but a concept of musical sound and training overrides the language skill.

How you want to sound is the chief control.

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JULY 1990 Notes -- Tuesday

Question: Did the trombonist in Monday's session have problems with the pallet rising properly?

AJ looks at the oral cavity in general: size of tongue, tonsils, feels for tension. An open throat is a relaxed throat. The goal is to promote general relaxation in the area rather than to pinpoint the specific component which gives difficulty.

Everyone can cope with the air pressures demanded by music performance. The one exception -- After a poorly performed tonsillectomy, a trumpet player was unable to handle pressures of four ounces without air escaping through the nose. For trumpet playing, six to seven ounces are needed for soft mid-range playing. Even this minimal amount was impossible for the performer. The operation effectively ended the player's career.

For a performer to examine a specific area of the body, the study of function must be made away from music. An examination of the back of the oral cavity, for example, would include a study of this area as it functions in the activity of chewing, swallowing, and language production. Exercises to normalize function are established away from music to correct a malfunction.

The instrument often becomes a trigger for conditioned reflexes. It is the sum of all the good and bad musical experiences. To avoid conflicts, remove the trigger. Work with the instrument aside. Sight is a powerful stimulus for functional improvement.

Work with auxiliary equipment which uses visual cues.

Question:
Discuss the breathing tube used by the trumpeter in Monday's class.

Conditioned response to a stimulus is the norm. If we desire a changed response, the stimulus must be changed. Students often understand verbal instruction but can't communicate with their bodies. The introduction of strangeness is needed to start change. The tube helps put the focus at the back of the oral cavity. In general, these devices promote non-verbal awareness. Use the tube to get away from music -- then work on transference of new skills to music.

Jacobs began work with physicians to discover function away from music. Got first spirometer, began studies at the University of Chicago using Chicago Symphony wind players, began accumulating equipment from heating/cooling industry. For $5000 equipped a studio that gave the effective information of a $25,000 lab.

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Often a "musician's breath" (low or regional breath) doesn't extend to the top of the lungs. Use the breathing tube (about 7/8 of an inch in diameter, three or four inches long) to focus attention on the air entering the mouth. Partially block the opening to change the flow rate. Feel the air entering at different rates.

A full breath involves complete enlargement. Establish full-empty cycle to increase enlargement. You feel air movement within the body only above larynx. The breathing tube puts the focus on this area. A compound flow gauge can be added to the set-up to provide a visual cue.

Breathe through a soda straw. Notice the resistances and the flow of air. Cut the straw into two pieces and feel the change in flow. Cut into three or four pieces and notice the differences.

At all times during these exercises keep the abdominal area like jelly. Weakness is your friend. Tension on the frontal abdominal wall is a trained response (probably from mis-training). Very little strength can produce much motion of air. Learn about air as motion.

Great power in torso is wrongly brought to performance. The biggest problem is to make students aware of the subtle. Pressure becomes downward, pelvic pressure as throat closes. This subtly shifts the function from one of respiration to one of pelvic push.

"Blowing from diaphragm" is impossible. The diaphragm is the main muscle used to lengthen lungs and lower organs -- it descends and lower air pressure in the lungs results. It raises as it relaxes. The high position of the diaphragm is the most relaxed.

The "low breath" with expansion in the abdominal area (but not in the chest) is usable -- especially by woodwinds needing only a low flow rate. We must follow through like a good athlete and use the entire torso for a full breath, not just a small part for a local breath.

When sitting, don't collapse, allow inhale and exhale to occur with simplicity. The torso as a bellows moves air simply.
Study air not muscles. Music is the big deal not physiology. All physical functions have control systems in the brain. The body is too complex to control by direct brain command. The untrained "natural" musician produces results by studying the product.

Study breath, not the body.

Scales are not an end in themselves. Don't play drills, play scales as music -- part of a concerto for example.

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Performance is 99% knowledge of music and 1% other information.

Question:
Sometimes students expand the chest and contract the abdomen during inhalation.

This is a reshaping process. It's expanding first breathing second. Work for full lung volume away from music. Make challenges away from the horn. Blow strips of paper as a visual cue. Learn to tell the truth about what the body does.

For blowing problems, work on inhale, establish motion. Turn the attention from problem region to the simple act of air going through the mouth.

Don't un-do or inflict remedial teaching. Start specialized work away from music. Protrude and contract mechanically but with no respiration. Notice the "piston up/piston down" action. Combine intellectual recognition and physical sensation. A mirror provides sight cues.

In a six liter bag, practice filling/emptying the bag by re-breathing own air. Get the feeling of motion without hyperventilation. In this exercise the muscles of enlargement will learn to work apart from the muscles of reduction.

French Horn example:

Slight forcing; a little too much effort. Exaggerate sense of flow and ease will come into the tone. Work in the middle range first, then add extremes. Introduce new senses and still talk to the audience. Reduce back pressure and increase flow.
Rub the tongue on the floor of the mouth, say "*ta, la, ta, la.*" Know by feel the dimensions of the oral cavity. Blow a thick steam of air.

Work with Inspirex (incentive spirometer), a hospital device for therapy. Use sight to eliminate internal conflicts. Be aware of breath at the top of the system -- air at the back of the oral cavity. With the spirometer, go from maximum resistance to easier resistances. The first, massive challenge gets the inhalation muscles separated from the exhalation muscles. Later, with the spirometer, work on ease. Remember that low air pressure is high air flow.
Hands on abdomen, three times protrude/contract with no air movement, three times protrude/contract sucking air.

When the horn comes up; be a storyteller; sell the sound, emotion. Sing every sound in the head. Don't practice with mediocrity.

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Inhale at front of mouth (air flow gauge for visualization). The regions of the brain concerned with respiration are always at work. The problem is to communicate with them.
In a cartoon, the words appear over the characters' heads in a balloon. Imagine a balloon over your head and suck the air from it.

Learn about "flab" and weakness. Don't develop strength for musical ends. We must weaken ourselves, then apply only the needed strength for music -- it's not very much strength!

Tuba Example:
Teachers attention: With young players, aim for quality of phrase, not phrase length. Don't do a long bow task with a short bow.

When the first note won't speak, the sound in the brain is lacking. Keep singing in the brain. Have two voices: one in the head singing to communicate musical message to muscles, one on instrument singing to audience.

Don't ask questions -- make statements.

In a long piece, it's not necessary to always start work at the beginning. Start wherever work is needed. Give attention to phrase, music, character of tone, to singing. Treat the embouchure as vocal chords.

Question:
Difficulty getting full chest expansion.

If you expand to breathe, this reflex will come into play. Learn about the fast breath from slow ones.

Slow breath exercise to develop sense of fullness and emptiness. Work for six months to two years. "Help" the breath in and out with an accompanying arm motion. Be patient with yourself.

Breathe in for 5 counts (or 7 if you have a large capacity) Blow out for 5 counts (or 7)
Breathe in for 3 counts Blow out for 3 counts
Breathe in for 1 count Blow out for 1 count

Breathe in -- fill up one half at a time
Blow out -- release one half at a time
Breathe in -- fill up one third at a time
Blow out -- release one third at a time
Breathe in -- fill up one fifth at a time

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Blow out -- release one fifth at a time

Breathe in, hold breath -- but without closure in the airway
"Be surprised," notice the sensation of the expanded torso
Breathe in and blow out. Notice
the sound of moving air
air movement (use a paper strip as a visual aid)
the feeling of moving air at lips

In 5/4 time: Blow out for counts 1 through 4
Breathe in on count 5
In 4/4 time: Blow out for 3 1/2 counts
Breathe for 1/2 count
In 8/8 time: Blow out on beats 1 through 7
Breathe in on count 8
In the meters above, with different tempi
Always observe a large quantity of air passing the lips.

JULY 1990 Notes -- Wednesday

Hyper-ventilation is the imbalance of oxygen and carbon-dioxide. For wind players, it's really only a problem for the high flow rate instruments. Some players of low flow rate instruments like oboe may intentionally hyper-ventilate to achieve more sustaining power.

Question:
If AJ had to assign the tuba to a junior high student, what traits would he look for?

The desire to play and love for the instrument are most important. If the student is small, it's likely that the air capacity is small too. This would be akin to using a short bow on the violin. Good music can still be made.

Question: Can a breath be "too big"?

Correct breathing is stretching and relaxing motions. If you expand to breathe, straining might result, but if breath is the focus, the body follows in the correct configuration.

Breath expulsion may be generated by elastic contraction of the body's tissues alone. See figure: 3/4 of a pound of positive pressure can be generated by relaxation pressure as tissues attempt returning to their relaxed state after a full inhalation. During exhale pressure decreases. On the "last half" of the breath (negative side of the chart), effort is expended to "get all the air out." A healthy body can exhale 80% of the breath in one second and remove the remaining in the next two or three seconds.

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During playing, learn to use the top half of the capacity for music making. All recovery breaths bring the level back to full.

Often, incorrect playing relies on the middle third of the breath, never refilling back to the top of the capacity. A shallow breather doesn't retake enough air and has less quantity to proceed. Playing with shallow breaths is similar to playing a violin only at the tip of the bow.

Be comfortable at phrase ends. Most players breathe for the first notes. Better is to breathe for the last notes of a phrase and ensure their quality.

Exercise:
Take in a great breath; keep the throat open (no closure, a feeling of "surprise"), say "one," pause with throat open, say "two," pause with throat open, say "three," . . . continue. If you are not used to taking a full breath, you may be tempted to close the throat and pressurize.

Use the tongue as a focusing tool, not as a valve to stop the air. The consonant "T" is unvoiced it only build up pressure. An instrument's tone is a vowel. Emphasize the vowel of the sound's sustained part; minimize the "T" of attack. tOO or tA
Start with a long tone then articulate. A half note followed by four eighths. Does the articulated material have the same tone quality as the long note?

Don't set rules about the placement of the mouthpiece. Stabilize the music, not the tissue. If a young student has problems with embouchure placement, be sure the airflow is in good motion. Play music on the mouthpiece. Challenge with music and skill will develop through the strangeness. Let the placement of the mouthpiece work itself out. Don't always answer how-to questions. As the music sounds better, placement will improve.

Question: Is it wrong to fill-up with air from bottom to top?

"From bottom to top" is not a necessary concept. Start with suction at the mouth, and let the air go where it wants. Proper enlargements will follow.

To use a complex machine, know what buttons to press. Make simple tasks simple.

Don't let a voice teacher teach you breathing for wind instruments. A singer's low demands on the breathing system allows for

OK results with misapplications.

Trombone example: Plays etudes, orchestral excerpts.

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Play some material on mouthpiece. Meet the challenge to make music on just the mouthpiece. Play with song and wind on the mouthpiece and then on the horn. Play with the mouthpiece on a spirometer, then on the horn.

Don't focus at the tongue; focus at the vibrating lips. Give the tongue no importance; magnify the use of the lips.

In a phrase, don't by-pass any note. Play a phrase of notes like walking up a flight of stairs -- don't skip any, step on each one.

A worried body is difficult to work with -- a body asking questions is moving towards a "fight or flight" stage.

Use your body at its tallest and longest with a relaxed frontal wall.

Play three low Ds and then three and octave higher. Have the lower D teach the upper one.

In playing, tone color is dominant. The sense of a love song is present. Start with the authority of a powerful mental concept.

Make your job easy -- let language work within music.

Wrong: TA Right: tHA

Say "*who, too, who, too*" -- same air flow same sound of moving air for both words, only the smallest "t" is added for "too."

The strangeness of a new approach should not be an inhibition; enjoy the strangeness.

Question:
What is the difference in breathing potential between a man and a woman?

Comparing a man and a woman of the same height, weight, and body type, the woman will have about 20% less air capacity. However, keeping the song in the brain is the more important issue.

Do a variety of things with the breath that show results outside of the body. Blow out matches, blow up paper bags, blow paper boats in water. Work with visual cues.

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Increase your potential for inhale to its fullest: After a full exhale, wait (in an empty state) for 20 seconds, then inhale while raising your arms. Notice the expansion.

Question: How do you evaluate students?

By observing their size and body type and comparing with the instrumental sounds they make. A student with a very large breath potential can under-use it. Take in an excess amount and monitor the flow at the lips.
AJ lost 50 pounds and gained a liter of air capacity. Lose weight, gain air.

Flute example:

Play an articulated passage under a slur. Work toward and excellence in the slurred version. Retain the tone color of the slurred version when the articulation is re-introduced. The slices of bread have the same ingredients as the whole loaf.
Singing *bel canto* qualities of tone must be present in articulated material.

After a silence, the first not is very important. It establishes the high quality. Have a role model in the brain and match it. Don't allow .10 cent notes, always play $100 ones. Have tone qualities of lyric music in fast articulated passages.
Think of the flute and the brain sends "flute playing" signals. Breathe without regard to the instrument, then play.
Work on the psychology of the inhale not the physiology of it.

In the five count breathing exercise of yesterday, use arm motion to pull quantities of air out of the body. Have the same sound of moving air in as moving out.

Tools of the artist dominate. Put the attention of breath in perspective.

Avoid paralysis by analysis.

JULY 1990 Notes -- Thursday

Some of the tools used this week:

Inspirex (incentive spirometer)

WPS (6 liter bag)

Voldyne (volumetric exerciser) from Cheesebrough Ponds, Inc.

See-Through Human Anatomy (the "thin man" chart) from George Cram Corp.

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Question:
After practicing for 20 or 30 minutes using very full breaths, my rib cage felt sore.

First make application of these techniques away from music. Take comfortably large breaths at first. Start with a flow that doesn't relate to music. Get familiar with movement of air as motion, not static pressure.

Question: Why do I have a tight, "bottled-up" feeling when I play the oboe?

With a low flow rate instrument like the oboe, static pressure immobilizes the torso. The bellows-like function wrongly becomes a pelvic or static pressure.

Hold the back of your hand a couple of inches from your mouth.

Say "who" at the back of your hand.

Say it several times remembering the feeling of air at the back of your hand.

Achieve the same feeling of air movement by "blowing" a silent "who." The brain deflates the lungs starting with no pressure build-up. With a valve (tongue) release, pressure builds behind the tongue then the air is released (at times explosively) to the embouchure.

Work toward a blown release even in forte. Keep the ease, freedom, and quantity even with massive air requirements.

Question: What was your greatest teaching problem?

A tuba student couldn't match a pitch. He would hear a pitch but would be unable to sing it back. Students who have great retentions can build a memory bank of musical experiences. The problem is to educate the brain to music. To educate this "tone deaf" student, a single note was played on the piano. After a long silence, another note. Surrounding the notes with silence allowed the student to build a memory of the isolated event. The student had to carefully post-hear each note. With a twelve window strobe, the student would hear a tone, see which wheel would "stop," and after a pause try to stop the same wheel by whistling. Slow gradual progress finally built an ability to successfully match tones.

Tuba example:

Improve bellows motion of torso; get smaller when you blow. Establish music in the mid-range; transpose material that sounds good in one octave and maintain excellence. The fine qualities of one register are introduced into extreme registers.

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Be a great artist in your imagination. Don't listen to results, but imitate sound in your head. When you ask questions about playing, you're no longer in charge.

Practicing is 85% making statements and 15% asking questions.

Start with bad sounds and make them into good ones. Silence can not improve.

Don't allow standards to change when you play.

In the low register, use a thick column of air. The small embouchure of the high register trumpet also uses a thick stream of air. High notes are fast vibrations; low notes are slow vibrations. Don't make a big deal out of the number of vibrations. Approach range as a performer and always strive for high quality.

Question: How do you get the image of a good sound into a student's head?

Have a good play present a live demonstration (preferably with the students own instruments and mouthpiece). Develop a feel for playing by playing on the mouthpiece only. Mouthpiece playing is important away from the full instrument.
Question: Describe the non-musical equipment used this week.

The equipment is to provide a visual stimulus. The tools show moving air and are helpful in development away from the instrument. They introduce strangeness, some can be adjusted to vary the resistance, some can be used with a mouthpiece.

Trumpet example:

Use slow air for piano; fast air for forte. To ensure a large fuel supply breathe as if the whole page were to be played in one breath.

With a mirror, check to see if you look the same or different when comparing the breather-bag exercises with trumpet playing.
Create note-by-note in your head and on the horn. We may hear music phrase by phrase but we play it note-by-note. Don't settle for less than the best. Establish quality in the mid-dynamic range and keep the quality in the louder and softer dynamics.

Bassoon example:

Low breathing with no use of chest. Chest immobilized producing an uncomfortable feeling while playing. With hand on sternum, be aware of the sternum rising during an inhale. It must rise up, not out. A long tall body keeps the ribs in the correct configuration during inhalation and exhalation. During a quick inhale the rapidly rising sternum frees up the lower area's muscles.

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In practice, play for an imagined audience.

JULY 1990 Notes – Friday

Question: Can you learn "absolute pitch"?

You can come close by carrying a pitch source around with you. Zero-in on one pitch and check your memory of it. Can you play a pitch on the tuning fork or pitch pipe and remember it for a long time? How long? Throughout the day at odd times, recall the pitch and check yourself on your pitch source. Use a portable keyboard to check your pitch sense on a melodic line.

Can you sing the first note of a solo or etude before picking up the instrument and playing it? Can you remember a pitch with more ease by imagining the fingering? Improving inner ear skills away from the instrument will strengthen your aural imagination.
Be flexible with your intonation in ensemble situations. In an orchestra, don't insist that you're the only one "in tune."

Question: What kind of warm-up do you recommend?

If you play a lot, you're always in shape and ready to play. Phil Farkas (Chicago Symphony first horn in the `50s and `60s) used an hour warm-up before each concert. He'd sound as good on the first note of the warm-up as he would sound at the end of the hour. If he would arrive too late for the complete warm-up, he'd still sound great in the concert. His warm-up was really to become comfortable with the concert environment rather than to "warm" the embouchure. Once the brain and the embouchure are connected, you're ready to go. You don't need to have an athlete's warm-up to promote blood flow. The embouchure always has a great blood supply. The best warm-up of brain/tissue connections is to find the norms of a great sound in the mid-range using a mid-dynamic. Then as you play, expand the pitch and dynamic ranges.

Question: How early should students begin to learn new breathing techniques?

AJ at the age of 15 knew music, not physiology. Let music be the teacher. Don't let students get into the mode of "how do you do it?" or "how should I do it?" The concern is how we sound.

Poor teaching -- "support with the diaphragm" -- misses the point. The diaphragm pulls down during the inhale. It relaxes during exhale.

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Trumpet example:
Player changed embouchure while in school. A successful jazz player; then difficulties with classical repertoire. AJ: Jazz was from the brain, classical was from trying to play "correctly."

Use the embouchure as the focus of performance not as blockage for the air. Buzz a mouthpiece ring to put the focus back at the lips. Use thickened air with a great inner song. Stabilize the lyric qualities of the trumpet sound. Allow the embouchure to change if it wants to.

Remove conflict, sneak in the backdoor of problems. Attend to brain work; get organized in the art form. The instrument will follow.

For octave leaps, let the lower octave educate the upper one.

Play a "C" on the trumpet, play a "C" on the mouthpiece, play a "G" on the trumpet, play a "G" on the mouthpiece, play a "B" on the trumpet, play a "B" on the mouthpiece, without using valves play a "B" on the trumpet. Notice that a "B" is sounded but with no resonance from the trumpet. If the music is present at the mouthpiece, it will come out of the horn.
Solfege converts written notes to sound -- a great mental/musical exercise. There's a great deal of danger in converting printed notes to fingerings. Solfege is a good challenge for a beginning player. Exercise to refine the skill of converting printed notes to music.

There is a danger in acquiring information without also practicing the ability to tell stories in sound and impart information. When learning, use the sense of sight and hearing. Allow the senses to multiply and reinforce learned information.
Question: How does a reed player use the analogy of the embouchure as vocal cords?

Perhaps more help does come from using fingerings on a woodwind than on a brass instrument. However, establish recall of pitch. Play known material from memory. Spend time learning to tell a story. Sing the music.

Question: What's the best way to use a mirror while your practice?

Look at your general appearance in the mirror. Don't ask questions or look for distress signs.

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Trombone example:

Holding the horn is often a precondition to "hearing" a pitch with the inner ear. It's a good cue, but also develops skills away from the instrument.

Breathe with large movements but with weakness. Replacement breaths are the same as the first one. The primary friction of incoming air is at the lips, not in the throat. Suck in air and the brain orders the machine of the body to perform correctly.

Oboe example:

Use air flow, not air pressure. Start with wind. Blow wind outward past the embouchure as if nothing is in the way -- although the reed is really at the lips.

Work to end conflict between breathing out muscles and breathing in muscles.

Think of air as a column of water gushing up. The tone is a ball buoyed up by the column of air. Bring the expansion/contraction of the abdominal wall into play even if you pretend to have motion.

Question: How should we practice?

A practice routine includes time playing in a singing *bel canto* style to find the best tone qualities. Determine what you want the audience to hear. Work in the mid-range of both register and dynamics. 40% of the time is spent on drills. Even during this time, make music with a high standard. Repetitive material could be just as well found in a concerto as in a scales study book. 60% of the time spent on interpretive music. Develop musicianship -- even with children's songs or folk music.

Question: What suggestions do you have for doublers?

Doubling is not for elementary musicians. Always keep artistry in the foreground while playing the secondary instrument. Keep a program of practice that includes both primary and secondary instruments. Play the secondary instrument at least two or three times a week.

Notes by Charles Lipp, bassoonist-composer, writer for a software company
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APPENDIX 7

Arnold Jacobs Master Class

United States Marine Corps Seminar 1991

Transcribed from original videotape by David Kutz.

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Introduction

(General Bourgeois)

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

(Arnold Jacobs)

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, it's 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.

I just want to say again that I am honored to be here, I love band music. 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 up with 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 [other] parts. I know that there are nine measures in a Chorale at the beginning of the slow movement [of Dvorak Symphony no.9]. I was playing it at Gunnison and they gave

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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 [retired] 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 but I can't carry it. 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.

Once again I must confess that I have strange feelings about doing these classes. When I left the symphony, I was invited to the Minneapolis Orchestra for their enrichment program. They brought in Janos Starker for the cellists, André Watts in there, and they asked me if I would spend a week with them for their wind players 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. Then 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... 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.

Respiration

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

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we are discussing the subject. After all, if you are discussing the *Lamaze* 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 a simple 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. All right, 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 here, I could call for a volunteer-- a male, and 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].

Previous Thoughts on Pedagogy

I have been teaching for many years, nearly a half century, and I have run into all sorts of body types; somatotypes of individuals, which are important. Ideas about respiration, how to breathe, what to do with it--these ideas 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 when 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 quite small--also with small instruments. Flute players have similar problems as we do in the lower brass family. But the big voices [opinions] were from the singers, the oboes and people from the low flow instruments. One of the readings that I did indicated very

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strongly that-- discouraged showing enlargements in the body--that when you take a breath nobody 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 eight ounzes of intra-oral pressure to drive the air, and as high as 20 ounces in very loud playing. 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 5 ½ liter lung capacity. That means he would have all sorts of air left even after a minute. 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 [to the oboe].

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 out breath is, and we have to have enough--it don'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.

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They were not practical for all instruments, they worked in some cases, and 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, and create the tests to find out. Of 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, the general range of use of air and air pressure in the clarinet compare it to the tuba. Compare it to anything else-- each instrument has its 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 also 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 somatotype 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 to worry. If he is playing a low flow instrument like the oboe, it doesn't bother me, but if he is playing flute or a 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 he isn't and he 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

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like a breath that when you finish a phrase that you have some reserve, that you are not out of air.

Again in looking out into the audience 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. 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, which 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.

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Stimuli, Nerves and Reaction

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 Strauss' Till Eulenspiegel opening theme, plays again on the right side of face, then left, then with crossed lips...)* As you see, you can't stop it, the lip 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 every 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 sides] are all undeveloped fiber groups that I would have to develop to be highly functional as a player, but 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 mouthpiece 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 that he could play in more than one position. 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,

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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 reflexively to a stimulus. If you poke your finger in your eye, you would have a real difficulty because that eye would close automatically as your finger got close, it would be a natural biological reflex. With a conditioned reflex, you touch a hot stove, you will have an instant withdrawal. The next time you are in that situation, 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. We are using all sorts of conditioning factors which we develop in practice; we develop 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 stimulus first. This is important information because it makes things much easier once you understand it because it is so easy to make these transitions, and we will be getting to this 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, and 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, you just change direction-- go the way you want to, that's all. 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.

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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, my body language and all of this. You can hear me through the auditory nerve in 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 five 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 from 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, and 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 (Jacobs taps microphone). I did this as a motor activity. I wanted to make some noise so I touched the microphone and made some noise. That is psychomotor--the thought that proceeded the actual movement. The nerve is a one-way street; the electron flow from the brain to the effectors. The sensory nerve is a one-way street where it goes from the receptor to the brain. It goes inward to the brain and it is one-way street. What is not readily known is that playing a brass instrument or 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, twenty million dollars--you have a job to go on to 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 you. Those of us in music do this all of the time--These are our tools that we use as

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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.

Habits

I think that the simplest way to put it; as we are growing up, our habits 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 of 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. The mind is tremendously active in the gathering of information—but how active is it to send information? Those of us in music must 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.

Experience: The Curtis Institute, Chicago Medical Studies

I received a scholarship when I was fifteen years old at the Curtis Institute of Music in Philadelphia. My practice studio was situated along the corridor where people had to walk by my studio to get to some of 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 out faculty used to walk by. There was no way that I was going to sit in my studio and sound bad by taking music that I couldn't play and letting it be obvious to the rest of the people outside that I couldn't play it. I'd either

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slow it up and play it note by note or, play it an octave lower if it was too high, or and octave higher if it was too low, but the very difficult things I would take home and work out. The rest that I would work at in the studio-- I always had to sound good, and I was only fifteen years old when I started--my instinct told me "don't sound bad." I attribute a lot of that to whatever success I had later to that marvelous conditioning of being forced to have people like Reiner and Stokowski walking by my studio where I couldn't see them, but I knew they could hear me. I do this now with my students at a professional level where, based on the imagination, I always have them playing for someone else-- not themselves. Play for a tape recorder-- listen to the playbacks later. There is always going to be some feedback where you hear yourself while you are playing, but it should be at such a low level that it doesn't interfere with your 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, we 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 will have to tighten down because this gets heavier-- then with 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 asked me to stand as still as I could as 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 then had me blow through a piece of tubing; He instructed me to blow as steady I could without a waver. I tried that, and I figured I could be pretty good at that--it should be a successful test. There was always a little line going through it showing motion and when we did it with a mechanical pump, there was no line at all. You see, our nervous system fires at a

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particular rate and our nervous system showed up on the graph. You 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 you body because you don't have to worry about it. Only in music do I find people worrying about using their body's 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—such as 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 an 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, the vibration of the lip. It has 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

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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 reflexively 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 and you have to be somewhat ignorant about tissue and somewhat knowledgeable about vibration.

On Teaching Other Instruments

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 the 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 way 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 *(Jacobs illustrates by bearing down and holding his breath)*. 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.

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Anatomy

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]. The heart is attached to the upper side of the diaphragm, right under there is a little knob called the *ziphoid process* at the attachment at the sternum, and here sits the heart. 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.[Boyle's Law] 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 and 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

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[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, 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 [the neck] will be as hard as a rock-- everything will be all closed up.

Pedagogical Approach; Body Typing

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—this has 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. This is 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.

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Now body typing is a very interesting study. In the Chicago Symphony Orchestra we have a trumpet player named William Scarlett and he is about five foot seven inches tall. He was studying with me some years ago and doing quite well, and I used to notice 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-- Herseth has a very normal structure and he is a great artist. Anyway, 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, and found out that he had about 6500 ml of air. That is ridiculous for a man of 5 foot 7. That is usual for someone who is 6 foot 3 inches tall--that is the lung capacity for a very large person. I called the medical 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 that was the study of body typing. It just so happens that we can take three people of the exact same height with different body types and 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 all sorts of factors that if you don't know about them, and it can be very confusing. That is why it is kind of important that you must not tell a person "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

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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 my maximal lung capacity was around 4 ¾ liters, and I think that the maximal lung capacity came at the age of 20 or 21. In extrapolating the tables backward, I figured that's what I had when I was 20 or 21--about 4 ¾ 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 with Pat Sheridan.

Now, let's 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 equipment) 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). Jacobs 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 intra-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 playing, 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.

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Emphasis of his Pedagogy

This is an art form--it should be considered an art form. I don't like this constant stress on instrumental playing, in other words--I am learning to play the trumpet, I am learning to play the trombone, I am learning the 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-- 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 but you do it in the stylistic aspects of it--what do you want it to sound like? Whether it's 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 girlfriend's sons ask me to teach him the trumpet so I had him come over. I 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

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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 on 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 begins to work more and more towards it. I am a strong believer that you study this-- you study music.

Jacobs' Education

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, but I won anyways. When I was playing tuba, 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. 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. So when I went to school in Santa Monica, I told the bandmaster and he said, "Well, we have a brand new King Sousaphone and nobody to play it." That was my

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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 five dollars. I never saw the money, 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, but 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 lip is doing. Your lip can feel good or 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 should study the phenomenon of buzz.

Buzzing The Mouthpiece

I do not recommend buzzing the lips without a ring-- buzz in the lower mid-range, one octave, and no high notes on the ring at all, because you begin to mask and 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 that 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 cannot come to the precise

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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; it is very beneficial.

I will tell you a story about that. The mouthpiece, 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. When I began to feel a little better my mother brought my mouthpiece for me. I remember they moved me out of this one section to a wing where no one could hear me. I practiced everything I could think of-- I played on the mouthpiece. I was in the hospital about a total of 2 ½ to 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 reflexively 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. Also, even though I was very young, I remember a story being at the Curtis Institute and people would be having troubles with their lips-- 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. 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.

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Breaking into Habits

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 just counters it and sends the same signal that it has always sent, 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 an embouchure that was difficult to hold, but he started a pattern of change that 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 provided the other two. The factory has provided two phenomenon; pitch vibration and acoustical resonance. One soundboard 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 tat 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 two-thirds of the three-thirds 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 pressing a button. Sure we press the buttons, but we have to be very aware of the pitches that we send in and it must have the right length

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of tube that it can amplify and resonate in the vibratory rate that we are sending in. In other words, our brains have to work very much like a singer's brain. I don't think of this like a wooden reed (embouchure), it is like a set of vocal chords...for the instrument. But it has 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, especially when we start getting into the large pitch changes, but if I get into a playing a [whole step], and tuba is like a bass fiddle in terms of size compared to violin or trumpet, and if you are standing beside me-- you will 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 that you have to become a singer in your brain. I was a singer so it was fairly easy for me, but this potential exists in all of us. There is recall and recognition of sound and if there isn't-- I teach solfège, 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 now 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. 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 a tape recorder in my studio and I brought out the Conn 12 window strobe tuner. 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

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silence, re-hear it in the brain where no body else can hear it, because 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.

Vowels, Tonsils, Tongues

The biggest thing then would be blockage of air 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 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 *Hee, Tee, Kee*...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, 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..) [Singing Opening theme from Tchaikovsky's #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

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approached by fear of the tongue or consequences of 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 *[Sings Tchaikovsky's #4 opening again*]. In other words, there going to be times where you want a veiled pianissimo (a 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. As 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.

Conceptualizing

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 breath. I will be going into the ability to take the *snatch*, very fast breath, and the very efficient fast inhalation. It is so easy to do that 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. Do not just take a little gasp but I mean inhale to 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

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of the corner of is mouth and he said that it helped him to help get rid of his air when he had a chance. I work with Mike Henoch, 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 CO^2 level, so he could go through the 45 seconds or whatever the solo was, very successfully because it took that much longer for the CO^2 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 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 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

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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 correctly. 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 to 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? It is 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 breathing with the student behind him. He places the student's hands on his chest and on his side. He breathes in deeply, and then repeats the action 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 [Jacobs is sitting rigid and expanded, not having taken a breath] than when I am inhaling. (*Does the same again*)...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. (*Jacobs 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-- (*works with him*). There is a difference right away, if you expand to breathe in these regions you don't have nearly the

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connection to the brain that this one does. The controls are much more biologically natural if you go by the lips.

Q: What happens if I raise my shoulders when I breathe?

Oh don't worry, the shoulders are involved in capacity breathing. If you ever watch an asthmatic in the middle of an attack, you may have seen them go to a table or a chair, and he would have to hold on as he is struggling for a breath. He may have to raise his shoulders because at this time he may gain a little more space in the upper respiratory system because he will raise the clavicles and he will have a little increase in the very upper lobes of the lungs. It is part of a natural system of function. Now, what they should be teaching is; don't be teaching clavicular breathing (lifting his shoulder and breathing) -- I had a student just recently who had misinterpreted some information about respiration and he was inhaling clavicularlly--and obviously it has very little to do with the respiratory system. This would only have to do only with the upper regions and under special circumstances. Don't take something like that and ruin the rather positive aspects of breathing....What instrument do you play? [Clarinet]

Well, what on earth do you need to play with strength for? The study of physical skills--you may have crudities that enter such as shoulder rising and so forth but out of the crudities will become skill. These crudities will leave you. If you were going to cancel all of the benefits you are going to get simply because one aspect is a little off, you would be very foolish because we are interested in how much air we are getting into the lungs and the whole respiratory system. In other words, you are much too powerful here [in the abdominal region].

(*Inaudible statement*)

Yeah, but you might want to try next time you are practicing to put one leg up on a chair and bend over, then twist your body side to side while you are playing--then run up a flight of stairs. You are going to find that you are still playing fine and enjoying it anyway. Playing in a state of rigidity is not good. You will have to find the state that we

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call *minimal motors*. In other words, how easily can you do something--not how difficult you can do it. More questions?

Q: On the Clarinet, when you have a mouthpiece that actually goes into the oral cavity, I really like this idea of respiration that begins at the lips. What do you do when you have this stuff protruding inside the mouth?

The embouchure is restored with the thought--it is responding to reflex stimuli. In other words, people think that the embouchure has to be held in place are making it a much harder job than it needs to be. All you think of is the music, the pitch, and then you find you have plenty of room by simply [Jacobs inhales and sticks his finger in his mouth]. You can get a tremendous amount of air in a hole as small as that. The big problem in respiration is that you train your nervous system to react to what you do with the lower musculature, and when they reach the apex of contraction, the brain says "alright, you have reached it", and turns everything off. There may still be much more room for air, it may be a much more comfortable way to do it, but you will have trained it to do so. If you would have simply done this with your arm each time (demonstrating the drill of sucking in while bring arm up)...if you use air or wind, as the focal point [Jacobs stops and asks student to come up to demonstrate]. You see, air should be the easiest thing that we do--taking in air, it should be a very simple matter. The music should be the complexity in playing. The interpretation, the styles, rhythms, sonorities--this is where the adult intellect must be--involved in deciding what to do. But the simplicity of just replacing the air, as I will show you as we go along, you want to put that into perspective--you are simply drawing air in. It is like going to a gas station--filling it up and getting back on the road!

I have worked with many adults where they are blowing--there are problems where the air is not being used comfortably as fuel. It is being used intentionally as pressure and as a result, its function as wind is gone. With wind there is always pressure, with pressure there is not always wind. In other words, there is no such thing as wind without pressure. It doesn't happen like that in nature. But, there is pressure without

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wind--that does exist in nature. So we have to guard against the philosophy that you do this, and as you get the wind and ignore the pressure, you concentrate on the beauty of the music you are playing--the crescendos, decrescendos. You would normally say "blow harder"--say that you are "blowing a larger quantity"--change your terminology, it is very easy. You see, pressure triggers certain things in your brain--unfortunately it is part of nature where the whole system of function reverses and we would have to put in rectal gauges in order to find out these pressures because we can no longer find them in the oral cavity. We just have to bring them back to a normal state.

(Jacobs ends session and explains that he will be seeing the participants later in the week).

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APPENDIX 8

Arnold Jacobs Master Class Notes 1993

By Julia Rose (Pernic)
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ARNOLD JACOBS WORKSHOP- 7/26/93

A.
The embouchure is not complicated

It's just vibration- we can buzz anywhere on our lips

We don't need to find placement; we just hear notes

We buzz without thinking

The lips just have to vibrate

When there's air, there's not necessarily a buzz

We need great knowledge of the art of sound and ignorance of physiology.

B.
The brain must have a concept of good sound

Memory is very important

We aren't aware of our vocal cords during speech

We should treat the embouchure as vocal cords

Sound is most important

The adult brain should only be involved in music

The body is only hardware

Demonstration is the most successful form of teaching

Stabilize the sound, not the body.

C.
The nervous system

Motor nerves- carry signal from brain to effectors

Only carries signals one way

Takes orders from brain to body parts

Sensory nerves- gather information only

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We learn through our sensors and act through our effectors

Therefore, always focus on the product, no the process

D.

The nervous system and practicing

You can't use the sensory system primarily when embarking on a motor activity

i.e. listening to yourself play instead of practicing

You must be involved only with the message

Always focus on the product, not the process

If there's a physiological problem, take care of it away from the instrument

The instrument is a powerful stimulus for bad habits

Focus on the person, not the musician

E.

Be a storyteller of sound

There are 2 instruments- one in the hand and one in the brain

The horn in the hand- must be a mirror of your thoughts

Imitation is a powerful learning tool

Hear the ideal sound in your mind always

Don't blow and just listen to yourself

Don't stabilize the meat, stabilize the sound

To drive a car it is not necessary to know how a car works

The human body is too complicated to understand

F.

Sensory awareness can't be involved in performance

You should be aware only of your mind's horn

Don't just listen to yourself when you practice

Demonstration- "Promenade" from Pictures at an Exhibition

Performers shouldn't be afraid to play in public

We're in an art form

Practice so you're performing

We're communicating

Low pressure in oral cavity, high air flow through horn

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Little backpressure

Go to extremes during practice- use as little air pressure and as much wind as possible

You can blow hard but not have much air

Your body can lie- your diaphragmatic area can expand without any air being inhaled

Less pushing, more air

The psychology of suction in inhaling causes less pressure in exhaling

It's almost impossible to be tense when you've taken a free, full breath

G.

Blowing air out freely is the physiological opposite of childbirth and defecation

Don't stabilize the diaphragmatic and laryngeal regions, or else you may trigger the Valsalva maneuver

Don't confuse your body by tensing up these regions and blowing

As long as there's tone, there's wind

Pressure always exists as a phenomenon of wind

Minimize the air pressure, and the tone gets automatically better: we do this by using more wind

H.

Accuracy comes from the brain, not the chops

The "breath builder"- you must use it with a minimum of effort

Because of hyperventilation, you can only do 3-4 repetitions

After working with the breath builder, the horn in your mind must become more important

The tongue should only be used in extreme range leaps

Inhale deep breaths with as little effort as possible

Raise the chest if necessary

Don't breathe deeply according to body motion-just take in a lot of air

When making physical changes, always do them away from the instrument

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ARNOLD JACOBS WORKSHOP- 7/27/93

A.

The tongue

Takes up most of the space in the oral cavity in repose

Ah, Oh, Oo- Are the 3 most open vowel sounds

Ss, K- most closed

You must get the tongue out of the way during playing

'T' is an unvoiced consonant- it cannot make a sound

It's a blockage of air

'T' makes no sound or music whatsoever

The tongue and "diaphragm" can cause the most problems in playing

"A most unruly organ"

It does strange things and consists of many muscles

Stuttering on a brass instrument is caused by isometric contraction

The tension can be felt under the chin

This isometric contraction also occurs in swallowing- it closes off the windpipe

During a deep breath the larynx moves down and opens up

Having the chin down in playing closes off the airway

Inhaling openly and largely prevents closure in exhaling

Static air pressure ('t') we try to avoid

Concentrate on blowing air out, not on the tongue

Think of wind, not pressure

You can't control the meat in order to control the sound

Don't concentrate on the feelings of the tongue or chops

This makes pressure, not wind, the most important

B.

When you play your horn, forget about it all except for the music

Avoid "paralysis by analysis"

15% of thought on respiration, 85% on music

The lungs and heart are attached to the diaphragm

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Don't immobilize the diaphragm area

Think of a piston going down in inhaling and up in exhaling

Don't buzz without the mouthpiece or ring (open lip buzz)- you must feel the lips vibrate

Don't think loud or soft- think tone quality

Strength isn't needed- what we need is weakness

Sit-ups, weightlifting, etc. don't affect playing because we want weakness

No sound from the horn means that you are trying to make sound without buzzing

EXERCISES:

Slow breathing- in 4 counts, out 4 counts

Allows you to "follow through" and use all necessary muscle groups

Also helps for stage fright

Done many times throughout the day

Start with a full lung capacity

A study of the psychology of breathing

Fast inhalation- exhale for 7 eighth notes, inhale for 1 eighth note

Vary speed by making tempo progressively faster

Study of the rapid, full breath (However, don't think about breathing exercises during playing!)

Don't fight old habits, replace them with new ones

In legato playing, slurring is done with the brain, not the valves

ARNOLD JACOBS WORKSHOP- 7/28/93

A.
Strength

654 of our 659 muscles are antagonists to each other

All of us have more than enough strength to play

We want weakness, not strength

Conceive of air outside the mouth, not inside

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A sure sign that things are working correctly

B.

Question: Resuming practice after a long vacation

Focus primarily on interpretation

Find your finest quality of tone- even on 1 long note

Make sure you go after the music, not drills

Gradually increase range

Don't try to stabilize the meat, stabilize the tone and sound

Hypertrophy- decreases after 3 weeks of not playing

Play easy music that you know

Don't accept lower standards even though you haven't been playing

Copying is very important at this stage

Question: What causes hiccups?

An irritation of the diaphragm- the diaphragm makes a spasm downward

Re-breathing in a bag or holding breath works best to get rid of them

Increase carbon dioxide in the lungs

Sugar scrapes the throat; works for some

Question: How do you form a mental image while playing music you've never seen?

Mental image should be based on past experiences

Music should remind you of music you've played or heard before

Sight-reading is like walking through tall grass -1st time- no path is made; no memory is achieved –

Each additional time a greater path is made; a better memory of the piece is achieved

Question: Where should the destination of the air in the lungs be?

No specific region; just the lungs!

Every area of the lungs fills equally at the same rate

Thinking about full breaths allows more air than thinking about regional breaths- More area to expand

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In high flow rate instruments (tuba) it is more important to have air reserves
The ribs lower as you get out of breath -As you inhale the ribs widen and raise- You can't expand the lungs with the back muscles- it is very inefficient- allow the rib cage to move up -Just take in huge volumes of air and don't worry about being wrong

Question: Controlling long phrases without running out of air

Maximum efficiency -If the embouchure wants to vibrate, less air is automatically required -Concentrate on a free buzz
Some have a smaller "gas tank" than others, but we all need the same amount of air to play -Those with a smaller tank just need to take in more breaths
Long tones make things much more efficient
Articulation- sometimes wastes air
Mouthpiece buzzing
Produces a feeling of strangeness which can be beneficial in getting rid of bad habits
It is a pure connection from the brain to the lips
Don't warm up- use the lips as vocal cords -Mental thought in playing should be the same as in singing- only the message reaches the lips through the 7th cranial nerve rather than the vocal cords vial the laryngeal nerve -Buzz songs that aren't too fast or slow
Avoid problems involved with adding the horn -Breathe a thick column of air -Think air and buzz, song and wind
Covering backbore causes the same resistance as the horn -Good for buzzing pedal m tones
Length, thickness and tension exist in all vibration -When articulating in the low register you must use a slightly more tense embouchure than if playing legato -Playing general music in the low register helps -Interpret music down there

C.
Playing routine

Concentrate on the love song- music
Whether long or short tones, always play with the same quality of tone

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Daily practice

Long term goals- ex. orchestral excerpts -Anything practiced regularly

Recital program

Short term practice- ex. etudes -Orchestral parts- even practice quarter notes! -Practice things you don't include on the job- balance. -Control the tone to control the meat, not vice versa -Piston (lungs) down when you breathe in, up when you breathe out - Breathing exercises can only do 4 repetitions if you do things correctly -Don't concentrate on moving the body during breathing- if you breathe correctly it moves without thought

D.

Replacement breaths- exercises

Slow breath- long body (as if standing)

5 counts each way

Study what happens to your body during the slow breath- like "long bow" exercises

Mid 40's or so- some elasticity is lost -Still keep breathing deeply- it shouldn't matter if you were breathing correctly in the first place

Exhale for 4 beats, inhale 1 beat, exhale -You must work as a person on breathing, not as a brass player

Exhale 7 eighth notes, inhale 1 eighth note

Use your arms as a visual aid during the exercises

During exhalation, move arm away from the body

During inhalation, move arm toward you -Arms represent air well because they are visual and represent change -Air cannot be felt as air below the larynx- it's more of an imitation

Many times replacement breaths are inadequate

Practice moving air out and in by thirds while moving the arms- begin to sense quantity

Also, do long and fast inhalations using arms

Short breaths can fill lungs to capacity- you must be very efficient (no half breaths)

You can't get tense or you can't get full lungs capacity

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The sensation of having too much air to get a fresh breath is caused by too much pressure inside the lungs

You don't have to empty lungs totally when playing; there is always gas exchange

ARNOLD JACOBS WORKSHOP- 7/29/93

A.

Summary

The source of stimulus must be in the brain for the embouchure

ex. Trumpet part to Zarathustra- Hear the high 'C' a moment before you play it

High register- must be played in enough - Play songs up high - Lyricism more important- get a good concept of what the high register should sound like - Stabilize the sound and the music- the embouchure will develop later

Make sure replacement breaths are large enough

Every note must have a stimulus in the brain

When buzzing, feel where the lips are vibrating

It's the buzz that plays the horn, not the air

Always mentalize when you play

Always sing when you play- even use numbers or solfege if needed

Don't tolerate anyone who plays better than you

High standards are in the head, not the lips

The horn in your hand must mirror the horn in your mind

If your mental image is good enough, soon you will play better than those you imitate

You can't control the embouchure- you must control the music

The less air pressure and resistance you use, the better tone you will have (Darker)

Match tone qualities when slurring octaves

As you rise one octave the backpressure doubles -ex. 7-14-28 6-12-24

The freer you play in the low register the less backpressure you will need

Arpeggios- must be free

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B.
Breathing aids

The breath builder

A good "frog and tip" study

Use weakness

Closing the port- causes more resistance

You must put the tube between the teeth and over the tongue

3-4 reps only

Hospital inhaler

Can have variable resistance

Keep the ball up as long as possible

Anesthesia bag- like long tones -Put mouthpiece in to measure air used when playing

Inspiron alone, or with rubber tube for mouthpiece work -Ordinarily it is a breath exerciser

3/4 inch tube- lets you feel the air going into the mouth

Putting your mouthpiece through it aids resistance

Finger also works in place of the tube

Snatched inhalations- use arm for visualization

Smaller women- must be more efficient

Snatched inhalations- practice quickly using arms -Also practice on horn

C.
You must have a note in your head during silences

D.
Pressure in the body during playing

Standing and sitting should feel the same

Replacement breaths- must be large at all times

No gasps

80% of lung capacity can be removed in one second in healthy males

15% - takes 2-3 seconds

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5%- residual air; can't be removed

Large inhalation stretches tissues

Tissues have an elastic rebound effect

3/4 lbs. of pressure right after inhalation

Rest position- This portion usually used during sleep; about 1/3 of lung capacity; in balance with atmospheric pressure

The amount of work gets greater as you pass 0 pressure

Asthmatics and emphysema sufferers- take longer to empty lungs

Work harder than healthy persons

Also occurs in older people

Replacement breaths- don't need to fill lungs totally, but should be comfortable into the positive pressure area

In general, breathe comfortable large breaths and exhale in a way that expels air the quickest

Practice holding your breath without closing your throat, or try panting, or a gasp of surprise

Hold your breath without closing the throat and use the breath as needed in orchestral situations (actually this can be very calming).

Refilling the lungs can be very quick no matter where you are in the pressure curve (neural inhibition= reversal of inhale and exhale is instantaneous)

Palpating the sternal region- makes exaggeration in the chest region apparent- bring the chest up and utilize that space

Every area of the lungs must expand- the chest and diaphragm area included

Aerobic exercise doesn't help lungs, but does make you healthy!

If you use 4 liters of air, take 4 back in

Stay out of the negative pressure curve

Always take air in through the mouth: Think of the air vacuum meter at the lips

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ARNOLD JACOBS WORKSHOP- 7/30/93

A.
The embouchure

Play it down- it develops based on the music you play

It develops with lots of range, dynamic and musical practice

Basic musculature

Upper lip consists of all the muscles from the nose to the lip opening

Lower lip consists of all the muscles from the top of the chin to the lip opening

The cheek muscles are also involved- from the ear to the mouth

No embouchure exists except inside the mouthpiece

The embouchure consists of only the vibrating surfaces

High register problems

Adjust the vibrating surfaces, not the rim surface

Small muscles of the orbicularis oris bring the vibrating surfaces inward

We aren't aware of these small muscles- we must concentrate on the sound instead

High notes are nothing but a fast vibration, Low notes are nothing but a slow vibration

The high register doesn't involve strength

Don't stabilize the embouchure, stabilize the sound

Try getting a good high sound in your brain

Too often the embouchure in the high register is forced to vibrate

No forcing is needed

Take music you know and put it in the high register- it will take a little time, but it will develop with more practice

The ring around the embouchure consists of hypertrophy of small muscles

Mouthpiece pressure has a purpose

It helps isolate the region

No pressure- only works in fanfare situations

Prepare everything but air pressure when playing- the cellist prepares everything but motor movement

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Changing mouthpieces

If you go by the product, changing doesn't affect it (The same rim helps, though)

If you go by feeling, it affects playing (however, we shouldn't play by sensory information)

Changing mouthpieces helps the psychomotor aspect of playing

Strangeness- gets rid of conditioning

It changes the stimulus- thoughts become more important

3 variables- the horn, the mouthpiece, and the embouchure-

Placement of the mouthpiece

Much to do with taste

You should find your own placement

Pressure should be equal at all points- if the angle isn't correct we will try to equalize pressure at all points, causing over-pressing on one lip

Pivot system- don't pivot for small intervals like 3rds, 5ths, etc.

We should concentrate on small embouchure changes

Pivoting definitely helps in large intervals, but don't overdo it in small intervals

Buzzing

Visualizer- very inefficient- no acoustical benefits

It isolates the vibrating surfaces though

Can cause more air pressure than in the horn and less air flow- a danger exists of carrying this to the instrument

Practice only low and middle ranges with the visualizer

Buzzing without the mouthpiece (free buzz)

Difficult to transfer to the mouthpiece- the ring makes transfer easier

It is almost perfect buzzing, but it is so close to being right it is dangerous (the embouchure does not actually buzz this efficiently)

Can make the vibrating surfaces too tense

The visualizer isolates muscles for buzzing but lip pressure is not the same

The double buzz is an airway problem

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Caused by not thick enough of an air column

Not enough air- therefore not an embouchure but an air problem

Puffing cheeks

Don't draw attention to it- the corners of the mouth are the only thing that matters

Fix this problem by working on articulated interval studies- they require firm corner muscles

-Demonstration- Vaughan Williams Tuba Concerto-

If you don't always use your full lung capacity you run into problems in later life

Inhale feeling friction at the lips during suction- suck!

Air and embouchure, not air and tongue- even in fast staccato passages (the visualizer helps awareness in buzz, not tongue)

Full and empty exercises using arms as frog and tip visualizations

Suck air at lips, not throat

Inhaling is much more important than exhaling

Slow breath studies for quantitative purposes

Exhale in 4 beats, inhale in 1

Put lips forward during suction- the tube in the mouth alters the stimulus

B.

The aging process and wind playing

45-50 was the age that brass players used to retire

Loss of elasticity and chest wall compliance

Tonguing problems also showed up

Those who then gear toward the feelings they had when they were younger also ended up retiring

Bud Herseth and other successful older brass players are geared toward music and therefore don't experience this

Age brings on only a "shortening of the bow"- Mental states are much more serious

Difficulty in tonguing and tightening of the throat are the first symptoms

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More wind- the solution

Music and song always

-Demonstration- Rochut etude #4

Add the dimension of song

Listen to musicians and singers- copy and create

All practice must be based on the concept of art

Don't prepare tissue, or there will be no music- hear notes, prepare the music

Song and wind

Song is all-important

Wind is secondary

Put the mouthpiece in an inspirometer; try to lift the ball while buzzing- imagine raising a ball when buzzing on your horn

C.

Final comments

Song and wind are very simplifying concepts- the only challenge in playing is musical

Preconceived sound

Very important; almost vital to a brass player

A brass player must have excellent relative pitch

Have recall after you play also

Mouthpiece buzzing is very important in developing relative pitch also

Solfege is a fine way to develop this; even think the syllables when you play

Singing and brass playing are closer to each other than any 2 instrument families

Talking is very easy because there's a message- if you have nothing to say it gets difficult- the same is true with brass playing

You can sound great when doing everything physically wrong if you think musically

Vibrato

Use visual aids; shake the horn, etc., and don't allow any guessing internally

Always go by sound

Imitation is also important

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APPENDIX 9

Arnold Maurice Jacobs (1915-1998)

Arnold Jacobs was born in Philadelphia on June 11, 1915 but raised in California. The product of a musical family, he credits his mother, a keyboard artist, for his initial inspiration in music, and spent a good part of his youth progressing from bugle to trumpet to trombone and finally to tuba. He entered Philadelphia's Curtis Institute of Music as a fifteen-year-old on a scholarship and continued to major in tuba.

After his graduation from Curtis in 1936, he played two seasons in the Indianapolis Symphony under Fabien Sevitzky. From 1939 until 1944 he was the tubist of the Pittsburgh Symphony under Fritz Reiner. In 1941 Mr. Jacobs toured the country with Leopold Stokowski and the All-American Youth Orchestra. His was a member of the Chicago Symphony from 1944 until his retirement in 1988. During his forty-four year tenure with the Chicago Symphony, he took temporary leave in the spring of 1949 to tour England and Scotland with the Philadelphia Orchestra. He was on the faculty of Western State College's Music Camp at Gunnison, Colorado during the early 1960's. In June 1962, he had the honor of being the first tuba player invited to play at the Casals Festival in Puerto Rico. Mr. Jacobs, along with colleagues from the CSO were part of the famous 1968 recording of Gabrieli's music with members of the Philadelphia and Cleveland Orchestras. He was also a founding member of the Chicago Symphony Brass Quintet, appeared as a soloist with the CSO on several occasions, and recorded the Vaughan Williams Concerto for Bass Tuba and Orchestra with Daniel Barenboim conducting the Chicago Symphony.

Arnold Jacobs had the reputation as both master performer and master teacher. He taught tuba at the Northwestern University School of Music and all wind instruments in his private studio. He was one of the most sought teachers in the world, specializing in respiratory and motivational applications for brass and woodwind instruments and voice. His students include many in orchestras and university faculties around the world. Mr. Jacobs has presented lectures and clinics throughout the world. During the CSO's 1977 and 1985 Japanese tours, Jacobs presented clinics in Tokyo. In January 1978, he lectured at Chicago's Michael Reese Hospital about playing wind instruments for the therapeutic treatment of asthma in children. He presented master classes at Northwestern University a week each summer from 1980-1998. The Second International Brass Congress presented its highest award to him prior to his lecture to them in 1984. In 1991 he presented a clinic for the United States Marine Band in Washington D.C. Mr. Jacobs presented master classes as part of the Hearst Scholar program at the University of Northern Iowa and the Housewright Chair at Florida State University. The Midwest Clinic presented Mr. Jacobs their highest award, the Medal of Honor in 1985. In 1994, The Chicago Federation of Musicians awarded him for Lifetime Achievement at the first Living Art of Music awards. During his eightieth birthday celebration in 1995, he presented a lecture to the International *Brassfest* at Indiana University and the International Tuba-Euphonium Conference at Northwestern University. Northwestern's School of Music presented him the first Legends of Teaching award. Mayor Richard M.

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Daley proclaimed June 25, 1995 as Arnold Jacobs Day in the City of Chicago. Mr. Jacobs was given an honorary Doctor of Music degree from the VanderCook School of Music in 1986 and DePaul University in June of 1995. On October 7, 1998 Mr. Jacobs passed away but as a performer and teacher his legacy will continue for generations.

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DISSERTATION PARTICIPANTS

Richard Armandi

Richard Armandi has been a figure the Chicago area freelance scene for a number of years. He received two degrees (B.Mus, M.Mus) from Roosevelt University's Chicago Musical College in 1983 and 1985 respectively. Over the years Armandi has studied with Arnold Jacobs, Frank Crisafulli, and Charlie Guse. Richard is not only a tuba player, but is also a busy freelance bassist with numerous bands and ensembles. As a teacher, Armandi works at Triton College in River Grove, College of DuPage, Xavier University and he used to hold a similar position at Concordia University (South Chicago). He also has a large studio of private students and teaches at several Chicago area high schools.

Nicholas Atkinson

Born in Manchester England, Mr. Atkinson came to Canada in 1957. In 1964 he joined the Canadian Army as a bandsman and played tuba and bass in the bands of Lord Strathcona's Horse and Princess Patricia's Canadian Light Infantry in Calgary. From 1968 to 1973, he was a student at the University of Calgary and graduated with a B.Mus in performance. In the summers of 1971-73 he studied privately with Arnold Jacobs. He has performed with the Calgary Philharmonic, University of Calgary Brass Quintet and in 1973 joined the prestigious R.C.M.P. Band in Ottawa. In 1976, he joined the National Arts Centre Orchestra and the Ottawa Symphony Orchestra. He has since then performed with numerous ensembles such as the Montreal Symphony Orchestra, Vancouver Symphony, Toronto Symphony Orchestra and the Hannaford Silver Street Band. He is also an active Chamber musician, performing with the Rideau Lakes Brass Quintet, Ragtime Brass and the Capital Brassworks, all ensembles who appear regularly on the Ottawa Chamber Music Festival stage. He has held positions at Queen's University, and the University of Ottawa and is sought after as both a performer and pedagogue.

Brian Frederiksen

Brian Frederiksen is best known as the author of the recognized book on Arnold Jacobs entitled *Song and Wind.* For many years, Frederiksen traveled with Jacobs and assisted him with master classes and presentations at a variety of college campuses and International exhibitions. Frederiksen attended the Interlochen Arts academy until 1972

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for High School, and then attended the American Conservatory of Music [on the fourth floor of the Fine Arts building]. He graduated in 1977 and then went to Northwestern University graduate school until 1980. He has studied tuba with David Sporney [Interlochen] and both Arnold Jacobs and Bob Rusk at Northwestern University. He is a busy computer and high fidelity systems consultant and also runs *WindSong Press*, a private business that distributes a variety of musical merchandise.

Michio Funakoshi

Chicago freelance tuba player Michio Funakoshi came to the United States in 1995 to begin studies with Rex Martin, Gene Pokorny and Arnold Jacobs. Before coming to America, Michio had attended the Tokyo College of Music where he studied with Shinsuke Tanaka, principal tuba of the Tokyo Symphony Orchestra. Michio was appointed as the principal tuba of the Kyushu Symphony Orchestra in 1991 where he played for five seasons. Michio has studied with many internationally recognized tuba players including Dennis Miller of the Montreal Symphony, Floyd Cooley, retired tuba of the San Francisco Symphony and Bob Tucci of the Bavarian State Opera. Michio continues to perform with numerous Japanese orchestras as a regular substitute as well as having performed with the Zurich Opera Orchestra. He lives in Evanston with his wife Kozue, a violinist with the Chicago Symphony Orchestra, and their dog Victor.

Michael Grose

Michael Grose joined the University of Oregon music faculty in 2001 as assistant professor of tuba. Prior to accepting his position at Oregon, Grose was principal tuba of the Savannah and the Hilton Head Orchestras. Grose received his Bachelor of Music and Master of Music degrees from Northwestern University, where he was a student of Arnold Jacobs. After graduating from Northwestern, he continued his private study with Mr. Jacobs until 1998. Before assuming his position in Savannah, Grose played with the Civic Orchestra of Chicago and the Illinois Philharmonic. He has performed with the Chicago, Atlanta, Milwaukee, Honolulu, Oregon, and Jacksonville Symphony Orchestras. An accomplished chamber musician, Grose was the recipient of the Sweepstakes Award at the Fischoff International Chamber Music Competition, making him the first tubist to receive that prize. Grose has also been a prizewinner at the Coleman Chamber Music Competition in Pasadena, California. Both awards came while he was a member of the Chicago-based chamber ensemble, The Asbury Brass Quintet. A founding member of the Millar Brass Ensemble [Evanston, IL.], Grose has recorded on the London/Decca and Crystal Records labels. Formerly an adjunct faculty member at Armstrong Atlantic State University and Georgia Southern University, Grose spends several weeks each summer performing at the Brevard Music Center in North Carolina.

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Gregory B. Irvine

Gregory B. Irvine graduated from the University of Toronto in 1978, where he studied with Charles Daellenbach of the Canadian Brass. Since then, he earned a Master of Music in tuba performance from Northwestern University, where he studied with Arnold Jacobs. Irvine has recently received his Doctor of Music degree in tuba performance and pedagogy from the same institution under the supervision of Rex Martin. He has taught applied music at the University of Western Ontario and at McMaster University in Hamilton and held the position of principal tuba with the Hamilton Philharmonic Orchestra for eleven years. Professor Irvine has performed extensively as a tuba soloist, in chamber ensembles and orchestras, as a free-lance artist in the Toronto area and now performs regularly with Symphony Nova Scotia. He has also served as conductor for a variety of ensembles. In addition to leading the UPEI Concert Band from 1990 until 1996, he has conducted bands at regional music camps and the brass ensemble of the National Youth Orchestra. Professor Irvine currently coaches and conducts all of the brass ensembles at UPEI. Since 1995, he has also conducted the Northumberland Brass, an ensemble made up of professional brass players.

Rex A. Martin

Rex Martin is Professor of Tuba and Euphonium at Northwestern University in Evanston, Illinois. Over the years he has earned the reputation as one of the world's finest tuba players and brass pedagogues. He has performed recitals and given master classes in Japan, Korea, Latin America, Denmark, England, France, Germany, Italy, Norway, Sweden, Switzerland, and throughout the United States. His playing can be heard on more than 75 recordings by the Chicago Symphony Orchestra, Saint Louis Symphony Orchestra, Chicago Sinfonietta, Symphony II, Chicago Pro Musica, and Manheim Steamroller. As part of his busy freelance career, he is a member of the Chicago Sinfonietta, The Ravinia Festival Orchestra, Symphony II, The Ars Viva Orchestra, Fulcrum Point and the Chicago Brass Ensemble. He has also performed with the Atlanta, Baltimore, Boston, North Carolina, Zurich Tonhalle, Lucerne Festival and OFUNAM (Mexico City) Orchestras. He has performed with Dave Brubeck, Ray Charles, Frank Sinatra, Tony Bennett, Luciano Pavoratti, Sarah Vaughan, Wynton Marsalis and the Ringling Brothers, Barnum and Bailey Circus. Before joining the faculty at Northwestern, Martin has been a faculty at the Oberlin Conservatory, Illinois State University, DePaul University, the University of Notre Dame, The Vandercook College of Music and the University of Illinois at Chicago. Martin was the host of the 1995 International Tuba and Euphonium Conference. A graduate of Illinois State University and Northwestern University, Martin received Illinois State's "Outstanding Alumni Award" in 1999.

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Dennis R. Miller
Born and raised in Vancouver, Canada, Dennis Miller has been Principal Tubist of the Vancouver Symphony, the Houston Symphony, and now L'Orchestre Symphonique de Montreal which he joined in 1989. He has given solo recitals and performed concertos with orchestras and bands in both Canada and the United States. He was a soloist at three International Tuba-Euphonium Conferences: in Los Angeles in 1978, ITEC95 in Chicago in June 1995 and most recently in Regina, 2000. He has had several pieces written for him and has given premiere performances of works by such composers as Harry Freedman, Ian McDougall, Alec Wilder and Howard Bashaw. Mr. Miller is also Assistant Professor of Music at McGill University where he teaches tuba and brass techniques and conducts the McGill University Brass Choir. He has acted as an adjudicator at music festivals in Western Canada and the United States and frequently is asked to be a juror for the Conservatoires de Musique du Quebec. Dennis studied with Arnold Jacobs for several years beginning in 1968 with his last lesson in the summer of 1979.

Michael Sanders
Michael Sanders has been the principal tuba with the St. Louis Symphony Orchestra since his appointment in 1991. Before coming to Saint Louis, he played with the San Antonio Symphony Orchestra (1973-1991) and the Utah Symphony Orchestra (1987-88, 1989-1990). His principal teachers have included Arnold Jacobs, Wayne Barrington, Donald Knaub (Eastman), Cherry Beuregard and Robert Pallansch. Mr. Sanders holds a degree from the Eastman School of Music.

Charles Schuchat is an active freelance artist in the Chicago area. He has performed and recorded with numerous ensembles such as the Chicago Symphony, Boston Symphony and Israel Philharmonic, Tower Brass and the award winning Asbury Brass Quintet. He has participated in numerous music festivals including the Spoleto Festival, Ravinia Festival and Tanglewood Music Festival. While at Tanglewood he received the CD Jackson Award for Achievement. He spent the 1997-98 season as principal tuba of the Israel Philharmonic, and is currently a faculty member at both Northern Illinois University and Roosevelt Universities. Charles is a native of Washington, DC where he studied with Joel Brister. He is a graduate of Northwestern University where he studied with Arnold Jacobs and Bob Rusk.

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David William Kutz, B.Mus, M.Mus, Certificate, DM.

Born in Toronto (1966), David began his musical studies at an early age, performing with the *Burlington Teen Tour Band*, a touring ensemble of high school students with a membership of over 200. His family relocated to Kingston Ontario when he was sixteen years of age, and he began taking lessons with John Van den Engle of the Canadian Forces *Vimy* Band. After making the decision to continue studying music, David began his studies at Queen's University where he studied with Clive Gilbert and Nicholas Atkinson. Taking a one-year hiatus to Victoria British Columbia, David enrolled in the studio of Eugene Dowling. After graduation, David attended McGill University in Montreal Quebec where he received his Masters of music in Tuba Performance with Dennis Miller. After McGill, David moved south to Chicago Illinois where he began his studies with Rex Martin at Northwestern University. He graduated with a Certificate in Performance in 1994 and began his Doctor of Music degree (Performance) in the same year. While in Chicago, David has also had the opportunity to study with Gene Pokorny of the Chicago Symphony, Floyd Cooley (formerly) of the San Francisco Symphony Orchestra, and has also worked with Roger Bobo in Lausanne Switzerland.

In 1995, David was asked to be the Conference coordinator for the 1995 International Tuba and Euphonium Conference (ITEC) at Northwestern. The conference was incredibly successful and was featured on many international news programs such as CNN and ABC news. Following the conference, David accepted a one-year Sabbatical replacement position at the University of Prince Edward Island. Since this appointment, David has worked at several other Universities including the University of New Brunswick, Northwestern University, Northeastern University, Trinity International College, and the University of Missouri-Columbia.

As a performer, David has performed with numerous ensembles and has appeared with the Saint Louis Symphony, Chicago Sinfonietta, Zürich Opera, Saint Gallen Symphony Orchestra, Illinois Philharmonic, Millar Brass Ensemble, *Sirius Brass Quintet*, and others. As a soloist, David has been a featured recitalist at the 2000 ITEC in Regina Saskatchewan and at the Ottawa Chamber Music Festival. He has also appeared with many other ensembles including the Saint Louis Brass Band. He has competed on an international level, performing at the solo competitions in Germany and France.

David now holds the Principal Tuba position with the Radio Orchestra of the Netherlands, performing in Utrecht, Rotterdam, and Amsterdam in the Netherlands.

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