

**Teaching tools and thoughts with
Professor Eugene Rabine, The Rabine Institute,
Lessons, August 10, 2015 and 15-18, 2016,
Walheim, Germany**

General Statements

1. Student's first priority is understanding that there is a fixed and living instrument
 - a. the fixed instrument is non-changing, so the living instrument is the awareness factor
2. all actions in music are from the autonome sensory system (non-conscious)-100% of living instrument is through the autonome—must feel what you are doing and thereby can repeat it—conscious brain cannot do that
3. the fascia system (surrounding system of organs, muscles and every part of body) transports signal to autonome to conscious at almost speed of light
4. when we touch a hair on our arm that is the fascia going to the autonome; autonome: receives 40 million bits of information per second
5. central (central nervous system) is the muscle along with skeletal (conscious); conscious speed equals the speed of speech
6. difference in autonome and centrala example: if hammer is hit on toe, the centrala route takes 2.5 seconds to transmit message to the brain; the autonome system is the immediate reaction—the fascia system transports signal to autonome to conscious
7. key point: how do our playing actions feel?
8. when we do movements, we have to have a body movement or posture that allows the movement we want, not forcing
9. words and things we do are codified to emotions
10. we recall emotions which recall the word or action
11. sometimes thoughts originate in organs—emotional
12. how things are said is more important than what is said—just proved scientifically at Max Planck Institute, Gottingen, Germany
13. Physiology, Emotional, Neurological = Psychosomatic which is the goal
14. REPLACE OLD HABITS WITH NEW ONES—DON'T SAY GET RID OF OLD ONES
15. We have to understand the difference in
 - a. 1-posture and tonus (push up, do not pull up) and then
 - b. Definition of tonus: a normal state of continuous slight tension in muscle tissue that facilitates its response to stimulation before willful directives to move
 - c. 2-body movements (raising legs and arms on breathing—if body is tight then breathing will be tight) and then
 - d. 3-facial muscles
 - e. fourth system is knowing that inner vocal tract adjusts its formant structure in relationship to pitch and dynamics—the ability to allow the vocal tract to adjust its impedance (openness back to the folds) as a student plays higher or lower; we

need feeling of playing fff rather than forcing fff—can recognize perception of how you feel—if are not asked, then they cannot know

- f. can we repeat the same emotion so that what we want in sound (our brain telling our body what to do) can be repeated exactly or not
16. eventually we have to get to feeling, because thinking of muscles is too slow; we do not feel lungs directly, but they do have a feeling; we feel in the thoracic cage pressure; feeling is fast through autonomic instead of muscles through central nervous system

Professor Rabine

17. Has researched evolution

18. Neanderthal—vocal in hyoid bone

- a. Muscle that raises soft palate not developed—could produce sound, but not speech—could produce power

19. Homo sapiens out of Africa

- a. Taller, agility, running, swimming (with swimming came holding breath)
- b. Climbing—low pressure air
- c. Weight lifting—high pressure air
- d. Speed and agility—low pressure air
- e. Levator palatine muscle—raise soft palate—close nose to airway and leave throat open
- f. Explosion of development
 - i. Larynx moved below hyoid bone=speech

Double Valve—Theory of double valve

Vocal folds – inhale valve

Vestibular – exhale valve

20. Why it is the most neurophysiological important system

21. Next embryology (i.e.) to see why double valve is important

- a. 2nd to 3rd week—embryo has blood cells into a clot
 - i. Cells go into embryo and divide it
 - 1. One half develops heart and the other develops vocal chords
 - 2. Together it becomes the circulatory system
 - 3. Heart and breathing systems cannot change independently
 - 4. Better breath causes heart rate to lower
 - 5. 1st valve—glottis inhale—remains dominant—activity of those muscles stay in place—when vocal folds open many more neurological systems are affected than when vestibular closes
 - 6. 2nd valve—vestibular—if becomes closed, then have to blow open—when vestibular closes, that affects many neurological systems but less than when glottis opens
 - 7. Exhale is bad; inhale is good

Posture

1. we want the instrument to meet the embouchure without the head changing optimum posture
2. train inhalation tendency in relation to posture
3. spinal column should feel engaged in lengthening of body
4. Exercise
 - a. put hands on hips and notice motion of pelvic area—should be curved in for inhale—back expanding—pelvic curved back for exhale; as we focused on pelvic curve, the larynx lowered and voice and breathing became bigger with less effort
 - b. getting pelvic and posture change will require tonus change (conditioning of muscles to accomplish slight and gradual movement of skeletal frame for pelvic and posture change)
5. move head with horn for marching band, don't plant mouthpiece on face and push in to keep stable—keep head and lips stable and make horn move with it
6. Exercises (going to feel the back as a result of other activities)
 - a. stand from sitting in a chair—observe what is happening from the soles of feet, calves, thighs, hamstrings, gluts, pelvic, hips all into the back
 - b. sit from standing to a chair—same observations
 - c. push up
 - d. all muscles for posture start in the soles of the feet—think of posture as pushing up not pulling up
 - e. stretch back muscles by pushing up
 - f. put finger on chin and keep head level, then do oo-oh-ah and breathe
 - g. most instrumentalists will use pressure and changing the angle of their neck structures to play
 - h. do not change angle of head and neck
7. stand while breathing; this causes posture to be powerful and upright; we can do this by standing and breathing quickly on one leg—that will make posture strong and ready to breathe
8. tonus equals thinking—thought pattern to nervous system (tonus is the constant low-level activity of a body tissue, especially muscle tone)
9. differentiation is the process by which cells or tissues change from relatively generalized to specialized kinds, during development, especially in the muscles for using the pharynx, lip and tongue muscles
10. teach posture by teaching push up from soles of feet up through body
11. notice head tilt with pelvic feeling—head up tenses pelvic lower back area—head level releases tonus in the lower back at the pelvic area
12. head level cause knees to come forward slightly, head up cause them to go back
13. whatever happens in the pelvic area has a huge effect on the legs and feet
14. when bringing tuba up to lips, what do we feel in the soles of our feet?
15. cross right ankle over left knee—inhale and exhale and observe what is felt in the knee—then put right hand on right knee and push down as inhaling

Breathing

Good singers use low air pressure and use the resonator for the rest. Need to find an air pressure that is non-disturbing to the rest of the functions.

- Elastic recoil—no control in body
 - More lungs in back than in front
 - Over 50% lung volume triggers high pressure
 - o Singer trains to reach 80% to stay low pressure
 - o 70%--singers can sing 25-27 seconds
 - Voice singing—will not even blow a candle out
1. do not breathe with the stomach—will have pain
 2. air pressure is a result of reduction in air flow
 3. glottis is an air valve: double valve system—inhale is the glottis; exhalation is the vestibular
 4. train inhalation muscles: that will regulate posture and muscles
 5. inhalation is the dominant emotional structures
 - a. inhalation to embouchure: how to demonstrate allow air pulled into lungs—silence—mouth opening
 - 60% lung volume in half second of inhale
 6. embryo build two systems cardio and breathing
 7. back is the main inhalation area
 8. double valve: vocal folds are inhale valve, vestibular folds are exhale valve
 - a. heart moves into the middle when breathing
 - b. inhalation is external intercostals and exhalation is internal intercostals
 9. sing ah, oh, oo, oh, ah on different pitches
 10. then sing pattern again, then exhale after last ah and inhale—what was the feeling of that breath?
 11. observe what happens in the back when breathing—back and ribs under shoulders expand
 12. less effort for breathing—smooth inhale and exhale
 13. second breath feeling is what we are after, but how do we get there on first breath?
 - a. second breath feeling has the tongue more out of the way, better expansion in the back and sides, tongue in a better curved position—therefore put tongue in second breath position for first breath
 - b. organize the breathing by feeling body posture changing and tonus will allow the first breath to be good
 14. yes there is a pelvic diaphragm—important for women in childbirth and for all of us in defecation
 15. learning to open for breathing with triggering a yawn will be a good result
 16. when talking about pelvic area, inhale changes dramatically for more air and better vocal sound
 17. two fingers in mouth causes correct inhale
 18. different sports (like different instruments) will have different breathing tendencies
 19. example: running
 - a. notice when inhale happens during foot strike

- b. try 4 steps (2 for each foot) for the inhale
 - c. try 4 steps (2 for each foot) for the exhale
 - d. then, depending on the tempo, go for 4 steps for inhale and 2 for exhale
 - e. how do we cushion the shock of heel strike without disrupting things
20. move head with horn for marching band, do not plant mouthpiece on face and push in to keep stable—keep head and lips stable and make horn move with it
21. Exercises
- a. touch fingers to side of nose for ooh, then slide fingers down as embouchure goes to oh then to ah—this is a visual and touch sensation to keep embouchure rounded for inhalation shape
 - b. once embouchure has reached ah, then breathe in then sing ah-oh-oo; expansion is in the back and abs do not go out but come in a little because breathing is in the back—muscles along spine are contracting towards pelvis, ribs coming up and out, shoulder blades expanding out—abs staying basically where they are
 - c. men have four parts to abs, women have five parts: abs stay in to support the back expansion
 - d. abs going out during inhalation is not correct if back expands
 - e. breathing is expanding and elongating whole thoracic cage
 - f. feel front part of abs moves in, but ribs and back stay upright and stable
 - g. there is no law that a phrase must be unbroken, but there is a law that says we must breathe
 - h. getting air into 80% of lungs is a high attainable goal-takes 1.5 seconds; getting 60% can be done as quick as .5 second
 - i. vacuum theory—expand to breathe and air is drawn into the vacuum to equalize inside lung pressure with atmosphere—technically correct, but back movement has to do that
 - j. left lung is different than the right lung; in the expansion, the heart moves position into the middle so that there is no stress and to avoid pressure—directly affects the vocal folds because in the embryo the folds and heart are made at the same time then separated
 - k. inhale with arms going up—perception might be that arms are level but left arm might be higher than right arm—palms up; may look like tilting to the right or left in posture
 - l. inhale must FEEL the air fill up in the lungs in the back all the way up and down the lung space
 - m. feel the air going down into lungs rather than into the back of the mouth!!
 - n. breathe in through the lungs rather in the mouth!!
 - o. offset for vocal is just moving folds open which stops the sound—leaves the functions available to produce sound again right away if needed!!!!
 - (Porter) this is very similar to holding the “oh” for staccato and moving notes
 - p. breathing should involve feeling the whole body
 - q. when breathing and singing, the octaves are not far apart—resonance melds one to the other—(Porter) like Jacobs taking low frequency lip vibration into the high note vibration
 - breathing regulation guides complexity of singing
 - r. do buzzing and lifting one leg on the inhale and keep it there for buzzing

- s. play tuba and lift one leg while inhaling and keep it there for the exhale and playing a scale
 - t. diaphragm helps breathing no matter what position we are in—has many differentiating muscles that will move in any direction needed
 - u. expansion can only occur in the thoracic cage in relationship to a lengthening in the body (back muscles along the spine)
22. diaphragm is lifting the ribs and flattening a little but diaphragm does not invert in its downward motion
 23. explain how diaphragm goes down without pulling everything with it
 - a. Vocalis muscle—vocal folds
 - b. Muscles contract in directions it is formed—each end and in middle
 - c. In 1982, Professor Rabine started teaching that diaphragm muscles contract both ways
 - d. Diaphragm contracts bottom up—rib lifter to the 10th rib—and it does not push organs down
 24. how can lip shape be on the inhale the same as when buzzing or singing out?
 - a. shaping for the buzz
 25. pelvic movement—if the instrumentalist can raise the leg while breathing and be aware of tonus of the standing leg can that be the same as the pelvic tonus awareness? training that for each side of the body is not the same—have students stand on one leg while breathing in—try on each leg; the physical side of the living instrument
 26. inhale can be trained to be faster
 27. how much back expands depends on the shape of the mouth and facial muscles—it allows the breathing muscles to react
 28. holding ribs out is an intentional tension which limits all movements
 29. have better body posture which allows a different feeling for breathing muscle which allows those structures to differentiate how you are going to allow the air pressure to work against which resistance so you come out with a tone; each step is part of the whole but there is a heirachy; if want good embouchure have to have good body posture; if want breathing have to have good body posture
 30. we want as little movement as possible between inhalation laryngeal position and articulation laryngeal position

Pharynx and Airway Openness

1. we want as little movement as possible between inhalation laryngeal position and articulation laryngeal position
 - a. glottis—five directions of neurological systems meet
2. First question: how can we allow the larynx to descend? (key word is ALLOW not force)
 - a. allow the tract to lengthen, don't force
3. pharynx: get rid of neck openness; change to upper air way from lips to vocal folds
4. trachea is a neurological connection (embryo heart and voice made at the same time then separated)--is a highly sensitive system
 - a. Bernoulli effect is present but not the answer to all functions
 - b. feel vibrations

- c. minute frequencies change under vocal cords
 - d. resonance equals hearing sound: cannot hear the resonance in trachea
- 5. vocal ligament has unbelievable sensitivity
 - a. vocal ligament is embedded in its attachment
 - b. question from Rabine for himself: vocal ligament has three types of cells—has pressure and air flow measurement system—vocal folds oscillating movement bottom to top; question is how does the signal get transmitted up over the top of the fold especially for vibrato? first the ligament is not embedded but is clasped with other attachments—whole body of ligaments is the same way—cartilage system of arytenoid is very flexible and changes around the vocal fold ligament—now he has rotation of the fold which explains the signal transmitted
- 6. three elements of phonation: pitch, dynamic, vowel form—our goal is to train each separately
- 7. work on vocal tract alignment and openness rather than air pressure for tuba playing—provides smoother tonguing, higher quality, more consistent and not as hard sounding timbre

Tongue Shape and Movement

1. tongue pushes on jaw to go down—jaw depressor
2. tongue can never be passive
3. Exercise: put tongue on lower lip (small aperture opening) and try to lower jaw—more difficult
4. three elements of phonation: pitch, dynamic, vowel form—our goal is to train each separately
5. changing vowels will change the sound color and harmonic frequency resonance
6. raising the tongue lowers stability of the tip
7. back of tongue feeling: rounded form is optimum differentiation potential
8. Definition of differentiation: process by which tissues change from relatively generalized motions to specific kinds of movement during their development
9. back of tongue is stationary for multiple tonguing in second video, which is why vocal cords stayed open—needs to be the same for single tonguing
10. tongue: change to movements and differentiation and tonus—natural curved shape is the result—tongue has to have a touching point (behind bottom teeth) to have differentiation

Jaw Placement and Movement

1. change to jaw movement
2. no jaw forward
3. tongue movement is directing the air (tip anchored without pressure to back of bottom teeth and then tongue in natural curved shape with back of tongue brought forward as a result of natural curved shape
4. jaw placement—when we form the oo-oh-ah, how does the jaw move? a little down and slightly forward until it goes back for ah; movement of jaw in relationship to its joint; ‘oo’—chin goes a little down and forward; ‘oh’—a little more down and forward; ‘ah’—

goes a little back; that is the final position of the jaw

5. Exercise: say oo, put tongue on the bottom lip, then go to oh and ah without pulling tongue back; we are using our tongue as a jaw opener; training to open without pulling tongue back will (Porter saying this) help to isolate the preparedness of embouchure for breathing

Lip Aperture Shape and Movement

1. adjust lip aperture and let air match it rather than adjusting air and try to match lip to air—do not use air for closure, use the lips
2. “Oh” syllable is open “ah”
3. vowels go with certain frequencies—he mentioned vowel formants
4. lips will take on a different form with breathing
 - a. lip formation takes 98 muscles and 18 organs to form
 - b. openness of mouth—larynx becomes a reflex, not a breathing mechanic
5. changing speech pattern takes much work but could yield good results
6. lip formation is the key to inhale and pressure
7. New Exercise: oo to oh to ah descending an octave then ascending ah to oh to oo
 - a. keep mouth open for ah, like two fingers between teeth, keep open as ascending
 - b. allowing things to happen rather than making them is key—because of correct inhalation and exhalation
 - c. try to buzz with fingers touching corners to make them stay in
 - i. we worked on keeping lips rounded, which mimics what inhalation will be like
 - ii. work on the mouthpiece the same way
 - iii. playing on the tuba—do a lot of discussing about shape of vowel form, tongue shape
 1. basically whatever vowel form does best sound is the one to use—try different ones with tongue anchored to bottom teeth but not pushing on it—use tip to articulate but not the whole tongue is curved in a natural rounded form
 2. experiment with the spectrum analyzer moving different parts of the lip and tongue till the harmonic spectrum had several frequencies even with each other in intensity
 3. do oo-oh-ah singing to keep rounded shape of lips
 4. play and work on having lips do movement to notes almost before they happen which shortens the distance, makes the micro-tonal notes sound and is smoother
 5. when mouth embouchure was open and tongue anchored to bottom teeth, the cheeks did not puff for the low notes
 6. tongue anchored to bottom teeth gives more room for differentiating of movement—use cupped hand finger tips turned down touching other hand palm to imitate picture
 7. work on changing the pitch (7 tones micro-tonally) in the semitone before moving a valve
 - a. easier going up than down

- b. had success to having notes move smoothly—next step to do for whole range
 - c. changing the vowel changes the sound in the tuba—what is needed to do scales in range—do ah-oh-a (long a) from low to high
 - d. sinus question: not important since singing and resonance can happen without them
 - e. one of last things a singer will ever master is dynamics because they feel the vibration and have to feel the intensity of the dynamic since they can't hear it well
 - i. sounds familiar to playing with ear plugs in on tuba
- 8. lips vibrate inner to outer in two directions and a third direction push forward from openness
- 9. lip position and aperture openness change to lip movement and differentiation
- 10. round the lips again—contracting obicularis oris to go forward and rounded—this took all the other fascial muscles out of the formation of the embouchure
 - a. then work on crescendos by increasing inner resonance back into vocal folds—hold the oh and opening vocal tract like a cylinder to the vocal folds into the trachea—feeling of opening folds like in the last laryngoscope
 - b. changing vowels will change quality and make playing easier or more difficult—trick is experimenting to find the best vowel for best quality sound
 - c. ah was an open sound, oh a more covered sound, long a and oo brighter sound
 - d. had best success on extreme high notes by saying the long a vowel
 - e. during the playing be wary of the head starting to tilt up and lean forward some
 - f. singer comes from the folds to the lips; brass player is going from lips to folds—inner resonance affecting sound—call impedance (sound going from one resistance factor (lips) to another (folds) and vice versa.
- 11. always ask what we feel and what we hear—in that order—these two elements have to come together
- 12. Exercise One—trace fingers just touching the skin on the face from sides of nose to corners of mouth while forming oo-oh-ah has a direct effect on the angle of the mouth—breathe in at end of exercise
- 13. Exercise Two—trace fingers from soft area of cheek behind the teeth to the corners of the mouth while forming oo-oh-ah—observe the stretching of the cheeks during forming of the mouth—breathe in at end of exercise
 - a. we are dealing with touching facial muscles which also has an emotional connection to—cannot go too fast
- 14. Exercise Three—touch and trace fingers saying oo-oh-ah (all exercises with both hands parallel) from jaw bone joint down around jaw bone to angle of chin—highly sensitive area—breathe in at end of exercise
- 15. Exercise Four—trace from ridge of nose back around cheek bone to over ear and resting just on backside of ear as you form oo-oh-ah (breathe in at end of each exercise)
- 16. Exercise Five—trace from ridge of nose back around cheek bone to ridge just behind the ear—forming oo-oh-ah—breathe in at end of exercise
- 17. purpose of exercises was tracing the extension of all of the jaw opening muscles—my interpretation was keeping them forward and not involving facial muscles in the buzz

18. embouchure rounding helps create vowels for embouchure; the rounded embouchure allows the breathing to respond for inhaling the most air

Timbre Quality and Awareness

1. there are 7 notes in a half step=5 up and 2 adjusting down
2. need to be 3 meters away from someone to hear them properly and objectively
3. two formants
 - a. speech articulation is the 2nd formant (1st formant is weak and 2nd formant is dominant)—where is the tongue in the mouth cavity for this process
 - b. first formant produced above the folds if the larynx is descended
 - i. larynx is lower than in speech
4. dynamics
 - a. are dynamics only a decibel? no, the embouchure and air pressure can accentuate higher frequencies in harmonic structure which can give the perception of being louder, but decibel meter may not change
 - b. playing with breathing and embouchure in the Professor Rabine methods caused the decibel meter to read louder even though it did not really sound that way in person
5. when a musician plays a sound, they are communicating an emotion whether they know it or not
6. changing vowels will change the sound color and harmonic frequency resonance
7. in playing two scales with decibel meter, one the old way (before Professor Rabine instruction) and one the new way (after Professor Rabine instruction), the second one was more projecting and louder and had a center to the sound that was more clear—sounded a little flatter too
8. playing with the new habits definitely has a more clear core and projecting sound—blares more on the computer speakers
9. the quality of the low pitches determines the quality of the high pitches physically
 - a. neuro muscular law as well that low training helps train the high training
10. resonators for singers—how they ring out over the orchestra? Formants—their ringing formants are a frequency that the orchestra (2,800-3,200 hertz) cannot produce; do not need a lot of energy to hear, male or female, and our hearing is sensitive to hear it; deals more with how vocal tract is adjusted.
11. can same happen on tuba? Singer feels the formant frequency, but does not hear it; sometimes the singer can substitute a nasality, but is not the same; the formant has more quality of the sound and we are moved more emotionally; experiment with spectrum analyzer in finding the quality that utilizes the harmonics more equally; use vocal tract to accentuate the harmonics—like a cylinder of openness and resonance
12. when singers really get into their formant, they swear they are singing less loud, but in reality the formant is making the sound bigger; dynamics become the energy within the formant.
13. Style—what is the difference in slurring and non-legato?
 - a. Legato is continuous sound: undisturbed
14. sound travels different (slower) through bone than air—singers have secondary system through the skeletal structure