EXCELLENCE IN SINGING

multilevel learning and multilevel teaching

VOLUME 1: Beginning the process

CELUMBRA
Redmond, WA

with precision is one of your main responsibilities as a voice teacher.

Because most of these controls operate outside of your student's awareness, you must teach them indirectly, which you do by aiming her toward flow phonation—a quality of sound and kinesthetic sensations. Consequently, she learns flow phonation through what she hears and feels, placing her attention on her breath and resonance. (See the heading "Focus on Flow Phonation," in v. 2, ch. 9.)

Resonance

Another function of the voice is to extend the range of tone qualities, a function commonly called "resonance." If you could hear the sound at your student's larynx, it would sound buzzy, like a trumpet player's lips when the player practices without a trumpet. After the air pulses leave her larynx, her body uses the vocal tract—the tube shaped by the tongue, cheeks, lips, soft palate, nasal cavity, pharynx, and larynx—to further modify the air pressure pulses, expanding the range of tone qualities possible. She also uses her vocal tract to produce sounds.

The air pressure pulses from your student's vocal folds travel upward through her vocal tract and reflect back and forth, resounding at each bounce. As the pulses reflect back and forth, they interact with each other, changing the amount of pressure in each other before they reach the outside air. We discuss the reflection of these air pulses in the next chapter. (See the heading "Reflection of sound waves," in v. 1, ch. 5.)

You help your student make a difference in resonance by having her adjust the size and shape of her *vocal tract*. The vocal tract is the hollow area that extends from her vocal folds to her lips. It has

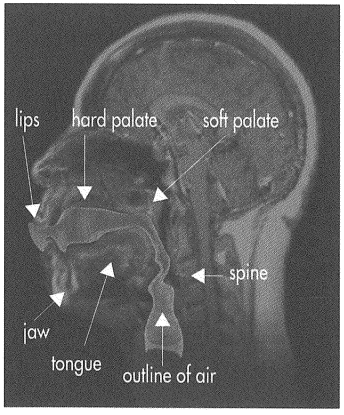
several cavities: the *throat* (also called the "pharynx"), the *mouth* (also called the "oral cavity"), and the *nasal cavity* (the area that extends from the soft palate to the outside air at her nostrils). There is also the *laryngeal tube,* a small area inside her larynx that lies above her vocal folds and below her pharynx.

Her pharynx is further divided into three parts: the *laryngopharynx* (the part nearest her larynx), the *oropharynx* (the part nearest her oral cavity), and the *nasopharynx* (the part nearest her nasal cavity). These hollow spaces form the air column above her vocal folds. Any change in size or shape of her vocal tract changes the tone quality.

Your student's body can change the shape of the air column by moving any of the parts that surround it. This flexibility lets your student produce not only the many sounds of language but the many tone qualities our voices can express.

The Major Body Parts that Control Resonance

Figure 16. From this magnetic resonance image, you can see the outline of the air in the pharynx and mouth.



The three-dimensional geometry of the vocal tract controls how the pulses become modified, and the structures that line the vocal tract control its three-dimensional geometry. Each part can move uniquely: the lips, cheeks, tongue, jaw, soft palate, and pharyngeal constrictor muscles. Because the movements of these parts articulate the sound, they are called "articulators" and their movements, "articulation." Additional parts that shape the hollow tube are the larynx (which raises and lowers, making the air column longer or shorter), the flexion and extension of the neck and head (which shorten or lengthen the air column, as well as expand and contract the pharynx) and, perhaps, the nasal cavities. These additional parts are not articulators in the traditional sense because they don't shape language sounds, but they can be significant in shaping the

air column for singing. (See Figure 16 in sidebar, and Figure 10 through Figure 13 on Plate 4.)

Because the parts that control resonance cause a change in the size and shape of your student's air column when they move—which, in turn, causes different qualities of sound—they are powerful controls for teaching your student. The number of ways they can transform her air column is astonishing, particularly because of her mobile tongue. And unlike the muscles within her larynx, she can consciously control these movements. So you will typically spend much of your time helping your student control the movements of the articulators, coordinating them to create the three-dimensional shapes that produce your target sounds.

The tongue

The tongue is considerably larger than many people realize. It extends from the tip in front down to the hyoid bone, at the top of the larynx. It is the most flexible of all the movable structures in the vocal tract. The tongue is actually a block structure made of several muscles, which are tightly packed with nerves and so intertwined that it is difficult to tell where one begins and another ends. This interconnectedness allows rapid and subtle movements to occur in three dimensions.

It is useful to think of the tongue in three parts—the tip and blade, body, and root—that can move independently or together as a unit.

The tongue helps control the shapes that produce different vowel sounds. Every vowel sound is classified by where the tongue constricts the air column.

When the high arch of the tongue is forward in the mouth, we hear the vowel [i] (ee). As the high arch of the tongue gradually lowers, we hear the vowels change in sequence from [i] to [ɪ] (ih)

to [e] (ay) to [ɛ] (eh) to [æ] (aah as in "cat") to [a] (ah). Because the arch of the tongue is forward in the mouth, these vowels are called "front vowels" in the International Phonetic Alphabet.

The International Phonetic Alphabet (IPA for short) is an alphabet in which each symbol stands for a single sound. (See the "International Phonetic Alphabet" in the Appendix for this volume.)

When the high arch of the tongue is in the back of the mouth, we hear the vowel [u] (oo), which is why [u] is called a "back vowel." As the high arch of the tongue gradually lowers, we hear the vowels change in sequence from [u] (oo) to [ʊ] (oo as in "book") to [o] (oh) to [ɔ] (aw) to [ɑ] (dark ah).

- The lips also play a critical role in shaping the vocal tract for back vowels.

When the tongue is more or less flat, without a distinctive arch, we hear the vowel [ʌ] (uh), which is called a "neutral vowel." The tongue is also fairly flat for [ɜ] (er without the "r") and [ə] (schwa).

The jaw

Any movement of your student's jaw affects the shape of her vocal tract, so the jaw plays a powerful role in speaking and singing. Her jaw—or *mandible*—hinges on her skull with joints called the *temporomandibular joints* (or *TMJ*), in front of her ears. Two membranes plus a cartilage between them create a flexible joint. From the skull, just in front of each ear, the first membrane hangs down, which, at its base, has a cartilage attached. Beneath the cartilage, the second membrane hangs down, and the jaw attaches to the bottom of the second membrane. The two membranes are like curtains, and the cartilage is a stabilizing rod between them. This

structure allows the jaw to swing up and down, forward and back, and side to side.

Your student's jaw is like a cradle for her tongue. Whenever her jaw moves, her tongue moves, though her tongue also moves independently. Her jaw might lower while her tongue arches upward, lower more while her tongue bulges forward at the tip, or rise while her tongue rests motionless. A loose, free jaw allows her tongue to move with freedom and gracefully shape the air column. A tight jaw stifles the motion of her tongue. Helping your student sing with an easy, free-moving, supportive jaw is a major goal of teaching and learning to sing.

When her jaw juts too far forward or retracts too far back, it can dramatically affect her voice. These jaw positions not only change the shape of her air column but can interfere with the many muscles that affect the shape of her vocal tract and her laryngeal muscles. An easy, free jaw helps free the other muscles she uses for singing, particularly those around her larynx. (See the exercises under the heading "The Jaw," in v. 2, ch. 10.)

The larynx

Your student's larynx forms the bottom end of her vocal tract, shaping the air column as she raises and lowers it. When she raises it, her air column becomes shorter; when she lowers it, her air column becomes longer. Either move dramatically affects her sound. Compare the sound of a piccolo to that of a flute to get a sense of how much the length of the air column affects the sound.

Many muscles govern the position of your student's larynx. Because her larynx is a floating structure attached to the base of her tongue at the hyoid bone, the position of her tongue affects the position of her larynx. Many of her muscles extending down her throat are attached to her jaw, so jaw movement can also

influence the position of her larynx. The muscles of her neck—the constrictor muscles and extrinsic laryngeal muscles—can raise or lower her larynx by several centimeters. (See "The constrictor muscles" and "Extrinsic laryngeal muscles," on page 199.)

You help your student train the muscles that raise or lower her larynx by helping her feel a soft, relaxed throat, in which the throat is neither squeezed nor stretched, and by having her suspend her larynx in a comfortably low position, neither elevated nor depressed. (See the exercise "To Discover a Low Larynx," in v. 2, ch. 9.)

The lips

The movements of your student's lips shape the opening of her vocal tract: opening or closing it, rounding or spreading it. For instance, when her lips protrude, they lengthen her vocal tract; when they spread, they shorten her vocal tract. Her lips are active in creating certain vowel sounds, particularly the back vowels in English.

Except for nasal sounds, the lips shape the interface between the air column inside her body and the huge expanse of air outside her body. Narrowing or enlarging this opening changes the resonance of her air column dramatically. (See the exercises under "To Become Aware Of the Lips and Cheeks," "To Relax the Lips and Cheeks," "To Explore Vowel Colors," and "To Modify Vowels," in v. 2, ch. 10.)

Her lips are involved for creating certain vowel sounds. For example, her lips are neutral—neither spread nor rounded—for the forward vowel [i] (ee) but extend and become rounder for the back vowel [o] (oh). Notice that when her lips round, they can also stretch forward. You teach your student to delicately lengthen and

shorten her vocal tract with her lips, just as a trombone player precisely lengthens and shortens his instrument.

- The lips work in tandem with the muscles that move the larynx to lengthen and shorten the vocal tract.

Her lips move from a more closed position to a more open position when singing the forward vowel [i] (ee) followed with [æ] (aah). The lips also move from a more closed position to a more open position when singing the two back vowels [u] (oo) and [o] (oh).

Repositioning her lips can create many variations. One lip can stretch more or less forward than the other. Or the upper lip can retract up over the upper teeth, making the teeth the end of her vocal tract. Doing this not only shortens the vocal tract but creates a hard surface at the orifice, which affects the reflections of the waves inside the mouth. Female singers sometimes retract their upper lips to help sing high notes. A tremendous variety and subtlety of lip movements occur when singing the different positions for vowels. (See the exercise "To Explore Bright And Dark Qualities," in v. 2, ch. 10.)

The cheeks

Your student's cheeks form the sidewalls of her mouth and the muscles above the teeth on either side of her nose. They are composed of layers of muscle tissue that can pull back or push forward and be tense or relaxed. Primarily, her cheeks move forward and back, assisting the movements of the lips and changing the shape of the walls of her vocal tract.

You can use your student's cheeks to help train her jaw, because when they stretch forward, her jaw tends to relax and hang into a

position beneficial for singing. You often see brilliant singers relaxing or contracting their cheek muscles with delicacy, just to the side of and below their nostrils, pulling their whole faces forward. You rarely see inexperienced singers activate their cheeks with such subtlety.

The soft palate

The soft palate, the gateway to the nasal cavity, is the soft, springy part of the roof of the mouth. It is connected to the hard palate, the firm, fleshy roof of the mouth, and it functions as a flap valve, opening and closing the passage to the nasal cavities. The soft palate works in concert with the *superior constrictor muscles* of the pharynx, which act as a sphincter.[10] (See the heading "The constrictor muscles," on page 199.)

The soft palate rests in a low position when your student breathes through her nose. But for speech and singing, her soft palate generally rises, dropping down occasionally only to produce a nasal sound or to modify a tone.

- There are three nasal consonants in English: [m], [n], and [ŋ] (ng).

Your student's soft palate works with her lips and tongue. On the consonant [m], her soft palate lowers and her lips seal, closing the air passageway through her oral cavity and routing the air through her nasal cavity. When she sings [n], her soft palate lowers and the tip of her tongue seals the air passageway at the teethridge (alveolar ridge) and again routes the air through her nose. When she sings [ŋ], as in "hang," her soft palate lowers and the back of her tongue seals the air passageway at the soft palate, directing all air into her nasal cavity. The lips and tongue assume their normal

shapes for nasal vowels, but the soft palate lowers, routing the air through both the mouth and the nose.

Any movement of her soft palate can dramatically affect the overall shape of her air column and, consequently, the sound. As we mentioned, the movement of her soft palate also influences the constrictor muscles in her neck. When the constrictor muscles contract, they narrow her pharynx; when they relax, they open her pharynx. Therefore, you can use her soft palate to train her constrictor muscles to relax properly, in addition to exercises for "softening" the throat.

You can train your student's soft palate with exercises that alternate nasal and nonnasal sounds.

Kinesthetic sensation in the nasal area versus a nasal sound. Your student must learn to distinguish between the sensations in the nasal area and a nasal sound. When your student raises her soft palate while producing a sound, no air enters her nasal cavities, and she produces no nasal sound. However, she might feel a tremendous sensation of vibration in her nasal area: the vibrations along the walls of her vocal tract transmit into the bones and other tissues of her head like the vibration along the walls of the New York City subway transmit to the sidewalks and streets above.

You and your student can use these sensations as guides for shaping her vocal tract. Many teachers use such phrases as "Sing through the mask" or "Move the tone more forward" or sometimes "Add more nasal resonance." Each refers to the sensations produced in the nasal area by the vibrating air column in the vocal tract. Your student can keep adjusting the muscles of the vocal tract until she feels the sensations there.

You hear a nasal sound, however, only when she lowers her soft palate and allows the air into the nasal cavity. If she lowers her soft

palate during nonnasal speech sounds, for example, you hear *nasality*—an undesirable twangy, sharp quality. Nasality is usually a result of a lazy soft palate and can originate in childhood speech habits.

Nasality and the ring of the voice are distinctly different tonal qualities, produced differently.

The head

Movements of your student's head affect the upper and back walls of her vocal tract. As her head nods forward and backward, her spine moves against the back wall of her throat, and her hard palate moves up and down. As her head extends upward, it widens her pharynx from front to back.

The movements of her head also influence the musculature of her neck, larynx, and vocal tract—one reason posture and head position figure so prominently in teaching and learning to sing.

Laryngeal tube

Another important area is the space inside your student's larynx, between her vocal folds and her pharynx, called the "laryngeal tube." Its size varies depending on the position of her epiglottis and arytenoids.

Nonetheless, your student does not usually experience the ring of the voice as originating in the throat or larynx. She usually feels it in her face—in the bones and other tissues of her head—which is why we frequently refer to it as "singing in the mask" or "singing with forward placement." We look more closely at the ring of the voice. (See the heading "The ring of the voice," on page 204.)