

Vocal Technique

A Physiologic Approach

SECOND EDITION

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Preface

HOW TO USE THIS BOOK EFFECTIVELY

As a university voice teacher for more than 30 years, I worked with many students with varying interests regarding the technical aspects of singing. Most of my students have had graduate school and professional singing goals in mind when beginning studies at the undergraduate level; some have wanted to become professional teachers of singing, and others only to improve their vocal technique so they could find more personal fulfillment from their endeavors as singers. This book is appropriate for all of them!

I am of the opinion that a singer must know and understand the anatomic and physiologic functions connected with the speaking and singing process in order to feel “in control” of that process. In addition, this knowledge will enable the singer to maintain optimum technical skill and vocal health throughout a long singing and/or teaching career. A singer who knows and understands his or her own body will necessarily be a better singer and a better teacher of singing. This book is based on that premise. Knowledge is power!

This book is intended for use in voice lessons or a voice class at the college or university level. Portions of it may also be suitable for teaching voice at the high school level, where students are interested and dedicated to learning a strong vocal technical foundation. As you read this book, do not hesitate to utilize the exercises given here as well as those assigned by your voice teacher. Practicing regularly what you are learning in voice lessons or a voice class is the only way to improve dramatically! You must come to know your voice intimately in order to utilize it to its fullest potential. You can only do this with many hours of practice in the privacy of your own home or practice space.

I have found, over the years, that vocal progress is somewhat different than the progress made by instrumentalists studying technique. Singers seem

to make great strides as they initially learn about and begin to understand the technical aspects of the process, and then the growth process slows somewhat while the brain and muscle connection “catches up.” Do not be frustrated by seeming plateaus in your learning. As the muscles learn to obey the commands of the educated brain, the complex inter-workings of the anatomic system will begin to come alive and work for you. It takes time, patience, and perseverance!

Use this book to gain as much knowledge as you possibly can in regard to the technical aspects of singing; that is, anatomy, posture, breath management, physiology, articulation, and resonance. Use it also to help you begin to learn to apply the important International Phonetic Alphabet (IPA) to the languages typically used by singers, and to help you learn about good health and nutrition for all people. Take all of these concepts and make them your own. Apply as much information as you can to your own situation and think carefully about how the information can help you become the best singer you can be. Then, be a discoverer! Go out and read more books and articles on the subjects contained in this book. Gather more facts and opinions, which will help you in establishing your own personal vocal technique.

Those who aspire to be professional singers or teachers of singing should pay particular attention to the health and nutritional aspects of this book. You are your instrument, and being a professional singer or a teacher of singing requires a tremendous amount of energy and excellent health in order to be successful. Begin now to study the appropriate eating and exercise suggestions, and begin to make them a habit for the rest of your life. A healthy body is a necessity for a life in the professional world of singing and/or the teaching of singing!

Following a voice class or initial voice lessons, you should expect to go on to study privately with a voice teacher for many years. A class in vocal technique is merely a beginning to a lifelong process that requires daily practice and study in order to achieve success. After you successfully complete a voice class at the high school or collegiate level—or a year of voice lessons—you should, however, have a strong foundation on which to base your choice of voice teachers and vocal technique. There are probably as many vocal techniques as there are voice teachers, and choosing the right teacher and technique for you is very important. Use the body of information you gain from this book to make decisions in this regard, but also continue to read books on technique and interpretation, as well as poetry and foreign languages. You will want to read other books in the area of music as well if you wish to become a professional musician. Begin now to be a lifelong learner!

I wish you well in your vocal studies and hope you gain much knowledge and insight from using this book!

Jan Bickel

A NOTE TO VOICE TEACHERS

There are a variety of ways to use this book in your teaching. If you use it for a voice class, I suggest that you assign Chapters 1, 3, and 4 very early in the learning period. Teaching posture and breath management is essential to every other aspect of the

course. Since you will want to have your students singing vocal repertoire throughout the entire learning period, it might be helpful to teach the information in Chapter 6—*An Introduction to Articulation and Lyric Diction for Singers*, in sections; that is, teach the general International Phonetic Alphabet as it applies to the speaking language of your students first, and then develop one language at a time, beginning with English, Italian, or Spanish, and then moving on to the more difficult German and French languages. You may also choose to have your students sing only in English and Italian in a beginning voice class, and save the other languages for later in their development.

I have found it helpful to teach posture and breath management first, and then return to Chapter 2—*Anatomy of the Singer's Instrument: Design and Function*. If you use the correct anatomic and physiologic terms when teaching posture and breath management, your students will find Chapter 2 much easier to understand and remember because they will have heard much of the terminology before they read Chapter 2. Then you can proceed to any of the other chapters that seem appropriate for your particular students. Some voice teachers like to teach the information on keeping the voice healthy very early in the semester, which is a very good idea. Please feel free to move around the chapters of the book as they seem to fit your teaching style and the learning style of your voice students. The chapters do not necessarily need to be taught in the order presented here. If you have questions, please do not hesitate to contact me via the companion website for this book. I will be happy to assist in any way that I can.

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The Physiology of Vocal Tone Production

*I*t is widely understood by singers and singing teachers in this century that increased knowledge of how the vocal instrument functions will enable a singer to sing more beautifully both technically and interpretively. With this increased knowledge comes a greater understanding and appreciation of the singer's art. The singer's instrument is inside the body and therefore requires great control mentally and physically. A careful study of how the vocal folds and resonators function in conjunction with breath management will enable the singer to exert more control over how the most beautiful, vibrant vocal tone is produced. Of course, there are some singers who sing quite well without this knowledge, but, in general, a student of vocal technique will improve more quickly with this knowledge than without it.

THE PHYSIOLOGY OF PHONATION (CREATING VOCAL TONE)

If you gently put your finger on your Adam's apple (the somewhat prominent protrusion in the front of your neck), you are touching the most physically obvious or prominent part of the external laryngeal structure: the *thyroid cartilage*. This is the largest of the three large cartilages that comprise the voice box or larynx along with two pairs of smaller cartilages. Please refer to Figure 2-8 for illustrations of the larynx anatomy and the companion website for this book for 3-D visualizations. Swallow and

notice that the Adam's apple rises and then falls approximately three-quarters of an inch. The flexibility necessary for this motion is present in the larynx because it is made up primarily of cartilage-translucent elastic tissue. Hum or sing a phrase in the middle or lower part of your range as you touch your Adam's apple and you will notice both motion and vibrations being produced here. This is where the singing tone begins.

As we have already seen in our study of the anatomy of the vocal instrument (Chapter 2), inside the larynx or voice box are two tiny muscles that are attached front to back and on the sides of the voice box at the top of the windpipe (trachea). These are the *vocal folds* or vocal cords. When a person merely thinks about making sound, these two tiny vocal folds come together almost completely closing over the top of the windpipe. When air is allowed to pass from the lungs through the trachea and against the vocal folds, they begin to vibrate producing the sounds we associate with speaking or singing. There is only a slight difference between singing and speaking. Singing is an extension of speech that allows each vocal vibration to continue for a longer period of time. Speaking requires short puffs of air and generally less breath support than singing, as singing requires the sustaining of tone for a longer period of time. Much of this process of *phonation* or vocal tone production is below the level of consciousness. In learning to sing correctly, however, we learn to control more of the process than the average person will ever need for the act of speaking.

Both speaking and singing are learned functions of the larynx for which it was not originally intended. The larynx and, particularly, the vocal folds function as a valve to open and close the windpipe to allow air to pass in and out of the lungs, protecting the airway from choking on material in the throat, and regulating the flow of air into our lungs. When additional strength is needed for heavy lifting or pushing, the valve closes to help create pressure in the thoracic cavity and thus enable the human body to utilize increased energy levels. Humans have learned to use this valve to create advanced sounds of communication as well as for its intended purposes. For a review of the structure of the larynx, please read the section in Chapter 2 entitled, *The Larynx or Voice Box*.

Making vocal sound within the human larynx is a complex function, much of which takes place below the level of consciousness. The action of the multilayered structure that makes up the vocal folds causes the vibrations that produce what we know and define as vocal tone. Through a complex interworking of all the muscles and cartilages connected to the larynx and breathing mechanism, the vocal folds are able to change length, thickness, and tension in order to create a wide variety of sounds that are thought of as pleasant to the human ear. The coordination of these muscles either bring the vocal folds together (*adduction*) or allow them to lie back inactively against the sidewalls of the larynx (*abduction*). Add to the complex muscle coordination of the larynx an appropriate supply of breath pressure, and sound is produced. This entire process is referred to as phonation. The larynx is capable, through a complex coordination of musculature, cartilage, and bone of performing the various necessary functions of singing including:

1. Starting and stopping tones
2. Establishing particular pitches
3. Changing volume levels (*dynamics*) in varying degrees from soft to loud
4. Changing *timbre* or tone color of a particular pitch.

Each of these functions is discussed separately in the following paragraphs.

STARTING AND STOPPING A TONE

The initiation of a vocal tone is generally referred to as the *attack* or the *onset* of that tone. Ending or stopping the tone is referred to as the *release* of that tone. At the onset of vocal tone, the vocal folds come together almost completely across the top of the windpipe, stretching the muscles to form a nearly complete closure over the *glottis*: the space between the vocal folds. When the tone is released, the muscles are relaxed so that once again air may pass through the windpipe freely in an unobstructed manner. When the vocal folds are mentally prepared for the onset of the tone, they obstruct the flow of air by closing the passage through the windpipe. The air then moves against the vocal folds causing them to vibrate. It is this action that produces vocal tone. The process, although seemingly simple, must be very carefully and consciously coordinated (particularly in the learning stages of vocal technique) by the ear and brain in order for the best vocal tone quality to be produced. For a completely *coordinated vocal onset* to take place, the inhalation process must be complete and without tension so that breath management may be properly coordinated with the phonation process.

WHAT HAPPENS IF THE COORDINATION IS NOT PRECISE?

If air goes through the vocal folds before they have been mentally prepared to vibrate, the sound produced will initially be “breathy.” This is known as an *aspirated onset*, and is undesirable for the singer because the tone will lack clarity and focus. An example of this type of attack can be experienced if the singer will attempt to sing any word beginning with the letter “h” (ha, ho, hey). The breathy quality is caused by air escaping before the glottis (the space between the open vocal folds) is closed. This type of *uncoordinated onset* can usually be adjusted by having the singer mentally hear himself singing the tone before allowing the process to happen physically. This allows the brain and laryngeal

musculature to consciously close the glottis before the onset of vocal vibrations.

If the glottis is tightly closed before the breath reaches the vocal folds, causing a buildup of *subglottal* (below the vocal folds) pressure, the vocal folds explode open, producing an undesirable “chif” or scraping sound. This is known as a *glottal onset*, and should generally be avoided by singers. Not only can a glottal onset be harmful to the vocal folds but it also produces a rather ugly tone quality. True glottal onsets are used rarely by professional singers and then only in a text requiring a highly dramatic or emotional outcry. This type of attack can be experienced by preparing to sing an “ah” vowel but not letting go of the breath until after a feeling of pressure has built up in the voice box. The feeling is much the same as holding one’s breath and then letting go suddenly with a cry. There are different degrees of glottal onset, the lesser of which are used carefully and in a consciously controlled manner when singing in some foreign languages, such as German, and some Slavic languages. Even in these cases, the singer must take care to avoid unnecessary subglottal pressure at all times.

The *coordinated onset* is the desired and correct way to begin a tone. In this instance, the release of the breath and the closure of the vocal folds over the glottis are perfectly coordinated following the deep and relaxed inhalation process. The result is a smooth and beautiful beginning to a tone and vowel sound that is free of extraneous noises and muscular tension.

DEVELOPING A COORDINATED ONSET

Developing a coordinated onset is a very important aspect of learning a vocal technique that will serve you through many years of fine singing. It requires, first, knowledge of what the feeling and sound of a coordinated onset ought to be, and then a conscious and determined effort to produce each new tone in this way until the process becomes subconscious. Experiment with each of the three types of onset so that you have a good feel for which is the correct

one. Following is an exercise that will help you learn to produce a coordinated onset each time you begin to produce a singing tone. Be aware of the use of *glottal onsets* or breathiness in your speaking voice as well, remembering that singing is an extension of your speech process.

USE OF THE INITIAL (l), (m), AND (n) TO ACHIEVE A COORDINATED ONSET

Using the consonant [m] or [n] at the initiation of a tone, rather than beginning a tone on a pure vowel such as [a] or [o], has generally proven helpful for singers attempting to produce a coordinated onset. Try speaking the syllable [na], and be sure the [n] is produced by placing the tip of your tongue gently on the ridge behind your upper teeth. There should be no feeling of tongue pressure against the ridge of the gum line. Allow the vocal tone to resonate freely in your nose on the consonant, and feel how gently the tone begins. Now try singing a five-note downward scale on this syllable. Try to feel the same freedom of vibration as on the spoken example. Attempt to memorize this feeling of freedom and vocal tone vibration. Do this several times at different pitch levels to be sure of the correct feeling.

Now, *imagine* feeling and producing the [n], but do not physically speak or sing it, to determine if the tone will start as gently and smoothly as before. This should help you to bring the vocal folds together in order to close the glottis and prepare the vocal folds for vibration before the breath begins to actually vibrate the vocal folds. Be sure to consciously take a deep and relaxed breath before trying to speak or sing the sound. The consonants [l] and [m] can be used in the same way. It is almost impossible to create a glottal onset when beginning with an [l], [m] or [n] consonant. Figures 5–1A and 5–1B contain a series of vocal exercises to help you develop a coordinated onset. The development of a smoothly coordinated onset takes time and practice, but will pay off in more beautiful tone quality and a healthy set of vocal folds, which will serve you for a long and productive singing life.

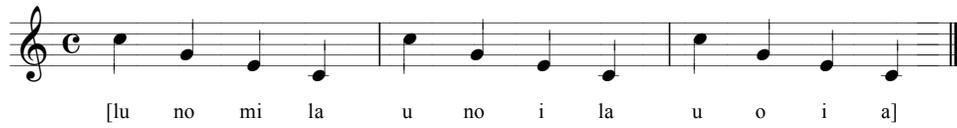
[mi me ma mo mu mi me ma mo mu]

[mi ni me na mi ni me na mi ne ma]
 [la me ni nu la me ni nu lo ni nu]
 [li e o li e o li e u]
 [a e i u a e i u a i u]

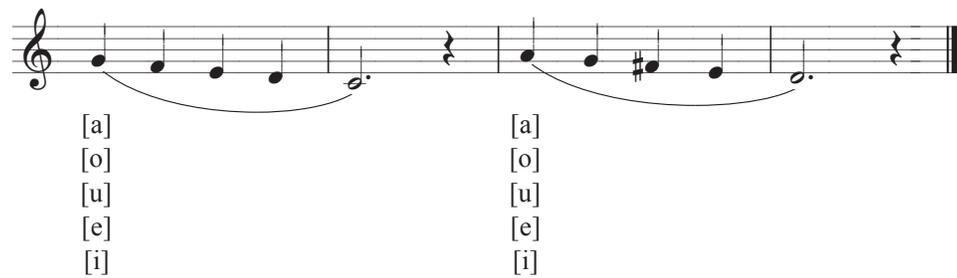
[mi e ma o mu mi e ma o mu]
 [i me a mo u i me a mo u]
 [i e a o u i e a o u]

A

Figure 5-1. A. Exercise for developing a coordinated onset (attack). Begin each new pitch with an (l), (m), or (n) in this exercise to help you become aware of the correct sensation at the onset of each vocal tone. It is very difficult, if not impossible, to begin a tone with a glottal or aspirated onset when beginning with a voiced consonant. Perform these exercises at low, medium, and high pitch levels. Once you have an understanding of the correct sensation of a coordinated onset, begin to remove some of the voiced consonants and continue doing the exercise until you can begin each tone with a coordinated onset on the vowel alone. (*continues*)



B



C

Figure 5-1. (continued) **B.** Additional exercises for developing a coordinated onset/attack. In these additional exercises, be sure to allow enough airflow to vibrate the voiced consonants. Then, using the same amount of airflow, sing the phrases at low, medium, and high pitch levels with and without the initial consonants. **C.** Exercise for developing the coordinated release. To practice a coordinated release, perform the following five note downward pattern, holding the last note for three full beats. On the fourth beat, stop the breath and sound at the same time, imagining that this “stopping process” happens out in front of you rather than inside your throat or mouth. The ending of a tone should be just as smooth and easy as the onset. Turn off the air and tone simultaneously.

DEVELOPING A COORDINATED RELEASE

The *release* of a tone is as important as the onset, and can be thought of in a similar way. Here also the singer must be careful to coordinate the action of the vocal folds with the breath pressure. Releasing the vocal folds before stopping the flow of breath will allow the tone to become breathy, just as it did

in the aspirated onset, and will not give solid closure to a phrase. Stopping the breath flow before releasing the vocal fold closure will give a choked quality to the end of a phrase, which is similar to the “chif” heard on a glottal onset. You may find it helpful to think of releasing the tone several feet in front of your body so that the breath and vocal fold vibrations have traveled away from you rather than being stopped inside. This will help you to establish the coordination of breath and musculature necessary

for ending the vocal fold vibrations and the breath simultaneously. As in an appropriate onset, the release of the tone must be appropriate to the underlying meaning and emotional content of the text and music you are singing. Thus, on occasion, a breathy or dramatic opening or closure to a phrase might be appropriate, but generally a smooth onset and release are desired. In a smooth release, the vocal folds relax at the same time the breath pressure is released and thus the tone quality remains consistent to the end of the phrase. It is not necessary to crescendo or decrescendo to the close of a phrase to achieve a clean and beautiful tonal release. If this dynamic change is appropriate for musical and/or dramatic reasons, the singer must continue to work carefully to release the phrase endings at the new dynamic level without over or underusing the vocal musculature or breath pressure.

The singer must be aware that establishing a correct release of the final tone of a phrase will allow for a deep and relaxed inhalation as well as a coordinated onset for the next phrase. The release of the tone at the end of one phrase physically prepares the singing mechanism for the onset of the next phrase. The same exercises used for developing a coordinated vocal onset may be utilized for establishing a coordinated vocal release. In addition, an exercise is provided specifically for practicing your vocal release (Figure 5–1C). The singer need only be aware of consciously controlling the release of the breath and vocal fold vibrations at the end of each phrase. Practice both long and short rhythmic durations while attempting to achieve coordinated onsets and releases.

ESTABLISHING PARTICULAR PITCHES

To create or change pitch, the vocal folds work in conjunction with breath pressure and the resonance process. Primarily, however, change of pitch is due to a change in the length, thickness, and tension of the vocal folds. This process is primarily subconscious and connected to the *auditory* or hearing process. It is a highly complex neurophysical process, which in simple terms might be explained as follows: the ear hears the specific pitch to be

produced, sends a signal to the brain, which then sends the proper signal to the larynx to set the correct tension, length, and thickness of the vocal folds. When the air pressure sets the vocal folds in motion, they are already in the proper position to produce the desired pitch as heard. This is a subconscious process that is almost impossible to control physically. In a few lucky individuals, this neurophysical process is so highly skilled that they are said to have *perfect pitch*. Each of these fortunate individuals is able to identify any pitch by letter name and then sing that pitch without having heard the pitch physically. This is quite rare and is considered a musical gift for those who have it. A student may acquire good *relative pitch* by memorizing certain pitch sensations and then relating all other pitches to those memorized. It is thought to be nearly impossible to develop perfect pitch, but most people can develop excellent relative pitch.

Musicians who have been fortunate enough to have had a strong musical foundation within their family life, or during their formal education, will have established a good sense of aural pitch memory before they come to a voice class or initial voice lessons. This means they have had the opportunity to listen to music and/or participate in musical organizations such as a school, community, or church choir; band, orchestra; or chamber music ensembles. Those who have not been so fortunate may have problems matching pitches sung for them or played on a piano or another instrument. This can be corrected but requires concentration and development of good listening skills. The student who has not had a strong musical background may need to have extra help in the area of development of adequate listening skills. Classes in sight-singing and aural skill development are generally offered at most colleges and universities in the music department, and will aid greatly in this endeavor. Above all, the voice student who feels it is difficult to hear specific pitches and reproduce them with her own voice must remain relaxed and comfortable enough to be able to concentrate on hearing the pitches correctly. Experience is the best teacher in this instance and practice in matching pitch is essential to making progress in this area. Don't give up! It is possible for anyone with normally functioning ears and vocal folds to learn to match pitch and sing.