

Chapter Seven

Appoggio: The Historical Bel Canto Method of Breathing

BACKGROUND

Mastery of the breath is the very bedrock of Bel Canto. “Chi sa respirare, sa cantare” (“He who knows how to breathe, knows how to sing”) is a well known Bel Canto maxim. The great Italian tradition of singing spans over five centuries; indeed, the Italians *invented* singing as we know it. Most of the early masters were from the great Italian singing schools of Rome, Naples, and Bologna. The operas of Handel, Hasse, and other Baroque composers were all written for singers, both male and female, who were masters of breathing. Mozart wrote the title role of *Idomeneo* for the tenor, Anton Raaff (1714–1797), who was sixty-six years old and a student of Bernacchi.¹ We have intriguing legends about the incredible feats of the castrati, who studied the art of breathing from the time they were children. The prodigious feats of Farinelli and Caffarelli, students of Nicola Porpora, have been renowned for centuries. I have already described the contest between Farinelli and the trumpet player in 1722.

The most serious problem one encounters in attempting to study the vocal technique of the past is the lack of reliable information. The early maestri were very secretive about their methods and wrote very little about technique, especially breathing. They certainly did not conceive of voice in scientific terms, as many do today. The early Italians and some teachers today use the word *appoggio* from *appoggiare* (to lean, to support) to describe the Italian breathing method. The exact meaning of the word *appoggio* is difficult to ascertain. The Italian teachers stated that the breath was to be “leaned up against the inside of the chest.” I take this to mean that the feeling of inhalation was to be maintained during most of the phrase. Since Garcia, Lamperti, and others believed in a firm glottal closure before the attack, then this must also mean that a *slight* positive pressure was maintained in the trachea at all times. The operative word here is *slight*. The breath outflow, therefore, must be controlled by other means than the tight glottis. “Pressed” vocalism must be avoided at all costs. In this, *appoggio* differs from certain German methods of singing, and the difference must be thoroughly understood.

We should take into account that the *appoggio* of the breath was a part of a whole system and the early Italians also spoke of the *appoggio* of the head and of the hard palate, which are resonance concepts. Giovanni Sbriglia’s term for *appoggio* was *point d’appui* or “focal point in the chest.”² He believed that “great singers have always breathed alike and always will breathe alike, the natural way.” Tetrizzini used the word *breath prop*.³ The tone was said to “float on the breath, like a ball bouncing in a fountain.” Students were taught to “*filare il suono*” (spin the tone out) from the most pianissimo dynamic to fortissimo, then return to pianissimo—the famous *messa di voce*. The *portamento* was considered not only to be an important ornament but also to be absolutely essential to Bel Canto. It was a literal carrying of the voice from one tone to another, an implied continuity when pausing at consonants, rests, or even breaths. Garcia said, “No persons can ever become accomplished singers until they possess an entire control over the breath—the very element of sound.”⁴ The air must be subjected to regular and continuous pressure, so as intimately to unite all the notes with one another. This dragging of notes will assist in equalizing the registers, timbres, and power of the voice.”⁵

Aside from the Garcia school, the most important line leading back to the art of the masters of the seventeenth and eighteenth centuries was that of Francesco Lamperti.⁶ His students included Marietta Alboni,⁷ Teresa Stolz and Maria Waldmann,⁸ Marcella Sembrich,⁹ and Italo Campanini,¹⁰ who sang in the inaugural performance of the Metropolitan

Opera in 1883. Lamperti further amplified Garcia's statement about the *respiro*, or full breath. He was of the opinion that the pupil would know that the sound has been emitted with a full respiration by measuring first the length of the respiration and then that of the breath; as a breath slowly inhaled will last much longer than one hurriedly taken.¹¹

The study of breathing is very controversial. There seems to be an enormous amount of misunderstanding among singers and teachers on the subject. Furthermore, the statements of many famous singers are contradictory, confused, and downright misleading. Many do not have a clue as to "how they do it"—like Adelina Patti, who said, "What is a diaphragm? I have never heard of it during my career."¹² Some, like Lilli Lehmann,¹³ by dint of iron determination, have illustrious careers in spite of a bad method. Lehmann was an advocate of "pancostal breathing" for twenty-five years, until she became better informed by an Italian colleague. Thereafter she advised students to seek out an Italian to teach them how to breathe!

It seems that many are intent on finding a *more efficient way to force!* Some teachers seek to avoid the subject entirely by suggesting that, since everyone has to breathe, whatever one does must be *natural* and no special study needs to be made. One observes much weak, collapsed singing among many young singers, who are being taught nothing at all under this threadbare concept.

The movements of the chest and respiratory system are extremely complex, and some of the interrelationships are still not clearly understood, even in the medical community. However, understanding a few general anatomical facts will help us in our study of breathing for singing.

THE MUSCULAR SYSTEMS OF RESPIRATION

Inspiration

The chest expands by the contraction of the inspiratory muscles. These muscles are voluntary and can be trained. The diaphragm is the principal muscle of inspiration. When in a condition of rest, this muscle is dome shaped with the concave surface toward the abdomen. It consists of a central tendinous portion and a muscular perimeter that is attached to the lower ribs. Thus, it forms the floor of the thoracic cavity and separates the heart and lungs above from the viscera beneath. Contraction of the diaphragm causes it to flatten out and, if allowed, the chest to expand from back to front (abdominal breathing). This action also presses upon the lower organs, a sensation that causes some singers to talk about breathing very low. At the same time, because the edges of the dome-shaped diaphragm slope down vertically, its contractions also elevate the lower ribs.

Contraction of the intercostal muscles (external and parasternal intercartilaginous muscles) also raises the ribs during inspiration. As the ribs are elevated, the angle of slope of the ribs pulls the sternum forward and the ribcage sideward. Therefore, both dimensions of the chest (front to back and side to side) enlarge. Because of the increase in chest volume and the corresponding drop in intrapleural pressure, atmospheric pressure fills the lungs. Other accessory inspiratory muscles, such as those of the shoulder girdle, also contribute to the movement of the chest.

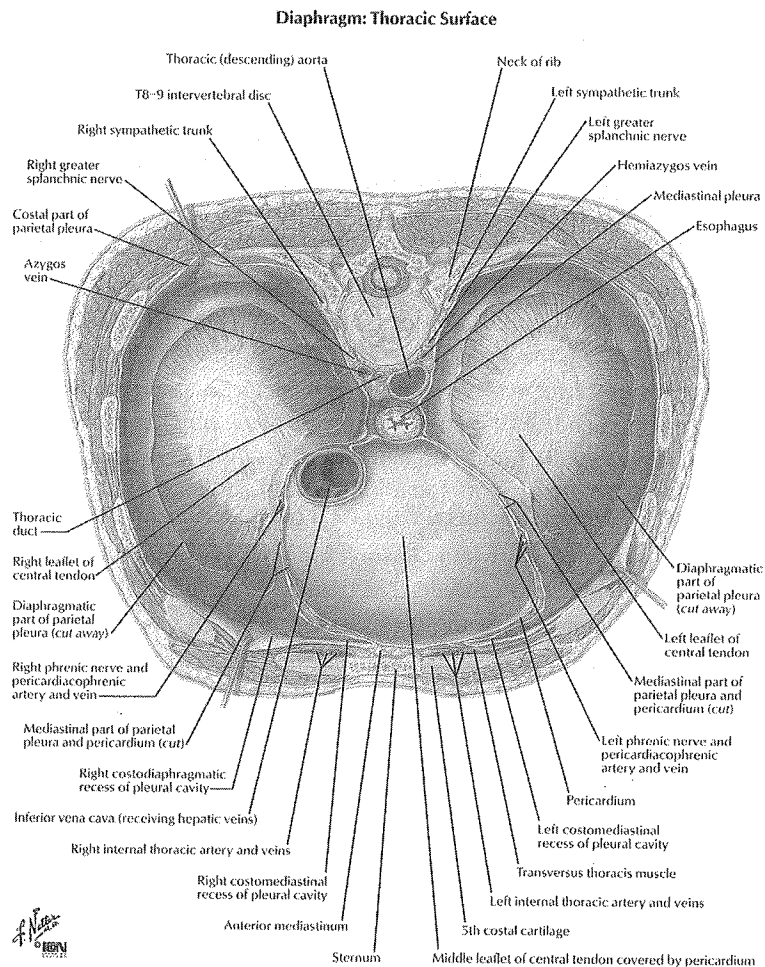


Figure 7.1. The Diaphragm Viewed from Above.

Expiration

In *quiet* breathing, at the end of the inspiration, the diaphragm relaxes and expiration occurs passively as a result of recoil of the lung and the displaced lower organs. However, expiration does become active at higher levels of ventilation when movement of air out of the lungs is impeded, such as when the glottis closes in singing or speaking. Muscles involved in active expiration include the internal intercostal muscles, which depress the ribs, the external and internal oblique abdominal muscles, and the transversus muscles, which compress the abdominal contents, depress the lower ribs, and pull down the front part of the lower chest. These expiratory muscles play important roles in regulating breathing during talking, singing, coughing, defecation, and parturition.

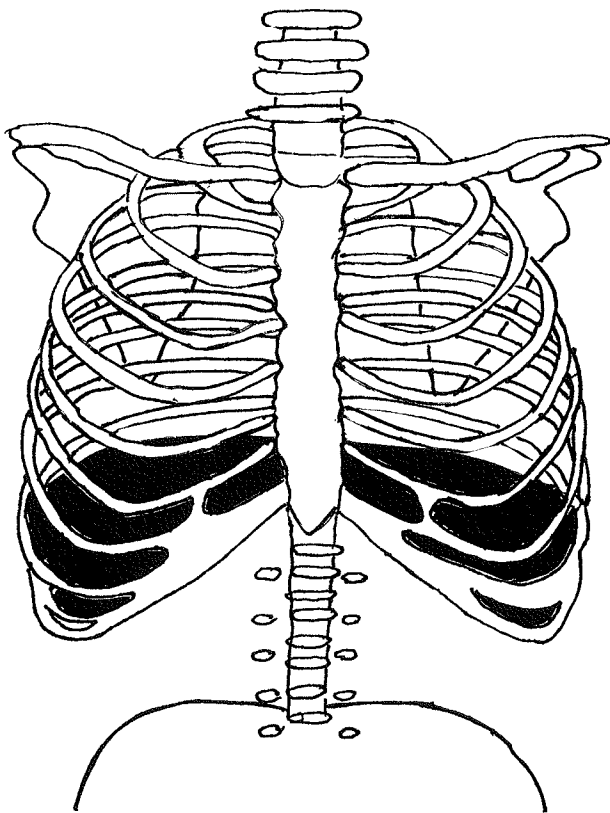
It should be noted that there is some disagreement about the role of the rectus abdominus muscle in singing. Meribeth Bunch states that:

The rectus abdominus is a powerful flexor of the lumbar spine balancing the activity in the powerful postvertebral muscles. It does not play a significant part in respiration. Despite some references to the contrary, electromyographic studies (Campbell, 1952) show that the rectus abdominus plays little or no part in respiration, even when forced. It will act if the spine is being flexed against gravity, a movement that should not be encountered normally when singing).¹⁴

This point is central in our study of *Appoggio* and probably incomprehensible to practitioners of “breath damming,” described below. These descriptions are simplified but can be studied in greater detail elsewhere, if one is interested.

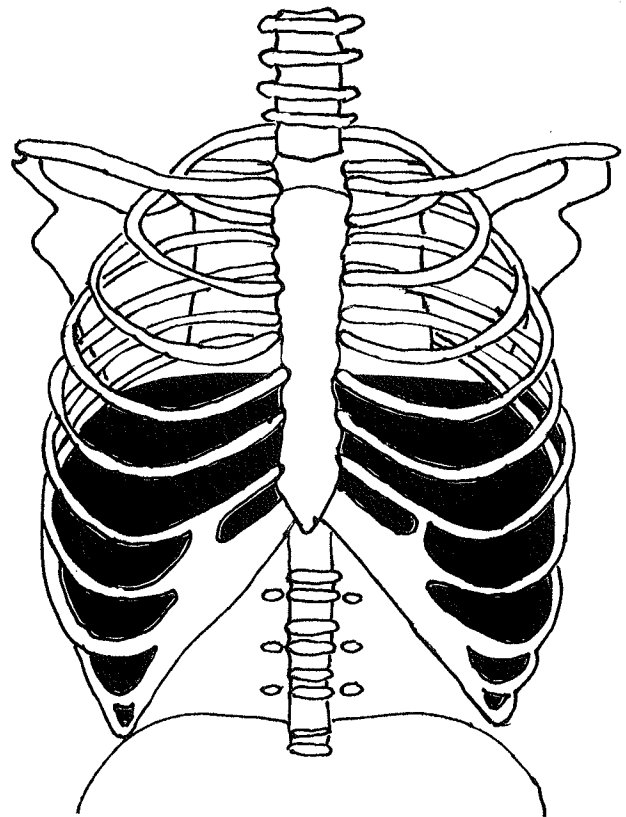
MODES OF BREATHING

We know that there are three distinct ways in which a human being can breathe: shoulder or high chest breathing (called scapular or clavicular), belly breathing (called abdominal or diaphragmatic), and intercostal (called rib or back).



Ribcage and Diaphragm at Maximum Inhalation
(Note Proximity of Lower Ribs to Top of Hip)

Figure 7.2. Inspiration (Intercostal).



Ribcage and Diaphragm at Maximum Exhalation
(Note Proximity of Lower Ribs to Top of Hip)

Figure 7.3. Expiration (Intercostal).

Muscles of Respiration

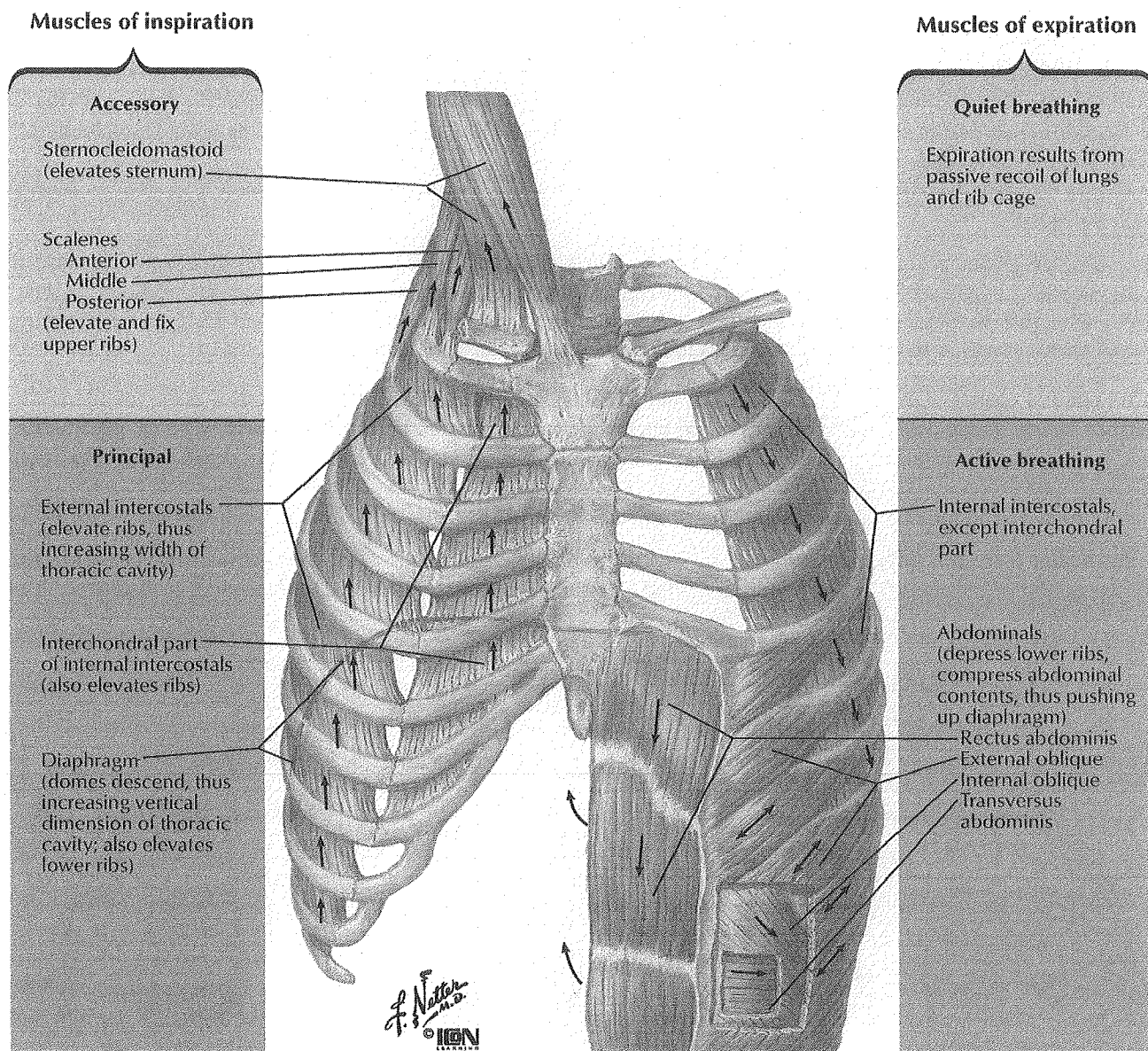


Figure 7.4. Muscular Systems of the Chest.

Witherspoon calls them, respectively, “the breath of exhaustion” (we see tired runners with hands on hips trying to give their shoulders a rest); “the breath of life” (babies and animals breathe abdominally), and “the breath of activity” (associated with heightened physical activity).¹⁵

Scapular or Clavicular Breathing

Most schools of voice training oppose high chest breathing, although one observes the heaving chests in a majority of young vocal students. Evidently, the message is not getting through! In this kind of breathing, the diaphragm becomes relatively inactive and, upon the act of expiration, the chest collapses down upon it much as a cylinder would move down upon a stationary piston. As the air is expelled, the chest drops and the head droops down and forward. Since the muscles of the larynx need a good alignment of the neck and spine to function freely, constriction of the throat often ensues. The

Bel Canto masters called this kind of attack *colpo di petto* (stroke of the chest). Besides the obvious lack of chest volume and misalignment of the neck and spine that this method entails, there is a serious lack of control involved because *all the muscles used in shoulder breathing are inspiratory!* This is an important point to remember when we consider the importance of the erect posture in maintaining equilibrium against the expiratory muscles.

Abdominal Breathing

In this mode, the chest is held rather low, and the belly protrudes as the diaphragm contracts and flattens itself out. One must consider that a muscle does one thing—it contracts. Each muscle depends upon its opposite to counterbalance its pull and allow movement in the opposite direction. The diaphragm is no exception. When forceful exhalation begins, the diaphragm begins to relax and move upward, as the abdominal muscles tighten and push up against it. This is where the singer begins to feel the sensation in the larynx called subglottal pressure. Some have called it “the fist in the throat.” One can experience this grunting feeling by picking up something heavy. The resulting pressed feeling in the glottis is associated with the Valsalva maneuver.¹⁶ If one attempts to tighten the glottis, the tone becomes impressive but very fatigued after a time. The powerful abdominal muscles are directly pitted against the tiny laryngeal muscles. As a result, fine coordination of the inner laryngeal muscles is

often lost, and the closing muscles are replaced in function by the tensors (See the chapter on primary vibration). One hears many so-called “dramatic” singers who can sing only fortissimo or in a falsetto piano after years of singing in this manner. Coloratura is a lost cause, and dynamic flexibility is impossible. The telltale grunt when one releases a note is an indication that the singer is pressing the breath into the glottis.

American operatic singing has been greatly influenced by the German approach of *Stauprinzip* or *Staumethode*—“breath damming.” This pernicious method seems to be based on the Nietzschean principle that “whatever doesn’t kill me, makes me strong”! The principal hallmark of this technique is the chest held in a low position with the abdomen thrust outward and downward. This has the effect of allocating most of the breath into the abdominal region, thereby using the abdominal muscles exclusively for the expiratory phase and to exert an increased downward pull on the larynx from the weight of the trachea and lungs. The glottis is firmly closed and tensed to resist the pressure exerted by the abdominal muscles. This pits some of the most powerful muscles in the body against the tiny muscles of the larynx, drastically increasing subglottal pressure. The result is a lowering of the pitch of the vocal pipe and a subsequent heavy and unwieldy tone. One often hears the slow irregular movement of the tone called a “wobble” in the lower male voices who have been singing with this pressed tone. This wobble is caused by irregular breath pressure. Many variations of abdominal breathing seek to combat this tendency by pressing out against the abdominal muscles with the muscles of the back. Some techniques exacerbate the condition by actively pressing in! One wonders whether this abdominal squeezing has an effect on the nervous system by pressing on the solar plexus. Also, the high incidence of reflux among singers may be a result of this kind of pressure. Sbriglia, the teacher of Jean and Edouard deReszke, Lillian Nordica, Pol Plançon, and Sybil Sanderson was no stranger to this approach and described it: “Now it is different; everybody is in a hurry. The new pushing method of singing with the back of your neck, sunk in chest, and muscularly pushed-out diaphragm, is a quick way to get results in singing, and only a little less of a quick way to ruin a voice.”¹⁷ Enrico Delle Sedie stated, “A forced pressure gives to the respiratory apparatus a useless fatigue and will greatly destroy the sonority, flexibility and mellowness of the voice, and that the listener will hear the noise of the reed [vocal cords] instead. [The forced and compressed support] in time may engender a disease in the larynx and trachea.”¹⁸

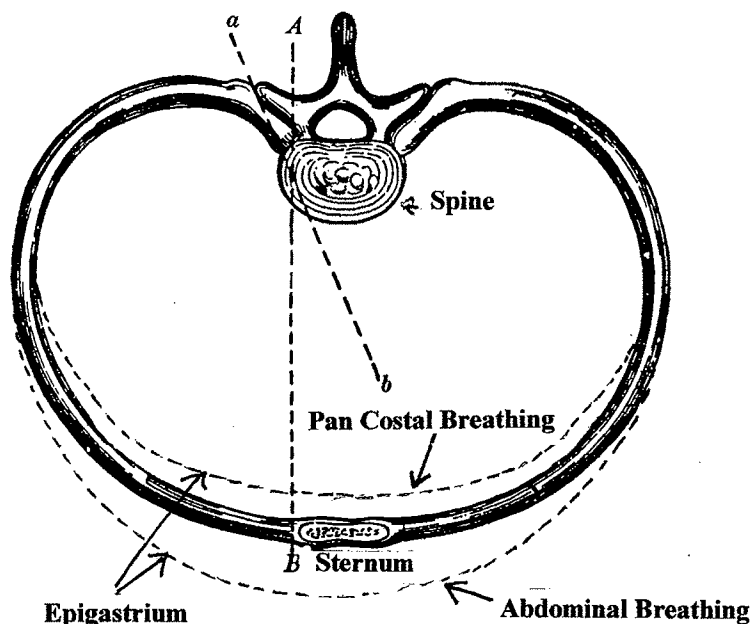


Figure 7.5. Abdominal Breathing, Cross-section of the Chest.



Figure 7.6. Jussi Björling as Manrico in Verdi's *Il trovatore*.

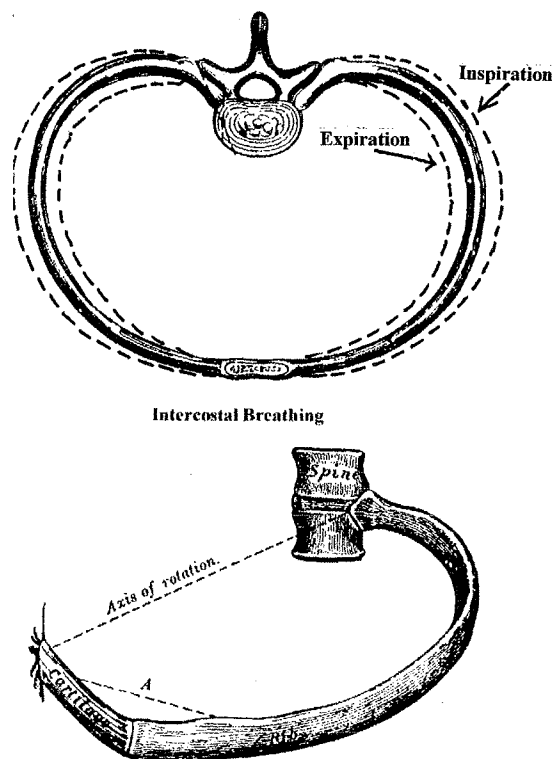


Figure 7.7. Intercostal Breathing, Cross-section of the Chest.

The late Jussi Björling was no less scornful of this approach. Giuseppe Valdengo recalled:

Björling was always helpful; he explained to me that one should breathe high in the chest and [later] when we sang together, he would sometimes point to his diaphragm to remind me to keep the breath high. He became really angry when he heard once that a singing teacher advised that the sound should sink toward the abdomen. "Jackass!" he exclaimed. "That is the perfect way to ruin the voice!"¹⁹

If the singer is less assertive, he will just "step aside" and allow the glottis to open slightly, thereby releasing the tone in a breathy quality. The Italian teachers called this *voce velata* or veiled tone. One often hears this quality in young singers, and those who value "crooning" in pop music consider it a virtue. This quality is also associated with the uncoordinated falsetto. Sometimes a singer will attempt to overcome this breathy sound by constricting exterior muscles such as the tongue, jaw, swallowing muscles, etc. Admonitions to relax these organs only serve to make things worse because the singer is relaxing the *wrong* muscles, where tonicity is needed instead! These constrictions often lead to the fast, irregular movement of the tone called a tremolo, often associated with sopranos whose jaws quaver in a spasmodic movement. It is usually a tight tongue, not a tight jaw, that produces this constriction. I once knew a soprano whose eyebrows moved up and down in perfect synchronicity with her quivering jaw! Exercise 2 introduces abdominal breathing alone.

Intercostal Breathing

We have discussed problems associated with abdominal breathing, but this method is definitely superior to clavicular breathing in postural terms and in the volume of air processed. We must now consider our third mode of breathing, that is, intercostal breathing (*inter* meaning between, *costal* referring to the ribs). In this mode of breathing, as one inhales, the exterior intercostal muscles contract and the flanks expand, while the diaphragm contracts and flattens. Upon expiration, the interior intercostals contract to expel the air. These two muscle groups are natural antagonists of equal strength; they are spindle-shaped and easier to control than the broad sheet muscles of the abdomen. The intercostals are also extremely powerful, and their involvement is very important in repertoire that demands prolonged energetic singing. In nature, the intercostal breath comes in during heightened forms of physical activity. Exercise 4 helps to locate the intercostal breath. There is also some activity in the oblique and transverse abdominal muscles, but this should be minimal for most singing tasks. The intercostal breath is sufficient for most normal length phrases, but not all. For this we need a combination of the abdominal and the intercostal.

Thoracic Breathing

The combination of the abdominal and intercostal is called diaphragmatic-intercostal or thoracic breathing (relating to the thorax or chest). The abdominal breath should be considered the *reserve*, and one should strive to sing while controlling the outflow of breath with the intercostals as much as possible. Lauritz Melchior said, “I sing with my interest, not my principal!”²⁰ I take this to mean that the intercostal breath is the interest and the abdominal the principal. Think of the intercostal breath as your checking account and the abdominal as the savings account. We only dip into our reserves when the primary breath is exhausted.

Skill in breathing technique is not about increasing the volume of air we take in; it is in *controlling the shape that the chest assumes when we inhale, thereby allocating the air to the proper part of the chest and using the proper muscular systems to resist the expiratory force upon the attack or onset*. When I speak about controlling the shape of the chest, I mean that the shape of the chest on each inhalation is determined by the tension on the various inspiratory muscle groups. For instance, if I inhale only abdominally, allowing the belly to inflate down and out as far as it can go (many basses breathe this way), I find that the air will “flow” into this cavity, the intercostal breath will be “locked out,” and that I have no choice except to control the subsequent phrase with the abdominal muscles alone. The shape of the chest in this instance would resemble an oval, with the large axis running from front to back.

If, on the other hand, I choose to overtighten and lift the abdominal muscles excessively before the next breath, my ribs will expand mostly to the sides. I will have a powerful breath driving into a tense glottis, but the breath will be short because the tense abdominal muscles will prevent the diaphragm from descending in front. The shape will tend to be oval, with the long axis from side to side. This kind of breathing is called *pancostal* breathing.

THE NOBLE POSTURE

One of my students is an architectural historian. I asked him what was the most important element in a building and, without hesitation, he replied: “Without question, it is the foundation.” So it is with our instrument, the human body. The skeleton, which is aligned by interactive muscular systems, is the framework upon which our power supply, the breath, rests. These systems function like the guy wires on a sailing ship—balanced tension preserves the integrity of the system. It does no good to talk about relaxation all the time as a means of combating unwanted tension. Such interfering muscular tension is the result of the failure of antagonistic muscular systems to balance the pull of those muscles that we need for singing and the compensation of other, less appropriate systems to do the job. The act of singing requires the keyed-up, buoyant, exuberant, and athletic body for maximum efficiency. If relaxation is called for, it is mental relaxation. In the historical Italian Bel Canto breathing technique (*appoggio*), the body is erect and the head up. This is called the Noble Posture and ensures that the inspiratory muscles of the shoulder girdle will be engaged, thereby providing a muscular antagonism to the pull of the abdominals. The posture is a very important element in the singer’s (and actor’s) technique. Those who practice the Alexander technique stress that the position of the head is all-important. The head lifts up and away from the body and the body follows the head. The torso should feel buoyant and, as Louis Bachner stated, “one should get up out of the hips.”²¹ The shoulders should not be pulled back, but allowed to ride forward in a comfortable manner. The chest is *always* up. Firm abdominal musculature is a must to keep the powerful muscles of the back from pulling the spine out of alignment into a swayback-potbellied appearance. Abdominal curls are a good exercise for the singer. Use exercise 1 to establish the correct posture.

The weight should be distributed forward upon the balls of the feet—not back upon the heels, which causes the knees to lock. One should learn to advance one foot slightly in front of the other,



Figure 7.8. The Noble Posture. Beniamino Gigli as Manrico in Verdi’s *Il trovatore*.

placed fairly close together. This allows one to be balanced fore and aft, as well as from side to side, and looks graceful. I do not like to see a singer standing awkwardly with feet spread, swaying slightly to try to maintain balance. The vocal artist spends a lot of time on his feet. Birgit Nilsson was asked what the most important requirement is for enduring a five-hour Wagnerian performance. Miss Nilsson replied: "A comfortable pair of shoes!"

APPOGGIO

To begin a phrase *ben appoggiata* (well supported), the resonators are positioned in the shape of the vowel to be sung, and one inhales through the nose and mouth simultaneously as noiselessly as possible. If the preceding phrase has completely emptied the reserve (abdominal portion of the breath), the abdominal breath must be taken first, expanding not so much *out* as *down*, and being limited by the firm (not locked) abdominal muscles. The sensation is of a "column or cushion of air" extending from the bottom of the sternum to the top of the pubic arch. After the abdominal portion of the breath is taken in this *limited* way, the inspiratory intercostal muscles contract, and the sides and back expand to finish the inhalation. It is of supreme importance to calibrate where the full respiration is. Lamperti said that it is prejudicial to begin a phrase with less than a full breath. His students were trained in exercises to inhale for up to eighteen seconds when preparing to attack the tone. This was to be followed by an eighteen-second phrase. Try it! You will be astonished by how long eighteen seconds is and what a lack of expiratory tension this engenders. Besides the lack of control, underinflation frequently leads to singing under pitch—an all too common phenomenon.

It is also important not to overinflate the chest because this often results in too much subglottal pressure. The great baritone Mattia Battistini was asked about his breathing. He replied, "I take in no more breath for singing than I do when smelling a flower."²² Exercises 4 and 5 help to establish where "full" is.

It is hoped that most of the time the singer finishes the phrase with the reserve or "talking breath" intact. If this is the case, then the subsequent breath can be all intercostal and the initial abdominal part of the breathing sequence can be dispensed with. When this coordination has been mastered, the abdominal and intercostal sequences become one—the thoracic. Garcia describes the inspiratory phase of the *appoggio* technique in this way:

In the first attempt to emit a sound, the diaphragm flattens itself, the stomach slightly protrudes, and the breath is introduced at will by the nose, by the mouth, or by both simultaneously. During this partial inspiration, which is called abdominal, the ribs do not move, nor are the lungs filled to their full capacity, to obtain which the diaphragm must and does contract completely. Then, and only then, are the ribs raised, while the stomach is drawn in. This inspiration—in which the lungs have their free action from side to side, from front to back, from top to bottom—is complete, and is called thoracic or intercostal. If by compression of any kind the lower ribs are prevented from expanding, the breathing becomes sternal or clavicular.²³

If the inspiratory muscle groups (external intercostals, muscles of the shoulder girdle, and diaphragm contracted and down in the abdominal area) are kept engaged and not allowed to collapse, the exhalation (singing) will largely be driven by the interior intercostals and, to a lesser extent, the oblique and transverse abdominals. This ensures that the vocal cords are relieved of excessive subglottal pressure. William Shakespeare, an English concert and oratorio tenor, is our most important source on the breathing technique of the Lamperti school. He wrote, "It seems to the good singer as if the breath, though vigorously pressed out, *still remains inside the body*. This is a sign that should never be lost sight of, as proving that the breath is being regulated. On the contrary, in bad notes, the breath rushes outwards, only restrained by the tightly held throat."²⁴

LUTTE VOCALE

This leads us to the concept of *lutte vocale* (in French) or *lotta vocale* (in Italian). Indeed, when the voice is *ben appoggiata*, the singer feels that he is expanding, not contracting. Some masters spoke of *inalare la voce* (inhale the voice). Francesco Lamperti was eloquent on this subject:

To sustain a given note, the air should be expelled slowly; to attain this end, the respiratory muscles, by continuing their action, strive to retain the air in the lungs, and oppose their action to that of the expiratory muscles, which, at the same time, drive it out for the production of the note. There is thus established a balance of power between these two agents, which is called the *lutte*

vocale or vocal struggle. On the retention of this equilibrium depends the just emission of the voice and by means of it alone can true expression be given to the sound produced.²⁵

Shakespeare understood the principals of *appoggio* and believed that the old methods were equal to the demands of Verismo and the Wagnerian operas, both of which were on the rise during his time. He wrote:

We have then, at our control, the powerful breath pressure necessary to loud singing, for we can regulate this by balancing the *upward and downward* action of the muscles of the ribs, while balancing the downward movement of the diaphragm against the contraction of the abdominal muscles.

There can be inside the body, therefore, an opposition between the muscles which send out the breath and the muscles which draw in the breath. The latter restrain and regulate its onrush, economising it. Such is the control which is of supreme importance to the singer. He can press it out and yet hold back in such a way that when he sings, he *need not contract the throat*.²⁶

He rightly expressed the antithetical positions of the *Stauprinzip* and the *Appoggio* schools:

We can take a very deep breath by using the diaphragm only; in this case the abdomen is expanded at its very lowest part. If we do this, however, we cannot raise the ribs; had we done so, the diaphragm, being attached to the sixth and lower ribs, would have been prevented from descending to its fullest extent.

For singing purposes diaphragmatic breathing must be combined with rib-breathing; but when using the rib raising muscles, especially the important ones up the back as far as the shoulder blades, we cannot breathe so deeply with the diaphragm; the latter is affected by the raising of the ribs; it can only contract so as to cause the abdomen to bulge higher up at the soft place just under the breast bone. The diaphragm is materially assisted in its descent by the spreading out of the ribs to which it is attached. The shoulders should rest in their normal position.²⁷

To maintain the inspiratory force, one should concentrate on three points—the soft place under the breastbone (epigastrium) and up under the arms on either side—to feel this counterbalancing force. This feeling of expansion will be spread around the entire chest if the chest is shaped more nearly round on each breath.

It may help to think of the chest as a cylinder with the front border located on a line from the sternum on down and the lateral and the posterior portions expandable. In this way, the breath is allocated to the proper expiratory muscles for a controlled and powerful emission. The skeletons of the castrati were delayed in ossification because of the interference with normal glandular functioning. It is reported that they had round chests and all did strenuous breathing exercises from the time that they were young boys. I think that there was a connection. Many great singers, like Caruso, have barrel chests.

The diaphragm will “flow” into whatever shape the chest cavity is positioned. Sbriglia is purported to have developed the “Sbriglia Belt” to limit the abdominal expansion but *not* the intercostal expansion! It is to be understood that such devices are not to assist in abdominal pushing but to help the allocation of the breath to the intercostal region.

Lutte vocale, then, is the control factor for the outflow of the breath, not the glottis. The outward flow of the breath is accomplished by *the gradual release of inspiratory tension*. Since the chest is inflated in singing, the expiratory muscles are already engaged and tend to return to their position of rest. Of course, when louder singing is required, the expiratory force is increased, but always under the control of the inspiratory muscles—the *lutte vocale*. The salient point is that the breath is not to be *driven out*, in most cases, but *released* by a gradual relaxation of the inspiratory intercostal tension. This works in much the same way as the bowstring, which drives the arrow forward by returning to its position of rest when it is released by the hand of the archer. Therefore the inspiratory tension is to be considered the control factor; not how much more or less the breath is expelled.

Plácido Domingo, one of the greatest singers of this or any other time, learned the *lutte vocale* by listening to the records of Caruso. He said:

I tried to imitate him . . . and suddenly I realized I could sing anything. So that day I went alone to the piano and I sang about twenty-five arias, because I realized it [Caruso’s method] was based on the old technique . . . [in] which they don’t waste any kind of breath singing. And that was the singing of Titta Ruffo.

If you hear most of the singers in Europe, like Gobbi, they sing in that old technique . . . it’s only working the air It was my next step, hearing the Caruso recordings. And since then I have found a consistency in my column of sound, equal from top to bottom.²⁸

See exercise 4 for practice in this controlled exhalation.

TWO TYPES OF INHALATION

Both Garcia and Lamperti describe *two* distinct types of inhalation. Garcia does it best:

When the lungs have been completely filled, without any jerking movement, they have the power of retaining the air without effort; this slow and complete inspiration is what the Italians call *Respiro* as contrasted with that slight and hurried inspiration which gives the lungs a slight supply, merely sufficient for a moment, and technically termed the *Mezzo Respiro*.²⁹

This is one of the great principles of Bel Canto. The slow unhurried inhalation of the *respiro* has been appropriated by the great composers such as Handel, Mozart, Bellini, Donizetti, and Rossini. Their music has periodic interludes of accompaniment, which take into consideration the need of the singers to breathe.

The *mezzo respiro* is a device that makes it possible to negotiate several pages of music written without rests or interludes. The essential thing is that the artist simply replaces the breath that he has used in the previous phrase by using the intercostals to return to the position of "full" each time. One must not panic and try to gasp and overbreathe. Each breath will be of a different volume, governed by the expenditure of the previous phrase, and may number as many as seven or eight *mezzi respiro* before one has the luxury of taking the full *respiro*. The following excerpt for alto, example 7.1, "Erbarme dich," (BWV 47) from *The Saint Matthew Passion* by Johann Sebastian Bach, illustrates this point:

Quiet, imperceptible breathing was the goal of the great singers of the past. Giovanni-Battista Rubini, the great tenor of Bellini and Donizetti, was a master of this kind of breathing. He won a bet from the equally celebrated bass Luigi Lablache by singing for four minutes without Lablache's being able to discover any sign of breath taking.

THE BREATH "STANDS STILL"

Now we arrive at another element of Bel Canto often overlooked or disregarded. The breath, in Lilli Lehmann's phrase, "stands still" at the end of the inspiratory phase. This allows *lutte vocale*, or equilibrium, to be established between inspiratory and expiratory muscle groups. The attack is made *without excessive subglottal pressure*.

Louis Bachner states the following:

The full intake of breath gives to the lungs the keyed-up resistant strength through which maximum intensity and concentration of tone are possible. Muscular activity, however, in the intake of a full breath, disturbs the balanced adjustment of the breathing apparatus, which permits free co-ordination of its various parts in singing. To attain this adjustment, there should be the slightest instant of repose at the end of the inhalation when the change to singing takes place. The instant of repose, when activity in the intake of breath ends, permits the co-ordination necessary for beginning to sing to take place. It is an adjustment of the breathing apparatus for the elimination of tensional interferences and for the attainment of correct balance. This balance and nicety of adjustment is a matter of rhythmic timing, not of muscular control.³⁰

Tetrazinni's advice was:

Do not attack a note at the same time that you are inhaling. That is too soon. Take the breath through the nose, of course, and give it an instant to settle before attacking the sound. In this way you will avoid the stroke of the glottis which is caused by the sudden and uncontrolled emission of the accumulated breath.³¹

(Many believe in breathing only through the nose, but the space is insufficient when one must breathe quickly, and formation of the vowel before singing is not possible.)

Pierre Bernac connects this concept to expression:

In the vocal line of a song there are often silences, while the piano part goes its way. These silences, more or less long, may occur in the middle of a literary phrase, or of a musical idea; they should not be 'dead' silences, and the singer with his 'presence' must succeed in 'making a bridge' between the two fragments of a phrase. The best way to achieve this linking of the musical and literary idea is to take a breath immediately and slowly at the end of the first fragment, and to hold it until one resumes singing, instead of waiting until just before singing to take a breath. Thus the tension is held; it makes a great difference.³²

This concept is *very* important. The chest must be *still* on the attack; if it is moving, it is impossible to stabilize—like marbles rolling down a hill. You must finish the breath before you begin to sing. When a singer masters this kind of

R = *Respiro*; MR = *Mezzo Respiro*; ♪ = *Breath*

Piano

The piano introduction consists of two staves. The right hand features a continuous, flowing sixteenth-note pattern in D major, while the left hand provides a steady eighth-note accompaniment.

A

2

R

Er - bar - - - me dich

pp

The first vocal entry (Soprano) begins with a whole rest followed by a half note G4, marked with a *Respiro* (R). The piano accompaniment continues with the sixteenth-note pattern in the right hand and eighth notes in the left hand. Dynamics include *pp* (pianissimo) and *p* (piano).

A

4

MR

MR

er - bar me dich, mein Gott, um mei ner Zäh - - -

The second vocal entry (Soprano) begins with a half note G4, marked with a *Mezzo Respiro* (MR). The piano accompaniment continues with the sixteenth-note pattern in the right hand and eighth notes in the left hand.

A

6

MR

MR

ren wil - len; er - bar - - me dich, er -

The third vocal entry (Soprano) begins with a half note G4, marked with a *Mezzo Respiro* (MR). The piano accompaniment continues with the sixteenth-note pattern in the right hand and eighth notes in the left hand.

A

8

MR

MR

bar - - me dich, mein Gott, er - bar - - me, er -

The fourth vocal entry (Soprano) begins with a half note G4, marked with a *Mezzo Respiro* (MR). The piano accompaniment continues with the sixteenth-note pattern in the right hand and eighth notes in the left hand.

Example 7.1. "Erbarme dich," from *The Saint Matthew Passion* (1729) by Johann Sebastian Bach.

10 MR

A MR

bar - - me dich, um mei - ner Zä - ren, um

12 R

A R

mei - ner Zä - ren wil - len er - - -

Example 7.1. Continued

stabilization of the breath, very often there is a tremendous change in body language. When the breath stands still, singers seem to take on an air of authority, as if what they are about to sing has great import. One also sees this authority in great instrumentalists or conductors as they prepare to attack a phrase. Time itself seems to stand still!

The implication of this is that, as often as possible, the singer must commence breathing *long before the upbeat*, unlike the last-second gasp that most singers employ on the upbeat (a technique learned from countless choir masters, conductors, and coaches). This is of the utmost importance when preparing for a high note, a long phrase, or a high tessitura. When the breath is taken slowly one avoids the tendency of the expiratory muscles to tense up and “put the brakes on.” When a very deep breath is taken in this way, the inspiratory muscles (diaphragm and exterior intercostals) contract to the maximum, thereby ensuring that the emission will be under complete control and that the chest will not collapse. When the position of “full” is reached, the interior intercostals are stretched out and their tendency to return to the position of rest will provide the necessary air pressure for the attack without resorting to abdominal force.

The expiratory intercostal muscles and the previously mentioned abdominals maintain a slight positive pressure. The inspiratory muscles of the ribs and the diaphragm itself are *never* allowed to collapse, so the control of the voice is relegated to the abdominal muscles alone, damming up the breath against the fragile vocal cords and the laryngeal suspensory system. As the tone is spun out, the intercostal breath is exhausted first. The weakening of the *appoggio* is felt (hopefully not on a high note), and then, if necessary, the abdominal (or reserve) breath is used. The singer should realize that his reserve is being tapped and contrive to get back to the “full” position by taking another breath. If there is no time to take the full *respiro*, the singer must take one or more *mezzi respiri*. Under no circumstances must the residual breath be used by allowing the upper chest to collapse, for all the masters agreed that this is a disaster!

When the next breath is taken, one should not overinflate the chest. A comfortable fullness should be maintained. The exception to this rule occurs when one is faced with singing a high note at the end of a very long phrase. In this case, it is advisable to overinflate somewhat, fighting the tendency to expel too much air on the attack, until the pressure drops to manageable proportions.

Some teachers advocate a complete “dumping out” of the breath after every phrase, on the grounds that a complete oxygen transfer must take place on every breath. This may be true for running but not for singing. One often observes singers unconsciously holding their breath upon finishing a phrase, sometimes for long periods of time, and then taking a last-second gasp before the next phrase. This is to be avoided. The long, calm *respiro* is what is wanted, whenever possible.

Many of the Bel Canto masters would allow their pupils to sing only single tones for long periods of time. Steadiness, perfect intonation, and good placement were the goals. It was explained that the breath pressure is to be varied: held back at first, when the breath pressure is high, then used more lavishly toward the end of the phrase, when the pressure drops. The result is a tone that does not fluctuate in either pitch or loudness. The single tone is still a good exercise, although few have the patience to pursue it to its ultimate conclusion. We only use a small part of our vital capacity for singing; what is needed is a comfortable fullness and a quiet chest at all times. The quantity of breath that one takes is infinitely varied, governed by how much air was used in the preceding phrase.

The most important feature of *appoggio* is that one must *preserve the feeling of the balance of forces even while the expiratory tension of the act of singing threatens to collapse the chest!* If the *appoggio* gives way, the expiratory breath pressure will be opposed solely by the laryngeal muscles. Pitting these tiny muscles against the powerful abdominals will inevitably lead to a host of troubles: a pressed tone, if the singer has dramatic instincts; a breathy one, if not. Subglottal pressure driving the larynx upward will result in the *voce bianca* (white tone). Some singers are driven to try to combat excessive subglottal pressure by lowering the larynx. They press the tongue down backwards, which results in a guttural, choked tone that sounds big to the singer, but will not carry in the theater. The epiglottis will fold down backwards in this kind of production, reflecting the tone to the back of the throat. Concepts of yawning, lifting the palate, and other actions vie with trying to place the tone forward to compensate for lost nasal resonance, as the nasal passages alternately open and close under the pressure caused by the collapsed breathing system. As the vowels distort and the singer strives to “open the throat,” the spread vocal tract formation will ruin the natural harmonic relationship of the resonators to the vocal cords and will interfere with their vibration acoustically. *I believe that the “open throat” is simply a throat that is positioned perfectly for the vowel being sung.*

The more contracted the abdominal muscles are (especially the rectus abdominus) during the inspiratory phase, the more fatigued the external intercostals will be. This is like driving with the emergency brake on! I find that dancers who have studied ballet for years and have been counseled to keep the abdominals tight at all times are the hardest to instruct in breathing. *Appoggio* is also *not* the breathing method called “fixing the flanks.” This is a method that seeks to freeze the ribs in the open position in order to “free the abdominal muscles.” This is the *pancostal* breathing referred to above.

So far we have been discussing only the mechanics of breathing, but there is far more to it than that. Breathing is also a very important part of expression, and we should never lose sight of this fact. Consider how expressive a sigh is. We must always breathe with the emotion of the phrase. A sad song will be slow, and the breath should be taken accordingly. Of course, a happy or funny phrase will call for a light cheerful breath. One must never breathe in a vacant manner and then attempt to get in character when one begins to sing. Nothing is as annoying to me as a lounge singer’s choreographed vapid look into the wings on each and every breath.

BREATHING AND STRESS

One frequently noticed phenomenon about breathing is that, under performance conditions (especially auditions), there is often a distinct shortness of breath, coupled with undesirable muscular tension. We all experience the anxiety that comes with public performance, but I think that it is helpful to understand the *physical* reactions that come from these stressful situations.

Hans Selye, who was the world’s outstanding authority on stress, defined stress as the nonspecific response of the body to any demand made upon it.³³ He made it clear that he was not talking about mere nervous tension. Dr. Selye called this reaction the “General Adaption Syndrome” (or GAS).³⁴ Its phases can be summarized as:

1. Alarm. During this phase, the organism (from amoeba to human being) recognizes an outside stimulus entering its environment. It is important to understand that the stimulus can be *anything*; physical and mental stimuli are not perceived as being different from each other in terms of the body-mind stress reaction. A phone call informing one that a loved one has had an accident will trigger a similar stress reaction that a twenty-mile run would. This reaction is the familiar “fight or flight” feeling that we have all experienced. Along with an elevated pulse, pumping adrenaline, and increased hormonal activity, the aspect of the stress syndrome that concerns us as singers is the effect on breathing. During this phase, the brain needs an enormous amount of oxygen for its increased activity, and so the breathing becomes very fast, deep, and often irregular.

Imagine that you are about to step off a curb. A taxicab comes careening around the corner heading right for you! Your immediate reaction is to take a very quick, deep breath and then hold it, probably against the glottis. As you hurl

yourself out of the way, every muscle is taut, every sense very alert, your pulse pounding! *Missed me!* You then heave a sigh of relief, and the body and mind slowly return to normal. If the stimulus continues, then the organism enters the next phase of the stress syndrome.

2. Resistance. This is the familiar “second wind.” In this phase the organism begins to assess how much heightened activity is necessary to deal with the continued intrusion of the stimulus. We all know the feeling of “settling down” in a performance. The feelings of panic subside, we can think clearly, the breath is more easily controlled, and the muscles begin to do what we want them to do. This phase has been called “good stress.” During the resistance phase, training effect takes place because the organism (singer) gets used to dealing with the stimulus (singing plus performance conditions) and continues to get stronger in the important ways. This is why the constant avoidance of stress, physical and mental, leads to weakness and inability to deal with one’s environment. Too long an exposure to the alarm or resistance phases leads to the third phase.
3. Exhaustion. When an organism no longer has the physical or mental resources to deal with stress, it begins to break down. This is also called distress and goes beyond being tired! Elite athletes who overtrain begin to experience strange illnesses such as stress fractures and the like. This phase is probably outside our subject of inquiry here, but it gives food for thought in some aspects of the singer’s career—for example, a lyric singer who insists on singing dramatic roles or one who follows crazy schedules of air travel and has difficulty in adapting to different time zones. The trick is to *stay in the resistance phase as much as possible*.

Many of the world’s great philosophical systems, such as Zen and Hatha Yoga, have recognized that systematized breathing techniques can be utilized to gain control over the autonomic nervous system and thereby combat undesirable effects of the stress syndrome. Marilyn Horne, in a talk to the New York chapter of the National Association of Teachers of Singing described “creating her own space” when she performs, which seems to be an almost instinctive kind of super-concentration or auto-hypnosis. Elite tennis players speak of “zoning out” in big matches, when their environment seems to be reduced to themselves, the ball, and the net.

I believe that the Bel Canto masters were cognizant of these concepts and had techniques for overcoming stress reaction as well as for the sheer mechanical aspect of producing tone. The study of *respiro*, the extended relaxed intake of breath, offers many rewards to the singer who wishes to control his performance anxiety as well as his voice. For this reason, Alexander, Feldenkrais, and similar techniques are of great help vocally to some singers, along with general postural improvement for their stage appearance. Controlled breathing has a salutary effect on the nervous system and can be used to mitigate the effect of performance anxiety.

BREATHING EXERCISES

Exercise 1. Postural Alignment

To align the posture for the *appoggio*, stand with the arms extended overhead, thumbs together, and stretch upward keeping the head level. You will notice that the chest is expanded and the spine is straight. Occasionally, artists speak about keeping the buttocks tensed, “pressing the dime,” so to speak. I believe that the value of this is in keeping the hips aligned when the rectus abdominus is allowed to relax. Some singers experience back problems when they forget that the torso is cantilevered out in front of the spine, instead of being centered in the middle of the body. The result is that we sometimes arch the back too much. Slowly bring the arms down to the sides, keeping the head and chest in the same position. Most people will observe that the chest is a good deal higher than usual and the head is up and alert looking. Do not draw the shoulders back in a “West Point brace,” but allow them to be loose and riding comfortably forward.

Exercise 2. Manuel Garcia I’s Exercise to Open the Chest

Manuel Garcia Père had strong opinions about the importance of the chest not being allowed to collapse. In his *Exercices pour la voix* of 1820 he stated, “The position of the Body must be erect, the Shoulders thrown back, with the arms crossed behind, this will open the chest and bring out the voice with ease, clear and strong without distorting the appearance either in Face or in Body.”³⁵

Exercise 3. Abdominal Breathing

To experience abdominal breathing alone, stand erect as in exercise 1 and place a fist on the epigastrium (the soft spot just under the sternum). Place the other hand over the fist and press in, permitting the air to escape. Do not allow the chest to fall! When all the air is expelled, gently inhale until the belly is filled with air. You will perceive that there is quite an epigastric bulge as the fist is pressed outward. This is an indication of too much abdominal breath. Try it again, this time limiting the bulge by stopping the influx of breath when the epigastrium comes even with the sternum. Now take a little more breath, allowing the diaphragm to move *straight down* until you feel that you are pressing upon the organs in the lower abdomen. *Do not overfill*; just experience a comfortable feeling of fullness. This is the “talking” breath. Some advocate lying on one’s back on the floor, with heavy objects placed upon the epigastrium as a means of teaching the abdominal breath. I do not, because I believe that this interferes with the functioning of the intercostals.

Exercise 4. The Intercostal Breath

The intercostal breath is next. Sit upon the edge of a straight chair, with the elbows on the knees. This immobilizes the shoulders and ensures that clavicular breathing does not interfere. Take the *limited* abdominal breath as before, without allowing the epigastrium to bulge, and you will discover that at the end of the comfortable abdominal breath, the ribs will start to expand up under the arms. The abdominal breath acts as a “fulcrum” for the intercostal and abdominal “column of air” and should always be established before making the intercostal inspiration. Later, the two movements seem to act as one.

Exercise 5. *Lutte Vocale*

Now stand erect, as in exercise 1. Place the hands on the ribs up under the arms as high as is comfortable, draw in the *limited* abdominal breath, then feel the sides expand. Begin a panting motion with the flanks. The object is to achieve a cycling balance of inspiration and expiration. The belly will bounce a little as it inflates and deflates, but this should be a passive movement; not an active one of the abdominals thrusting in and out. The muscular activity takes place in the intercostals. Try to breathe through the nose and mouth simultaneously. This will prepare you for good resonant attacks when you begin singing, and it also prevents dryness. When the panting seems comfortably established, stop the breath at the top of the inspiratory cycle. This position helps to calibrate where “full” is for you, and you should always strive to sing from that position. Do not sing from a collapsed chest, but try to maintain from 75 to 100 percent full at all times. Sbriglia’s *point d’appui* and Lamperti’s *lutte vocale* are located just about here. If one contracts the inspiratory intercostals a little more, one feels the area under the breastbone contract very slightly. This will set up the proper coordination for extended dramatic singing or a high tessitura, but is probably excessive for normal singing. *One can fatigue the thoracic muscles by excessive overbreathing.*

Hold the breath with the glottis open. You are now controlling the outflow of air with the coordinated muscles of the chest. Now, gently allow the breath to issue forth as slowly as you can manage (up to fifteen seconds), preserving the inspiratory tension at all times. This will ensure that the voice is *ben appoggiata* when we sing. Stop and restart the exhalation a few times, using the muscles of the chest and not the glottis, before feeling the weakening and upward slip of the diaphragm.

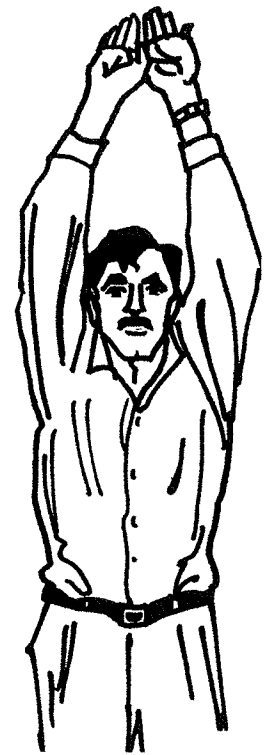


Figure 7.9. Exercise 1. Postural Alignment.



Figure 7.10. Exercise 4. The Intercostal Breath.



Figure 7.11. Exercise 5. *Lutte Vocale*.

If the intercostals collapse immediately, place the hands on the ribs again as in exercise 4 and vigorously press or have a partner press in. Sing while energetically resisting this collapse by maintaining the inspiratory tension. The strength of these muscles is amazing in almost everybody!

Exercise 6. Lamperti's Exercise for Breath Control

Francesco Lamperti described his version of the previous exercise: The singer is to breathe in slowly for a period of up to eighteen seconds and then emit the sound for the same length of time. One will feel every space in the chest fill with air and the remarkable relaxation of the expiratory muscles. When the tone is initiated, it is only necessary to release a little of the inspiratory tension and the tone will flow out evenly and steadily. The expiratory muscles, having contracted fully, want to return to their position of rest, much as a bowstring will propel an arrow when released by the archer. He stated that if the singer begins the phrase with less than a full breath, the tone will be lacking in steadiness and feeling.

Exercise 7. William Shakespeare's Exercise for Proper Allocation of the Breath

William Shakespeare described the following exercise from the Lamperti school, which assures the proper allocation of the breath:

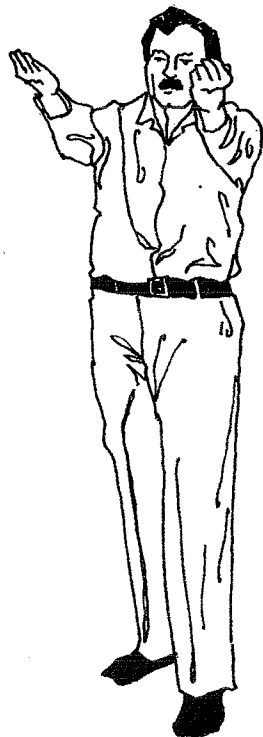


Figure 7.12. Exercise 7. William Shakespeare's Exercise for Proper Allocation of the Breath.

1. Balance the body beyond the front foot, and become conscious of the existence of the back muscles by extending outwards and forwards the arms, with palms upwards and thumbs back, while keeping the elbows in.
2. Do the quick breaths or quiverings in and out, through the mouth, noiselessly, until they are felt at the soft place under the breastbone and under the shoulder blades. This gives us the full breath not felt at the points of the shoulders, nor at the chest.
3. Press out the breath as though warming some object with it, while mentally pronouncing a long Ah for ten or fifteen seconds, and finally without losing control, stop the breath by arresting it with the breath muscles, the throat being open.³⁶

Exercise 8. Limiting the Epigastric Bulge

If you have trouble limiting the epigastric bulge, try leaning against a wall with the weight supported by a sturdy book placed just under your breastbone. Inhale abdominally (but not out past the sternum) and feel the "column of air" become established. After filling the intercostal area, sing without locking the abdominals or pushing out with the back muscles. This is a brutal exercise but, endured for short periods of time, it can be very beneficial.

Exercise 9. Manuel Garcia II's Exercise for Increasing Breath Control and Power

Manuel Garcia II set forth the following exercise in 1841:

We would remark that by submitting the lungs to a particular exercise their power and elasticity will greatly increase. This exercise consists of four distinct and successive practical operations now to be described.

First—The pupil should gently and slowly inhale for a few seconds, as much air as the chest can well contain.

Second—After taking a deep breath, the air should be exhaled again very gently and slowly.

Thirdly—Fill the lungs, and keep them inflated for the longest possible time and

Fourthly—Exhale completely, and leave the chest empty as long as the physical powers will conveniently allow.³⁷ It must be confessed that all these exercises are at first extremely exhausting and must be separately practiced after long intervals of rest. The two first, however—namely, the gentle inspirations and expirations—will be more equally effected by nearly closing the mouth, in such a way as to leave only a slight aperture for the passage of air. By these means, the pupil will acquire steadiness of voice—a subject that we shall revert to hereafter. The breath influences the mode or character of vocal execution; being capable of rendering it either steady or vacillating, connected or unconnected, powerful or feeble, expressive or the reverse.³⁸

CONCLUSIONS

The historical Italian school of Bel Canto stressed breathing as the foundation of its technique, which was called *Appoggio*. Most Italian masters opposed the “breath damming” approach as damaging to the voice. Important features of this technique are: *respiro*, the long controlled inspiration of breath, and *mezzo respiro*, the half breath; the combined abdominal and intercostal modes of breathing called thoracic breathing; and *lutte vocale*, the control of subglottal pressure by means of the opposition to the expiratory muscles by constant inspiratory tension. The shape of the chest can be controlled upon inspiration, and this, in turn, allows the singer to apportion the amount of air for which each muscular system (intercostal or abdominal) is responsible. The “noble stance” (good posture) is important. The breath is taken before the upbeat and allowed to “stand still” for an instant before attacking the tone. The intercostal portion of the breath should be used first and then the abdominal, if necessary. Residual breath should never be used.



Figure 7.13. Exercise 8. Limiting the Epigastric Bulge.

NOTES

1. Antonio Bernacchi (c.1690–1756). A castrato pupil of Antonio Pistocchi (1659–1726), founder of the Bologna school in 1706.
2. Margaret Beyers, “Sbriglia’s Method of Singing,” *The Etude* 60 (May 1942): 307. Giovanni Sbriglia (1832–1916) was a Neapolitan tenor. He was responsible for changing Jean de Reszke from a baritone into one of the nineteenth century’s greatest tenors. Among his other famous students were Edouard de Reszke, Pol Plançon, and the great American sopranos Sybil Sanderson and Lillian Nordica.
3. Luisa Tetrazzini, the most famous of the Italian *coloratura sopranos*. Tetrazzini possessed a phenomenal florid technique and a powerful high voice.
4. Manuel Garcia II, *The Art of Singing, Part I* (Boston: Ditson, c.1855) 10.
5. Garcia, *The Art of Singing* 12.
6. Francesco Lamperti (1813–1892). One of the greatest names in the history of Bel Canto; others who carried on the Lamperti teaching were his son, Giovanni Battista Lamperti (1839–1910), William Shakespeare (1849–1931), and Herbert Witherspoon (1873–1935).
7. Marietta Alboni (1826–1894) was considered to be one of the greatest mezzo sopranos of the nineteenth century. Her technique was flawless and she also had the distinction of being Rossini’s only pupil.
8. Teresa Stolz (1836–1902) and Maria Waldmann (1844–1920) were the *Aida* and *Amneris* in the Milan, Paris, and Naples premieres of *Aida* and were the soprano and alto soloists in the first performances of Verdi’s *Requiem* in Paris, London, Milan, and Vienna.
9. Marcella Sembrich, equally proficient in piano and violin as well as possessing a stunning *coloratura* technique, was one of the finest musicians of all singers in vocal history.
10. Italo Campanini (1845–1896).

11. Francesco Lamperti, *A Treatise on the Art of Singing*, reprint (New York: Schirmer, 1980) 23.
12. P. Mario Marifioti, *Caruso's Method of Vocal Production* (New York: Dover, 1981) 95. Adelina Patti was the "prima donna assoluta" of the nineteenth century.
13. Lilli Lehmann (1848–1929). German soprano, teacher and author. Lehmann sang 170 roles in 119 operas in German, Italian, and French.
14. Meribeth Bunch, *Dynamics of the Singing Voice* (Vienna: Springer, 1982) 37.
15. Herbert Witherspoon, *Singing* (New York: Schirmer, 1925) 55. Witherspoon was a bass singer, a teacher in the Lamperti line, and became manager of the Metropolitan Opera in 1935.
16. Suzanne C. Smeltzer and Brenda Baré, *Brunner and Suddarth's Textbook of Surgical Nursing*, 7th edition (Philadelphia: J.B. Lippencott, 1992) 921. Carol Taylor, *Fundamentals of Nursing* (Philadelphia: Lippencott, 1989) 813. Clayton Thomas, *Taber's Cyclopedic Medical Dictionary*, 16th edition (Philadelphia: Davis, 1985) 1972. *Webster's New Collegiate Dictionary*, ed. H.B. Wolf (New York: Merriman, 1979). Antonio Maria Valsalva, Italian anatomist, (1666–1723). Valsalva's maneuver: attempt to forcibly exhale with the glottis, nose, and mouth closed. If the eustachian tubes are not obstructed, the pressure on the tympanic membranes will be increased. Maneuver can also be done with just the glottis closed, but only intrathoracic pressure will be increased. There is also some involvement of the false vocal cords. This causes increased intrathoracic pressure, slowing of the pulse, decreased return of the blood to the heart, and increased venous pressure. Voluntary contraction of the muscles of the abdominal wall, fixing of the diaphragm, and closing of the glottis aid in increasing intra-abdominal pressure up to four or five times the normal pressure that aids in expelling feces. This technique, termed the Valsalva maneuver, may be contraindicated in persons with cardiovascular problems and other illnesses. Could this be a factor in the deaths of celebrated singers such as Ludwig Schnorr von Carolsfeld (1835–1865) who created the role of Tristan? There are those who attribute the exertions of preparing this role as a factor in his untimely death.
17. Beyers, "Sbriglia's Method of Singing" 307.
18. Berton Coffin, *Historical Vocal Pedagogy Classics* (Metuchen, NJ: Scarecrow, 1989) 45. Coffin quotes from Delle Sedie, *L'Estetica del canto e dell'arte melodrammatica* (Leghorn, 1885). Enrico Delle Sedie (1822–1907) was an early Verdi baritone and author of the first treatise that took into account Helmholtz's discoveries concerning vowel resonance.
19. Anna-Lisa Björling and Andrew Farkas, *Jussi* (Portland, OR: Amadeus, 1996) 175.
20. Lauritz Melchior was the greatest of all the heldentenors. He sang 515 performances of the dramatic repertoire at the Metropolitan Opera during a career that spanned the years 1926 to 1950.
21. Louis Bachner (1886–1945), teacher of Marjorie Lawrence (1909–1979), Heinrich Schlusnus (1888–1952), Sigrid Onegin (1889–1943), and Frida Leider (1888–1975).
22. Mattia Battistini was called "La Gloria d'Italia." His art survives on records and is an invaluable link to the singing art of the nineteenth century.
23. Manuel Garcia II, *Hints on Singing* (London: Ascherberg; New York: Schuberth, 1894) 4. In Garcia's time, women had to contend with tight corsets!
24. William Shakespeare, *The Art of Singing* (Boston: Ditson, 1910) 26.
25. Lamperti, *A Treatise on the Art of Singing* 25.
26. Shakespeare, *The Art of Singing* 14.
27. Shakespeare, *The Art of Singing* 12.
28. Jerome Hines, *Great Singers on Great Singing* (New York: Doubleday, 1984) 102.
29. Garcia, *The Art of Singing, Part I* 10.
30. Louis Bachner, *Dynamic Singing* (New York: Wynn, 1944) 56.
31. Luisa Tetrazzini, *The Art of Singing* (New York: Metropolitan, 1909) 26. I believe that Tetrazzini was incorrectly using the term "stroke of the glottis" to describe an explosive attack.
32. Pierre Bernac, *The Interpretation of French Song* (New York: Norton, 1970) 9.
33. Hans Selye (1907–1982). Professor and director of experimental medicine at the University of Montreal.
34. This syndrome is described in Hans Selye, *The Stress of Life* (New York: McGraw-Hill, 1956).
35. Coffin, *Historical Vocal Pedagogy Classics* 16.
36. Shakespeare, *The Art of Singing* 12. William Vennard, the outstanding American pedagogue and author, is critical of Shakespeare as deceiving himself and as using shoulder muscles (latissimus dorsi) in his breathing technique, which he is attempting to avoid. Vennard misses the point. The above exercise effectively allocates the breath and prevents improper use of the shoulders and overinflation of the abdomen. Furthermore, the weight of the outstretched arms contracts the upper back muscles and counters the tendency of the head to drop forward as tension is increased in the crico-thyroids and abdominals. Roberta Peters demonstrated this in a master class in Carnegie Hall when she held a medicine ball in her outstretched hands, so moderate weights may make this exercise even more effective.
37. The 1894 *Hints on Singing* eliminated this fourth step. It is probably unnecessary.
38. Garcia, *The Art of Singing, Part I* 10.