APPROACHES TO BREATH SUPPORT AND CONTROL

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PREFACE

This paper is written to supplement a recital required in the graduate program in applied music. It seems that a study of breathing and breath support is quite in place. Because the paper is organized around the writings of several authorities in this field, and because the flow of materal is continuous, and material from any other sources is excluded it is written in essay form. Subheadings would almost have to be contrived.

The writer thanks Dr. Thomas H. Steunenberg, Dr. Tommy Goleeke, Professor Clyde Jussila, members of his graduate committee, and finally, Professor Luther O. Leavengood, Head of the music department, for the critical reading of this paper.

This report provides the voice student with several approaches to breathing, support, and control as used in singing. They are taken from the writings of singers, teachers, conductors, and doctors. It includes comments by the writer also.

The following discussion will include the basic physiology of the breathing mechanism, and clavicular, costal, and diaphragmatic methods of breathing.

Percy Judd, a teacher, has the following to say about the upper breathing mechanism: "The bellows consist of the lungs and the organs exerting pressure upon them." They are suspended in the chest, bounded by the spine, the ribs and breastbone, their base resting on the powerful muscle which forms the floor of the thorax or chest, and separates it from the abdomen--the diaphragm."

Dr. Terry Lawson, a singer and physician, also gives an explanation of the mechanism used in breathing. He also gives a convincing account of deep diaphragmatic breathing, the method to which this writer ascribes.

Mr. Henry Coward, a noted choral director, teaches the lateral costal (side rib) method. He has the following to say: "In deep inspiration, by drawing in the abdomen, the liver and stomach, being firmly held in the basin-like dome or arch of the underside of the diaphragm, prevent any downward movement of this strong muscular partition below the level of the flying ribs." (my emphasis)

This writer, having observed students who have been taught costal breathing, has come to the conclusion that these singers fail to develop any real vocal power.

Clavicular breathing is discussed briefly in this report. This type of breathing allows the clavical to raise during inspiration. This

> The bellows consist of the lungs and the organs exerting pressure on them. The lungs are two masses of sponge-like material containing a system of air-cells connected by tubes of everincreasing size and uniting in the trachea, or windpipe, a vertical tube held rigid by rings of cartilage and terminating above in the larynx. The lungs have the elastic quality of sponge in that they spring back to their normal shape after being squeezed, the air-cells refilling instantaneously. They are suspended in the chest, bounded by the spine, the ribs and breastbone, their base resting on the powerful muscle which forms the floor of the thorax or chest, and seperates it from the abdomen--the diaphragm. The whole trunk is sustained by the spinal column and an elaborate system of muscles. All these organs have a bearing on the function of the lungs--breathing. It will be readily understood that good posture is an essential part of the art of singing.[1]

Another very good authority on breathing is Dr. Terry Lawson, a man who has not only been a singer a good part of his life, but is a phycician as well. He speaks with authority on the location and the use of the vital organs used in singing. Lawson says the following:

Lawson believes that singing built on a foundation of good breath control is like a house built upon solid foundation.[2] He later says: "Perhaps few people really know where and what the diaphragm is, and how it is brought under control."[3] Describing the diaphragm, he says:

> There are dozens of other muscles that are important also, e.g. the intercostals. These fill the spaces between the ribs, and, in breathing, expand or contract the chest wall. The muscles of the neck, shoulder girdle, back and abdominal wall also play a part.
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> The diaphragm itself is a large dome-shaped structure that completely divides the chest cavity (containing the heart and lungs) from the abdominal cavity (containing the liver, stomach

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[1]Percy Judd, Vocal Technique, (London: Sylvan Press, 1951), p. 34.

[2]James Terry Lawson, Full Throated Ease, (New York: Mills Music Inc., 1955), p.p. 12, 13.

[3]Ibid. 12, 13.

and bowels). It passes from front to back and from side to side across the body about the level of the lower ribs. It can be likened to the horizonal partition in a two-story house. It forms the ceiling of the living-room below and the floor of the bedroom above. As it moves up in breathing it pushes air out of the lungs, and as it moves down it draws air into the lungs much in the manner of a piston in a pump or a syringe.[1]

In the following paragraphs Dr. Lawson shows exactly how the diaphragm works, and in so doing states his case in favor of deep diaphragmatic (abdominal) breathing. This method of breathing is probably the most commonly used method being taught today; therefore, it is most important that the reader carefully digest the following paragraphs taken from Dr. Lawson's book:

> If the diaphragm is to be allowed to function in singing as it should, the chest should be kept high. Whereas the upper chest is high, the shoulders are not. They are relaxed and the arms dangle.
>
> When the chest is lifted and held up, the abdomen lengthens in a vertical direction, and draws in, causing the V-shaped groove at the bottom of the breast bone and between the right and left lower ribs to form a concave hollow. Feel it yourself. If you take a deep breath with the lower ribs and diaphragm, this hollow becomes a bulge. It must bulge out because the diaphragm drops, pushing down the liver, stomach, etc. deeper into the abdominal cavity below the diaphragm.
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> This bulge should be the focal point of your effort to control breathing. While it is not the diaphragm, the bulge is caused by the diaphragm dropping during inspiration. Therefore, to all intents and purposes, if you consider this as being the actual diaphragm you will not go wrong. Since you cannot consciously feel the diaphragm any more than you can consciously feel your heart beating or your stomach and bowels contracting you must concentrate on what you can feel when it is working well.
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> One way to get the correct feeling of the way the diaphragm should work is to ask someone to plant a fist firmly in the hollow between the ribs. Lean your whole weight upon the fist. Breathe in and out deeply with the lower part of your chest and the upper part of your chest and the upper part of your abdomen. Feel your whole body riding in and out with each breath and develop some idea of the strength latent in your breathing muscles.[2]

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[1] Ibid. 12, 13.

[2] Ibid. 15, 16.

Dr. Lawson makes it crystal clear as to where the diaphragm is located, and how it is used in deep diaphragmatic breathing.

After having reviewed the writings of some 30 authors on the subject of breath support, this writer is of the opinion that Dr. Lawson has written the most logical and clear cut case for deep abdominal (diaphragmatic) breathing. In his book, Full Throated Ease he proves scientifically, through an explanation of the anatomy used in breathing, that the diaphragm moves substantially only one direction, down. Therefore, the only logical method of breathing is "Diaphragmatic".

An entirely different approach to the problem of breathing and support is found in a book entitled, Choral Techniques and Interpretation, by Henry Coward, a noted choral conductor of the past. The method of breath support taught by Coward is known as the "Lateral Costal" method, even though he has the following to say: "Diaphragmatic breathing may be used in two different ways, the abdominal (stomach), and the costal (rib), now generally spoken of as the Lateral Costal (side-rib) method."[1]

For the purpose of identification, the writer will refer to the method advocated by Coward as "Costal", and the method advocated by Lawson as "Diaphragmatic".

Coward has the following to say about breath support used in singing:

> The dual object of respiration in relation to singing is to inhale sufficient breath to fill the lungs entirely, to get the best advantage.
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> In deep inspiration, by drawing in the abdomen, the liver and stomach, being firmly held in the basin-like dome or arch of the underside of the diaphragm, prevent any downward movement

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[1]Henry Coward, Choral Techniques and Interpretation, (New York: Novello and Co., 1949), p. 52.

> of this strong muscular partition below the level of the flying ribs (my emphasis). It is therefore forced to extend with an outward expansion. This expansion, coupled with the existance of the intercostal muscles, causes the ribs to widen in an outward and upward direction, thus giving the widest possible breath space, as well as aerifying the upper part of the lungs.
>
> Further, this pressure of the abdomen against the thorax enables the singer to regulate the air current to the requirements of the sound he wishes to produce.[1]

This writter having observed students who have been taught costal breathing, has come to the conclusion that these singers fail to develop real vocal power. It seems reasonable that the rib cage, which is rather rigid, can expand only a limited amount, whereas the abdominal cavity allows ample room for great downward expansion of the lungs, and the abdomianal muscles supply the needed control for expiration.

A third, and very rarely used method, is known as "Clavicular". In this type of breathing the chest and thus the clavical is raised each time a breath is taken. This results in breathing that is very shallow, and poor breath support is the result. This method is given little attention by most vocal authorities; they usually dismiss the subject by saying it has been used by some singers of serious music in the past. Some amateurs and popular singers use this method because they have no real need for a great amount of breath support. It is said that Jenny Lind used the clavicular method of breathing, but it is thought that she probably used it along with the "lateral costal" method. Most singing teachers do not allow their students to raise the clavical while breathing. A cure for clavicular breathing is to apply physical force to the shoulders to keep them from raising during inspiration.

The reader, having read this short discussion on the three main methods

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[1]Ibid. 52.

of breathing, should be made aware that there is another school of thought on this subject. It is known not for its method, but for its lack of method in teaching breath support. Its advocates believe that breathing will take care of itself if it is ignored. They also believe that any type of formal training in breathing will keep the student from breathing "naturally".

Percy Judd states the case for natural breathing in the following quotation from his book, Vocal Techniques:

> The very diversity of theories of breathing should surely make an intelligent person hesitate to accept any one of them. Indeed it may legitimately raise doubts whether there is such a thing as one, and only one, proper way of breathing. Chest expansion is a complex movement in three dimensions and, as for as the singer is concerned, it matters little what the ration of expansion may be between the three, providing he can control the breath and tone. It is a clearly established fact that since the floor and lower walls of the chest cavity are its most mobile parts the greatest expansion will take place there. If this requirement is not complied with, ungainly movement, raising of shoulders, having of chest, fatigue and badly controlled breath will result. Breathing exercises without phonation, intended to develop this expansion, result in increased breath capacity and probably in increased breath pressure, but, as we shall see later, they do not even approach the problem of breath control. It is generally assumed without argument that such exercises are essential to the student of singing, and indeed to the student of elocution: but is this true? We have seen already that breathing is instinctive.
>
> There is, it seems to me, no difference in kind between inhalation in singing and in the other activities of everyday life; the difference is purely one of development. Shortness of breath in singing has not necessarity anything to do with the muscles of respiration--one pupil of mine who was particularly short of breath in singing was a successful long-distance runner. There is nothing whatever to be gained and much to be lost by changing an easy instinctive movement into a laborious conscious one. The regulated silent exhalation so beloved of the breathing fanatic is certainly of no possible use to the singer. In it the normal relaxation of the muscles following inhalation is retarded to conserve the breath in the lungs and reduce the rate of its escape. It would perhaps not be true to say that this never occurs in any circumstances in singing, but we shall see in our discussion of breath control that it is in conflict with the natural functions of the organs in phonation. Like most instinctive activities, breathing is best left alone. In many years spent in teaching all types of students the only ones I have met whose breathing could not be satisfactorily developed

> in its instinctive state were those who had been taught to breathe--who had been made to attempt conscious control of the breathing muscles.[1]

It is true that breathing has to be done naturally, or as nature intended, but such naturalness is a conditioned reflex. Without this process of learning, the singer has poor control. Any fine athlete knows that the easy manner in which he performs comes from much hard work and practice. The same is true of singing.

It should be stressed that any student of singing should acquaint himself with as many views as possible; that he should couple these with his own experiences before he makes a seasoned judgement about a given situation or problem. A student must always strive for the truth and then put this truth to work in the manner that best fits his needs.

It seems quite logical that a singer must utilize the entire facilities available to acquire good breath support. Consequently there will be a slight movement of the clavical, an expansion of the ribs and a lowering of the diaphragm when a full breath is taken. All three areas will work together to supply the control and support that is needed for good singing.

The reader has no doubt gotten some insight into the methods of breathing generally taught and some knowledge as to the anatomy used. The remainder of this report contains writings of people whose professions bring them into contact with singing in one way or another, i.e., doctorts, singers, and teachers.

Friedrich S. Brodnitz, M.D., in his book entitled "Vocal Rehabilitation",

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[1]Judd, On. Cit., 37, 38.

has the following to say about the breathing mechanism as it is associated with singing:

> The laryngologist who wants to diagnose and treat disturbances of the voice needs an understanding of the function of the vocal organs that goes beyond the somewhat sketchy description given in most medical textbooks.
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> The reader of this manual is expected to be familiar with the anatomy and the basic physiology of the vocal organs. For the physiology of the larynx, he is referred to the comprehensive review that Pressman and Kelemen wrote for this series of manuals and monographs, published by the American Academy of Ophthalmology and Otholaryngology.
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> In this chapter the physiology of the vocal organs will be discussed only to the extent of reviewing briefly the function of the vocal organs in producing the speaking and singing voice.
>
> In this connection, it should be kept in mind that the use of this complicated assembly of structures to produce voice is a function which appears late in evolution. The respiratory mechanism serves primarily the exchange of gases which provides the body with oxygen. The larynx (Negus) is primarily a sphincter. It is first observed in the amphibians as a protection to the lungs against water entering on submersion; it then is adapted to other functions that require intrathoracic pressure, such as heavy work with the forelimbs, coughing, bowel evacuation and vomiting.
>
> The oral cavity, with the tongue and the other articulating structures, is primarily designed for food intake, for the functions of chewing and swallowing. Only very late in the evolution of man, and his developing needs for communication, did all of these structures become adapted to the additional function of producing voice and speech.
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> It is possible that this evolutionary youth of the vocal functions makes them more vulnerable than the primary ones that have stood the test of millions of years through the mammalian ascendancy.
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> The human voice has been compared frequently with some of the musical instruments. None of these comparisons really fits. Although the vocal organs share many characteristics with the wind driven instruments (wood-winds and brass), in the regulation of pitch the larynx makes use of a mechanism similar to the string instruments. And the resonating cavities above the vocal cords are quite unique in the family of instruments because of their extreme variability.
>
> The laryngologist should always be aware of the fact that the vocal cords are only one part of the vocal mechanism. Our training, which stresses the examination with the laryngoscopic mirror, encourages us to think of the vocal cords as the seat of voice production. Actually, the respiatory mechanism and the resonating cavities rank equally with the vocal cords in determining the accoustics of the voice. All three parts belong and act together. They constitute, to use the accustic term, a coupled

mechanism of three parts that constantly act on and influence each other.

For practical purposes the vocal instrument can be described as consisting of three parts: the activator (respiration), the vibrator (vocal cords), and the resonator (supraglottic airspaces). They will be considered separately but only as parts of one coordinated mechanism. If the singing voice is frequently mentioned in this connection, it should be kept in mind that singing is a highly specialized form of using the vocal organs that produce both the singing and the speaking voice. Much of our knowledge of the function of these organs derives from the study of the physiology of singing. We know more about the speaking voice because of some of the research devoted to the singing voice.

Speaking and singing require expiratory air pressure as the activating force of vocal cord vibration. In everyday speaking and in untrained singing the regulation of this expiratory pressure is controlled by the same unconscious adjustment that regulates depth and frequency of breathing in all situations of daily life.

The respiratory mechanism can be shifted from automatic to conscious activation, but only within the limits of the oxygen needs of the body. The average person hardly ever becomes aware of the possibility of conscious breath control. Only on rare occasions does he attempt to manipulate his breathing: for instance, in training for certain sports or during the examination of his chest by a doctor.

The singer and, to a lesser extent, the actor and the public speaker learn to handle breath control as a part of their vocal technique. Much of the effort that is devoted to the training of the voice goes into the teaching of conscious control of the breathing mechanism.

If one considers the importance of breath control for the production of a well adjusted tone, it is astonishing how few teachers of singing and speaking have a clear understanding of the mechanics of breathing.

The expansion and the squeezing out of the lungs is achieved by two separate but closely coordinated mechanisms, chest and abdominal breathing. Raising the ribs from a downward slant to an almost horizontal position expands the chest cage, mostly in the anterior-posterior axis; lowering of the ribs contracts it.

The abdominal mechanism of breathing is slightly more complicated. The antagonistic muscle groups are the diaphragm and the muscles of the abdominal wall. On deep inhalation the radial muscle fibers of the diaphragm contract and flatten it. Its center descends sharply, as any doctor knows who has ever fluoroscoped a patient. The expansion of the chest further flattens the diaphragm. The descent of the diaphragm exerts pressure on the tightly packed organs of the abdominal

cavity. Relaxation of the abdominal muscles permits the abdominal organs to escape the pressure of the descending diaphragm. The abdomen bulges forward.

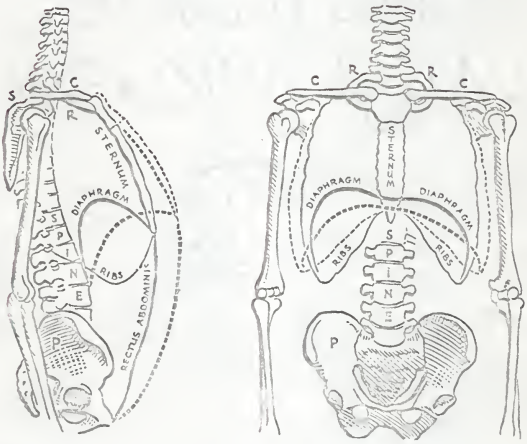

Fig. 1--Chest and abdominal breathing, p. 10.

In expiration, the phase of speaking and singing, the process is reversed. Now the abdominal muscles, not the diaphragm, are in active control of the mechanism. Tightening the abdominal muscles exerts pressure on the abdominal organs which transmit the pressure to the diaphragm. Under the force of intra-abdominal pressure the relaxing diaphragm is pushed upward, squeezing the lungs from below. Figure 1 shows the coordination of chest and abdominal breathing.

Trained singers exhibit an extensive motility of the diaphragm. Figure 2 shows the movements of ribs and diaphragm of a Wagnerian baritone in extreme inhalation and exhalation.

Fig. 2--Movements of diaphragm and ribs in deep breathing. (A) Deep inhalation. (B) Deep expiration, p. 12.

In this connection it should be added that a well developed lung capacity is not in itself a guaranty of good breath control. As Mackenzie has pointed out, in good speaking and singing the minimum is always the optimum. At the end-point of a very deep inhalation the intrathoracic pressure becomes too high to permit the slow release of air that characterizes the good speaker and singer. And the extension of vocalization into the stage of extreme exhalation produces a similar lack of balance. The longest musical phrases of an aria require no more than 1000 to 1500 cc. of air (Tarneaud), which is only one third of the total vital capacity of a normal adult.

In all discussions of the technique of speaking and singing the term "diaphragmatic control" appears with great regularity. Books by singing teachers and drama coaches abound

with instructions "to speak (or sing) from the diaphragm." If one questions teachers of singers or actors about this, they usually put their hands on the epigastrium, where they claim to feel a contraction of the diaphragm. From the discussion of the mechanics of breathing it should be clear that diaphragmatic control is a misleading term. There is little hope of abolishing this term after a hundred years of misuse. But it is important for the laryngologist, the voice therapist, the actor and the public speaker to be clear about the facts.

As we have seen, the active control of the stage of exhalation--the phase of speaking and singing--is controlled by the abdominal muscles while the diaphragm gradually relaxes. What the singer "feels" when he puts his hands on his upper abdomen is the slow contraction of the abdominal muscles. The diaphragm cannot be felt. In addition, it lacks the sense of position. For all these reasons the term abdominal breathing would be more appropriate and should be used.

Thoracic and abdominal breathing should work together in coordinated function. Animals, children and adults who are not spoiled by civilization breathe in this manner. The greatest extent of respiratory movements is normally found in the lower part of the chest and the upper part of the abdomen.

Many deviations occur from this normal pattern. The balance between chest and abdominal breathing is frequently disturbed in favor of an excessive reliance on chest breathing. The sedentary habits of modern life, the long hours of working behind desks, the confining effect of girdles and belts, the lack of exercise, even of simple walking, weaken the abdominal mechanism of breathing. The result has been a generation that hardly knows how to breathe properly.[1]

Dr. Brodnitz does an excellant job of explaining the breathing mechanism and the way in which it performs. It would be wise to note well the breathing excesses which Dr. Brodnitz mentions, and how they affect good singing.

This factual report by a physician who is also a knowledgeable singer is followed by the words of a famous singer, Madame Lilli Lehmann. Though Lehmann did not have vast knowledge of the physical make-up of the singing mechanism, she did write with the experience of one who enjoyed many years of successful professional singing. About breathing she says the following:

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[1]Friedrich S. Brodnitz, M.D., Voice Rehabilitation, (Rochester, Minn.: Whiting Press, Inc., 1959) p. 9-12.

The breath becomes voice through the operation of the will, and the instrumentality of the vocal organs.

To regulate the breath, to prepare a passage of the proper form through which it shall flow, circulate, develop itself, and reach the necessary resonating chambers, must be our chief task.

How do I breath?

Very short of breath by nature, my mother had to keep me as a little child almost sitting upright in bed. After I had outgrown that and as a big girl could run around and play well enough, I still had much trouble with shortness of breath in the beginning of my singing lessons. For years I practised breathing exercises every day without singing, and still do so with especial pleasure, now that everything that relates to the breath and the voice had become clear to me. Soon I had got so far that I could hold a swelling and diminishing tone from fifteen to eighteen seconds.

I have learned this: to draw in the abdomen and diaphragm, raise the chest and hold the breath in it by the aid of the ribs; (my emphasis) in letting out the breath gradually to relax the abdomen. To do everything thoroughly I doubtless exaggerated at all. But since for twenty-five years I have breathed in this way almost exclusively, with the utmost care, I have naturally attained great dexterity in it; and my abdominal and chest muscles and my diaphragm have been strengthened to a remarkable degree. Yet I was not satisfied.

A horn player in Berlin with the power of holding a very long breath, once told me in answer to a question, that he drew in his abdomen and diaphragm very strongly, but immediately relaxed his abdomen again as soon as he began to play. I tried the same thing with the best results. Quite different, and very naive, was the answer I once got from three German orchestral horn players in America. They looked at me in entire bewilderment, and appeared not to understand in the least my questions as to how they breathed. Two of them declared that the best way was not to think about it at all. But when I asked if their teachers had never told them how they should breathe, the third answered, after some reflection, "Oh, yes!" and pointed in a general way to his stomach. The first two were right, in so far as too violent inhalation of breath is really undesirable, because thereby too much air is drawn in. But such ignorance of the subject is disheartening, and speaks ill for the conservatories in which the players were trained, whose performances naturally are likely to give art a black eye.

Undoubtedly I took in too much air in breathing, cramped various muscles, thereby depriving my breathing organs and muscles of their elasticity. I often had, with all care and preparation for inhalation, too little breath, and sometimes, when not giving special thought to it, more than enough. I felt, too, after excessive inhalation as if I must emit a certain amount of air before I began to sing. Finally I abandoned all superfluous drawing in of the abdomen and diaphragm, inhaled but

little, and began to pay special attention to emitting the smallest possible amount of breath, which I found very serviceable.

How do I breathe now?

The diaphragm I draw in, my abdomen just a little, only immediately to relax it. I never raise the chest, but I distend the upper ribs and support them with the lower ones like pillars under them. In this manner I prepare the form for my singing, the supply chamber for the breath, exactly as I had learned it from my mother which, however, I had exaggerated. At the same time I raise my palate high and prevent the escape of breath through the nose. The diaphragm beneath reacts elastically against it, and furnishes pressure from the abdomen. Chest, diaphragm, the closed epiglottis and the raised palate all form a supply chamber for the breath.

Only when I have begun to sing--especially when singing long cantilena-like phrases--do I push the breath against the chest, thereby setting the chest muscles in action. These combined with the elastically stretched diaphragm and abdominal muscles, (the abdomen is always brought back to its natural position during singing,) exert a pressure in the form, which, as we have already learned. is the supply chamber and bed of the breath. This pressure enables us to control the breath while singing.

From this supply chamber the breath must very sparingly and gently pass between the vocal cords, which regulate it, and over the epiglottis. The vowel a lifts the epiglottis; it must always be again and again kept in mind, always be placed and pronounced anew--even when other vowels are to be enunciated. Then the singer only experiences the sensation of the inflated, well-closed form of the supply chamber which he must be heedful, especially when carefully pronouncing the consonants, not to impair. The longer the form remains flexible and unimpaired, the less breath escapes and the longer it may flow from the form.

This form or supply chamber, the breath pressure, which includes abdomen, diaphragm and chest muscles, is often named "Atemstauen" (breath restraint), and "Stauprinzip" (law or principle of restraint), which terms carry in themselves the danger of inducing the pupil to make the diaphragm rigid, to hold back the breath and to stiffen the entire vocal organs instead of making him realize that only from an eternally alive form with elastic muscular action can the breath flow, the tone resonate.

The more flexibly the breath pressure is exerted against the chest,-- one has the feeling in this of singing the tone against the chest from whence it must be gently and flexibly pushed out,--the less the breath flows through the vocal cords and the less, consequently, are they directly burdened. The strong cooperation of chest muscles and diaphragmatic pressure prevents overburdening of all the directly participating vocal organs.

In this way, under control, the breath reaches the tone form prepared above by the tongue; it reaches the resonance chambers prepared for it by the raising and lowering of the soft

> palate and those in the head cavities. Here it forms whirling currents of tone, which now fill all attainable resonating cavities necessary for tone perfection. Not until the last note of a phrase has passed the "bell" or cup-shaped cavity of mouth and lips may the breath be allowed to flow unimpeded, may the form or supply chamber be relaxed, which, nevertheless, must quickly prepare itself for the next phrase.
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> In preparing the form for the flow of breath (tone-flow), all the organs, abdomen, diaphragm, upper ribs, larynx, tongue, palate, nose, lungs, bronchial tubes, abdominal and chest cavities, and their muscles, participate.[1]

It is obvious that Madame Lilli Lehman was a famous singer. In view of this fact it leaves doubt in the mind of the writer that she did actually use her breathing mechanism exactly as she felt she did. She expresses her ignorance of correct breathing in her early career, and it is probable that she knew little of the physiological make-up of the breathing mechanism. It is debatable that what she felt she did and what actually took place were one and the same thing.

The last section of this report will deal with information from The Art of Singing and Voice Technique, by Viktor Fuchs, a teacher.

He says:

> A famous doctor once claimed that man's life-span depends on the state of his blood-vessels. Other doctors may well stress other factors, but agreement would be reached about fundamentals. The practice and teaching of singing is not a science but an art, although it is based on technical principles, and universal agreement on essentials is asking the impossible.
>
> Opinions on breathing differ more widely than on any other topic in singing, which itself is the most controversial branch of music study. But most performers and instructors will probably agree that breath-control and head resonance are essentials. The minority not only deny the importance of breath-control, but deprecate its training. The masters of the bel canto era, they say, did not explain how or where to take breath. They were merely concerned with how it had to be used once it had been taken.

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[1]Lilli Lehman, How to Sing (New York : The Macmillan Co., 1918), p. 23-29.

Tosi for instance, only says that the singer must be taught to manage the breath so that he will always have enough. Caccini writes: 'Per l'eccellenca di essa arte, ne e tanto necessaria la buona voce per essa quanto la respirazione del fiato, per volersene poi, ove fa piu di mestiere ...' Freely translated, this means 'Mastering the breath, like having a good voice, is essential to good singing. It must be used where it is most needed.' There are many other passages to the same effect.

Even in his excellent work about the castrati and their accomplishments, Franz Haboock says nothing to explain how these extraordinary singers, possessed of almost interminable breath, learnt or taught the art of breath control. All we get are ambiguous and generalised instructions. 'Take breath easily, not tightly: inhale quickly and noiselessly, let it out evenly, in a floating way, even in dramatic singing,' etc. But there is no sign of an exercise!

Even in modern times, a student may well be confused by the information given in authoritative books. Take a book called Authentic Voice Production by W. Warren Shaw, A.M. Lecturer at Pennsylvania University:

'Thoughts of breath control and breath support in the minds of students who are trying to learn to use their voices properly are, all in all, about the most destructive thoughts that they could possibly entertain ... to control the breath purposefully is scientifically untenable and practically subversive of desired ends.'

Compare this with the following, taken from Resonance in Singing and Speaking by Thomas Fillebrown, M.D., lecturer on voice development, copyright 1891:

'... enough has been said in the preceding chapter to make clear the necessity for breath control, and to show what constitutes this control for the singer--the professional breather.'

Opinions are even more conflicting if a student consults singing teachers. So far as breathing is concerned, they may be divided into five main groups:

1. Does not discuss it. If asked, may reply 'Breathe as you do in speaking, that is all.'

2. Believes in one of the many exaggerated methods. Fails to emphasise the importance of note-placement, and over-exercises on breathing, causing muscular tension.

3. Tells the student to 'take a big breath' with his upper chest, and disregards the grave defect of lifting the shoulders. (Mercifully this group is slowly disappearing!)

4. Tells the student to feel the lateral expansion of his ribs while inhaling. Other recommend feeling the expansion of the back muscles.

5. Stresses how breath-control functions, and the need it serves, at the right time. He shows how his own abdominal muscles function when he sings. By using them correctly, the lateral expansion of the lower ribs and back abdominal muscles automatically come into action, just as in a car the rear lights

flash on when the driver stops.

One good explanation is the following: Breath is the raw material which the singer transforms into continuous, floating sound waves. The more raw material a factory has at it its disposal, the bigger its output. In daily life we only inhale what we need to stay alive. At automatic intervals the city-dweller lifts his chest and fills the upper part of his lungs. If he goes out to the country or seaside, he takes a deep breath, just as he does for a doctor. In other words, during routine living we do not use all our breathing capacity, but in singing we need all the breath (or raw material) we have got. Some singers, of course, use less breath than others. A Wagnerian singer naturally uses more than a light coloratura soprano. Others use less because they do not tense their throat and neck muscles. When there are no hindrances in neck and throat, the whole stock of breath can be transformed into notes. Exercises can be given to relax the muscles, so that this can take place. It is like an engineer who diverts a mountainstream into a canal, so that the whole volume of water runs freely. Those who insist on breathing as in ordinary life are like engineers who disregard the possibilities of hydraulic power!

We can also think of breath-control as being like the management of money. We acquire as much as we can and use it as well as possible. Some people never have enough because they spend their whole income, whilst others carefully balance up spending against income.

There are eight main principles in breathing for singing:

1. The quantity has to be increased by using the abdominal cavities, which are generally neglected in daily life.

2. The outgoing breath has to be controlled by the abdominal muscles, so that it will be adequate for any note or phrase.

3. All the available breath must be transformed into tone. (Caruso was a pastmaster at this.)

4. An emergency reserve must be allowed for, just as in driving it is unwise to use the last drop of petrol! Otherwise the voice may be overstrained.

5. The chest should never be moved, either in inhalation or exhalation. By standing erect before and during inhalation, the chest cavities can receive no more air; it then goes to the abdominal cavities, which supply the breath used in singing. By constant inward pressure on the abdominal wall (or exhalation) all the air there can be used without using the breath in the chest cavities.

6. The abdominal cavities should not be filled to capacity, otherwise a phrase cannot be attacked well, with smooth, clear tone.

7. The breath must be prepared by a moment of suspension.

8. Regular exercises must be practised, and the teacher must check constantly that they are being done correctly, so that they can become quite automatic.

Abdominal Breathing

We PRESS on the muscles of the abdomen continually, but do not PUSH them. I ask a girl to hiccup and check on what muscles she is using. They are just the same as those used in elimination and breathing. Daily exercises before breakfast will strengthen these muscles. Caruso liked to show friends and visitors how strong his were by moving the grand piano with them! But avoid exaggeration, which causes tension.

Abdominal Breathing has numerous advantages:

(a) It is easier to sing a smooth phrase when the air comes from a greater distance, i.e. from the diaphragm, and not the short way from the chest. Chest breathing is always dangerous as we inhale too much too quickly, and so press on neck and throat muscles.

(b) It reduces the possibility of strain in the throat, which leads to throaty singing. If we have to lift something heavy, we prepare by tautening the right muscles. If the abdominal muscles are not reinforced before a big top note, the throat muscles automatically come into action. The breath that is taken before dramatic notes and phrases must be in direct relation to what is going to be sung. A singer has to learn to co-ordinate throat and abdominal muscles rather as a driver has to keep his hands on the wheel, and his feet ready to use the pedals.

(c) Notes and phrases sung with abdominal breathing sound much more expressive. It is easy to understand why. By using these muscles, we influence the sympathetic nervous system. We feel all our emotions in the abdomen, so that when we are upset we cannot eat or keep down our food. When we laugh we 'hold our belly'. Michelangelo was right to represent Moses' emotion (in the famous statue) by having him hold his stomach with his right hand.

Caruso frequently, while on tours through Europe, liked to visit synagogues on his free evenings to listen to the cantors, who have a tradition of warmly persuasive devotional singing, ergo, with the proper use of their abdominal muscles.[1]

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[1]Viktor Fuchs, The Art of Singing and Voice Techniques (New York: London House and Maxwell, 1964) p. 72-77.

By reading this report, it is hoped that some understanding of the vast differences of opinion on breath support will be realized. It seems as though the value of this report lies in the number of views it contains on this problem.

Students of voice will begin to develop good insight into problems of breathing after they have examined all the available information.

Even though some teachers, singers and others discussed in this report seem to have mistaken ideas as to what the correct action of the breathing mechanism is when singing, each of them had something of value to offer the student of voice. Correct breathing has no value unless used in proper coordination with the larynx and resonators above. Some good ideas about the controlled use of good breathing and the relaxation of the proper mechanism seems very import.

Building strong back, costal and especially abdominal muscles is necessary for good support and controlled expiration.

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APPROACHES TO BREATHING AND BREATH SUPPORT FOR SINGERS

by

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AN ABSTRACT OF A MASTER'S REPORT

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This report provides the voice student with several approaches to breathing, support, and control as used in singing. They are taken from the writings of singers, teachers, conductors and doctors. It includes comments by the writer also.

The following discussion will include the basic physiology of the breathing mechanism, and, clavicular, costal, and diaphragmatic methods of breathing.

Percy Judd, a teacher, has the following to say about the upper breathing mechanism: "The bellows consist of the lungs and the organs exerting pressure upon them." "They are suspended in the chest, bounded by the spine, the ribs and breastbone, their base resting on the powerfull muscle which forms the floor of the thorax or chest, and seperates it from the abdomen--the diaphragm."

Dr. Terry Lawson, a singer and physician, also gives an explanation of the mechanism used in breathing. He also gives a convincing account of deep diaphragmatic breathing, the method to which this writer ascribes.

Mr. Henry Coward, a noted choral director, teaches the lateral costal (side rib) method. He has the following to say: "In deep inspiration, by drawing in the abdomen, the liver and stomach, being firmly held in the basin-like dome or arch of the underside of the diaphragm, prevent any downward movement of this strong muscular partition below the level of the flying ribs." (my emphasis)

This writer, having observed students who have been

taught costal breathing, has come to the conclusion that these singers fail to develop any real vocal power.

Clavicular breathing is discussed briefly in this report. This type of breathing allows the clavical to raise during inspiration. This results in shallow breathing, and poor breath support is the result. Jenny Lind is said to have used this method of breathing, however, it is thought that she probably used it along with the lateral costal method.

Percy Judd advocates the so called 'natural' method of breathing. He makes the following statements: "The very diversity of theories of breathing should surely make an intelligent person hesitate to accept any of them." "There is nothing whatever to be gained and much to be lost by changing an easy instinctive movement into a laborious conscious one." "In many years spent in teaching all types of students the only ones I have met whose breathing could not be satisfactorily developed in its instinctive state were those who had been taught to breathe--who had been made to attempt conscious control of the breathing muscles."

This writer believes that breathing has to be done naturally, or as nature intended, but such naturalness is a conditioned reflex.

Friedrich S. Brodnitz, M.D., includes a comprehensive report on the breathing mechanism in his book entitled, "Vocal Rehabilitation". He advocates deep diaphragmatic Breathing.

The factual report by Dr. Brodnitz is followed by the words of a famous singer, Madame Lilli Lehman. Though Lehman did not have vast knowledge of the physical make up of the singing mechanism, she did write with the experience of one who enjoyed many years of successful professional singing. The following quote is taken from her book entitled, "How to Sing". "I had learned this: to draw in the abdomen and diaphragm, raise the chest and hold the breath in by the aid of the ribs: in letting out the breath gradually to relax the abdomen."

The last section of this report deals with information from, "The Art of Singing and Voice Technique", by Victor Fuchs, a teacher. He gives several suggestions for using deep diaphragmatic breathing, and mentions Caruso as a master of this method.

This writer has taught deep diaphragmatic breathing for many years, and believes this is the best method by which to achieve the maximum inspiration and controlled expiration needed in the art of singing.