

Functional Vocal Training

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PART 1

PREFACE

There once was a man who had a frog. He trained him and taught him to jump on command. Testing his ability, he was astonished to discover that his frog could leap twenty feet. Soon the man began to wonder about the amount of propulsion contributed to each hind leg. Accordingly, he cut one hind leg off and again urged the frog to jump. Struggling under his terrible handicap, the frog did the best he could, but was unable to manage more than seven feet. "Humph," said the man to himself. "Interesting. I wonder how far he can travel with no hind legs at all." Straightway he cut off the remaining leg and repeated the command. Naturally, the frog could not move. "Damn," exclaimed the man. "My frog must have gone deaf."

This story is, of course, analogous to the way vocal training has been practiced for much too long a time. Attitudes are employed as principles, opinions dignified as facts, theories accepted without challenge, and, frequently, whenever valid principles are embraced, they are misapplied. Unable to learn, the student is then blamed for all short-comings because of an inherent lack of talent. The purpose of this monograph is to show a better, more logical path to follow for the fulfillment of vocal skills—one more consonant with natural order and functional logic.

FUNCTIONAL VOCAL TRAINING

In the short history of singing as a cultivated art form (circa 1600 to the present) it is curious that the high point of vocal virtuosity was achieved when there was a great dearth of technical knowledge related to the mechanics of function. Little or nothing was known in the seventeenth, eighteenth and early nineteenth centuries of anatomy, physiology, or acoustics, certainly not by the teachers of singing. Caccini, Tosi, Mancini, Porpora, and the elder Lamperti were musicians, and the concerns of science were totally removed from their sphere of interest. Yet it is a fact that, like the Roman Empire, the history of singing is notable for its dramatic and sudden blossoming, followed by a decline which, in the light of subsequent advances in technical knowledge, is not easily comprehended.

Careful examination of the available evidence related to early teaching practices yields some interesting testimony as to the "why" of this particular success. Through necessity, the founders of the art of *Bel Canto* became, in essence, natural scientists, in that they observed the manner in which the vocal organs were prone to respond and formed conclusions on the basis of those observations. Rather than inventing techniques which represented imposed disciplines, they studied vocal response patterns in terms of relationship. By simply observing, they were able to grasp the fact

that the response was not always uniform, and that the lack of uniformity was obviously contained within the dynamics of the musical figure or phrase being sung. From this it was but another logical step to conclude that the functional habits of the vocal organs were predictable—that there was a definite correlation between stimulus and response.

The first functional principle to gain general acceptance was registration. As early as the fourteenth century, an Italian named Marchetto reported that one of the vocal tricks of his time was to pass from the chest register to the falsetto, after the manner of a yodel. The two registers were known at the time as the *vox integra* and the *vox ficta*. Many years later, Giambattista Mancini (1716-1800) corroborated this evidence, as he offered a more specific definition. “The voice,” he stated, “ordinarily divides itself into two registers, one called the ‘chest,’ the other the ‘head,’ or falsetto. Every student, whether a soprano, alto, tenor, or bass, can easily know the difference between these two registers. The great art of the singer consists of acquiring the ability to render, imperceptible to the ear, the passing from one register to the other.”¹ It is important to note that for many years the falsetto and head voice were synonymous.

Inasmuch as our concerns here will be with types of response patterns within the coordinative process, it might be added that the registers referred to are caused by the contraction of muscle groups which hold the vocal cords in tension to meet the demands of pitch and intensity. Traditionally, the gap between the falsetto and the chest registers has been known as the “break.” To eliminate this gap between the mechanisms and unify the functional activities of the two registers, singers were introduced to the art of the *messa di voce*, or swelled tone. Because of the discovery of a parallel relationship between patterns comprised of pitch, intensity, and, as we shall see later, the vowel, and the mechanics of registration, vocal training became a dynamic process in which a faulty technique can be totally restructured.

Complete integration of the chest and falsetto voices into a functional entity reflects an extremely high level of technical refinement and skill. One of the primary goals of training is to coordinate these constituent parts, during which time there will be a gradual interchange of quality characteristics. The falsetto progressively loses its falseness and grows far more extensive in its tonal range, finally to become transformed into what is now recognizable as the head voice. For each functional arrangement (the possible combinations are virtually limitless), the stimulus pattern—that is to say, the pitch, intensity, and vowel pattern—acts as the catalyst. Just as bodily organs will recoil in horror at a terrifying sight, or become vibrant and expansive at joyous news, so, too, the vocal organs will similarly react to an external influence. In vocal training, the physical properties of the exercise patterns selected for use become subject to the laws relating to environment and organic health.

Once it was recognized that a proper selection of pitch-intensity patterns (a scale of tones sung at a given level of intensity on a particular vowel) would evoke a tonal texture attributable to a particular type of register reflex, a direct means of access to the seemingly inaccessible functional response of the vocal organs was assured. By careful selection of appropriate combinations, either a pure falsetto could be established, the chest register induced to respond, or a blending of the two effected in which the participation of one mechanism or the other could arbitrarily be made more or less dominant as desired.

From the standpoint of utility, the most impressive aspect of *Bel Canto* training is that the techniques employed were not mechanistic. There was a total absence of “do this” instruction and a natural phenomenon was dealt with in a natural way. Work on the voice apparently was done through the medium of tone, by getting at functional activities not subject to volitional control through their equivalent representations in registration. What is crucial to the training of the voice, then and now, is the insight provided by two important discoveries: 1) the theory of registration, which provided a means for influencing functional mechanics without recourse to methods of direct control, and 2) the reflexive nature of the vocal response, the fact that the vocal organs react to an outer stimulus.

The discovery of the interrelationship between the chest register and the falsetto mechanism does not, on the surface, appear to have far-reaching consequences. On closer inspection, one sees, the vocal registers have a more powerful effect on the functional activities within the pharyngeal tract than one had supposed. On the basis of my own experience in attempting to duplicate the procedures promulgated during the formative years of the vocal art, it is evident that:

1. There are two registers: one, the falsetto; the other, the “chest.”
2. Each register must be the product of a separate mechanical (muscular) action.
3. Each register appears as an automatic reflex to pitch and intensity.
4. When the falsetto merges with the “chest” register in a coordinate relationship to become the “head” voice, it considerably overlaps the lower, and the two share many notes in common.
5. Because of the overlap, the voice will often, when reasonably well coordinated, appear to be made up of *three* separate divisions.
6. Each tonal area, or division, is recognizable because it is represented by unique textures.
7. Each area owes its special tonal characteristics to the influence of a separated or combined register action.
8. By proper selection of pitch-intensity patterns the registers can be separated or combined on a rather arbitrary basis.
9. Even when operating as a unit, the ratio of registration can still be balanced and set up quite arbitrarily by the instructor, or by the singer himself if he is skilled enough, through proper use of pitch-intensity patterns. (This is only possible when the registers are already quite well balanced.)
10. The muscular response causing a particular register to predominate is purely involuntary.
11. The interplay of the registers, controllable through pitch and intensity patterns, represents the manipulative device to which the student can respond as an act of *will*.
12. As the reaction of the vocal organs to these simple patterns involves the involuntary movement of muscles, the movement of these supposedly

inaccessible muscular reflexes can be brought under a very practical kind of control.

13. By skillful use of pitch-intensity patterns the registers can be separated, developed independently, or made to draw together and act as a unit in innumerable relationships involving a balance to be shared between them.
14. These factors, plus temperament, musicality, anatomical structure, and psychological attitudes, are the contributing elements making each voice and personality a unique problem. ²

The above listings contain some of the conclusions that naturally follow from pursuing a functional approach to voice training. Careful analysis of the implications contained within these relationships will force us to one conclusion: that to improve the “voice” one must improve the coordinative process which is the qualitative factor. This is what was done in former years, and it is the path to which we must return if the art of singing is to be revitalized.

For many years, little or no dissatisfaction was expressed over the validity of the basic principles discovered and applied during the early centuries of the vocal art. Many of the great teachers complained about the decline of vocal culture, but in analyzing their comments, it is clear that criticism was not leveled against accepted functional principles, but against inept teaching. Not even Garcia, who opened the Pandora’s box which caused the gradual demise of an amazing era, found fault with traditional procedures. His only thought was to speed the training process.

The entire Garcia family was truly remarkable. The father, Manuel del Popolo Vincente, was a brilliant composer, singer, conductor and teacher. As a teacher, he had many celebrated pupils, principal among whom were his two daughters, Maria Malibran and Pauline Viardot, and his son, Manuel. It was the son (1805-1906) who was to become one of the most noted teachers in history. A learned man in many disciplines, his curiosity was immense. Impatient with time, he was fascinated by the idea of studying the chords during phonation in order to better understand the process. As a consequence, he invented the laryngoscope.

The invention of this device proved more useful to the field of medicine than to music and was responsible for the introduction of mechanistic methods. Voice teachers, medical doctors, and scientists all peered into the laryngeal area, each group arriving at different conclusions as to what was going on. Without troubling to distinguish between healthy and unhealthy functional activities, each group propounded a new theory of voice “production” based upon what had been observed. Traditionalists backed off. After all, how can one dispute an *observed* phenomenon! Consequently, the earlier theory of registration was discarded in favor of newer theoretical propositions; propositions which declared unequivocally that the voice was comprised of but one register, no registers at all, three, four or, as Emil Behnke suggested, five. ³

An example of mechanistic training is positioning the uvula. When a tone is well formed, the uvula will recede into the roof of the mouth, while at the same time the pillars of the fauces will broaden. To duplicate this physical arrangement, students were advised to raise the uvula and make space in the back! Having responded to this suggestion, it was only natural for the vocal organs to stiffen or, in vocal terminology,

become “tight.” In order to counteract the tightness (a feeling of the tone being caught in the throat), the next piece of instruction was to place the tone forward at the lips. At this point, a great tradition began to disintegrate, and mechanistic methods became the hope of the future.

The end result of this turn of events can be summed up by a statement made by the great tenor Jean De Reszke (1850-1925) to the effect that “I find the great question of the singer’s art becomes narrower and narrower all the time, until I can truly say now that the great question of singing becomes a question of the nose!”⁴ This priceless piece of rhetoric refers to a theory De Reszke developed in collaboration with Dr. H. Holbrook Curtis, a noted throat specialist. Discarding previous experience, they believed resonance to be the answer to all functional problems, and singing *dans la masque* is now a widely accepted training method. Unfortunately, what was thought at the time to be the hope of the future became the frustration of the present.

As it has always been a rarity to find musicians who have had a solid background in the sciences, it was quite natural for the majority of voice teachers to follow in the path laid out by Jean De Reszke and, in one form or another, adopt practices which tended to move farther away from the functional principles set forth at an earlier time. Increasingly, attention was directed to the sensations of vibration awakened when the register mechanisms were operative until, finally, the terms falsetto, head voice, and chest voice lost all significance. With the functional importance of the registers almost totally obscured, training methods became “sensation” centered. Subjective feelings were made to supplant functional principles, and the search for the right symptom of vibration, its locale, “ping,” and “point,” became the new fashion.

While it may seem to many that the link to traditional techniques that gave rise to the first Golden Age of Singing has been completely severed, upon closer inspection they will find this is not so. The vocal jargon of today still has its roots firmly grounded in the past. It *is* possible to retrace the way, and it *is* possible to rediscover the functional principles from which the terms of reference evolved. Let us, for a moment, examine some of the probabilities.

Expressions familiar to most members of the singing community would include “head” voice, “chest” voice, “hooking” for the acquisition of high tones, and “forward” placement and “low” placement, with tones being described as being “heavier” or “lighter.” Another fashionable term is “focus.” Although as functional representations these terms are without meaning, nevertheless, it is evident that they are all natural derivatives of those working principles contained within the concept of registration developed from an earlier time; they are symptoms of a specific type of functional activity.

What immediately captures the attention when comparing older terms of reference with contemporary nomenclature is that most of the expressions indicate some kind of polarity. With great consistency, “high” is placed in opposition to “low.” “Hooking” the tone certainly implies an impetus whose intent is to initiate a change from one type of physical arrangement that can only be described as lower, to that of another that is higher. “Heavy” and “light” surely point to the certainty of there being at least two mechanical factors present to account for the differences in tonal weight. Perhaps most interesting of all is the reference to the “half” voice. Of course, this could merely

indicate a reduction in the level of tonal volume, but if this were true one would, more likely than not, refer to half “volume,” rather than half voice.

All of the above terms are plainly derivative. When referred to their functional origin, these expressions will convincingly demonstrate that the registers clearly operate, or are potentially operative, as a functional unit in all voices, high or low, male and female. It is these two mechanisms which create the *illusion* of “headiness” and “chestiness,” of depth, of a feeling of heaviness or lightness, of a sense of tonal “position.” Without the phenomenon of registration, the voice would be seamless and the mechanism inaccessible to training.

On a functional basis, it is demonstrable that the vocal mechanism is accessible; that either the head register or the chest register can be tonally extracted at will. By simply knowing the formula which evokes a register response, the feelings of vibration which are their sensual equivalent will appear. The chest register, when dominant, will exhibit a quality which Tosi observed to have come from the breast by strength, a quality of weightiness; while the head register will exhibit qualities of “lightness,” “height,” flexibility, and general buoyancy, each texture and symptom of vibration being the result of the registration. ¹ To reverse this equation is to invite pedagogic disaster.

THE MECHANISM

If voice training techniques are to be reestablished on a practical basis, the first step to be taken in that direction would be to determine the kind of mechanism we are dealing with and the possible means at our disposal for assisting that function. Superficially, we are concerned with the organs of voice, but a far more comprehensive view of the subject will be possible if the mechanism is recognized for what it truly is—a respiratory organ. Due to the fact that the respiratory system possesses those elements necessary for making tone, it can be readily converted into a sound-producing instrument. As such, it is being used as an adaptive mechanism. There are two phases to this process: 1) a series of muscular contractions which cause the vocal cords to adjust to the required length and tension for pitch, and 2) the positioning of the entire pharyngeal tract to answer the needs of resonance.

In rather simplistic terms, the vocal cords become vibratile by means of antagonistic tension having been brought to bear on the thyroarytenoid and the cricothyroid and arytenoid muscles. The ratio of tension shared by these muscle groups determines the registration. On the other hand, the laryngeal pharynx is moved into a position favorable to resonance by a forward movement of the base of the tongue, a movement made possible by simultaneous tension having been brought to bear on the genio-hyoid, hyo-glossus muscles, as well as the anterior and posterior fibres of the genio-glossus. Another factor in open-throated resonance is proper relaxation of the swallowing muscles. Thus, the act of phonation is comprised of separate yet totally integrated activities.

“Voice,” therefore, is a product of function and has no mechanical function of its own. It is the end result of a coordinative process involving a complex of laryngeal and pharyngeal muscles, and all devices and techniques employed to improve the tone after the coordinative pattern has been set are useless. What a constructive program of vocal study *should* attempt is the discovery of a technique whereby the coordinative

process of the muscles engaged in phonation can be improved and perfected. As no vocal technique is faultless, success in teaching and learning depends in large part upon a program given over to changing an habitual coordinative process.

The means available for employment as a stimulus control in singing are not hard to find. Because of the phenomenon of registration and its relationship to specific patterns of pitch and intensity, the vocal organs can be made to respond beyond the singer's power of volitional control, or, for that matter, even his preconcept. Consequently, new and predictable coordinative patterns of response are easily induced. By this process changes can be brought about in the way in which the air spaces surrounding the vocal cords are set into motion. When training techniques succeed in bringing the functional alignment of the coordinative response into harmony with nature's laws, the end result, "voice," will show marked improvement. In the profoundest sense, this is the meaning of vocal training. It is the point of beginning where functional laws reveal themselves to those who observe. ²

FUNCTIONAL STUDIES

To facilitate the discovery of functional laws, it is necessary to project a wide variety of stimulus patterns. In this way one can discover similarities and dissimilarities within the dynamics of the process, namely, stimulus, organic response, and tonal texture. A procedure of this kind raises important questions. Is the response always the same? Are there textural differences which can be equated with a particular type of stimulus? If so, what kind of relationship can be discovered?

Analyzing reflex responses assumes that a better than average vocal technique is being studied. Poor reflexive responses obscure nature's laws, and all attempts to discover functional truths will fail if conclusions are arrived at on the basis of inadequate material. Only free voices, expressing a consonance with nature, will reveal the mechanical principles upon which a correct vocal technique is founded.

To begin, suppose the student, a soprano, has been instructed to sing a descending C major scale at a comfortable level of intensity on the vowel "ah," with the further request to preserve at all costs (even at the risk of sacrificing tonal vitality) the textural properties established on the topmost tone. If this instruction is carried out faithfully, only one course will be left open—she must gradually decrease the amount of pressure applied, and consequently, the intensity.

Carrying this experiment further, it will be discovered that exactly the same reaction occurs, under the same set of conditions, while singing other vowels. Of added interest is the fact that the noticeable point of difficulty always seems to be located in the vicinity of F, immediately above middle C. Now a question arises. Why do the lower tones of the scale, provided the textural properties of the upper tone are maintained throughout, grow progressively weaker?

Before answering, let us revise the scale pattern and investigate other alternatives. Of particular interest is the pitch area below middle C. Using a single tone on the vowel "ah" and commencing at B flat, or perhaps A, the student is now requested to raise the intensity and sing at a comfortable forte. Now what happens? The entire structure of the preceding tonal texture will automatically and reflexly undergo a radical

change! Sweetness will have given way to a rugged, almost masculine sound, a quality which can be recognized as the chest register.

Having made the discovery that within certain tonal areas the reflex response of the vocal organs is predictable, and having further discovered that an equation exists between response and stimulus, we may now be said to have made contact with a natural functional activity. At no point in the instruction was the student asked to “produce” a specific kind of sound; the sound produced itself. It emerged as a logical, natural reaction to an environment. This is the essence of functional training. It leads to tonal naturalness, to spontaneity, and to self-awareness.

Suppose, now, we try to discover whether or not the student is able to connect these two characteristically different sounds she has been made aware of. This will, of course, necessitate the use of a larger musical figure, so an arpeggio covering a range of one octave and a fifth will be useful. The vowel to be used is “ah,” the starting note A, below middle C, the intensity forte.

In attempting this figure, the student soon finds that a smooth connection is impossible and that a disruption of the tonal flow occurs between the first and second notes. Thus, we learn that there is a “break” in the voice. As the student was requested to sing smoothly, it again becomes clear that the break is also reflex to a specific arrangement within the stimulus pattern. What transpired is this: The chest register responded willingly on the tonic because the pitch-intensity pattern prompted its emergence. As the voice moved upward, however, the third above the tonic proved unmanageable, a situation to which the vocal organs readily accommodated by changing registers. Again the conclusion is unavoidable—that a change in the pitch-intensity pattern is naturally accompanied by a corresponding change in the registration.

Examining the cause of the break will reveal that the crossing of the two registers occurs in the upper portion of the tonal range of the chest register where the intensity is always high, and in the lower portion of the head register where the intensity is quite low. This fact is of great importance to the training program, because it enables the teacher to manipulate the *interior processes* of the mechanism and revitalize its function. If there were no such thing as a register response to correlative patterns of pitch and intensity, very little could be accomplished toward promoting an improvement in the functional condition of the vocal organs.

Other interesting possibilities soon suggest themselves. If the student is instructed to execute the identical musical figure, with the single exception that it be sung at a strong mezzo piano, or a slack mezzo forte, yet another type of involuntary response will take place. As a reaction to this type of change within the stimulus pattern, the vocal organs will display a reflex tendency *to combine the two textures* recognized as belonging to the chest and head register, first minimizing, then eliminating, the break. Keeping the textural properties of the registers in mind, it is immediately evident that, with the break between the registers bridged over, a third tonal texture has made its appearance. Again, this texture was not sought after, but appeared reflexly in response to the changed stimulus pattern. This condition might advantageously be called a coordinated registration, combining as it does the activity of *both* registers, which now operate as a functional entity.

In establishing the concept of registration as a functional reflex, it develops that three separate sets of conditions can be induced by rearranging the stimulus patterns.

They are: 1) the falsetto, or head register, 2) the uncoordinated chest register, and 3) a combined, or coordinated registration. Shortly, a fourth possible arrangement will be brought under discussion, a mixed registration.

We have now seen that under specific conditions vocal organs habitually respond in a manner both consistent and predictable. We have also discovered that the responses are reflex to a specific type of stimulus, the stimulus itself being comprised of pitch, intensity, and the vowel. Some of these arrangements tended to create tonal textures which divided the mechanism into two separate units, while others obliterated the inner mechanics and unified the function.

So we have discovered a correspondence between a given pitch-intensity pattern and the texture of tone yielded. Therefore, the question raised earlier as to why both the tonal texture and the intensity soften with the descent of the C major scale can be answered. In our first experiment with a stimulus pattern, the head voice was encouraged to maintain its characteristic texture. If the singer had *failed* to decrease the intensity with the descent of the scale, this would have been impossible. Regardless of any effort made to avoid a textural change, the higher intensity level would automatically engage some element of chest register participation. Only by singing more softly was it possible to maintain the head register balance. In physical terms, the effect of this disengagement was to fragment the mechanism. Consequently, the contour of a pure head register, obscured in a combined registration, was revealed.

From the standpoint of practical application, the predictable response of the vocal organs to the musical idea contained within the pitch, intensity, and vowel pattern presents many opportunities for assisting a more efficient functional response. We have just seen how the head register can be disengaged from its unitary function with the chest register, indicating that the teacher can arbitrarily balance the mechanism in a variety of ways. There is a second alternative. Should a stimulus pattern be introduced that would serve to isolate the chest register from contact with the head voice as, for example, singing forte on a single tone in the lowest possible tonal range, the division of the registers, whenever such division is necessary, can be speeded. In this manner, two normally integral parts of the mechanism can be made to work independently.

The conclusion to be reached from these observations points up the real significance of voice-building. For if it is true that the mechanism is susceptible to disengagement of its parts, it then follows that the entire coordinative process is equally susceptible to reconditioning. That is to say, when necessary, it can be taken apart, tidied up, and put back together again in what should be a healthier functional order.

Ideally, there is but one mechanism, and, unless all of the parts operate as a harmonious functional unit, there will be a serious loss of power, range, flexibility, and evenness of scale. However, a complete integration of the parts is not usually an immediate aim of functional instruction. Deficient areas of development must be corrected and brought up to strength before unification is feasible. Premature unification "builds in" limitations. The important point is that the means are now at hand for reconstructing a poor vocal technique.

Returning again to the subject of nature's laws, it should be clear that we have observed some of these laws in operation. None of the physiological, anatomical, or acoustic phenomena may as yet be understood. Nevertheless, from a pragmatic standpoint, the evidence clearly indicates that these laws have been operative. Contact

with functional law is essential to a durable technique, and the means here described open the way for the establishment of that contact.

PROBLEM VOICES

So far our examination of functional happenings has been addressed to the type of response habitual to well-formed voices. What, then, of the problem voices—those voices in which healthy mechanical responses are so obscured as to make detection of functional activities difficult, if not impossible?

The techniques for eliciting a favorable vocal response, even with poorly used voices, must consistently employ the pitch-intensity patterns already discovered to be helpful. However, it is not always possible to achieve a spontaneous reaction through the simple means described, by reason of the fact that habitual misuse tends to “mix” the registration. In a mixed registration, the two registers, instead of working as a harmonious, cooperative entity, conflict with each other.

A fairly accurate picture of a mixed registration is provided by imagining two people of unmatched stride lengths walking side by side. Rather than moving rhythmically, the couple constantly collide because their steps are out of phase. Thus, natural movement is impeded and walking together not only becomes difficult, but unpleasant. In principle, this is exactly what happens in a mixed registration. The chest register, which when healthy is robust and powerful and should at the extreme go no higher than E, above middle C, becomes thinned out by being driven too high and intrudes into a tonal area fully an octave higher than it ought to go. The head voice also presents a problem, because its pattern of response will have been forced out of character by the more aggressive quality of the chest register. Muscular activities which should work together harmoniously become mutual irritants.

So it may be seen that a mixed registration is also a muscular reflex to an outer stimulus of pitch and intensity, but a badly coordinated arrangement. The chest register operates far too high into the pitch range at an intensity far too low, while the head register is disrupted by this intrusion and becomes incapable of responding in a way natural to its own functional interest. A mixed registration will always seriously impair the natural beauty of the voice, with a consequent loss of range, power, and resonance.

THE “BREAK”

Almost all voices of any stature present a problem during training because of the break occurring in the vicinity of F, above middle C. Unless this problem is resolved successfully, smoothness and evenness of scale and, consequently, a good legato are impossible achievements. The break is caused by discrepancy in the balance and development of the registers. It occurs at virtually the same pitch in all voices. With women’s voices, it will be found in the lower tonal range, and with men, in the upper tonal range. The reason for the seeming discrepancy is that women sing an octave higher than men.

While the break must be dealt with effectively during training, it must not be looked upon as a vocal malaise. On the contrary, it is only the better-formed voices that have to face this problem, as those which are perfectly smooth in scale are limited very

often to lyric singing of a sweet and pretty kind. Such voices can never sing freely until the gap in the voice has been opened and a new program of development and integration begun.

There are several ways the break can be eliminated, but, regardless of the approach selected, certain conditions must be met: 1) the mechanism must be joined at maturity, *i.e.*, after each register has been brought to its fullest strength and development, 2) an equitable balance between them must be established so that they cooperate in their activity rather than conflict, and 3) inhibitory tensions in the form of throat constriction or perhaps faulty resonance adjustments must be eliminated. Failure to achieve these ends will result in a mixed registration.

What appears to be an insuperable problem in the break area is the seemingly incompatible nature of the two qualities and intensities to be joined. As the chest register moves upward in the tonal range, it becomes increasingly aggressive, whereas the head register in the same area is weak and passive. To reconcile this imbalance within the overlap area, the chest register must be encouraged to *lower* its intensity so that the head register can participate more actively. Great care must be taken in doing this, however, as it is important not to devitalize the chest register to the point where the throat will constrict. In effect, what must be accomplished is to encourage the muscles activated while singing in the chest register to hold position and tension at a lower level of intensity, while at the same time the head voice is urged into greater prominence. In this way, tension is shared rather than being engaged on an either/or basis.

It is interesting to note again that the stimulus patterns projected throughout all stages of functional vocal training *evoke a predictable response*. This is important, of course. But even more important during training is the growing awareness of response as movement. For it is through movement alone that the muscular coordination resulting in "voice" can be changed in a rather dramatic way. This is exciting, because it provides the vocal teacher with a direct means of access to an involuntary process without recourse to methods of direct control.

RATIOS OF REGISTRATION

Unless the chest and falsetto registers operate in some degree as a functional unit, it is impossible to sing. Whether the balance is correct or incorrect, some degree of coordination must be operative. From the first lesson to the last, the object of training is to synthesize the registration so that the two mechanisms balance perfectly and combine with an equally perfect resonance adjustment. A ratio of registration describes the constantly shifting proportion of tension shared by the laryngeal and pharyngeal muscles whose contraction holds the vocal cords in tension to define the pitch, the intensity, and the vowel.

Legitimate singing, then, finds both registers synthesized into a functional unit. Only the proportion of tension shared by the two mechanisms will alter as the pitch changes and the tone is swelled and diminished. At pianissimo, the percentage of head register participation will be high, while that of the chest register is negligible. In swelling the tone to forte or fortissimo there will be a gradual increase in head register response until its optimum degree of tension has been reached. At this point, additional tension will be assumed by the chest register and all subsequent increase in volume

can be attributed to this mechanism. When a perfect equilibrium within the phonative process has been attained, the singer will have complete mastery over the *messa di voce*.

THE *MESSA DI VOCE*

The supreme art of the singer is a properly executed *messa di voce*. This is a musical effect in which a single tone is gradually increased in intensity from pianissimo to fortissimo and then diminished. Not many vocalists today have a technique capable of this. Some appear to be able to sing loudly without being able to decrescendo; others appear to be able to sing softly without having the ability to swell the tone out to a full forte; while a greater number seem unable to sing either extreme very effectively and are forced to remain within rather narrow limits of intensity.

To swell and diminish properly, two functional arrangements must be operative: 1) a register balance must exist in which both mechanisms are engaged at a ratio of tension equivalent to the pitch and intensity being sung, and 2) a resonance adjustment must be maintained which does not alter its position regardless of the changing ratio of registration. When these two phases of technique operate in complete harmony, the ability to execute a beautiful *messa di voce* will become an integral part of the singer's technique.

THE VOWEL

Correction of vocal faults is not the exclusive province of the vocal registers. Other agents must be found to assist in reconditioning a badly conditioned reflex. One such agent is the use of primary vowels. Ideally, the articulative needs of the registration and the vowel should be jointly served, and a wisely selected musical exercise will be one which enhances both the purity of the registration and the purity of the vowel at the same time.

Vowels are of particular interest throughout training. Tonal impurities are easily detectable there, as well as misconcepts in the area of pronunciation and quality. However, as vowel distortion lies within the functional process as a whole and not within the vowel proper, purification of the vowel without regard for the condition of the registration or the resonance adjustment will be ineffective. *A vowel will only be as pure as the coordinative process will allow.* Consequently, work on the vowel must move toward two major functional objectives: 1) it must improve the resonance adjustment, *i.e.*, eliminate constrictor tensions, and 2) it must assist in making changes in the registration, whether it be for purposes of separation or unification. The best way to study the behavior patterns of the vowels is to construct an exercise wherein all primary vowels are included so that *they represent the changing factor in an otherwise stable environment.* This can be done quite easily by using a single tone and maintaining a constant level of intensity, while linking the five primary vowels together as "ah," "ay," "ee," "oh," and "oo."

If a technically well-advanced baritone is asked to sing this exercise on D, below middle C, at a relaxed forte, it will be noticed that the "oo," and to a lesser degree the "ee" vowel, will always require slightly different adjustments. It is perfectly comfortable

and easy to articulate the “ah” with the mouth quite open, and to both feel and hear the rumbling quality of the chest register for the simple reason that it is the dominant mechanism. However, with the “ee” and the “oo,” neither the physical position nor the tonal texture remain the same. Moving into the “ee,” the mouth automatically closes a bit, while at the same time the textural properties of the head voice emerge somewhat stronger. In phonating the “oo,” the mouth has to close even more, the tonal texture further softens, and the overall feeling is that the tone has come “forward.”

Now, suppose the same exercise is performed an octave higher, what then happens? Exactly the same thing—except that the reacting patterns will be even more pronounced, with the “ee” and “oo” presenting even greater problems. Perhaps not surprisingly, we now find the “oo” vowel particularly awkward, and it can no longer be well articulated with the mouth in a relatively closed position. The mouth *has* to open more and great care must be taken not to let the vowel degenerate into an “oh.”

The functional significance of such a study is plain. It should be noticed that when on the upper D the “oo” tended to open up into an “oh,” there was a corresponding shift in the tonal texture. The head register quality of the “oo” when the vowel was kept pure had to modify and disintegrate when the texture changed, as this vowel is incapable of being articulated in the upper tonal region unless the registers are extremely well coordinated. If the textures of the lower “oo” and the upper “oo” are compared, it will be apparent that the vowel changed reflexly to the change in the ratio of registration. The texture which made the “oo” degenerate into an “oh” was that of the chest register.

If one were to insist on keeping the vowels pure at all costs so that a real “oo” is maintained on the upper D even at forte, the singer has no other recourse but to “cover” the tone. Covering, it is true, will take away the “too open” quality which makes “oo” sound like “oh,” but it also destroys the effectiveness of the resonance adjustment—shutting it off and inducing constrictor tensions. With a covered tone, the effect is one of a “lid” having been placed on the tone and, consequently, this leads to the ultimate distortion of all the vowels. Covering is a practice to be avoided, except as a temporary expedient.

Returning to the problem of the “oo,” how can it be made to maintain its purity at forte without recourse to covering? Here we come to the art of the *messa di voce*, the art of balancing the registration so that the ratio of registration for each pitch, intensity, and vowel is in exact proportion to the needs of the musical pattern. Before practicing the *messa di voce*, however, a groundwork must be laid so that it can be executed properly. This groundwork is prepared by employing the same exercise, with one exception. Rather than keep the intensity constant throughout all five vowels, a slight decrescendo will be made as the “oo” approaches. The effect of this will be to slack off some of the chest register tension, but not enough to cause the resonance adjustment to collapse. In this way more of the upper register texture will be pulled in. This will immediately eliminate the “too open” quality of the “oo” and provide a healthier functional climate. With both registers equitably engaged, pressure can slowly be increased. As long as the unitary function is maintained, there will be no real reason for modifying the vowel any longer.

A striking example illustrating the problem of the “oo” vowel as it pertains to registration will be found with women’s voices. It is impossible for women to sing the

“oo” softly in the chest register, and even when sung loudly it is extremely difficult and tends, as with men’s voices, to cause the vowel to modify to “oh.” So we arrive at four conclusions: 1) that the so-called open vowels are more advantageous when singing in the chest register, 2) that the closed vowels are more adaptable for bringing out the strengths of the head register, 3) that the same reacting patterns occur in both men’s and women’s voices provided the patterns of pitch, intensity, and the vowel are identical, and 4) that even though the pitch-intensity pattern remains unchanged, the ratio of registration will change with the changing vowel.

The significance of these observations is clear. Registration and adjustments for resonance are not *purely* the result of a functional response to pitch and intensity, although this is primarily so. Equally essential is the assistance of discreetly selected vowels to facilitate the program of register realignment being undertaken.

Needless to say, the possibilities contained within the practice of vowel manipulation are endless. Some of these possibilities have already been explored. In general, a good rule of thumb to remember is this: “Ah” tends to expose the strengths and weaknesses within the registration and affords excellent insights into the type of imbalance present. It is also useful in bringing the chest register into greater prominence. The “ee” tends to coordinate the registration, but at the same time exposes the weaknesses within the resonance adjustment (constrictor tensions are very easily detectable with the “ee” vowel). The “oo” helps to separate the registers, and to coordinate the “oo” vowel properly is a difficulty not commonly surmounted even by fine artists.

Manipulation of the vowels in order to improve the resonance adjustment and create a better balance of registration is an important teaching tool. Much can be done in this way to bring about a better functional arrangement provided, of course, quality is regarded as vowel quality. The procedure is straightforward. Vowels are used to perfect the purity of the registration, as it is purity of registration (a unified and harmonious coordinative process) that purifies the vowels. Vowel purity and beauty of tone quality are always the result of a healthy functional condition, not causes. Quality is what happens. Function is what makes it happen. Functional freedom alone is responsible for vowel purity and naturalness of tone quality.

QUALITY

From what has been said about vowels and the textures of registration, it should be quite clear that training procedures developed to meet functional needs must ignore contemporary attitudes toward quality. At no time is the instruction primarily geared to making lovely sounds, including resonance of whatever kind, the cultivation of “ping,” or the use of concepts such as tonal projection. There are but two legitimate areas of concern, and these are registration and the vowel.

Whenever a good equilibrium has been restored to the mechanism, the question of aesthetic beauty will vanish. Inner beauty is always present and ready to surface the moment functional relationships have been made right. Natural tonal beauty is the end result of vocal freedom, and never has to be made. To make it is to destroy it. When the singer learns to respond without inhibition to the stimulus patterns projected by the teacher, and the mechanical function is free and well coordinated, the prerequisites for

tonal beauty will have been met. Natural tone quality is achieved by this kind of identity and through no other.

PART 2

RESONANCE

The second area of functional interest during training is resonance. Ideally, registration, the vowel, and resonance are equal concerns, no one superseding the others in importance. In actual practice, however, the focal point of instruction will shift from one to the other. With poorly formed voices, registration is always more crucial, because a well-tuned resonance adjustment is impossible when the registration is out of line. On the other hand, when the technique is advanced, the resonance adjustment demands greater attention than the registration, as the efficiency of the registration can be enhanced under certain technical conditions by concentrating on purification of the vowel. During intermediate stages of development, there will be a dual emphasis; each lesson will include those exercises designed to correct the registration, as well as those whose intent is to improve the resonance adjustment. As resonance is so important to vocalization, it is essential that it be defined.

Resonance is an immediate amplification of tonal vibrations set in motion by the vocal cords and occurs whenever a cavity is formed whose natural frequency corresponds to the natural frequency of the pitch. The principal cavities involved in forming a chamber of resonance are the oral, the postnasal, and the laryngeal pharynx. The air in these cavities also vibrates in sympathy with the harmonics, or overtones, within the fundamental vibrations determining pitch. This further increases the intensity of the initial source of vibration and reinforces the tone. Tonal resonance, therefore, is the product of a cavity formation which is "tuned" to the natural frequency of the vibrating cords. Quality is a product of the type of vibration set into motion by the vocal membranes, plus the manner in which overtones are concentrated, dispersed, and augmented. As the quality of sound given off by the vibrating cords alone is inconsequential, cavity resonance of the kind described is an extremely important factor in singing.

Not all of the resonance heard in vocal tone, however, is the product of cavity resonance. In addition, there is forced resonance and sounding board resonance. Forced resonance is a condition in which the initial source of vibration, that is to say, the vibrator, forces a resonator to respond despite the absence of sympathetic tuning. If, for example, a tuning fork is set in motion and touched to a solid object, the initial source of vibration will be reinforced and become louder. Both the piano and the violin operate on the principle of forced resonance. Sounding board resonance has to do with the reflection of tone, as with the echo. The band shell and the tester poised over the pulpit in most churches are good examples of sound reflectors which increase resonance. It is probable that forced resonance plays a prominent part in vitalizing vocal tone. The solidity of the singer's bone structure and general sturdiness of frame (notable in so many great singers) undoubtedly contribute substantially to tonal vitality and could possibly be said to represent a superior potential. Sounding board resonance

merely gives the illusion of amplification, the apparent increase being due to an efficient transfer of vibrations from the vibrating source. It is hardly a factor in singing.

As a vocal concern, resonance is a relatively new development. Earlier instruction centered on but two elements, registration and “purity of intonation.” A hasty judgment would equate purity of intonation with pitch perception, but, although pitch is a factor, there is more to it than that. Vocal exercises were designed to strengthen the organic response, perfect the registration, and train the ear. But always the tone had to be pure. Pier. Francesco Tosi (1647-1727) made this clear when he wrote, “Let the master attend with great care to the voice of the scholar, which, whether it be *di petto* or *di testa*, should always come forth neat and clear, without passing through the nose, or being choked in the throat.” He also counseled, “Let the scholar be obliged to pronounce the vowels distinctly. . .if the fault is not the master’s, it is the singers’, who are scarce got out of their first lessons.”⁶ Purity as defined by Tosi implies an unblemished tone quality, and a pure tone is always resonant. Purity of intonation, resonance, and vowel purity are synonymous, each being the reflection of a precisely adjusted coordinative process.

Resonance as such was not considered a factor in singing until the early part of the twentieth century. Herbert Witherspoon, a prominent teacher and singer (1873-1935), wrote of “this comparatively new bugaboo, Resonance.” He further remarked, “It is an interesting fact that the term nasal resonance I have never found in one of the old books upon the art of singing, either in this country or in Europe.”⁷ This statement seems to be accurate. A considerable number of books appearing in the nineteenth century deal with the subject of *resonators*, but not resonance. In Garcia’s *Hints on Singing*, published in 1894, the subject is not mentioned.

With the arrival on the scene of the music of Wagner and Berlioz (and to a lesser extent, Verdi), it was only natural that greater interest should be shown in resonance. Suddenly, the size of the orchestra almost doubled, with heavy augmentation of the brass. Purity of intonation and registration seemingly needed a reinforcing agent. Volume of tone came to be more highly prized than purity of tone, and functional concerns were shunted aside in favor of concepts given over to tonal “projection.” Forcing for volume resulted, and strained, effortful vocalization gradually displaced the free-flowing cantilena of the Golden Age of Song. Only a small minority remained faithful to the idea of the immutability of functional laws—that the correct way to sing is correct for Wagner, Berlioz, and Schoenberg, as well as for Mozart.

With the advent of new techniques, abuse of the mechanism became increasingly common, and the throat doctor indispensable to a career. The vocal cords were apparently fragile, and something had to be done. H. Holbrook Curtis suggested “taking the attack from the cords” and focusing the tone in the masque (frontal sinuses) in order to relieve the pressure.⁸ Ernest White carried this idea a step further and declared, “The vocal cords have absolutely nothing whatever to do with voice. Their function is to *prevent* the passage of air into the mouth, nose and head.” White also quotes Sir Milsom Rees, who, in lecturing before the British Medical Association at Belfast (1937), commented, “These high tones with heavy volume mean an enormous strain with consequent exhaustion.”⁹

With an increase in the demand for big voices and voluminous tone, resonance became the focal point of most training methods. The result was that the core of the

functional problem was neglected in favor of peripheral concerns. Before too long, few seemed to remember that the sensations of vibration felt in the head or in the chest were due to registration. New systems were devised to “place the voice,” the singer being encouraged to feel the vibrations in the chest and head, to resonate in the sinuses, or to encourage the “ping” in the tone. These practices have been proven failures, and such vocal training, instead of solving problems, tends to create them.

The concept of head and chest resonance, of course, cannot be taken seriously. The antrum and sinuses are small, nonadjustable cavities, heavily damped and not at all suitable for tonal amplification. Furthermore, the openings to the sinuses are so small that these cavities can scarcely be considered a constituent part of the resonance system. William Vennard reports the findings of Warren B. Wooldridge, who, having blocked off entry into the nasal passage with cotton gauze, found no perceptible difference in the characteristics of resonance. Both Vennard and Wooldridge arrive at the same conclusion, finding the entire concept of nasal resonance totally without validity.¹⁰ Head resonance should probably be considered an illusion, an illusion created by forced resonance.

Chest resonance is also the product of illusion. In reality, the chest is a cage, not a cavity. Filled with soft, spongy material, it acts as a damper rather than a resonator. The only cavities which are large, adjustable, and possessed of suitable resonating surfaces are the postnasal pharynx, the oral pharynx, and the laryngeal pharynx. Because the larynx houses the vocal cords and surrounds the vocal membranes, and can be positioned, moved, and adjusted, it is ideal for the purpose of resonating tone. The laryngeal pharynx, together with the oral pharynx, represents the functional core of the vocal process. The mouth and the organs of articulation must be considered auxiliaries and, consequently, peripheral concerns. When the coordinative process within the functional core has been made right, all peripheral matters logically fall into place.

The muscles which position the resonators are of little practical interest. The vocal organs are respiratory organs, and muscular activities are involved which extend from the head to the pelvic floor. Some of the muscles can be brought under direct control; most can not. In any event, the interplay of muscles is so complex that the singer who worries unduly about them is in danger of becoming immobilized. He would be like the centipede who paused to think about which leg moved after which. A positioning process does take place, however, and this process is called a “resonance adjustment.” To know his voice, the singer must discover those areas in which he can exercise legitimate control over the resonators. This requires an entirely new concept of teaching and learning, one in which knowledge and understanding are gained by observing the natural responses of inner organic functions after they have expressed themselves in movement.

CONTROL

Regardless of the functional area with which one may be concerned during training, nothing happens without movement. The balancing of the registers, the adjustments made for resonance, and the positioning of the pharyngeal cavities for the vowel all involve some aspect of movement. But movement per se is of no great

consequence. What we are really interested in is natural movement, the kind of movement which indicates that the respiratory organs are being adapted to the vocal process in a compatible manner. Healthy movement is free movement; therefore, it is free movement which training procedures must cultivate and encourage.

Before natural body rhythms can be set into motion, the conditions must be right. Here the student must develop a new attitude toward learning. In effect, he must learn to prepare by not preparing. He must face the difficulty of “getting out of his own way,” of “letting go,” of “allowing things to happen,” and of being willing to lose all control, control which is related to nonfreedom and an absence of spontaneity. Should he succeed in this, the natural movements which will spring into being should provide a means of access to the muscular processes operating below the threshold of consciousness; that is to say, the important muscular activities which are related to phonation.

When contact has been made with interior body rhythms, the vocal organs, provided the proper stimulus patterns have been selected, will of their own disposition seek to move in a manner more in keeping with the functional logic by which they are governed. In short, like a wound that heals itself, the organs of voice will correct themselves—by responding more freely, they will adapt to the congenial climate to which they have been exposed. What the student must do is give in to an inner-directed impetus, and, by following and observing, learn the nature of vocal control.

Natural breathing offers the best example of what is meant by “getting out of the way” so that one can learn how to assist spontaneous organic rhythms. Breathing is both voluntary and involuntary. By removing all disciplines affecting the way one breathes, the act of inspiration and expiration will proceed naturally on an involuntary basis. Therefore, by observing the natural rhythm of breathing, one is able to perceive the sensation of movement, and so learn the mechanics of the function.

The moment one becomes aware of the natural rhythm of involuntary breathing, there should be no great difficulty in learning how to assist that movement through volitional effort, and in breathing either shallowly or deeply without losing the natural rhythm. This is the only sure way of gaining contact with a purely natural movement. Not until an inner force indicates the direction in which movement should be encouraged can one possess insight into the nature of an organic function and be in a position to institute legitimate control.

All muscles which respond to the inner rhythmic impetus of the vocal organs are, of course, involuntary. By keeping volitionally controllable muscles passive through nonmovement, a perception of interior movement can be gained. Under these conditions, all movement will be completely involuntary. Thus the singer, by observing, can sense the order, the logic, the impetus, and the laws of the vocal function. By proceeding in this manner, it is possible to maintain the integrity of his singing, both technically and interpretatively, because he has come to understand functional needs.

Awareness of inner movements and their natural rhythm is achieved by combining the rhythm of natural breathing with the movement of the musical phrase—its contour, intensity pattern, and vowel. At the onset of phonation, the posture of the body should reflect a condition of poised readiness, very much like a good dancer who is *about* to move. Then, without raising the chest or tensing the shoulder muscles, sufficient breath should be inspired to answer the needs of the musical phrase. With all

volitionally controllable muscles maintained in a state of passivity, the rib cage will naturally expand. Upon sensing that contact has been made with the rhythm of the inspiratory movement, the phrase must be launched forth without disturbing the rhythmic impulse, *con slancio*, with a sense of continuing movement.

The next step to be taken in developing contact with involuntary muscles is to devise an exercise pattern containing at least one variable. A simple major triad, to be sung on the vowel “ah” at a comfortable level of volume, fills this requirement nicely. Having initiated the attack in the manner prescribed, the student’s next point of concentration is the detail of the musical phrase—the pitches, the vowel, and the levels of intensity—and with singing musically. Further, he must be ready to “do” without being conscious of the manner of “doing”; he must “get out of his own way” so as to permit involuntary movements to take over, to let nature operate on her own terms.

With voluntary muscles now passive, the variable element in the triad (pitch) becomes the main point of interest. Vocalizing, the student must make certain to concentrate on moving from pitch to pitch *mentally*, prohibiting all external movement. This is not easy, and great care must be taken by the teacher to ensure that no stiffness is permitted to creep in. If the exercise is sung correctly (with a proper register balance and as pure a vowel as the singer can manage), the involuntary muscles governing the functional response at the point of tonal inception will have been activated. Because peripheral tensions to a considerable extent will have been lessened, a change will occur in the organic response. New sounds will appear; these sounds will serve to alter the student’s self-image and make him aware of the “feel” of the functional elements at work. Under this regimen, contact will have been made with the natural movement of inner organs.

There are, of course, innumerable possibilities contained within the framework of this approach. An exercise which I have found particularly useful is the practice of the trill. I use it at all stages of development, but rarely with the hope of executing a clean trill; rather, with the purpose of innervating involuntary muscles. This must be started on the upper note of the trill. As the tone is moved a full step lower, first slowly, then oscillated more rapidly, the resonance adjustment must be positioned and maintained without change. Two benefits are to be gained from the practice of this exercise: Throat tension of the wrong kind will be relieved, and the singer will be able to feel the interior workings of the organic response and sense how to energize involuntary muscles. The trill, as such, is not a matter of immediate concern, as its proper execution demands an extremely high level of technical competency.

Most contemporary methods overlook the fact that “voice” has no function of its own, but is the product of another set of functions. Also overlooked is the involuntary nature of the muscles which position the vocal organs to meet the requirements of pitch, vowel, and intensity. The general scheme of things is to bring the organs of voice under control by conscious effort. The mouth, tongue, and lips are carefully positioned, the diaphragm pushed in, up, out, or held, and the tone is resonated in the facial masque (even the use of the word “masque” is significant as it represents an excellent hiding place), or “hooked,” “lifted,” or “placed” forward and up.

It is pointless to attempt a complete listing of the techniques used to obtain direct control. All such techniques miss the functional point, and all are damaging in the extreme. Of more than casual interest, however, is the general inclination to get things

backward. Control of the breath is thought to effectively control function, whereas it is function that controls the expenditure of breath (the size of the glottal space regulating the amount of breath flow and the glottal space narrowing because of a well-balanced registration). High and low “placement” is used to free the voice, but the voice is free because of a healthy functional response within the throat parts. All legitimate control over tone is lost once the cords become vibratile. Placing the tone does not free the voice; it inhibits function. Neither is resonance “made” by putting the tone in any particular orifice. Resonance adjustments are made by positioning the oral, the postnasal, and the laryngeal pharynx in response to specific patterns of pitch, intensity, and the vowel. The important muscles involved in the positioning process are involuntary, and it is impossible to act directly upon an involuntary movement except to reverse it. Attempts at volitional control over a faulty coordinative process will encourage throatiness and be self-defeating.

RHYTHM, MOTION, AND EMOTION

If movement ceased, the universe would no longer exist; for in nature there is an ongoing ontology—rhythm, if you like. The galaxies are in a constant state of expansion and contraction, civilizations rise and fall, the seasons change, cells expand, contract, divide, and proliferate, and life forms have their cycles, all phenomena being expressed in terms of constant ebb and flow—in terms of movement, rhythm. Movement is a characteristic of all animate nature and reflects the manner in which energy is being expended. It is the agency through which contact is made with our inner being, with our fellow humans, and with the universe at large. Movement holds the key to the unblocking of a faulty coordinative process, and it is the means by which legitimate emotional identification is made with the materials of music.

When the functional properties of the vocal organs have been released, contact has been made with an essential life rhythm. Bodily organs become expansive, and, with expansive movement, pleasurable feelings are awakened. As the singer learns to energize and preserve the rhythmic integrity of inner movements, he will gain a profound insight into his voice as “self.” Equally important, he will have gained a perception of rhythm as expressive movement, as emotion.

The first scientist to recognize and define the organic connection between movement and emotion was Wilhelm Reich. He states, “Expressive movement is an inherent characteristic of the protoplasm. Literally, the term means that in a living system something presses itself out, consequently causing movement. This means protoplasmic movement, the contracting and expanding of an organism. The literal meaning of emotion is moving out, which is the same as expressive movement. The movement of the plasm, then, has an expression in the sense of an emotion, and the emotion or the expression of an organism is bound to movement.”¹¹

On the basis of this evidence, it is clear that the quality of one’s emotional equilibrium equates with the quality of one’s motility. Whether an organism is blocked or free has a direct bearing upon the quality of its emotional status, its capacity for feeling, the objects and events which attract or repel it, and, obviously, with vocal technique, musical taste, and interpretation. Rhythm is the communicating link through which contact is made between an organism and its environment, emotion and intellectual

comprehension, a performer and his listener. In short, it is the release mechanism which determines the kind of relationship one is capable of sustaining in the dual world in which all of us live, the world inside ourselves and the one outside ourselves.

The purpose of vocal training, therefore, is to establish a condition of functional freedom, freedom of motility. When the vocal organs respond to conceptual image, a rhythmic impulse will, when the technique is free, move outward. With energy directed toward an outer periphery, the organic participation becomes articulate; it appears to want to move *this way* and not *that way*. By this means, the singer who has learned to trust his instincts will sense with a high degree of perception the manner in which the plasmatic movements should be energized. His intuitive “feel” for singing will impel him to do that which is functionally correct.

If the vocal organs are to be encouraged to respond in terms of their own natural order, “getting with” the rhythmic essence of the material being worked is of the highest importance. Rhythm promotes spontaneity and, as expressive movement arouses feeling, the emotion awakened will be genuine and unforced. Both a secure vocal technique and interpretation are almost wholly dependent upon this kind of emotional identification. Rhythm and registration, combined with skillful employment of the vowels and tuning of the resonators, are the basic tools the teacher has at his disposal for developing such a technique. When used with discretion and understanding, they are more than sufficient.

THE VIBRATO

Nowhere is the presence of inner rhythmic movement more apparent than in the oscillations normal to all musical tone. Tonal oscillations may be of various kinds: tremulous, wobbly, sporadic, or perfectly regular. Regular (rhythmic) oscillations are known as a vibrato, and the vibrato is one of the primary manifestations of a healthy vocal technique. Few singers use their voices correctly and, consequently, a true vibrato is rare.

A vibrato is readily distinguishable through its physical features—an amplitude which increases and decreases in direct proportion to the rise and fall of intensity, coupled with a periodicity which remains constant. Other tonal movements such as the tremolo and the wobble behave differently. With less desirable tonal movements, it will be found that the amplitude has little relationship to intensity, while the periodicity is disturbingly irregular. A useful rule of thumb in estimating the character of tonal pulses is to determine whether or not the fluctuations are *noticeable*. In a true vibrato, one is unaware of oscillating movements; pitch appears to be centered, and the tone alive, vibrant, and beautiful.

An important feature of the vibrato is that it permits the voice to move rhythmically through the musical phrase; it establishes the voice as a legato instrument. When tonal oscillations are rhythmic, there is bound to be a moment in time when it is logical to move. This disposition to move does not necessarily occur in terms of the singer’s sense of musical discipline, but within his organic logic. Such movements may not always coincide with the time values set by the composer, but they will be, nevertheless, *rhythmically* correct. Historically, many singers with but the most prosaic

musicality have proved effective and phrased beautifully simply because their voices moved in response to a natural, free organic rhythm.

Above and beyond these important considerations, the vibrato is the reflector of the emotions, in speech as well as in song. The voice will tremble with rage, bubble with laughter, sound heavy with fatigue and despair, grow unsteady when depicting age, and, in general, reflect every emotion experienced by the singer. The vibrato indicates a healthy functioning vocal technique and is a sensitive barometer of the emotions. Technically, its appearance is due to a precisely balanced registration combined with an open-throated resonance adjustment. Artistically, it is an important and essential element in the development of musicianship and interpretation.

INTERPRETATION

The inescapable truth concerning interpretation is that none of its mechanical aspects (correct tempi, phrasing, accuracy of pitch, good tone quality, elegant diction, a sense of style, and knowledge of tradition) necessarily ensures an effective performance. As is also true with the mechanics of good manners, just being correct is not enough. Certainly the essence of an exciting vocal performance must lie elsewhere. If we return to the point made by Reich, that “the literal meaning of emotion is moving out, which is the same as expressive movement,” and accept his conclusion that “movement of the plasm, then, has an expression in the sense of an emotion, and the emotion or the expression of an organism is bound to movement,” we will recognize the essence of a vital communicative experience.

If rhythm is the consequence of an expressive movement and an expressive movement is recognizable as emotion, then organic (functional) freedom, freedom to inwardly move in response to an outer stimulus, must be the primary point of emphasis in building interpretive skills. Whether or not the student’s emotional identification will be in agreement with the poetic and musical context of the work being performed depends upon his ability to move freely. An unfree organic response must, by definition, turn expressive movement from its true course and create an emotional dichotomy.

In all areas of daily living where relatedness is involved, this same phenomenon may be observed. Characterological traits are reflected in movements which record with astonishing accuracy the emotional impetus causing them. In this sense, the body clearly possesses an expressive language which is essentially nonverbal. Movement relates its own story, and it is a story of contact or contactlessness, whether our sensate nature is tuned in or tuned out. It is through free organic movement that music comes alive.

In essence, this is what communication is all about, and the process of “reading between the lines” and seeking for “more than meets the eye” is that level of articulateness which operates beyond word language and the details of musical notation. Thus, the core of a moving interpretation will be found to combine the mechanical niceties listed above with kinetic movements to which they legitimately correspond. When these factors are balanced with intelligence and imagination, musical performance becomes transformed into art. To help bring the student to the point where he is able to identify with the expressive movements initiated within the deepest recesses of his being is the ultimate challenge of vocal pedagogy.

In discussing the purely technical aspects of the vocal function, the need to “let go,” to stop initiating either overt or covert control, was strongly emphasized. Such a procedure is not only essential for the release of inhibitory tensions, but for wholesome emotional identification with every phase of music, poetry, and drama, as well. Expressed in these terms, emotion in singing is not something that is projected, it is something that is awakened. Emotion awakened through free organic movement, guided by intelligence, refined by sensitivity and taste, and directed with imagination and understanding is the essence of an effective interpretation.

OPENING THE THROAT

We now have the necessary means at our disposal for attacking the most serious of all vocal problems, throat constriction. Throat constriction primarily affects the resonance adjustment, but it is also associated with a mixed registration and distortion of the vowel. It has already been established that a resonance adjustment, to be effective, is largely dependent upon a well-balanced registration. Nevertheless, it would be incorrect to suggest that this is always so. Psychological factors are involved, and it is often extremely difficult to determine whether vocal faults are the result of muscular imbalances or psychic tensions.

Regardless of the source of tenseness, it must be eliminated. In this respect, success in vocal training is largely dependent upon the characterological structure of the individual. To open the throat during phonation is pleasurable, and the movement of energy stimulating. The willingness with which the singer responds to the energy charge when the throat opens will determine his ultimate potential for mastering a vocal technique that is functionally free. This means facing up to the fear and anxiety that are ever present throughout the formative stages of training. No other phase of the learning process is quite as important as this. How the singer meets this challenge will determine whether or not his artistic ambitions will be realized.

Since anxiety is so intimately bound up with physical contraction and fear of movement, one of the major problems during training is to break down the student's innate dread of inner expansion. To accomplish this, knowledge of the mechanics of registration is absolutely essential. Given their nature, the registers *do* appear as a response to specific combinations of pitch, intensity, and the vowel; they *do* represent sounds which are the product of a particular kind of coordinative process; they *do* reflect some kind of muscular movement. When the vocal registers are skillfully used, they *can* be used to break down interfering tensions; they *can* assist the tonal impetus in such a way as to cause the throat to open.

Before constrictor tensions of the throat can be released, however, certain prior conditions have to be met. First, the student must possess the necessary vocal talent; second, and equally important, he must be able to respond. The other side of the coin has to do with the skill of the teacher and centers on such properties as sensitivity of hearing, knowledge of the dynamics of registration, and an ability to empathize. When these properties merge and reinforce one another, it becomes possible to release inhibiting tensions and become involved in a truly creative experience. Empathic identification is mandatory if the teacher is to succeed in his efforts to lead the student into a full-throated resonance adjustment.

The first step toward relieving a throat constriction is to rebalance the registration, which usually means some degree of separation. The specific mechanics for achieving this have already been discussed. Having separated the registers, the resonance adjustment can be worked on as a direct object of instruction. The chest register is particularly helpful in this. A rugged mechanism, it can tolerate a great deal of pressure, in which respect it differs radically from the falsetto, or even the head voice. Neither of the latter can be pressured and, when overdriven, will buckle and constrict.

Using the chest register to break down constrictor tensions involves a calculated risk. We have already seen that the ultimate goal of technique is the proper execution of the *messa di voce*, and that a correctly sung forte contains the optimum amount of head register participation. To eliminate interfering tensions, this goal must be abandoned. If the throat is to be opened, the chest register must be made to dominate the technique, yet in such a way as to achieve the desired effect without creating new problems which could be as serious as the old. There is no other way around this difficulty, as it is the chest register, not the head register, which provides the leverage for dislodging a constriction.

Both the falsetto and the chest register have something special to contribute in breaking down constrictor tensions, and the role of each must be clearly understood. One of the areas of confusion is the precise position of the falsetto within the tonal range, as well as its relationship to different voice types. The falsetto in its pure form begins on B, below middle C, and extends to the octave above. It is found in exactly the same area in all voices, regardless of sex. Expansion of the tonal range immediately introduces some degree of coordinate action with the chest register, and this causes a change in the resultant tonal texture. When the registers have coordinated, the new texture will be clearer and more “singy,” and it is this physical arrangement which is commonly referred to as the head voice. When the two mechanisms are unified, they should be combined in such a way as to leave the head register dominant at all levels of intensity.

Unlike the head voice, which is flexible but limited in strength, the chest register is robust and inflexible. Its tonal range extends from E, above middle C, downward to C, an octave and a third below. How great the lower extension will be depends, of course, on the natural tessitura of the individual voice. Women’s voices of all types should have little difficulty singing to F, below middle C; men’s voices, to at least the octave below that.

With registration so crucial to a successful unblocking of the mechanism, we must review the correlative patterns with which a register is associated. The formula is elemental: The chest register is always associated with low pitches coupled with high levels of intensity, the head register with lowered intensities covering a tonal range which extends from low G, below middle C, on upwards. On a given pitch and intensity, the so-called closed vowels tend to bring in more head register; open vowels, the chest. As throat constriction is so closely linked with a mixed registration, the solution to this problem lies with a rebalancing process in which each mechanism is encouraged to respond in a manner consonant with its lawful order.

A mixed registration is common to all voice types and seems to receive encouragement from two major sources, training and culture. In outlining possible cures, it is necessary to discuss the male and the female voice separately; it must be

clear, however, that there is absolutely no functional difference between them, the sole difference being one of tonal range, women singing an octave higher than men.

Our cultural attitude decrees, long before formal voice training, that women speak in the head voice, that this is more feminine. As a result, the chest register is left unused and, being unanchored, is free to drift into a tonal area far too high, in the region of C, above middle C, to the fourth above. This causes the voice to become weak in the lower range, overly strong in the upper middle, and somewhat short-ranged and “spread” at the top. As the chest register cannot tolerate reduced levels of volume, even within its legitimate tonal range, it becomes badly thinned out when forced higher and closes the throat.

Correcting a mixture of this kind is difficult. The chest register cannot be two places at once. If it is active in the upper middle range, it is not able to respond in the tonal area to which it rightfully belongs. For this reason, it is often unwise to attempt to establish contact with the chest register until the mixture is corrected. The theory behind this practice is obvious: If there are two parts to the whole, by isolating and purifying one part, the other automatically disengages and becomes pure. Thus, before any serious attempt is made to use the chest register, the mixed registration must be corrected.

When, as in a mixed registration, the mechanism cannot be immediately separated, steps must be taken to reduce the overweighted upper middle range. There are numerous ways of doing this, but in principle each will be quite similar: The voice, like a rubber band, can be weakened in the middle by being stretched in both outer directions. Not having the chest register articulate makes this procedure difficult. Preliminary exercises, therefore, must be designed to work the chest register out of the upper middle range, where it does not belong. One such exercise is the octave interval with a descending arpeggio. The first note, usually E or F, must be sung firmly with good depth and solidity so that the tonal weight is anchored. Moving from the lower to the upper tone, a true legato must be preserved, but at the same time the weight must be left on the bottom note, as the upper octave is taken lightly at a firm mezzo piano. This should introduce a softer tonal texture, the appearance of which will indicate that the registers have begun to separate. It is important in descending the arpeggio that the tonal weight which was subtracted while moving upward is added again, thus rebalancing the mechanism toward the chest register in the lower tonal range. The most favorable vowel for this exercise is “ah,” the exercise itself moving in descending patterns from E or F, if possible, to the octave below.

Continuing to work on the elastic band principle, the voice must be stretched into its upper reaches. This is accomplished by starting on the upper tonic and moving to the third above, then descending on an arpeggio of one octave and a third. In this way, the upper register will be pulled away from the improper mixture in the upper middle range; under which circumstances, the head voice should take over the task for which it is so well suited. The “ah” and “ee” vowels are helpful in this, and the exercise must be sung at full intensity. Care must always be taken in working these exercises to preserve the purity of the vowel and to avoid “spreading.”

Another scale pattern which helps extract some of the tonal weight from the upper middle range is the double octave arpeggio. This exercise should commence on the lower G and progress stepwise as far as is practical. The intensity level throughout

should remain at a firm mezzo piano, the upper tones not being permitted to burgeon out. If worked successfully, considerable stress will have been placed on the head voice, with the chest register participation minimized. The voice should now be more buoyant and less “grabby” in the upper area and, if so, the chest register should be ready to reappear where it rightfully belongs—in the lower tonal range.

At this point, single tones should be employed to test the articulation of the chest register. Should it respond, a whole world of possibilities opens up. Soon the resonance adjustment can be directly worked on to good effect. After the chest register has been consolidated, octave jumps are helpful, the low tone being started in a strong chest register, the upper note taken in the head voice. The purpose here is to take advantage of the fact that the chest register will have opened the throat. This being so, the skip into the octave above, *provided the singer has not moved*, should accommodate the upper register within the identical resonance adjustment formed by the chest register. If these exercises have been correctly executed, the singer will have sensed a new adjustment for the upper tone, an adjustment which will be freer and more open-throated. Again, it must be stressed that throughout all of these exercises the instruction to “not move” is important. This is particularly true of the octave jump, because the purpose of this exercise is to change the registration (a reflex response), but not the resonance adjustment.

If the octave jump is well executed, both function and concept immediately become more viable. Once the mechanism can be made to move out of an habitual pattern of response, consistent progress is assured. With the release of wrong muscular tensions, the vocal organs themselves, articulating their own functional laws, tend to dictate the new stimulus patterns, and the new requirements of the mechanism often call for remedies diametrically opposed to those which had worked so well at an earlier stage of development.

Other exercises for the release of interfering tensions are the trill, the staccato, and rapid scales. The staccato is especially helpful in creating an awareness of laryngeal activity, for, unless the throat resists the energy expended, it is impossible to execute this musical effect. When the throat does resist, the student is able to feel what it is like to have the throat actively open. (Garcia called this action the *coup de glotte*, stroke of the glottis, which, because of its being so widely misinterpreted, is a practice now totally discredited.)

If the staccato is well executed, the concept of laryngeal activity can easily be carried over into the legato phrase. To preserve the connection between the legato and the staccato, each can be alternated, the arpeggio first being sung staccato, the second time legato. The easiest way to do this is to sustain the top tone the second time around so that both the legato and the staccato continue to share an identical position of resonance. Rhythm is important to a good staccato, and the feeling should be one of a pendulum freely moving.

Some contact should now have been made with the singer’s instinct for oral expression, leading, in turn, to a sensual awareness of functional needs. Rapid scale passages are important at this time. If organic functions are recognized as being rational, the vocal organs must be given every opportunity to respond in terms of their innate logic. Rapid scale passages provide such an opportunity. Here the student must resist the impulse to control the voice. Concentration must be directed toward

naturalness of posture, toward following the design of the melodic figure, the vowel, and the intensity pattern, and “getting with” the rhythmic sweep of the phrase, nothing else. Of paramount importance is the fact that the rhythmic impetus must begin with the intake of breath, before phonation, and that all of the notes of the scale are conceptualized as a unit. Rhythmically, one moves *through* the tonic, *through* the upper octave, and then back to the tonic. Provided the psychological barriers have been successfully overcome, the vocal organs should have already begun to assume a position of open-throated resonance.

How to utilize the exercises suggested above is, of course, a matter of judgment. They must be employed on a discretionary basis in varying combinations, and there is no format or order of procedure to be followed. Like good cooking, it is a little of this and a little of that, then seasoned to taste. It must be reemphasized, however, that it is the chest register alone which is capable of eliminating a throat constriction. It must also be stressed that, regardless of the pitch and intensity level, in a correct technique, the head register is always the dominant factor. Arranging the technique so that the nominally weaker mechanism becomes dominant is an apparent contradiction which has to be successfully resolved if the voice is to be free.

The problem of open-throatedness with men would appear to be far less severe and more easily corrected than would be the case with women. All male voices have access to a considerable amount of chest register, at least an octave and a third, and this provides a strong opening wedge for the release of constrictor tensions. In reality, however, the male voice simply presents different problems. Tenors offer an example of one basic difficulty, since their range straddles the register break. Consequently, unless they solve the problem of register transition successfully, they will either fail to acquire their high tones or constrict the throat. To a slightly lesser degree, this is a basic cause of constriction with basses and baritones.

Making a smooth register transition is difficult. At the moment of transfer, the chest register is operating in its upper tonal range, where the intensity is quite high. At the same time, the chest register must be coordinated with the head voice, which at the transition point is rather weak. This requires careful manipulation of the intensity, as well as the vowel. Errors of execution will immediately show up in the form of throat constriction. A rule of thumb is this: Enough chest register strength must be maintained at the transition point to keep the throat open, while the head register must be encouraged to take over as the dominant factor in the technique.

Other devices for opening the throat are the “straight” tone and the vowel “a” as in “cat.” Each of these serves the same purpose; namely, to establish a sense of laryngeal resistance. For straight tones (tones with no oscillating movement), an arpeggio sung on the vowel “ah” is ideal. By pushing the tone straight, contact will have been made with an open-throated position which, by being pressed gently outward, can be maintained throughout the duration of the phrase. When this exercise is executed correctly, the tone will change; it will commence to pulsate regardless of the steady pressure being applied.

An important aspect of this exercise is that the new pulse will bypass the singer’s preconcept. As a result, he will not only discover how to energize the correct laryngeal action, but to hear new sounds in relation to his own personality. The “a” vowel achieves somewhat the same result and basically serves a similar purpose. One must

be certain in using this vowel that the lips do not spread and that the easy resonance of the chest register is never lost. It is also important that the intensity of the upper notes of the scale is not permitted to exceed that of the tonic.

To list all of the variations now possible would be impractical. Exercises repeated again and again become dull, so variety for the sake of variety is often desirable. With technical development, however, one exercise is indispensable—the double octave arpeggio. It can be effectively used at all levels of intensity, preferably on the vowels “ah,” “ee,” and “oo,” and every effort must be made in working this exercise to preserve the legato connection. Double octave scales are virtually foolproof and contain within themselves a tendency to rebalance the mechanism. An important benefit of this practice is that it will decrease the excessive tension in a mixed registration and permit the chest and head voices to shift into their rightful areas of operation. Theoretically, the double octave arpeggio should effectively combine the registers and, when the overall intensity is gradually increased through practice, pave the way for a beautifully executed *messa di voce*.

Exercises for opening the throat are virtually the same for men as for women, and those discussed can be used interchangeably. As a mixed registration is usually at the root of most technical difficulties, the first procedure is to realign the registration. With an improved registration and the throat relieved of its closing tension, the resonance adjustment commands greater attention. In attacking this problem, the functional response of the registers is pitted against the psychic, as well as physical, impediments barring the way. Nature herself offers an assist at this point, because after proper development the chest and head register mechanisms will balance themselves reflexly. But it must not be assumed that a resonance adjustment will have been formed simply because of an absence of muscular interference. The real difficulty is that the throat must be maintained in an open position of resonance throughout the duration of the musical phrase. Furthermore, if the singer is to have knowledgeable control over his voice, the resonance adjustment must be volitionally positioned.

The technique for gaining volitional control over involuntary movements has already been discussed. By approaching the problem in the manner described, the idea of a volitional positioning of the vocal organs becomes acceptable as a physical and conceptual possibility. On this basis, the singer can sense the nature of involuntary movements and understand how to assist them; he becomes aware of a control potential which avoids the arbitrary and promotes that which is natural. Yet, however skillful the teacher or responsive the pupil, the picture is not complete. What is required now is something extra, and this extra something is the singer's instinct for oral expression. Unless there is a strong desire to break through and fulfill a functional potential, the singer will never experience a truly open-throated resonance adjustment.

Apart from these considerations, the key to open-throated resonance lies with the attack, for it is that which occurs at the moment of tonal inception which will determine the success or failure of a vocal exercise. We have already stressed the need for a rhythmic launching of the phrase, and it has also been emphasized that it is the chest register which serves to dislodge constricting tensions. It is equally important to recall that the register balance must be permitted to readjust for every pitch and intensity, while at the same time the resonance adjustment remains unchanged. All exercises designed to open the throat, therefore, must combine these elements, all of which must

be summed up in the attack. Care must also be taken to ensure that the pitch, the vowel, the intensity, and the register balance are all precisely articulated. There must be no slurring; the chest register must be well-coordinated, solid, and secure, and the singer must concentrate on a pure legato. Whatever the shape of the exercise, and for whatever purpose it is employed, if these details are attended to, the throat will not only open, it will remain open.

Another phase of technique which has a direct bearing on open-throated resonance is the factor of tonal duration. In a legato phrase, tonal vitality must be sustained. If tone is not to alter or diminish, the resonance adjustment must not only be formed, it must be maintained. To be precise, it must be "held." This need is often recognized, but usually such a holding action is attributed to "support," and few methods now in vogue fail to incorporate a special technique of breathing with tonal support as the direct object of instruction.

All methods of breath control have proved to be impractical. Neither the breath nor any technique of controlled breathing is capable of supporting a tone. Acoustically, tone is nothing more than rapidly contracting and expanding air particles, and it is not possible to support moving currents of air. Physically, muscles can either relax or contract, and the kind of relaxation or tension shared by muscles which are mutual antagonists determines the character and efficiency of the coordinative process, not breath support. Support is probably confused with the positioning process which reflects an open-throated resonance adjustment.

A concept somewhat awkward to comprehend here is the use of the word "held." But this is precisely what happens! As the vocal organs move reflexly into position to establish a condition of cavity resonance, they must, as long as tonal duration remains a factor, "hold" the position to assure uniformity of quality. This holding process which maintains the resonance adjustment is crucial, for if it is not correct, in all likelihood the throat will constrict.

If we equate this concept of holding a resonance adjustment with energy output, a better perspective is gained. Energy must, if it is to be utilized economically, be confronted by resistance. This resistance is supplied by the muscles which position the vocal organs. When properly adjusted, all of the laryngeal muscles which function antagonistically are brought into equalized tension and counterbalance one another. When such a balance of tension occurs, the system is said to be in equilibrium. A resonance adjustment, therefore, must literally be "held" in balanced tension in order to resist the energy output. To the degree that it is held in a state of perfect equilibrium, the coordinative process will be correct.

A basic law of physics is applicable to the functional activity here described. It states that "for every action there is an equal and opposite reaction." The singer who enjoys a technique where the resonance adjustment and the registration are both held in a condition of balanced tension fulfills that law. His voice will be free because the energy used will prompt a physical *reaction* which will virtually cancel the *action*. As a result, energy is never wasted or diffused.

One may conclude from the foregoing that the establishment of balanced tension is a prerequisite to a secure vocal technique. Such a condition depends upon two factors: 1) registration, which when correctly balanced will cause the edges of the vocal cords to run parallel, thus closing the glottal space, and, 2) open-throated resonance, in

which all constrictor tensions caused by muscular interference are absent, thereby opening up unlimited possibilities for accurate “tuning” of the resonators as a coordinate act with registration.

There is an expression frequently used by the early Italian masters clearly indicating a need for “holding” (without tenseness) a resonance adjustment. Common reference was made to “*appoggiare la voce*,” to “lean on the voice.” Obviously, there is but one way to safely lean upon anything, and that is to have a resisting force providing an “equal and opposite reaction.” To accomplish this, the muscles which position the resonators must “hold.” It is a natural equilibrium among opposing muscle groups which leads a performer into believing his tone to be “supported.” To attribute this feeling to any special technique of controlled breathing would be a tragic error.

An interesting sidelight of functional training is the physical symptoms which invariably accompany a release of constrictor tension and the consequent opening of the throat. Yawning, dizziness, giggling, tingling sensations, and distracting conversation are common, while quite frequently the student will complain of having to regurgitate. On rare occasions, symptoms of asthma will make it almost impossible for the singer to phonate, a symptom which always accompanies an obviously more open-throated condition of resonance. Another oddity is the singer’s tendency to stop in the midst of a tone which is undeniably freer. In such instances, it is difficult to judge whether the interruption is due to being ill at ease with a new tonal identity, or whether it grows out of anxiety. Quite clearly, contact with natural movement leads to sensual awareness and a breakdown of psychic defenses.

Since time immemorial, man has erected defense mechanisms to protect himself from a fear of his own sensations. He has done this by tensing certain areas of the body. As a result, he became “armored.” Elsworth F. Baker defines two kinds of armoring, “natural or temporary muscular contraction and permanent or chronic contraction.” He then says, “the former occurs in any living animal when it is threatened, but is given up when the threat is no longer present. The latter originates in the same manner, but because of continued threats is maintained and becomes chronic, reacting eventually to permanent inner rather than environmental dangers.”¹² Of particular interest is the fact that armoring is known to divide into seven segments (ocular, oral, cervical, thoracic, diaphragmatic, abdominal, and pelvic) and that each of these segments, except the ocular, forms an integral part of the respiratory system.

Are they vocal organs or respiratory organs? This is an important question because if it is the respiratory system that is adapted to the vocal process, then psychological attitudes must be dealt with effectively. One sings with the entire body and, to quote the great English baritone Ffrangcon-Davies (1855-1918), “The whole muscular system from head to feet will be in the wise man’s singing, and the whole man will be in the tone.”

With six of the segments of bodily armoring related to the organs of respiration, tension or release of tension in one area of activity is bound to affect all others. Obviously, for the teacher of voice to transgress the limits of his own discipline would be a dangerous presumption. Nevertheless, he must learn to recognize psychological barriers for what they are and, by stimulating the movement of those involuntary muscles which serve to open the throat, help promote an overall functional

improvement. Should he succeed, the whole man will not only be in the tone, but both tone and man will be more complete.

MENTAL CONCEPTS

It may seem strange to comment on mental concepts last when in fact this phase of the subject would appear to come first. But, concepts held by the singer are one of the prime barriers to learning. While it is true that one cannot sing a tone not first conceptualized, it is also true that that which one conceptualizes is largely due to conditioning. Consequently, subjective evaluations are at odds with objective ideals. Like controls which must be relinquished, the mental concept must also be relinquished. The basic element in every vocal problem is that the concept, like the control, is incorrect. Just as the singer must learn to lose all control in order to discover a new kind of control, so, too, he must change his concepts so that they agree with functional reality. When objective and subjective concepts are in agreement, the singer may be said to have fulfilled his talent potential.

Concepts entertained by singers are invariably misconcepts. Being subjective, they merely represent a form of self-image. Many factors contribute to the formation of this image. Sounds uttered from infancy to adulthood become personalized, and to this kind of identification there is usually added other influences such as training, imitation of other singers, personal taste as it relates to aesthetics, and characterological structure. At the onset of phonation there is an automatic pre-forming of this concept which becomes, with rare exceptions, a pattern established by habit and familiarity. Consequently, there is a need to reform this concept. The obstacle here is that the quality looked for is the one quality the singer has never heard. Personalized qualities are the product of a coordinative process which reflects the *condition of the functioning mechanism*, not its ultimate quality potential.

The problem during training, therefore, is in the bypassing of the singer's pre-concept; he must be taught to do the seemingly impossible—produce a sound he has never conceptualized. The solution to this problem lies within the registration. If we recall that the vocal registers yield tonal qualities that appear as a response to a particular pitch-intensity pattern, and that those responses are independent of the singer's concept of quality, we have a ready means for changing both the coordinative process and the concept at one and the same time. It is for this reason that "preparing by not preparing"—"letting go," and the willingness to respond without inhibition—is so important to learning. When the student is cooperative, it is not too difficult to venture into new tonal experiences, experiences which are consonant with natural order and better serve the needs of a creative striving.

As almost all learning techniques deal with concepts, it is awkward to adopt an attitude which virtually disposes of this element. To be more precise, however, one does not have to reject concepts so much as goals. Certainly, a pitch, intensity, and vowel pattern represents a concept to which the student responds; but it should be a concept entertained without the encumbrance of aesthetic goals. What must be realized is that internal organs function beyond concepts. Watching infants grow offers proof of this, for they function in accordance with organic law long before they have developed the ability to form concepts. To bring a badly conditioned reflex into

conformity with nature's laws, the singer must abandon those concepts which have become part of his conditioning. He must reject learned responses and learn to respond. He must become like a little child and view events without prejudice, without prejudgment, and without aesthetic preference. In this way, he can become physically, emotionally, and vocally free.

CORE OR PERIPHERY?

In a rather whimsical moment, D.A. Clippenger wrote that "the real art of singing was lost immediately after it was found. . . [that] the only time it was perfect was when it began. . . [and] ever since it began we have been searching for it without success."¹³ This statement seems ludicrous, but it is at the same time extremely perceptive. Man has always been at odds with his own nature, as well as the nature around him. We read in the Bible of man's need to be "reborn," of ridding himself of the old Adam and taking on the new man, of becoming as a little child. Philosophies abound, all with intent of showing the way back to a state of nature which has been lost.

The history of vocal training has followed this same pattern. Great teachers have had special insights into functional activities and have understood the mechanism. These special qualities were lost because they could not be passed on like family heirlooms; each successive generation of teachers must rediscover that which has already been discovered. As in other areas of learning, new bodies of knowledge have been incorporated which on the surface would seem to clarify training procedures and expedite progress. Unfortunately, the reverse is too often the case; the simple is rejected for the complex, the core for the periphery, the natural way for mechanistic methods. Too often man builds better mousetraps only to become caught in them.

The structure upon which early training had been based was obviously one in which functional laws were formulated, understood, and utilized on a practical basis. Proof of this is to be found in a statement by Mancini. "Art," he suggests, "consists of knowing where nature directs us, and to what we have been destined; understanding at once the gifts of nature, cultivating them easily, man can perfect himself; how sure is harvest for the attentive farmer, who has observed and understood the different seeds, which are fecund in diverse types of earth."¹⁴ Another writer, Isaac Nathan (1792-1864), a legitimate heir of the Porpora school, made a distinction between core and periphery when he declared, "The subject of voice includes two principle considerations, tone and articulation. . . . To the organs of tone, which will be briefly noticed in the progress of this treatise, the nose, the uvula, the palate, the teeth, and the lips, may be considered only as auxiliaries, since they are more especially organs of articulation. . . ." ¹⁵

If Mancini's analogy to farming is taken seriously, we can retrace our way to the point where functional health, resonance, vowel purity, and purity of intonation meet as one. For, without question, his statement indicates an awareness of function, of a correlation between stimulus and response, of the importance of gaining consonance with nature's laws and, by implication, that the organic response of the vocal mechanism is predictable.

We have already discovered registration to be an organic response to a stimulus pattern comprised of pitch and intensity. If the vowel is considered, it, too, will be

recognized as being the result of a positioning process. This process not only involves the vocal cords, but the entire respiratory system. When the system is well coordinated, the tone quality is pure. When there is muscular interference, there will be a corresponding degree of tonal distortion. Thus, the idea that has been projected as a conceptual image to which the student responds is similar to the planting of seed in the ground, while the vocal organs can be compared with the fertile earth. When the total environment is favorable to the needs of internal organs, a natural growth process takes place. Just as plant life flourishes when exposed to a congenial climate, so, also, the vocal mechanism will yield sounds which are pure, resonant, flexible, and capable of encompassing an extensive tonal range whenever they are confronted with the kind of environment their growth pattern demands. As long as this energy exchange is maintained in perfect balance, the voice will be free and totally responsive to the singer's will.

Purity of intonation and registration remained clear-cut concepts for almost three centuries. Judged on the basis of Mancini's observation, training procedures were purely functional. The Porpora school placed some emphasis on breathing, but the idea of breath "control" was a much later development. Other and more serious departures were to follow. Garcia's invention of the laryngoscope was one. Another occurred toward the end of the nineteenth century. Singers who could best be described as having natural voices (voices extremely well formed with little or no formal training) introduced, when their careers had terminated and they became teachers, concepts which can only be described as pure fantasy. Lilli Lehmann (1848-1929) was a leading exponent of this kind of school, and her book contains entire chapters given over to the Resonance of the Head Cavities, Sensations of the Palate, Sensations of the Nose, and Sensations of the Tongue.¹⁶ The renowned Alessandro Bonci (1870-1945) brought his kind of thinking to its logical conclusion when he said, "Singing is like squeezing paint out of a tube."¹⁷

The Lehmann-Bonci "nonsense school" must be rejected out of hand as an unfortunate aberration having nothing to do with tradition or new bodies of learning. Far more serious has been the kind of misdirection supplied by devoted pupils and followers. Herman Klein, a distinguished pupil of Garcia's, one who collaborated in the preparation of *Hints on Singing*, offers a clear example of how well-intentioned friends and supporters can abandon the functional core for peripheral concerns. In Garcia's *Hints*, there are seven pages of material on the registers of the voice; not one word on resonance, very little on breathing, and nothing on breath "control."

Writing some years later, Klein lists the various elements of Garcia's training procedures in the order of their importance. These are set forth as follows: (a) breathing, (b) resonance, (c) vowel formation and attack, (d) the *sostenuto* (sustained tone), (e) the legato (slow scale, registers), (f) the *portamento*, (g) the *messa di voce*, (h) agility (coloratura, ornaments). Klein goes on to state, "The old Italian teachers had no trouble in obtaining a bright, ringing tone. Resonance, therefore, may not have entered very largely into their theory, but was far from being ignored in their practice."¹⁸

Here, quite clearly, Klein mounts the bandwagon. Witherspoon's "new bugaboo, Resonance" must, if one is "with it," be incorporated into the old scheme of things. Klein apparently had not realized that resonance is an event that occurs at the moment of tonal inception and is due to a precise positioning of the pharyngeal cavities. His was a

typical state of mind which made the time ripe for the acceptance of Lilli Lehmann's propositions. Lehmann was one of the world's great singers and a strong advocate of learning through feeling (purely on an "I feel it, therefore, you feel it" basis). If one is steeped in an older tradition and uncertain about the nature and cause of resonance, then it might be helpful to accept her idea that the sensations of vibrations felt in the palate, nose, and tongue are truly the cause of resonance. At the same time, DeReszke's postulate of nasal resonance (singing *dans la masque*) offered further inducement. But, if tone is to be resonated in the facial masque, it must be directed into and concentrated in that area. This led to techniques for volitionally "placing" the tone to get it "forward" into the frontal sinuses. There the vibrations could be concentrated and reinforced and the problem of resonance solved. No longer were teachers concerned with registration or a coordinative process which positioned the laryngeal and the oral pharynx. The new concepts of resonance would take care of everything.

How easy it is to part company with a functional truth. Nathan made a sharp distinction between tone and articulation, naming the nose, palate, teeth, and lips as auxiliaries. Garcia supported this view and observed that "the real mouth of the singer ought to be considered the pharynx."⁵ Dr. Marafioti, personal physician to Caruso and writer on vocal technique, chose to move toward the periphery and declared, "Voice is speech, and is produced by the mouth and not by the vocal cords."¹⁹

Contemporary theorists have continued to move from the core to the periphery, following the path set by Lehmann and DeReszke. D. Ralph Appelman, in a book filled with harmonic analysis of tones and detailed description of the muscular processes involved in phonation, makes these comments on the subject of vowel formation:

Each vowel represents certain well defined, physiological positions involving the tongue, labial orifice (lips), velum, mandible, and larynx, which have been determined by X-ray photographs and cinefluorography. TONGUE. To produce the basic vowel, the tip of the tongue must be placed against the bottom front teeth during phonation (production) of all vowel sounds sung on pitches within the area of stability. LIPS. In the high frontal, mid-frontal, and low frontal vowels, the lips are more spread than rounded. In the lowback, mid-back, and highback vowels, the lips are rounded progressively more than from lowback to highback positions. LARYNX. The laryngeal position is more lowered during phonation than the passive position assumed during normal breathing.²⁰

Conscious control leads to stiff, mechanical singing.

Another contemporary authority whose opinion carries considerable weight is William Vennard. He states, "We are accustomed to think of the larynx as merely the vibrator, since it is the site of the vocal bands, but after all, it is a cavity. Startling as it may be, our most prized resonance may be here!" Later on, speaking of the ring in the voice, he observes, "This ring has various characteristics that associate it with the larynx." But this is getting too close to the functional core, because in a subsequent discussion of "focus" and "covering" he declares, "The way to build a voice is from the front to the back, and not from the throat into the mouth. A means to this end is that synthetic consonant which I have called the 'hum on the tongue.' . . . This is an

implement for achieving the correct 'placement' of the tone, and thereby insuring its healthy development." ¹⁰

In each of the above quotations, there is an all-pervasive theme: avoidance of a functional core for peripheral concerns. Appelman's "well-defined, physiological positions" never arouse sufficient interest to develop a technique for influencing the positioning process at the point of tonal inception, for getting at the vocal organs and making them work from the inside. The idea of stimulating involuntary muscles is either abhorrent or never thought of. All approaches seem to favor the plan advocated by Vennard and work to "build a voice from front to back, and not from the throat into the mouth."

This oversight is not peculiar to the scientifically oriented voice teacher. Almost all teachers in one form or another pursue an identical course. When the technique is "throaty," the suggested cure is to "get the tone out of the throat" and to "bring it forward," obviously an avoidance of core activity. Tone is initiated in the throat, so the problem is not to get the tone "out" of that area but to release the constricting tensions within in. The solution to this problem depends upon a program given over to *opening* the throat, in which the entire coordinative response of the organs involved in phonation is reversed.

If a stone is thrown into the water, the ripples will move out from the point of impact in a series of concentric circles. In this natural event, we have a perfect example of the meaning and purpose of functional vocal training. By developing techniques which energize the core of the vocal process, all peripheral matters will take care of themselves; the tongue will assume the correct position, there will be no jaw tension, the mouth and lips will position themselves normally, tones will not waver, there will be no wastage of breath, and quality will be individual, pure, and beautiful.

Now is the time for teachers to forget such irrelevancies as the Bernoulli effect, and pronouncements which state that "in a position of rest the space between the wings of the thyroid is greatest, whereas in singing it may be a centimeter less," and adopt principles based on natural order. Mancini had the right idea when he urged his scholars not to distrust "the inclinations in regard to nature, which, when over-looked, make every attempt to overcome or correct by the aid of art, futile." ¹⁴

There is a story told of a young Buddhist who went to a priest and said, "Master, I want to be free." The master replied, "Who is binding you?" This story is pertinent because unless one is impatient with non-freedom, unless one wants to be free, functional training will fall on barren ground. Along with talent and other requisite gifts, the desire to fulfill one's potential is indispensable to the learning process. For those who have that desire, success, even in the face of adverse circumstances, can become a real possibility. The dream can become a reality.

Given this kind of desire and talent, the burden of instruction, especially in the beginning, falls upon the teacher. Many trees grow in the pine forest, but the tree that grows straightest, tallest, and most beautifully rounded is the one whose good fortune it has been to settle in the right environment. And environment is the teacher's direct responsibility. The exercises he selects, his understanding of functional mechanics, his sensitivity in knowing when to goad and when to coax, when to drive and when to relax, will determine whether or not the student's potential will be realized. Healthy life energy

starts at the core and moves toward an outer periphery. Unless the work of “unbinding” is core-directed, both physical and psychological potential will remain unfulfilled.

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