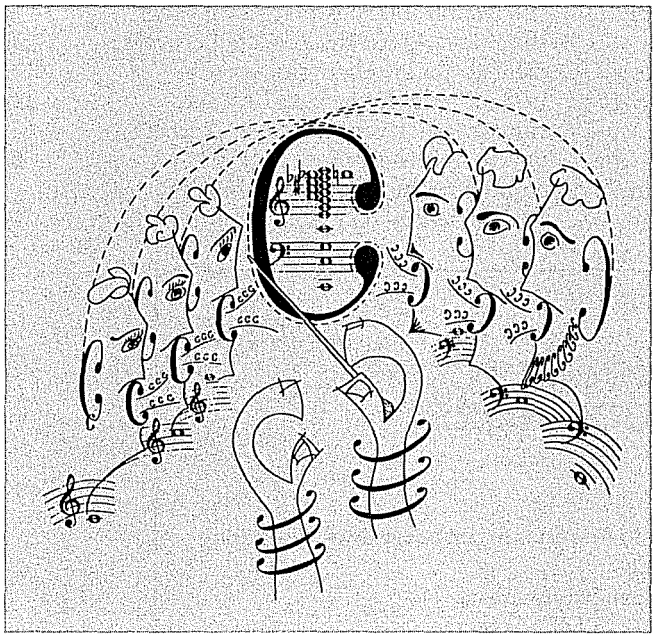
CHORAL SINGING, IN TUNE

by Jameson Marvin

OF ALL THE CHALlenges of the choral art, achieving good intonation is probably the most elusive. While other important goals in choral singing seem to be attained by straightforward means in a relatively consistent manner, it is often difficult to get a choir to sing in tune. Perhaps the reason for this is that *time*, as music's medium, requires that good intonation be recreated *each* time music is rehearsed or performed. Once choirs have achieved it, there is no guarantee that the next time they can do it again. Learning notes, rhythms, texts, dynamics, phrasings, articulations, etc., in rehearsals is a process that over time engenders accumulative learning. But somehow, learning to sing in tune does not seem to be effected by the same process. Acquiring good intonation is not just dependent upon accumulative learning; inherently, it seems to demand a primarily creative effort every time we rehearse. In fact, sometimes the more we pursue the goal of singing in tune, the harder it is to achieve. Thus, the acquisition of good intonation may remain frustratingly elusive.



The Rewards of Achieving Good Intonation

When a choir sings in tune, a listener can hear the structural components of the composition: the harmony, melody, rhythm, and texture. In this way, good intonation helps to heighten the listener's awareness of the composer's craftsmanship and of how the structure relates to the text. It also sharpens singers' ears. By singing in tune, singers acquire a special awareness of the compositional structure that orders the design and architecture of the music. In this way, understanding the structure provides the opportunity to achieve meaningful communication. When a choir sings in tune, the listeners and singers are consequently better able to hear and comprehend the expressive vocabulary of the composer, thus enhancing the "truth" of the composition. This, then, makes possible the experience of transcendence, the ultimate gift of music.

Good choral intonation is also beautiful. The sound of a choir singing in tune is an experience in hearing extraordinarily compelling sound-images produced through changing patterns of timbres, textures, and sonorities. In reinforcing the overtone series (one of the key principles in learning how to hear in tune), the resultant intonation creates a rich sonority that invites the listener into the music and heightens his or her awareness of the beauty of the choir that is singing it.

What Is Singing In Tune?

Pitch and timbre together define intonation. To sing in tune, therefore, means to unify the pitch — to bring all voices into like frequencies and compatible timbres. In choral singing, this means that unified pitch depends upon matched vowels. A vocal timbre within each section unified by matched vowels evokes a composite unison sound-continuum, providing the foundation for good choral intonation. Thus, the vowels as well as the pitch must be tuned.

Singing in tune also requires acute ears (conductors' and singers') and consistent reinforcement. Initially, the choir must be sensitized by the conductor to a good pitch-standard, one that is measured by the conductor's ear and degree of auditory perception. The ear is the channel through which sound information is transferred; it is the yardstick — the "truth teller" — the intermediary that makes possible the conductor's capacity to realize his or her conception of the score.

Consequently, of all the musical

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attributes that a conductor should possess, none is more important than having a good ear. Without it, the conductor will lack the conduit through which sound information is transferred. He or she will not have the prerequisite aural authority to fix, change, rehear, or rehearse. Moreover, the conductor will be handicapped in trying to attain his or her "mind's-ear" conception, or mental-aural image of the score.

How do we tackle the elusive pitch problem?

The process of teaching a choir to sing in tune is essentially a circular one. The conductor measures the sound produced by the choir against his or her mental-aural image (part of which includes pitch standard), feeds information back to the choir, and the choir then reshapes the sound. As this process continues in rehearsal after rehearsal, inevitably the choir's sound (and pitch perception) begins more clearly to match the conductor's mental-aural image.

The better the conductor's ear, the more effective he or she will be in attaining a mental-aural image of the score. However, the responsibility for maintaining good pitch lies ultimately with the singers. This is very important. No matter how good the conductor's ear is, if the singers do not know how to recreate the pitch standard required of them, they will not be able to establish a foundation upon which to achieve consistently good pitch.

The underlying philosophy then, that answers the question: how do you get a choir to sing in tune? is: the conductor must teach the choral singers how to teach themselves to sing in tune. The conductor has to develop within the singers a consciousness of the process they individually use to attain a pitch standard. Thus, acquiring good pitch perception is integrally connected to understanding the process by which it is attained. By teaching choral singers to become conscious of the process they have individually used, the responsibility is placed on their shoulders. Once the process becomes clear to them, choir singers are undoubtedly invigorated by the thinking that is required to recreate good pitch each time, and are stimulated by their own abilities (with friendly conductorial prods) to maintain it. In this manner, the ephemeral nature of "the intonation problem" can be effectively and consistently addressed.

Primary Factors that Affect Intonation

There are a seemingly endless number of factors that affect choral intonation. This article offers many specific suggestions to improve pitch; however, to enumerate every factor that can affect pitch, and to suggest a comprehensive list of remedies is not practical or possible. The purpose of this discussion is to address the underlying issue: how a conductor can help a choir to acquire good pitch habits, regardless of the cause of pitch problems.

Below is a list of subjects that directly affect intonation:

1) the acoustical theory of overtones.
2) the acoustical environment (rehearsal room, concert hall).
3) the weather — temperature and humidity.
4) the general health of the singer (vocal and psychological).
5) the singers' ability to achieve accurate ear/voice coordination and the degree of auditory perception that can be taught to them.
6) the degree of auditory perception of the conductor.
7) energy: healthy voices, housed in healthy bodies, full of energy, producing a well-focused, securely-supported vocal tone.
8) the structural components of the composition: harmony, melody, rhythm, and texture.

These factors might be best summarized by addressing them in three categories:

Factors over which conductors have no control: the singers' health and mood; the weather (temperature and humidity); the room acoustics; the science of acoustics and the overtone series producing the "Pythagorean flaw" — a fundamental problem that must be understood in order to aid singers in achieving good intonation. (For an

explanation of this, see the second note at the end of this article.)

Factors that affect choral intonation over which conductors have control, either immediate or long-term:

Immediate: the singers' postures; the acoustical environment within the rehearsal hall — seating/standing positions, design of sectional seating, space-distance relationship between singers; vowel uniformity; audition procedures that identify voices with pitch problems severe enough to prevent effective correction over time.

Long-term: choice of singers whose ears and voice/ear coordination hold a reasonable potential for acquiring the necessary habits over time to achieve consistently good pitch; choice of singers whose attitudes will engender the necessary effort; fostering of good listening habits that will develop good ears; development of good ear/voice coordination habits; development of consistent vowel uniformity; and development of proper support that produces a focused tone, breath control, long line, and healthy vocal habits.

Factors that directly affect pitch resulting from the compositional structure: the harmony, melody, rhythm, texture, text, and the expressive components (dynamics, phrasing, articulation, rubato, and linear direction). In rehearsal, these factors can be approached by unifying the basic elements of music: pitch, duration, timbre, and intensity:

Harmony: dissonance, chromaticism, key, mode, chord progressions.

Melody: whole-step/half-step scale motion, major and minor scales and associated pitch habits, specific melodic formulae (see the musical listing within this article), ascending and descending major and minor 2nds and 3rds, wide vocal leaps, long vocal lines, few rests.

Rhythm: slow notes, fast notes, speed of harmonic rhythm, tempo.

Texture: dense/sparse, high/low, polyphonic/homophonic.

Expressive components: dynamics — abrupt changes, sustained dynamics, crescendos, diminuendos; phrasing — long line, short note-groups; articulation — staccato, legato, marcato, sostenuto; rubato and ritards, accelerandos; linear direction — breath control to sustain lines.

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Given the tremendous complexity of the number of elements that affect intonation, how can we best sort out this information? The simplest solution to this question seems to be to limit the number of answers. The remainder of this article, therefore, offers specific practical suggestions that the author has found valuable in trying to address the elusive challenge of choral singing in tune.

The most important factors in attaining good intonation

No matter what causes pitch problems, good choral intonation can best be achieved by developing a consciousness among the singers of specific elements that, when consistently applied by them, are the most valuable aids to singing in tune. The following factors should be considered:

1) Tune principal cadences to the overtone series; sensitize singers to overtones in warm-ups and reaffirm this at major chords (held for a length of time), especially at principal cadences. Learn to hear perfect 8ves, 5ths (high to the piano) and 3rds (low to the piano); if at each structural point the vertical *concentus* is tuned, the music that precedes it will sound in tune.

Overtones are not hard to hear, although they may be more readily heard in reverberant acoustics. To aid students in hearing overtones the author suggests the following:

a) play a low C on the piano, loudly, and let the overtones ring.

b) have the students listen to the resultant overtones; play the low C again, and let them listen and then sing the overtones they hear — a major chord will result. In this manner the choir will realize that their composite ears hear a major chord "in the air" — proof that the fundamental (in this case, low C) produces one.

c) compare the "sound in the air" of the major 3rd to the piano major 3rd. The piano 3rd will be noticably sharp to the overtone 3rd. Be sure the students hear this.

d) play the fundamental low C again and compare the 5th "in the air" to the piano 5th. The piano 5th will be slightly flat to the 5th "in the air." Be sure the students can detect the difference.

e) play the fundamental low C one more time and listen for the 3rd and 5th as well as the 8ve. Soon students will hear all three notes.

f) have the bass section sing a low G on a unified "ah" vowel; ask the students to listen for the 3rd and 5th (and 8ve) overtones "in the air." Depending upon the room acoustics and where the singers are standing, some overtones will sound louder than others. The singers who are producing the low G may have a harder time hearing the overtones. Those who are listening can cup their hands behind their ears, as that often amplifies overtones, making them more apparent.

g) have the bass section (or eventually any section you choose) sing the eight notes of a major scale and let the rest of the choir listen. They (and you) should hear parallel 5ths or 4ths, conversely. Listeners will also often hear a countermelody (sometimes, more than one) that is not parallel with the major scale; it seems to literally "flip around" — an acoustical phenomenon apparently created by the relationship of the fundamental pitch frequency (as it ascends or descends) to the room acoustics and to where the listener is standing in the space.

Overtones are often perceived at first through color (timbre). The 5th sounds like a hollow conch shell and the 3rd somewhat like a low-pitched whistle. Often multiple octaves, 3rds, and 5ths can be heard "in the air" forming a beautiful, rich major chord doubled many times above the fundamental unison. By listening frequently for them a choir will learn to hear overtones readily — an intriguing adventure and a most enjoyable one. Overtones serve as an ever-present, absolutely consistent, and "perfect" gauge against which to measure vertical intonation.

2) Develop a consciousness of hearing and singing wide (to piano equal temperament) ascending half steps and whole steps, and narrow (to piano equal temperament) descending half steps and whole steps. Sensitize the singers to these "proper" wide and narrow intervals both in warm-ups and while learning compositions. It is in the half-step, whole-step relationships where the results of the "Pythagorean flaw" seem to show up. The two tuning systems, one based upon pure (acoustically perfect) 5ths, and the other on pure (acoustically perfect) 3rds, as we have seen are irreconcilable. The differences in pitch frequencies are especially audible in comparing the major and minor 2nds and major and minor 3rds of both systems. The imperfections of these two systems therefore manifest themselves most clearly in scale passages and melodic formulae that contain them. Singers inevitably find themselves singing in the cracks between the notes.

If one adds the associative pitch inclination of flatting when singing a descending passage, and not using enough energy (therefore flatting, again) when singing an ascending passage, the degree to which singers must be taught to think, as well as to sing wide steps ascending and narrow steps descending cannot be overemphasized.

For the same reasons, singers should pay close attention to the proper intonation of descending minor and especially major 3rds, both during warm-ups and while rehearsing individual pieces.

3) Pay particular attention to specific melodic formulae that always invite pitch problems. Sensitize singers to "rehear" these formulae (see the list of 22 specific melodic formulae that invite flat pitch).

4) Sit/stand in positions that allow each singer to take responsibility for his or her own pitch, without interference from another singer of the same vocal part. Sing in (STAB) (BATS) quartets or in some type of mixed position. This is a prerequisite for the acquisition of good individual pitch habits. Singers hear best when placed in concentric circles, facing each other. They also hear well in

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half-circles, or horseshoes, or so-called "acoustical cup positions." Even out of doors, a semicircle or U position acts as a natural "acoustical cup," resonating the choral sound with great warmth and ambience *if* the singers are placed in "mixed" positions and there is space between the singers. Acoustical shells try to compensate for this in concert halls. I have found that placing a choir in an "acoustical cup position" (a semicircle or horseshoe) is a far more effective manner to aid natural resonance than by simply placing the choir in front of an acoustical shell. Of course, if the shell is placed behind a choir that is already in the "acoustical cup position" the projection of sound, especially in a large, non-resonant concert hall, can be further enhanced.

5) Work constantly on matching vowels — in warm-ups and at all cadences. Tune the vowels as well as the pitch. In warm-ups, concentrate on pure vowels: oo, oh, ah, eh, ee; do not allow diphthongs or regional accents to violate the purity of a vowel color. Good intonation cannot be achieved until the vowels within and throughout all sections are unified.

6) Insist on proper vocal/breath support: energy-filled singing that affirms and constantly serves the vocal line.

7) While the piano may be used at the initial stages of rehearsal if it speeds up the process of learning the notes, wean singers early from the piano. When the piano plays, the conductor cannot hear or listen acutely for problems of intonation. Also, singers will not hear other sections (or their own) as acutely when the piano doubles their vocal parts. Furthermore, the piano is tuned to equal-temperament, to accommodate "the flaw" in acoustics. Wide and narrow half-step/whole-step relationships in ascending and descending scales cannot be accurately sung against the fixed pitch of the piano. Perfect 8ves, 5ths, and 3rds (that are in tune with the overtone series) are not in tune with the piano; thus, proper vertical intonation cannot be achieved.

Some Other Specific Suggestions for Improving Pitch

1) Choral singers learn faulty pitch habits at the initial sight-reading and note-learning stages. Immediately correct the pitch as well as the notes during these early stages. It is during this time that associative pitch problems develop (i.e., those problems related to the subtle ear/voice coordination required in singing). When the voice is consistently not allowed to land squarely on (or hold accurately) the proper pitch of a note, poor associative pitch habits arise; singers invariably (and unconsciously) perpetuate these habits long after the notes are learned. So, at the initial stages, correct the notes as well as the intonation of the notes.

2) Do not allow your singers to "mix functions." The functions of slowing down or singing a diminuendo must be separated from their natural associative tendency: flatting. Similarly, speeding up or singing a crescendo need to be disassociated from sharping. Develop exercises that counteract these tendencies within the compositional context (practice sharping while ritarding or singing a diminuendo for example). In warm-ups, have your choir sharp a half step over 16 beats while singing a diminuendo from forte to piano.

3) Avoid singing at extreme dynamic ranges (pp or p, f, or ff) until notes and rhythms are secure. Very soft dynamics require tremendous breath control and often invite flat pitch; very loud dynamics sung for great lengths of time invite vocal forcing and fatigue, causing flat pitch. Other than at the initial sight-reading (hearing/understanding the musical gesture) stage, when dynamics may be important to stress, separate dynamics from the other functions when learning the music in depth. Sing at a comfortable level: mp-mf. Later, incorporate the proper dynamics.

Hearing/understanding musical gestures is an important and essential experience that the singers should have before working too technically.

I define "musical gesture" as the relationship of harmony, melody, rhythm, and texture — the building blocks of music — to their attendant associated expressive nuances: dynamics, phrasing, articulation, rubato, and linear direction. If the power of the expressive nuances inherent in "the building blocks" is highlighted at the early note/rhythm/text-learning stages, students will be provided with a far more meaningful context within which to place the proper note, rhythm, or word. In addition, their motivation for learning the basics of the composition in depth will be far greater. Overlaying expressive nuances, especially when they have already been understood in the context of the beginning note-learning stages, is a process that will be filled with elation because the context — "the basics" — will have been established.

4) After the notes and gestures are *well* learned, if pitch problems persist, change keys — up or down a half step. This procedure changes the physiological associations of how the notes feel in the voice, and often counteracts many of the associative pitch problems that have accrued over time. If one is performing a choral/orchestral work where a long movement remains in one key (such as the Credo of Schubert's *G Major Mass*), learn it down a half step, and close to concert time put it back up. Bach motets, sung a cappella (such as *Jesu meine Freude* — consistently in e minor), can be learned at pitch and then moved down a half step. The sound of the key of e-flat minor is close to "correct" Baroque pitch, and the color is far more beautiful. Renaissance pieces can be performed at many pitch levels; in the 15th and 16th centuries there was no absolute standard of pitch. Range, color, tessitura, and internal balance can determine in what key one will eventually sing.

5) Keys: F major generally goes flat. After the note-learning stage is completed, change to E or F♯ depending upon vocal/balance/color considerations.

6) Separate the text from the notes early in the rehearsal process, as consonants affect breath control. The variety of vowels in vertical and horizontal sonorities provide no unified sound medium in which to place an aural foundation for the acquisition of good intonation. Once the notes are learned, sing them semi-staccato on "doo" (or, as I call it, "legato doo with space between the notes"). Insist on a pure "oo" vowel. Americans, in general, associate "oo" with the sound of "oo" in the word "you," "due," or "dew" — all of which contain automatic diphthong associations of "eeoo." Once choral singers can sing "legato doo with space between notes" in tune, they can easily sing true "legato doo" (i.e., connecting each note) very well in tune, and once the fabric of sound and the musical gestures are heard on a beautiful pure "legato doo" over numerous rehearsals, the foundation upon which the text can be placed will be set, producing a unified sound-image that greatly improves the intonation. N.B: "oo" used for too long a period of time can produce vocal fatigue. Change to "nah" in legato contexts, and/or go to another piece that is at another stage of rehearsal.

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7) Energize singers through exercise, posture, enthusiasm, humor, elation, exuberance, well intentioned anger, love of the music, positive reinforcement, and inspiration.

8) Work on rhythm to improve pitch. If working on intonation itself seems to increase the pitch problem (a not uncommon occurrence),

change the emphasis of the rehearsal. The new form of energy required by working on another basic element of music (rhythm), may be the catalyst necessary for restoring better pitch. It may re-energize the singers' abilities to improve pitch, especially by not working directly on it.

9) On long-held notes, ask singers to crescendo and sharp (subtly and with energy).

10) Rehearse in rooms that have clear non-reverberant acoustics yet with reasonable room ambience. Avoid low ceilings, acoustical tile, rugs, curtains, and low-roofed acoustical shells.

Summary

Many elements affect intonation: personal, psychological, musical, acoustical, vocal, aural, and barometric. Long-lasting results can be achieved by setting a foundation upon which the acquisition of good choral pitch becomes inevitably consistent. Responsibility for maintaining the consistency lies both with the conductor and with the members of the choir. This "inevitable consistency" can be best summarized as follows.

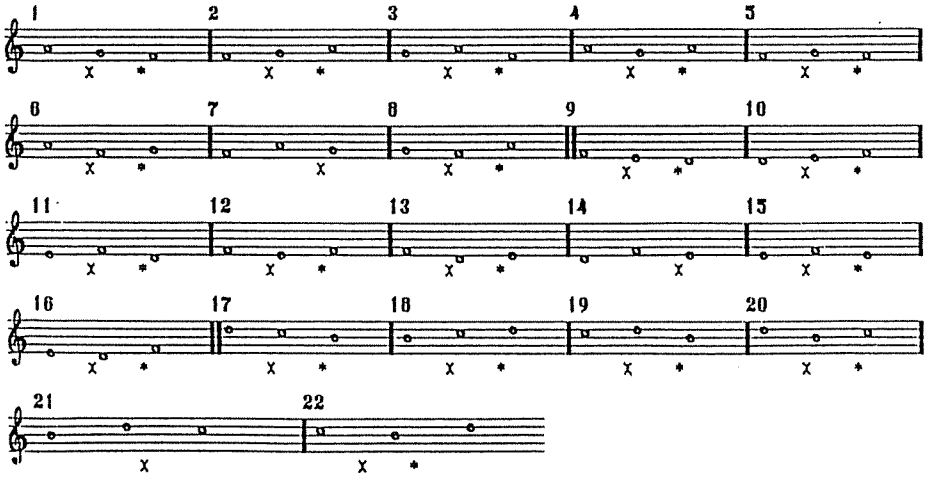
As the conductor: 1) place the choir in mixed vocal quartets in "acoustical cup positions" to give singers the best context in which to hear and to fix pitch; 2) insist upon proper breath support that constantly serves the vocal line through energy-filled singing; 3) change keys to eliminate "associative pitch problems;" 4) separate text from notes early in the rehearsal process; 5) wean singers from the piano as soon as possible; 6) teach your singers how to teach themselves how to sing in tune — place the responsibility on their shoulders.

As a singer in the choir: 1) tune primary cadences to the overtone series; 2) sing consistently with unified vowels; 3) rehear "proper" half-step and whole-step intervals during the process of learning melodies that contain them; 4) be conscious of the specific melodic formulae that invite poor pitch, and re-produce the "proper" intervalic distances within these formulae; 5) avoid "mixing functions" — insist that when the tempo slows down or a diminuendo occurs, you separate these functions from flatting the pitch; 6) make conscious the process you personally use to improve your pitch, each time, in every rehearsal.

Singers will take pride in this process. The pride they feel will be the catalyst they require for energizing themselves to "do it again." As conductors, refine your ears and listening skills so that you are able to serve yourself to serve your students to serve the music.

Melodic formulae that invite flat pitch

sensitize ears to "narrow" or "wide" intervals



x marks the flat note, * marks the resultant flat note. To avoid pitch problems, sing narrow (to the piano) descending half and whole steps and 3rds, and wide ascending half and whole steps and 3rds.

Empower your singers with the knowledge of how to teach themselves to acquire the ability of "choral singing in tune." In so doing, you will enjoy the fruits of two of the most profound rewards of the choral art: educating and inspiring your singers.

Notes

[1] A number of concepts and direct quotations in this article have been drawn from the author's essay, "The Conductor's Process," published in *Five Centuries of Choral Music: Essays in Honor of Howard Swan*. This festschrift, edited by Gordon Paine, was published in 1988 by Pendragon Press. The reader is encouraged to examine the essay, as it provides a context in which to view the information in this article, and a perspective on the breadth and depth of the intonation problem.

[2] The "Pythagorean flaw" is a term this author uses for a natural acoustical phenomenon—an irreconcilable "flaw" in acoustics. It is measured by the audible pitch difference between the e (for example) produced by the *fundamental* pitch C at the frequency ratio of 5:4 (the pure major 3rd) and the e produced by tuning a series of perfect 5ths (C-g-d-a-e-) at the frequency ratio of 3:2 (the pure fifth). The comparative pitch difference between the two e's is easily heard; one needs only to tune two ranks of a harpsichord to these temperaments to hear "the flaw"—it is not subtle. Pythagorean tuning (the one based upon pure fifths) contains large major 2nds and 3rds and small minor 2nds and 3rds. Mean-tone tuning (the one based upon pure thirds) produces a small fifth, and a pure major 3rd divided into two equal (small) major 2nds. If Pythagorean fifths are used to form the circle of fifths, the 12th of these fifths—the "unison"—is higher (by about one-eighth of a tone). This is called the Pythagorean comma. For further information the reader can refer to the entry "Temperament" on page 757 of the *Norton/Grove Concise Encyclopedia of Music*, edited by Stanley Sadie.

CJ