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Your musical basket---artificial or true?

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Why do we go to conventions, concerts and workshops? My experiences at ACDA's national convention clearly reminded me of the need to fill my musical basket with truth and beauty.

One session in particular set me on a course of thought about rehearsal process and the use of the piano. Gerald Eskelin's presentation on "acoustic tuning" not only piqued my interest, but led me to purchase his thought-provoking and humorous book, *Lies My Music Teacher Told Me* and to reconsider my approach to teaching my choirs how to tune and how to learn their music.

Basically, Gerald seeks to dispel several non-truths about music which have traditionally been promoted by most well intentioned music teachers. The greatest of these falsehoods surrounds the use of the piano as a means of tuning the voice.

Music as well has suffered from three centuries of 'progress.' An eighteenth century technological development in keyboard building has progressively dulled our ears and taken away the real 'basket' that would have helped us carry our tunes. Instead, we have put our faith in an artificial musical system that bears little relation to the way a human ear organizes musical structures.

The common sound for education purposes today is the piano, or its modern offspring, the synthesizer. Now, here is the problem. A keyboard instrument is not capable of delivering accurate pitch information to our ears since it has been tempered, or detuned from natural acoustics, in order to play in all keys. Tempered tuning, developed in the eighteenth century, consists of adjusting the pitches slightly so all the notes---black and white---are the same distance apart. This makes it possible for the keyboard to play in any key without returning. The adjusted intervals, authorities said, are so insignificantly altered that the human ear would not be sensitive to the difference. (They lied.)

This event in musical 'progress' encouraged music theorists to perpetuate the concept that musical scales are essentially patterns of whole steps and half steps. While a scale may be a pattern of whole steps and half steps as far as the piano is concerned, it is something very different from that when it comes to human perspective.

To demonstrate his ideas, Eskelin asks the reader to try several experiments. First, he suggests playing a pitch on a sustaining instrument such as a synthesizer, match your voice to this sound, and then slide your voice up very

slowly listening to relationships between the two sounds. You will experience various degrees of consonance and dissonance as you slide. The pitches which are most consonant are that way because of physics of vibrations which our ears perceive as harmonic relationships regardless of any keyboard steps or intervals.

Then Eskelin turns to Pythagoras' discovery of the mathematics of the vibrations in which not only the entire string, but also its halves, thirds, etc., vibrate to create relationships which we can hear such as 1:2 (the octave), 2:3 (the fifth), and 3:4 (the fourth). Eskelin's argument is that we can hear these relationships as tuned intervals without experiencing their keyboard names. We can perceive the relationships even if we can't name the notes!

Eskelin's next experiment is to identify the most consonant pitches to a given fundamental and compare with the keyboard sound for those pitches. For example, you can play a "C" on a keyboard or synthesizer, and then sing one of the most "agreeable" pitches or a fifth, fine tuning until it locks or feels entirely consonant with the fundamental pitch. Then if you play the piano or synthesizer "G", it will sound low to the acoustically tuned G! This will be true even if your piano is in excellent tune! The fact is that the true tuning of the fifth has been intentionally altered by the tempered scale of the piano.

Next, Eskelin suggests the same exercise with other intervals, such as the relationship of partials six and seven (G and Bb). Using the fact that the distance between partials gets smaller as the numbers get higher (1:2 is an octave, 2:3 is a fifth, 3:4 is a fourth, etc.) then partial 6 (G) and partial 7 (Bb) is actually a smaller interval (minor third) than partial 5 to partial 6 (G). However, "on the keyboard both these thirds contain one and a half steps and they sound identical in harmonic relationships when you play them. Clearly, the keyboard is not telling the truth here.

You can prove the keyboard is not precisely tuned to the correct acoustically fitting interval as you sound a sustaining C on the keyboard and then, as before, sing a Bb above and fine tune by listening. A surprising phenomenon will occur. Your finely tuned Bb will sound low to the piano Bb!

The problem with the keyboard is that the partials (or intervallic relationships) do not line up when you play in different keys. If you tuned the instrument acoustically on a C fundamental, you might tolerate the tuning on a closely related root like G or F. But if you played in a more distantly related key, like E or F#, it would sound pretty awful. So, from the keyboardist's standpoint, tempered tuning was a terrific thing. And it would have been a terrific thing for the rest of us too, had we been warned during our formative years regarding these natural facts of life. Instead, we got the plastic information.

The plastic information (the lies) about singing to the scale of the piano has prevented our singers from finding a higher level of harmonic awareness. In addition, over-use of the piano to learn scales or music has tended to prevent the development of an accurate sense of pitch. Over the years our singers' ears have been "tempered" by pounding out their parts on the piano to the point where they are so dependent that they struggle to sing a cappella or keep their pitch center.

Furthermore, in using the piano's tempered approximations we have encouraged mushy chord tuning. Eskelin reminds us of the no-keyboard-needed in barbershop rehearsals where the pitch is given from a pitch pipe, not a piano. Having sung with barbershop quartets and choruses, I thoroughly enjoyed "busting a chord," but thought that a well-tuned chord was merely a component of this "style."

Eskelin has shown me that the goal of the barbershopper should be common to all choirs: that each note of a chord, as well as each voice should melt into the beauty of the whole by matching resonance and vowel with careful "acoustic" tuning.

So, with all this discussion of the tempered tuning of the keyboard, does Eskelin promote the banishment of pianos from the elementary classroom? No, but he does suggest that young singers learn vocal music without a keyboard, and then after experiencing the purity of pitches in relation to each other, the piano could be added for accompaniment. Eskelin suggests that once the choral tuning is locked in, the tempered tuning of the keyboard does not seem to destroy the tuning---perhaps because of the quick decay in the loudness of struck strings. The same could not be said of organ accompaniment.

Eskelin also offers that an additional reason for keyboard accompanists to not play the melody which is to be sung by a soloist is that the singer will have better chance to acoustically tune by sensitivity to harmonic relationships between melodic notes.

I am impressed with Eskelin's ideas and have found that my high school singers respond with excitement over the fine tuning of a cappella vocalizes I have been concentrating on lately.

Simply state, I think they are responding to new-found beauty. Then once we are singing our repertoire they may be impatient to be stopped frequently to fine tune a chord. Yet, again their eyes do light up when the undisciplined or inaccurate sound becomes a oneness.

Perhaps with practice heightened awareness of the harmonic unity will come greater consistency and then more fulfillment in the quest for beauty.

I know that they, as well as I, are more challenged by a greater reliance on our ears and less on pianistic support. I also know that my musical basket and theirs will be truer and more beautiful as we together take time to really listen.