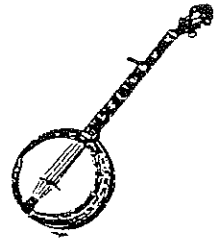




The Reston Folk Club

... Preserving Folk Traditions



Vol 4, No 6, July 1991

IT CAN'T BE SO!

by Dick Moore

You know that wonderful major scale that we've been using for several hundred years: do, re, mi, fa, so, la, ti, do?

I have news for you. It's out of tune!

It wasn't always out of tune, however. In fact, it was in tune throughout the renaissance period, but then came the dastardly deed: the changing of the so-called "natural" or "just" scale to the "equal-tempered" scale, often referred to simply as the "tempered scale."

Let me explain. This so-called major scale is also known as the diatonic or ionian scale. To the best of our knowledge, it originated in Greece, the source of much of our culture. Some experts attribute it to Pythagoras, the famous mathematician/philosopher. The Roman church later adopted the scale and developed it into twelve "church modes," including the mixolydian, dorian, aeolian, lydian and phrygian, which some ambitious jazz players make use of today.

The diatonic (or major) scale was constructed from three naturally occurring "consonant" intervals with precise mathematical relationships: the "octave" (2:1), the "fifth" (3:2), and the "major third" (5:4). (Any "note" is a vibration whose frequency -- or cycles per second -- can be expressed as a number, such as 440 for the concert pitch A note.)

Well, Pythagoras (or an unidentified contemporary) appears to have discovered that these mathematical ratios for the octave, major third and fifth intervals coincided with natural vibrations of a plucked string and sounded "right" to the ear. Problem was that other notes in the scale that sounded "right" didn't correspond exactly with mathematical ratios. The minor third, sixth and seventh which sound right appear nowhere in natural harmonica or mathematics.

The fact is that our nifty relationship between music and mathematics fails with the minor third. And, thus, the perfect ratios (of Pythagoras?), which make the intervals of the original -- or "just" -- diatonic scale were fine for singing plainchant, but raised problems for building an organ, constructing harmonics, and even in selecting the values for the five other notes represented by the black keys on the piano.

The basic problem was that -- in mathematical terms -- the half note (or semitone) of the Greek scale was in a natural ratio of 15:16. That made it impossible to squeeze 12 semitones into an octave. This was okay when music was performed in one key only, but the irresistible demand grew for more flexibility and the desire to write and play in several keys ... and still maintain the perfect-pitch of the natural octave.

(Incidentally, musicologists have learned that people in primitive, as well as more advanced, cultures, almost universally sing and play in the same octave range and fifth-interval range, but their other intervals vary considerably. If you don't believe this, try to play Indonesian music on your guitar.)

What to do? Well, the answer was to cheat a bit and detune all of the notes a little so that each half step is the same. So, it developed that the size of the half step under the so-called "equal-tempered" tuning is the twelfth root of two ... the number which, when multiplied by itself twelve times equals two. This, you see, would allow musicians and instrument makers to neatly package 12 notes into the natural octave range.

Well, you say, that should have been easy enough, but it didn't happen overnight. In fact, it took about two centuries, from the 14th to the 16th. This probably made poor Pythagoras slowly turn in his grave, but it opened the door to Bach, Beethoven, and other "western" composers to move from one key to another and always "stay in tune," or almost stay in tune. Bach demonstrated this by writing two preludes and fugues in each of the 24 possible keys



August 1991

Reston Folk Club



SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
4	Ray Kaminsky at Magpie's in Middleburg	5	6	7	8	9	10
11	RFC Folk Festival For Herndon (Town Center)	12	13	14	15	16	17
18	Ray Kaminsky at Magpie's in Middleburg	19	20	21	22	23	24
25		26	27	28	29	30	31



July 1991

Reston Folk Club



SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2 7:30pm Reston Folk Club Showcase Performance <i>T.M. Hanna</i>	3	4 12:00pm Hickory Grove at Colvin Run Mill 4:00pm 4th Party - Bill Davis'	5	6 8:00pm Eileen Joyner at "Open Door" Coffeehouse, Alex, V/A
7 Ray Kaminsky at Magpie's in Middleburg	8	9 7:30pm Reston Folk Club Bob Gibson	10	11	12	13
14	15	16 7:30pm Reston Folk Club Side by Side, Hard Rock Cafe-Harry Chapin Benefit	17 8:00pm Side by Side - Weatherwane, Frederick	18	19	20
21 Ray Kaminsky at Magpie's in Middleburg	22 7:30pm Side by Side, Alex Waterfront Park	23 7:30pm Reston Folk Club	24	25	26 7:30pm Eileen Joyner at Potter's House	27 8:00pm John Jackson/Scott Ainslie at Club
28 6:00pm Side by Side, Great Falls Concert on Green	29	30 7:30pm Reston Folk Club Showcase Lottery Draw	31			

Folk Club to Consider Name Change

After six years as the Reston Folk Club, the Board of Directors is considering a name change for the organization. In a mailing sent out in June the membership was asked their opinion of the proposed name:

The Folk Club

of Reston - Herndon

The reason the change is being considered is that the Folk Club has been more and more involved in the activities of Herndon since our move to the Tortilla Factory four years ago. We have been asked why Herndon was not part of our name enough times to realize that it should be. We are not abandoning Reston - just expanding.

The next board meeting will be at Forrest Ward's home in Fairfax on July 12 at 7:30. If you would like to participate - please notify Forrest so he can plan for the number of people who might show up.



No Newsletter in August

Be sure to come to the fourth anniversary party on August 20th. The newsletter will not be published in August as your editor takes a short break. Have a great summer!



Folk Club Friends to have Camping Outing July 13-14

Outing will be in Haymarket at Joe Kolankiewicz's property. Call Joe at (703)754-1023 or Lynn Jordan at (703) 437-7766 for additional information.



ATTENTION! ATTENTION! ATTENTION!

Check your Label - Are you expiring? "19910701" and "19910801" are expiring with this issue. Don't miss an issue - Don't miss the benefits of the Reston Folk Club. Please send in your membership check (\$12.00) to keep your membership active!

Moore - Con't from Page 1

in his "*Well Tempered Clavier*."

Actually, during this two-century period, there was an evolution to the equal-tempered scale. Along the way, musicians resorted to a compromise known as a "mean-tempered" scale ... but that's another story.

Well, where does that leave us? With a slightly out-of-tune scale ... that's where. The octaves are still perfect. Fourths and fifths are very close. Thirds and sixths are further off, and the well-tempered minor seven is much sharper than the natural minor seventh ... almost two percent.

So if you really want to play in tune, you should play the minor third and major sixth a little sharp and the major third and minor sixth a little flat.

Now that you know about this musical skeleton in the closet, you can do your part to help Pythagoras rest more comfortably in his grave.

Come on and bend those strings a bit for old Py.



The Reston Folk Club

President, Larry Mediate

Treasurer, David Hurd

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Ray Kaminsky, Ellen Kaminsky

Lynn Jordan, Joe Navarrete

Bill Davis, Forrest Ward

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