

A Note from the Tuner

Submitted by Dave Paulson RPT/RMT

A *Well-Tempered Clavier* (not to be mistaken for the mean-tempered variety) is a piano that enjoys a system of tuning that purposely puts the instrument out of tune. But for hundreds of years a war waged over the placement of the twelve notes of the scale and a way to reconcile God's gift of music with the inviolable laws of nature and the universe.

One of the definitions of the word "temper" is to make more temperate, acceptable, or suitable. In the case of the keyboard instruments, your tuner does this to break the octave into 12 equally divided notes. This allows us to play a song in any key, preserving a similar relationship between all the notes.

We must go back to Greek philosophers and mathematicians for the whole story. When sounding two notes together to create harmony, it was found that certain combinations of pitches created pure harmonies (perfect intervals) while others clashed violently. The belief that music was divinely given was strengthened by the discovery that the pure intervals had strict mathematical relationships. Combining two notes with a frequency relationship of 2:1 created an octave. The sound of a fifth was created by the relationship of 3:2.

Theoretically then, if we begin on one note and, moving up each time by a pure perfect 5th, complete the circle of all keys, we should arrive back at a note that would be in tune with our starting point. The actual result is far from harmonious, creating a dilemma for composers, instrument builders and tuners for hundreds of years. Many solutions were tried, all of which produced "heavenly" sounds in one key, but fiendish combinations in others.

Throughout much of history, the greatest musical, theological, and scientific minds put their best efforts to resolving the battle between just tuned and tempered scales. It was Prince Chu Tsai-yu, a sixth-generation descendant of the fourth emperor of the Ming dynasty, who is credited with solving the riddle.

Thankfully, by the age of Rameau and Bach, and after countless of experiments and treatise on the tuning of keyboard instruments, our system of equally dividing the musical octave has come to be accepted, though still debated in some circles. It would seem that the music, the gift of the immortals and reflecting the laws of the universe, must be performed on humanized scales.