

Michael Harrison
Revelation: Music in Pure Intonation

Program Notes by Stuart Isacoff

There are moments in every age when a new artistic direction seems to sprout and flourish. We can trace the slow germination and multiple sources that gave rise to it, yet a specific work or artist often comes to symbolize the break with the old. Think of Wagner's Tristan chord, Debussy's *Prelude to the Afternoon of a Faun*, Schoenberg's Op. 23 *Piano Pieces*, or Cage's *Sonatas and Interludes for Prepared Piano*. Each created new possibilities for their day, transforming the musical soundscape far beyond its traditional boundaries. The same can be said of Michael Harrison's music.

This composer, who, like his early mentor, La Monte Young, is deeply influenced by the East, has created an art form that allows the piano to probe territory normally outside of its range: his music exploits the "overtones" generated naturally by vibrating strings -- that is, the series of natural pitches that resonates softly above every "fundamental" tone. Out of acoustical necessity, these are purposely altered (some would say "violated") in the modern piano's tuning. The intricate textures and remarkable effects of *Revelation* are the result of Harrison's desire to resurrect the pure harmonies that have been lost.

The history of tuning began with Pythagoras and other ancient Greek philosophers, who discovered that the most consonant harmonies are created when two strings vibrate in simple whole number proportions: an octave is produced when the relationship is 2:1; a perfect fifth is the result of tones vibrating in the proportion of 3:2; a pure major third is produced by the proportion 5:4. These relationships are known as "just intonation" (hereafter referred to as "JI"). Michael Harrison returns to this approach, but extends it to numbers beyond those used by Pythagoras and in subsequent historical tunings.

There is a reason that Western music abandoned JI's pure, enticing sounds: when forced to coexist in a single instrument, they produce a phenomenon known as the "comma" -- a dissonant clash. Here is an explanation: A comma is the difference between two intervals with the same name -- a third, for example, or an octave -- that have been arrived at through different means. For example, a major third (Do to Mi) produced by a tuning that has been based on a series of pure fifths (Do to Sol) is wider than one produced by two strings that are in a "pure" major third relationship (that is, one resulting from two strings vibrating in the ratio 5:4). Play these two "major thirds" at the same time and a clash will result.

Therefore, in any instrument with fixed pitches, the strings can be tuned so that they offer consistently pure fifths or consistently pure thirds -- but not both. Attempt to have it both ways, and the keyboard becomes a minefield of dissonances. Western musicians have been avoiding these harmonic collisions for centuries, referring to them as "wolves," because they reminded listeners of the howling of wild animals. Over the course of history, many different approaches to tuning were tried in order to eliminate these inevitable clashes. Our modern tuning, known as equal temperament, does away with them -- but at the cost of losing the purity and color of naturally-produced harmonies.

Instead of avoiding them, Michael Harrison incorporates into his musical texture the clashes that occur when JI intervals confront each other in a piano. However, instead of using commas built on major thirds, Harrison uses what he calls the "Celestial Comma" (a ratio of 64:63) that results from the differences between pure sevenths (7:4 ratio) and pure fifths. In some ways, his vision represents the flip side of Arnold Schoenberg's. Schoenberg broke down conventional harmonic models by "emancipating the dissonance," ordering music through artificially chosen rows of tones rather than through the gravitation of natural tonal movement. Schoenberg freed music horizontally, and Harrison frees it vertically. (Though Schoenberg rejected what had come before and Harrison embraces the distant past; in a way, he has one foot in the ancient world, and the other in the future, since he extends the possibilities of JI well beyond those of its originators.) His music uses harmonies built atop subtle harmonies, with overtones wrestling or reinforcing each other -- often producing a concoction of otherworldly resonances. In other words, Harrison rehabilitates the comma into a newly welcome constituent of the harmonic universe.

The results are often wondrous. In the midst of clouds of dense clusters rapidly drummed in the bass end of the instrument, an astute listener can perceive high ghost tones -- sometimes bell-like, at other times vaporous -- as if a choir of angels were singing along. From Michael Harrison's perspective, the acoustic piano, which had evolved continuously since 1700, has now remained virtually unchanged for 125 years. In each age, composers have transformed the piano according to their needs; and his is the next great step in that development.

A complete performance of *Revelation* consists of 12 intertwined sections, and lasts about 75 minutes. It was begun in 1999, when the composer was one of four Americans to perform at a festival in Rome (the others were Philip Glass, Terry Riley and Charlemagne Palestine). "The intensive experience of rehearsing and performing my own work, as well as hearing the music of my colleagues was extremely inspiring," he remembers. "As the week progressed, I found myself contemplating the sonic effects that result from working with commas, or very minute, mathematically, and precisely tuned intervals. I woke up on the morning following the last concert with a radical new tuning in my mind. It came to me very clearly, seemingly with no planning or effort, with all of the mathematical proportions worked out in a well-balanced symmetrical configuration. It felt like a gift; however, I am aware that this moment could only have happened as a result of twenty years of working with JI tunings." The resulting work continued to evolve; the present version was 5 years in the making. His original tuning, which can be found on his website, MichaelHarrison.com, uses non-tempered musical relationships in what is technically known as an "extended JI tuning," and is based on the prime numbers 2, 3 and 7.

Revelation: Music in Pure Intonation is an astounding and exquisite piece. And it may well be one of those seminal works that mark a new direction in musical history.

Stuart Isacoff is a pianist, composer and writer. He is the author of *Temperament: How Music Became a Battleground for the Great Minds of Western Civilization* (Knopf), and *A Natural History of the Piano: The Instrument, the Music, the Musicians—From Mozart to Modern Jazz and Everything in Between* (Knopf).