



**1. The equal tempered Scale** - The notes in Western classical music were standardized about 150 years ago into a "equal tempered scale" which positions each note in the scale at an equal interval.

- *The thin vertical white lines at equal distance indicate the 12 semitones of the equal tempered scale - C C# D D#...*

In Indian music, the name of the notes refers not to a specific position or pitch but to a range of pitch.

- *See at the bottom of the chart, the colored ranges of the notes SA RE GA MA PA DHA NI.*

**2. Ragas are specific scales** - For each Raga the position or pitch of each note is different and specifically defined.

- *See how much the pitch of the notes varies and deviates from the equal tempered scale.*  
- *Note: the Megh and Madhyamad-Sarang Ragas have the same scale (same note names), but the pitch is very different. A piano will play exactly the same notes for these two Ragas! And this is the case for all Ragas using the same scale.*

*To differentiate between two Ragas built on the same scale, Indian musicians who use the harmonium have been forced to set standard phrases for each Raga. In addition to playing the Ragas out of tune, the standard phrases greatly impoverish the Ragas and the musicians' improvisation.*

**3. Two types of notes in Indian music** : Swaras (fixed notes) and Shrutis (moving notes).  
The Shrutis can not be reproduced with a fixed notes instrument like the piano.

- *On the chart, a wide colored band shows the oscillation of the Shrutis. For example the Ragas Bhairav, Malkauns, Darbari Kanhara and Madhyamad Sarang have Shrutis.*

**4. Glissando** (continuous sliding from one note to another) is not possible on keyboard instruments. Glissandos are used a lot in ragas. They open a door to the immensity and richness of the sound space.

**5. And most important** - In the equal tempered scale, the position of the notes is defined by dividing the octave into 12 equal intervals.

Result: **because of this conventional and unnatural position** of the notes, no note has a harmonic relationship with any other note in the scale.

**On the other hand, in the Ragas, each note is defined by a ratio, which indicates a harmonic relationship with the reference or tonic note - SA.**

**Among the ratios which define the notes of a Raga, some are close and refer to audible harmonics like  $3/2$   $4/3$   $5/4$   $5/3$  and others are distant and refer to inaudible harmonics, such as  $35/22$   $45/32$   $63/40$   $235/176$  and many others.**

The extraordinary feature of a Raga is that, among the thousands of harmonics and the millions of possible harmonic combinations, 5, 6 or 7 harmonics come together to form a perfectly coherent and harmonious scale.

This unique harmonious combination is the secret of the harmonizing power of the Ragas. Each Raga is a very subtle and complex musical architecture, a sound expression of a law of nature or Devata.

By this play of a perfect combination of certain obvious and other subtle harmonics, the Ragas enhance, by resonance, the same harmonics at the different gross and subtle levels of nature.

This perfect science of harmonics makes Gandharva Veda a powerful technology for enhancing harmony in nature.

**How can playing the Ragas with a equal tempered scale in which no note is in harmony with any other could generate harmony in nature?**

**This equal tempered scale is an aberration and constitutes a serious threat to the purity of the music and its ability to generate harmony.**

**It was this same threat of the tempered scale that motivated:**

- **Maharishi Mahesh Yogi**, initiator of the Gandharva Veda, to request that the harmonium be taken out of concert halls.
- **Rabindranath Tagore**, famous Indian poet and musician, to demand that the harmonium be banned on "All India Radio". Thanks to him the harmonium was banned from 1940 to 1974.
- **Mozart** to say when he heard the equal tempered scale: "I shall kill anyone who plays my music with that!"

**Note** : The reason that motivated Maharishi Mahesh Yogi to ask not only that the harmonium not be used in concert but that the instrument be taken out of the hall is purely physical: The equal tempered scale being distorted and out of tune, by resonance, the mere presence of the instrument in the hall tends to detune musicians and singers.

*"Gandharva music is the eternal melody of Nature, spontaneously sung in all levels of creation, from the most minute to the huge, enormous, ever-expanding universe."  
~ Maharishi Mahesh Yogi*

Henry Ward Poole, inventor of a tuning system for the organ, explains why this false (out of tune) scale may not shock the ear.

In 1850, in "An Essay on Perfect Musical Intonation in the Organ", he recognized the great advantage of equal temperament in being able to use his twelve keys since all are equally tempered. In the same sentence, he ironically tells us: " The ear, too, is more satisfied when all the chords are uniformly out of tune . " [Emphasis in original text]

In other words: "it's wrong, but when everything is wrong , it sounds better!"

### ***Tips for playing a well tuned Raga***

1. Always accompany yourself with a Tanpura. This traditional instrument of Indian music has for main purpose to generate harmonics which help the singer or musician to **hear** the right note of the Raga by amplifying the subtle harmonics which compose it.

**The tanpura is the first teacher of Indian music!**

2. Learn the correctness of Ragas from a teacher from a well-established Indian music tradition.

### ***Relationship between Gandharva Veda and Dhrupad***

- Dhrupad is the form of Indian music closest to the original Gandharva Veda. It is attached, among other things, to keeping the precise knowledge of the correct position of the notes of each Raga.
- If Maharishi's Gandharva Veda in its early days was a reference of well tuned Ragas, it is because all the musicians selected by Maharishi had either studied Dhrupad or their teachers had studied Dhrupad.
- In the opinion of Hariprasad Chaurasia, one of the most famous Indian musicians, all musicians should learn Dhrupad.
- By the way, Dhrupad was Maharishi's preferred form of Gandharva Veda.
- In modern forms of Indian music, such as Khyal, many musicians have not had the opportunity to learn Dhrupad. They place their notes "by feel". Sometimes they get it right, often not! It's a haphazard approach. Few of them know that the position of the notes of each raga is a very precise science that must be acquired by studying with a master.

### ***Origin of the equal tempered scale***

"Equal temperament - the bland, equal spacing of the 12 pitches of the octave - is pretty much a 20th-century phenomenon. It was known about in Europe as early as the early 17th century, and in China much earlier. But it wasn't used, because the consensus was that it sounded awful: out of tune and characterless. During the 19th century (for reasons we'll discuss later), keyboard tuning drifted closer and closer to equal temperament over the protest of many of the more sensitive musicians. Not until 1917 was a method devised for tuning exact equal temperament.

~ Ross W. Duffin - How Equal Temperament Ruined Harmony (and Why You Should Care)

### ***Questions answers***

**Yet many people enjoy the piano in classical music and Gandharva Veda accompanied by the harmonium?**

**Each music has its own beauty**

**In Western classical music, the melody is central.** The melody shows the genius of the composer, who has captured a musical moment, and polished it into a masterpiece.

The musician is the interpreter of this masterpiece. His virtuosity, the result of many rehearsals combined with his personal sensitivity, allows him to go beyond the technique and express the subtleties of the masterpiece as well as, or even better than, the composer would have done.

The genius of the composer, the outstanding character of the masterpiece, and the virtuosity of the performer together make Western classical music an "elite music". This is what makes its beauty, which remains beautiful despite the lack of refinement of the equal tempered scale.

**Indian music**, though it sometimes also becomes "elite music" is in its essence **an expression of the beauty of the notes**, of the Raga. By their beauty, the notes are almost self-sufficient. A note all by itself is sometimes held for a very long time. Far from boring the musician or the audience, its beauty, its presence, enchants us.

The melody comes by itself, naturally, inspired by the beauty of the notes.

The talent of the musician comes above all from his simplicity, his innocence, his sensitivity, his human qualities, his humility, his "greatness of soul" one might say, which allow him to be at the service of Raga and to let himself be "inhabited" by the Raga.

The improvisation, omnipresent in Indian music, expresses the play, the union, the complicity between the musician and the Raga. The musician is permanently co-creator.

It is the subtlety of the harmonics of the Raga that brings the musician into a deep state of silence and harmony, an expansion of consciousness, from which naturally emerges the improvisation he manifests.

The composition, at the end of the concert, is a final bouquet where the musician improvises with the percussion.

The true Gandharva Veda musician does not play for an audience, he plays for the notes themselves. He plays the Raga for the Raga. His music is an offering to Raga. He plays above all out of love for the notes.

The purity and beauty of the notes is due to the subtle harmonics that connect and unite them all. Thus each note naturally enhances the beauty of all the other notes in the scale. A Raga (an harmonic scale of Gandharva Veda) is like a bouquet of flowers or a flowery field where the beauty of each flower enhances the beauty of the other flowers.

Because the notes of the equal tempered scale are arranged uniformly and are not connected to any harmonics, they are in themselves completely "**insipid**", lacking in finesse, life, and uninteresting. For this reason, the beauty of tempered scale music is **completely dependent on the melody and the virtuosity of the musician**.

Often, after a Dhrupad concert, listeners are so deeply immersed in silence that they remain still, enjoying the well-being, even unable to applaud...

The purity of the notes of the Raga charms our heart, balances us, brings us back to our inner happiness.

Music expresses the beauty of nature, the beauty of life.

**Main difference between Gandharva Veda and Western music (specifically in equal tempered scale)**

**The beauty of life has two aspects:**

- Silence, unity, harmony, integration, on the one hand
- Dynamism, diversity, expansion, on the other hand.

**Gandharva Veda** expresses and promotes both aspects of life. Thus, it participates in the integrated development of all the values of life and naturally leads to fulfillment of life.

**Western music**, because it does not fully express the values of silence and integration, is not like Gandharva Veda a form of Yoga, or unified development of all values of life. It promotes diversity to a greater extent. Its characteristic quality is therefore **entertainment**.

### **Is it possible to play a Raga on the piano by tuning it differently?**

You can play the notes of a Raga, if it does not include Shrutis (moving notes). But you can't play the Raga because the piano doesn't allow glissando.

If you want to play the Ragas with a western instrument, it is better to choose a non fixed notes instrument like the violin.

A skilled musician can also perform Shrutis on wind instruments, such as the flute, by movements of the mouth.

### **Shivala**



In 1987, Maharishi encouraged Shivala to resume her music studies by telling her:

**"This is to bring bliss everywhere".**

After 15 years of conservatory studies, Shivala played for 3 years as a bassist in a fretless string orchestra.

Their conductor never imposed the equal tempered scale on them, and let them play naturally in tune. But, one day, the orchestra had to accompany a piano in concert. The conductor gave them double the number of rehearsals and said, **"You're going to have to learn to play out of tune!"**

Shivala discovered with amazement, that the tempered scale is false (out of tune). A reality hidden in conservatories and music schools.

Always in search of the purity of music, she stops classical music and goes to MIU (Maharishi International University), USA, to study Maharishi Gandharva Veda for 3 years.

These studies, although interesting, left her unsatisfied. "I found this music boring" she says.

At that time, Maharishi Gandharva Veda was taught on the harmonium!

Then, a scholar in pure musical scales came to visit the university and told her "If you want to learn the real thing, you have to go to India and find a Dhrupad teacher.

Immediately, Shivala left for India, where she met the Gundecha brothers, reputed to be among the greatest Dhrupad singers. She studied with them for 19 years.

Seeing the damage the equal tempered scale has on Indian and Western music (which was once not played in the equal tempered scale) Shivala, along with her Dhrupad teacher Ramakant Gundecha, set out to save as many of these precious Dhrupad scales as possible.

### ***11 years of research and work***

Shivala, thanks to the dedication and talent of the Norwegian programmer Ketil Helmersberg who designed a software to find the ratios corresponding to the notes of the different Ragas, succeeded with her teacher Ramakant Gundecha, to digitize more than 40 Ragas.

A second software to play the pure Dhrupad scales will be available soon - waiting for sponsors...

This long-awaited software will allow musicians around the world to play and sing the Ragas in their original purity and efficiency.

"When the music is right, it attunes us to the laws of nature. For more than 150 years, we have been polluted by a scale that is totally out of tune with the laws of nature.  
The power of music goes both ways. It can lead us to enlightenment or to the loss of our connection with the whole."  
~ Shivala

Shivala's website: <http://dhrupadmusic.com>

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