

The completeness theorem

Stringularity'; the 'Overtone-Series'

The moment of the so-called 'Big Bang' is frequently referred to as 'singularity'. The word '*stringularity*' is substituted here to indicate the 'harmonic series' embedded at the beginning of space-time and to show its self-referentiality. The harmonic series is [a] always a measurement in space-time (Hz) and it is [b] always true at all scales. It embraces reflexivity (action and reaction), relativity (time curvature), structure and sequence, synchronicity, resonance and locality from quantum to cosmological scales.

The 'Force Majeure' or 'factuality' of the 'Overtone Series'

With no appeal to any external authority, the rates & ratios underlying all waves & particles, self-referentially and deterministically create the factuality of the 'overtone-series' or waves-per-unit-time (Hz) as follows: -

- a) when the wave-length is decreased by 50%, the frequency (Hz) is increased by 200% and a 'perfect-octave' emerges (as a Hz doubling) . . .
- b) when the wavelength is decreased by 66.66%, the frequency is increased by 300% and a 'perfect-octave and a perfect fifth' emerges (as a Hz trebling) . . .
- c) when the wavelength is decreased by 75%, the frequency is increased by 400% and two perfect octaves emerge (as a Hz quadrupling) . . .
- d) when the wavelength is decreased by 80%, the frequency is increased by 500% two perfect octaves and a major third emerge (as a Hz quintupling) . . . ([and so on](#)) . . .

Lao Tse, Pythagoras, the rational overtone series and also the neg-entropic emergence of irrational Phi

In the Tao Te Ching (Lao Tse) there are 84 verses ($7 * 12$). Verse 42 reads, '*from one comes two, from two comes three & from three come the 10,000 things*'. His contemporary Pythagoras demonstrated this in the overtone series in his 'string experiment'. When the overtone series is continued over seven Perfect Octave ($2^7 = 128$ Hz) it emerges that this number doesn't quite commute with twelve Perfect Fifths ($1.5^{12} = 129.7643$ Hz) i.e. $2^7 \approx 1.5^{12}$ and this has been well-known for millennia.

Commuting these, simply requires 'Well-Tempering' (WT) the Perfect Fifths (PF). This has been well-known since the publication of the Well-Tempered Clavichord (J S Bach 1721). When $2^7 = 1.49830707686^{12}$, both totals commute at 128 Hz. The Hz differences emerging between PF & WT are known as 'the Pythagorean Comma' and there is a fundamental significance in this.

A Hz sequence, covering twelve Perfect Fifths in the Hz time of seven Perfect Octaves, shows that when the Hz differences between 12 Perfect Fifths & 12 Well Tempered Fifths embedded in the Pythagorean Comma are **fed-back on themselves**, the Hz value of 'Phi' emerges at exactly the Phi-point between the twelfth & the thirteenth steps. With the first step starting at zero, this derivation shows Phi emerging on a deceleration (neg-entropic) curve at step 12.618 precisely.

Starting at zero, this deterministic procedure is entirely and serendipitously self-referential. It represents a 'completeness theorem' which resolves the so-called '*Entscheidungsproblem*' as Kurt Gödel might have said, "*by a kind of miracle*".

The output of factuality enables the derivatives of diversity.

The self-referential nature of this is that it is true at any & at all scales. Moreover, the Phi-derivation remains constant starting from any reference value ([see model](#)). From this constancy significant issues are signalled, integrating: -

- a) Positive and negative entropy,
- b) Symmetry-breaking and symmetry-binding,
- c) Determinism and in-determinism,
- d) Synchronicity and Sequentiality,
- e) Universality, locality and entanglement
- f) The context for the values of Pi, Phi & Alpha,
- g) Instability and stability in the Standard Model of Physics,
- h) The double-helix structure of the DNA molecule,
- i) . . . and that from Phyllotaxis, to galaxies and to sub atomic particle decay,
- j) Phi-governed Dynamic Spiral-Structures (DSS) are ubiquitous throughout Nature.

Emerging at all scales of space and time, these are correlated and demonstrated [elsewhere](#). All musicians and particularly string players (e.g. Albert Einstein) have for eons, gratefully depended on stringularity daily in practice and play. As for 'avoiding extinction' from Climate Change . . . well it underlies C&C, "[The Well-Tempered Climate Accord](#)" and then some.