Musical Science: Pythagoras, Einstein and Divine Principle

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From time to time, I've been asked if I believe in the concept of a "cosmic chord" or a universal "chord of nature"; *Klang*, as it's referred to according to Schenkerian music theory. Is there some Aeolian harmony of the spheres that evokes a secret, metaphysical understanding of the laws that govern physics and music? Imagining that cosmic vibrations exist in the universe has been a part of the mythology surrounding music for eons.

When the late singer-songwriter, Leonard Cohen, wrote his iconic song, "Hallelujah," he referenced a "secret chord": *"Now I've heard there was a secret chord.*
That David played, and it pleased the Lord."

Could a single chord actually please the Almighty? St. Paul in Romans 1:20 asserts:


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"For since the creation of the world God's invisible qualities -- his eternal power and divine nature -- have been clearly seen, being understood from what has been made, so that people are without excuse."

We understand from *Divine Principle* that the natural world possesses various dual characteristics that maintain their existence and develop by way of harmonious relationships: male/female, stamen/pistil, cation/anion, positive valence/negative valence, for example. Ontologically, the created world reflects the nature of God's being and essence, and this comports with Paul's assertion. We can extrapolate that within the Godhead there exists the harmonious union of original masculinity and original femininity, and an original positivity and an original negativity. When examining the theoretical basis of tonal music we find several prominent polar paradigms:

- Consonant intervals/Dissonant intervals
- Major modes/Minor modes,
- Major chords/Minor chords
- Tonic chord/Dominant chord
- Primary dominant chords/Secondary dominant chords
- Tension/Resolution
- High pitches/Low pitches

It can be said that when these various polar opposites arrive at a harmonious junction they are an aural manifestation of godliness. Therefore, I submit that it may not have been when David played an isolated chord that the Lord was pleased, but rather, the Lord was pleased when David played several chords (at least two) resulting in a harmonious sonic occurrence because the resultant sound -- if based on the polarity paradigm -- embodied the Heavenly Parent's deity.

The cosmology of music has been expounded upon by numerous theologians, philosophers and theorists -- Pythagoras, Damon, Aristotle, Boethius, Rameau, Luther, Kepler, Schopenhauer -- hence there are numerous theories regarding this mysterious topic. Pythagoras' contention that numbers were the primordial constituents of the universe was a revelation in his time, and his explications regarding the production of pitches and intervals in Nature (vibratory energy in motion), are the basis of virtually every important treatise on sound production. Regardless of the musical genre or place of origin, Pythagorean theory is always in the equation (no pun intended).

The Greek concept of the *quadrivium* -- the four realms of study as outlined by Plato, namely, arithmetic, geometry, music, and astronomy -- has been considered the necessary foundation for a comprehensive liberal arts education. Attaining an enhanced understanding of various truth claims through multiple disciplines, including music, was very much at the heart of Albert Einstein's forays into the realm of theoretical physics. The speculations of Einstein and Pythagoras coincide in significant ways and are in accord with Divine Principle.

In his book, *The Elegant Universe*, Dr. Brian Greene asserts that Albert Einstein "was driven by a passionate belief that the deepest understandings of the universe would reveal its truest wonder; namely, the *simplicity* and *power* of the principles on which it is based." As Greene and others in the realm of theoretical physics sought to understand the deeper aspects of the complex principles that govern the universe -- string theory with its 11 dimensions, for example -- Einstein seemed to have been working

under the premise that it may all be rather simple.

Einstein also speculated (as does Greene) that through the realm of the arts, where creativity and imagination are paramount, epiphanies regarding the mysteries of the universe might be revealed with greater efficacy. It's intriguing to note that Einstein possessed a lifelong affinity for music and once stated that had he not pursued physics he would likely have become a musician. He began studies on the violin when he was six and also played the piano.

Einstein's son, Hans, elaborated on his father's reliance on music in the context of his work: "Whenever he felt that he had come to the end of the road or into a difficult situation in his work, he would take refuge in music, and that would usually resolve all his difficulties." Einstein would say, "My discovery was a result of musical perception." As a physicist, his relationship with the violin must have been especially meaningful due to the instrument's sonic properties *vis-à-vis* the overtones series in which natural harmonics (overtones) are especially evident in the production of sound on string instruments.

Einstein's assertion that "imagination is more important than knowledge" points to the importance of intuition in relation to cognition and perception in the process of our epistemological approaches in ascertaining truth. Because imagination is linked to the subconscious, the cognitive procedures we normally rely on to perceive information and data may not be as refined as needed in order to achieve a more comprehensive or "cosmic" understanding of the polar relationship of the corporeal and incorporeal realms, for instance.

Examining the simple truth of polarity, a concept the Chinese and Greeks espoused eons ago, we begin to understand that polarity lies at the heart of the natural world. Pythagoras believed in a "cosmic polarity" as it pertained to complimentary opposites. In their book, *The Pythagorean Sourcebook and Library,* Kevin S. Guthrie and David Fideler allude to Pythagoras' thoughts regarding cosmic polarity:

"We have seen that for Pythagoras philosophy represents a "purification," the aim of which is the assimilation to God. The universe is divine because of its order (*kosmos*), harmonies and symmetries which it contains and reflects… Moreover, as certainly as the principle of polarity underlies the world of phenomenal manifestation, so to the mind depends on dualistic typologies, such as the Table of Opposites, in order to make intellectual progress."

Guthrie and Fideler note that according to Pythagorean theory, the principle of *resonance* was an important factor in understanding polarity in terms of the "harmonic attunement" of mind and body as well as the incorporeal and corporeal worlds. For Pythagoras "man is a microcosm," therefore the investigation and utilization of the principles of harmony in the physical realm could "activate those same principles within." Aristotle's Table of Opposites that Guthrie and Fideler allude to is as follows:

- Limited/Unlimited
- Odd/Even
- Unity/Plurality
- Right/Left
- Male/Female
- At rest/In motion
- Straight/Curved
- Light/Darkness
- Good/Evil
- Square/Oblong

Einstein believed there was beauty in the mysterious and that was likely why he gravitated to music. As any artist knows, having an active and probing imagination is essential to the creative process. One may possess copious knowledge and well-developed craft, but imagination is the ingredient that can transform knowledge or data into art of originality, beauty and meaning -- art the touches the soul. Though the way that music affects our soul, our psyche and our being remains somewhat mysterious, the underlying principles that govern the relationships of musical components in the realization of musical art are quite simple.

One of the failures of modern avant-garde modes of musical composition ("new music") in the 20th century has been the rejection of beauty as a primary rationale of creating in favor of scientific, complex, formulaic, and decidedly left-brain methodologies that resulted in highly dissonant and indeterminate aural properties. The so-called "emancipation of dissonance" created a chasm between modern composers and their audiences, and for good reason. The polarity paradigm was subjected to an evisceration of sorts due to the predominance of mathematic procedures being applied to musical composition. When the aural relationships between the aforementioned musical polar opposites are obscured in ways that we can no longer perceive the differences between them, cognitive constraints will occur resulting in music that is neither satisfying nor pleasurable.

Unification Thought proffers that there are "dual purposes" in artistic activity: namely, creation and appreciation. These dual purposes are but another aspect of the polar paradigm and "are carried out in order to fulfill the dual desires to *realize* and *seek* value." Furthermore, the artist, in the position of object,

manifests value (beauty) for the subject, namely, God and humankind, "whereas appreciation is the activity whereby an appreciator, in the position of subject, finds and enjoys value (beauty) in an object, namely, a work of art." Because the abstract compositions of the 20th century avant-garde failed to take the appreciator into account, it can be said that this music is not in accord with Godism.

Leonard Cohen singing "Hallelujah" in London in 2009.

For Einstein, insight did not come from logic or mathematics. It came, as it does for many artists, from intuition and inspiration: "When I examine myself and my methods of thought, I come close to the conclusion that the gift of imagination has meant more to me than any talent for absorbing absolute knowledge." Elaborating further, he added, "All great achievements of science must start from intuitive knowledge. I believe in intuition and inspiration…. At times I feel certain I am right while not knowing the reason." But how, then, did art differ from science for Einstein? Interestingly, it wasn't the content of an idea, or its subject, that determined whether something was art or science, but how the idea was expressed:

"If what is seen and experienced is portrayed in the language of logic, then we are engaged in science. If it is communicated through forms whose connections are not accessible to the conscious mind but are recognized intuitively as meaningful, then we are engaged in art. Common to both is the loving devotion to that which transcends personal concerns and volition."

Einstein worked intuitively and expressed himself logically. Perhaps that's why he considered science, religion and the arts as being related in the same manner as Divine Principle, stating, "All religions, arts and sciences are branches of the same tree."

The second verse of Leonard Cohen's "Hallelujah" begins, "Your faith was strong but you needed proof." In our epistemological pursuits the transcendent attributes of beauty, whether experienced through nature or art, can be effectual in our attempts to validate various truth claims. I imagine that our desire to achieve cosmic order in our chaotic world will require surrendering to the simple truth that without the concept of "loving devotion" in our social equation we'll never "transcend" the "limitations of our personal concerns" to find our personal Elysium.

Elder Unificationists may remember a book published by HSA-UWC in 1975, titled *A Prophet Speaks Today*, a collection of short quotations from Rev. Moon's early sermons in America. One quote (p. 57) is especially relevant here: "The highest spiritual gift is intuitiveness." Alluding further to the polarity of mind and body, Father says, "Unless you find unity within yourself, it will be of no use to try to encounter Divinity." A profound, yet simple truth.

David Eaton has been Music Director of the New York City Symphony since 1985. In addition to his conducting career, he has been an active composer, arranger and producer with 64 original compositions and over 800 arrangements and transcriptions to his credit. One of his recent compositions, "70 and Counting!", was performed at the United Nations as part of its 70th Anniversary concert in 2015. Another recent composition, "Sing Praise, Halleluia!" was recently performed in Korea. In 2016, he was awarded an honorary doctorate by UTS.

Photo at top: *Professor Albert Einstein playing his violin in 1932.*