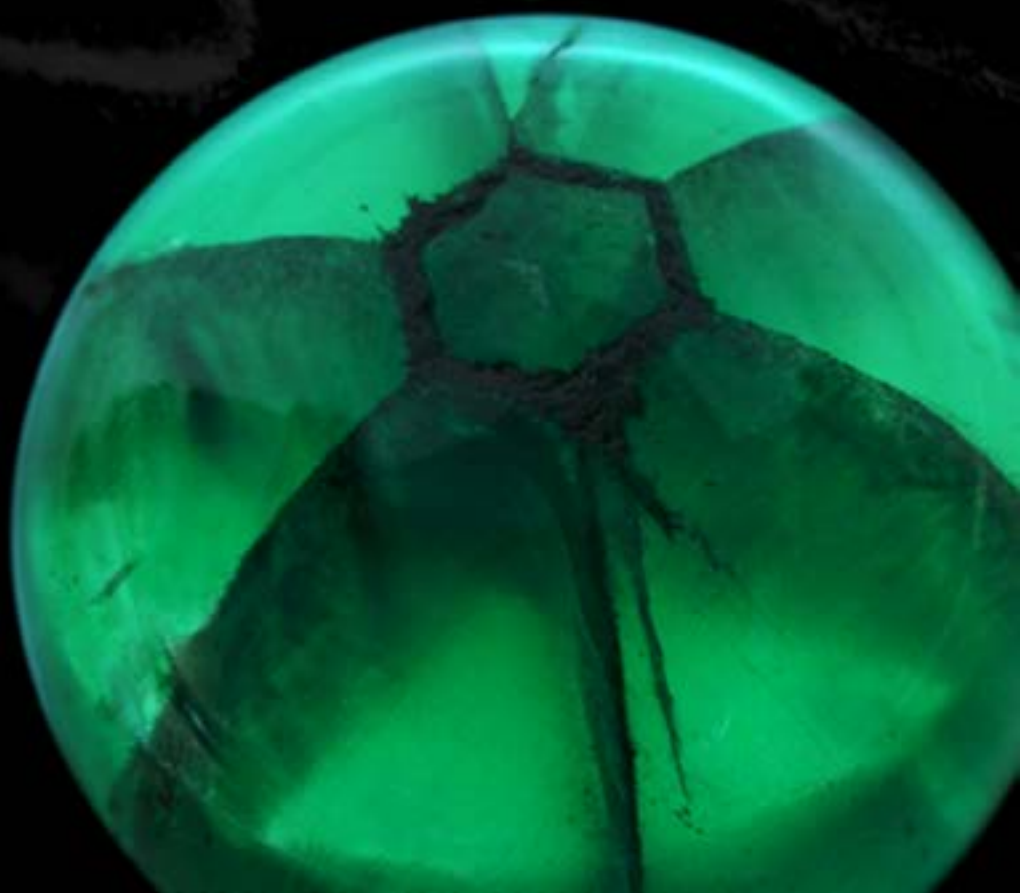


ECHOFORMATION

Acoustic Repercussion:
Cymatic Order of Matter

by : Jimmy Rotlewicz





ECHOFORM

“If you want to find the secrets of the universe, think in terms of energy, frequency and vibration” *-N. Tesla.*



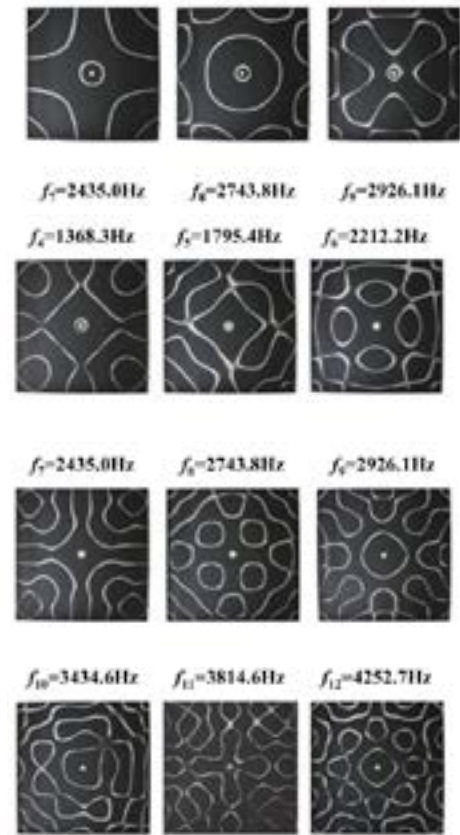
Chiestolite or Cruciferous Stone

In the seventeenth century, Abraham Werner, a Prussian geologist, wrote the structure and geometric configuration of the Andalusian, and noted the existence of a cross shape in some specimens, for whose curious feature, he named it Chiestolite, now popularly known as The Cruciferous Stone, which, due to its unique distribution, was used as an amulet by some of the pilgrims on the Road to Santiago.

Agustín Codazzi, being commissioned in 1851 of the Cartography in the New Republic of Colombia, on his trip through the Boyacá region, specifically in Muzo, found structures in beryl, but unlike the Chiastolite, some forms of this contained six radii equidistant from the crystallographic axis C each gives one of its edges, described by the French geologist Émile Bertrand in 1879 as a green beryl emerald variety Trapi-che type. The name Trapi-che is derived from the similarity of this structure with that of the main sprocket of the machine used for the extraction of juice from sugarcane. Today this term is applied to describe that typical hexagonal crystallographic structure in any mineral.



Trapi-che Emerald



Chladni Plates

Figures that coincide with the experiments carried out by the German scientist Ernest Chladni, who in 1808 demonstrates the formation of geometric figures by vibrating with the bow of a violin and a metallic sheet with sand, which magically is distributed geometrically, depending on the shape of the foil and the frequency it obtained when vibrating. Exclaiming in this demonstration: the sound can be seen! (They are peut être vu!), a rhetorical phrase pronounced by Emperor Bonaparte, assistant to this curious experiment conducted that year at the Paris Science School. In our case with the cruciferous pencil, the mills and other minerals, the scores of these frequencies were engraved in stone.

Today, these curious structures have been found in a wide variety of minerals, in various regions of the world:

Trapiche Formation

	Aquamarine Colombia, Namibia.	
	Emerald Colombia, Pakistan	
	Garnet Colombia, Myanmar	
	Crystal Quartz Colombia, Myanmar, Mongolia, Japon.	
	Spinel Myanmar	
	Amethyst Quartz Colombia, Brazil, Canada.	
	Cordierite Japon	
	Sapphire & Ruby Colombia, United States, Myanmar, Sierra Leon.	
	Diamond Zimbabwe	
	Tourmaline Myanmar.	
	Moscovite Argentina	

Lápiz Crucifer FOrmation

	Andalusite Spain, Colombia, United States, Australia, Austria.
	Euclase Colombia



Trapiches of different minerals.

These curious structures are found in a variety of minerals on all continents, formed in different ages and mineral structures, indisputably of different origins, with hardness ranging between 2 and 10, on the Mohs scale.

Surely, geological phenomena such as volcanic eruptions accompanied by pyroclastic events, earthquakes and monumental tsunamis, the frictional force between the continental layers, added to the acoustic repercussions helped form the current orogenesis.

The geological events, lead to hydro-acoustic effects influencing the mineralizing fluids possibly through cavita-

tion, water hammer or Zhukowski pulse as well as the hydraulic jump. These hydraulic phenomena in their migratory movement could have developed these effects that lead to acoustic reverberation.

Cosmic events, such as the collision of meteors that deformed with their extensive impacts territories of our planet, contributing their components and generating waves that possibly intervened in the result of the acoustic frequency in the mesoform states of mineral architecture. The resonance generated in large thunderstorms could have participated in the crystallization of minerals.



Malachite, behaving like non-Newtonian fluid

The vibration produced by each of these phenomena is transmitted through different solid, liquid or gaseous materials, with different frequencies, intensities and wavelengths, forming in some cases harmonic frequencies, such as the Mozart or Beethoven rhythm and in other discordant rhythms

such as those of the rock band Kiss with its heavy metal, it serves to behave sludge and grease as non-Newtonian fluids.

Acoustic phenomena are observed in some gems and minerals that have homogeneously distributed geometric shapes.



Geode with silica minerals.





Pyrites with different crystalline habits:

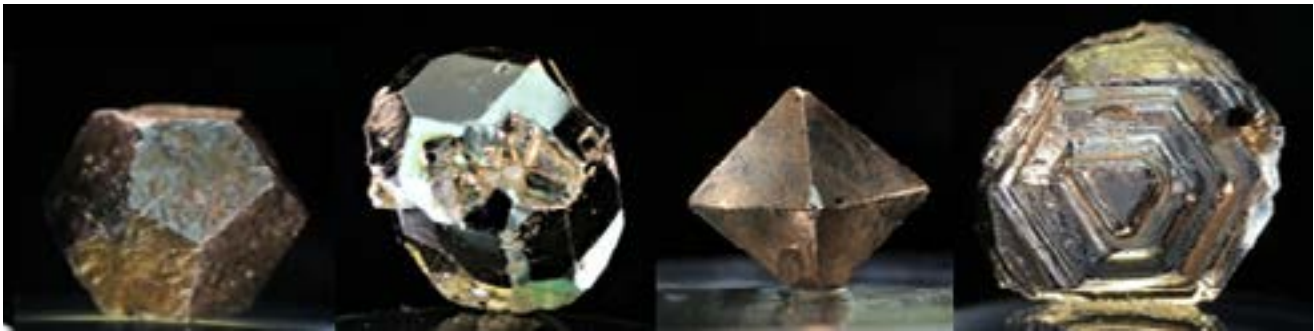
Cubic (4o harmonic)

Pyritohedron

Dodecahedron

Octahedron (8o harmónico)

Trigonal.



Acoustics could be another of the physical phenomena involved in the crystallization of minerals.

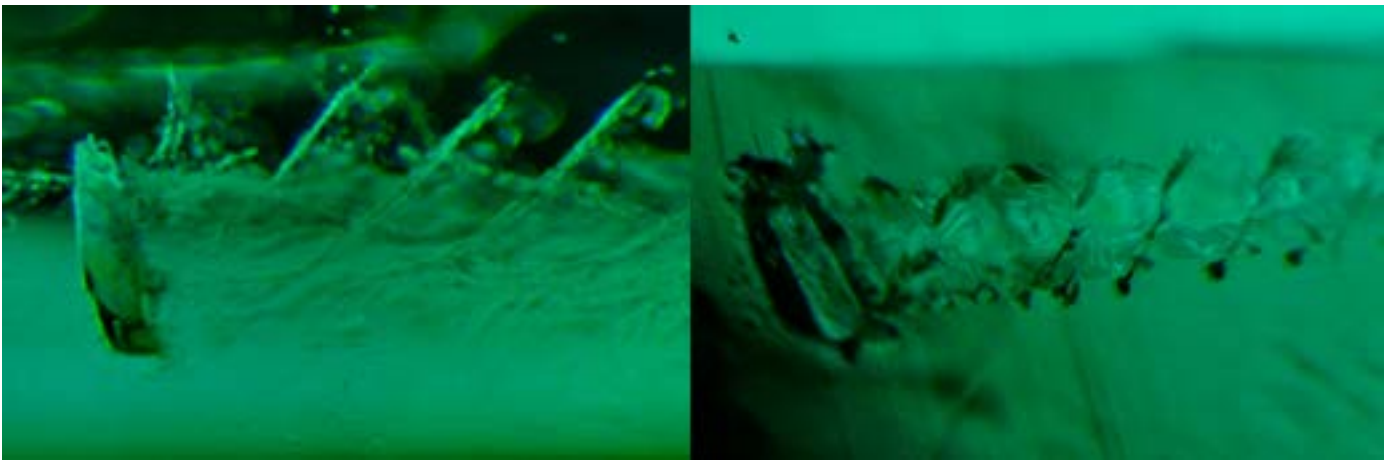
These resonance waves together with the juxtaposition of all other physical and chemical phenomena, possibly contributed to the crystallization of this unique geometric formation and structuring, but in the resolution of the geometric solids found in the minerals around the planet, with a distribution of different habits, such as isometric or cubic pyrite, pyritohedron, octahedron, dodecahedron, trigonal, as well as the distribution of inclusions

in the triangle or hexagonal in the trapiche diamond, cross (cruciferous pencil) in the Chiastolite or hexagonal (trapiche) throughout another range of minerals, as well as in disordered forms observed in Chalcedonies or Malachites.

It seems as if each of these mineral substances, enjoyed and chose a partner, dancing rhythmically and in tune with these powerful waves, with different musical chords, by which they obtained this impressive and unique pattern of geometric ordering.



Trapiche Diamonds: Hexagonal (lft.) & Triangular (rgt.).

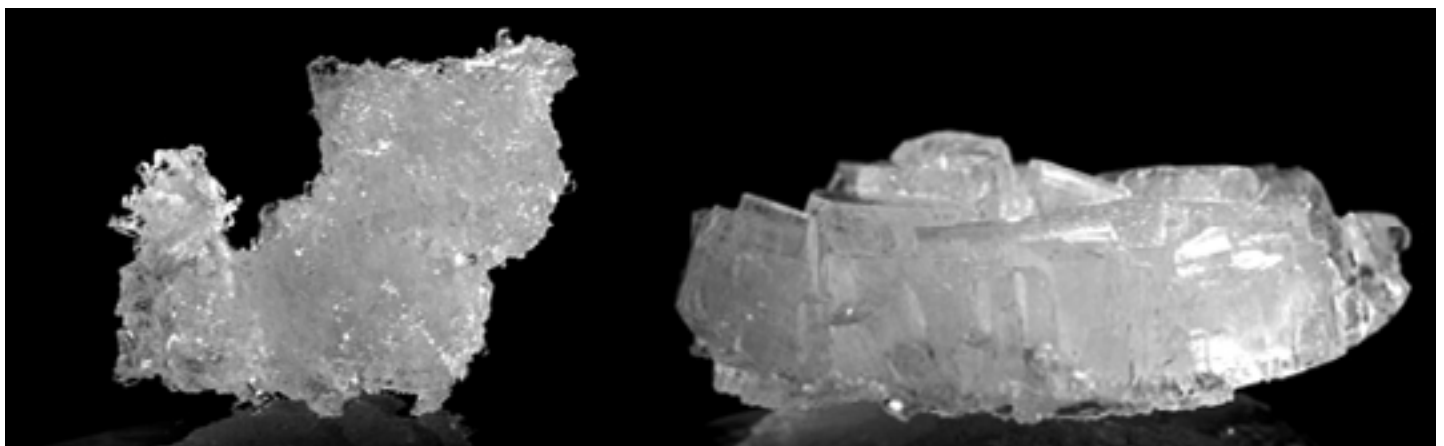


Crystal inclusions in emerald, which denote elasticity in the crystallized material.

The percussion phenomena generated by hydraulic means (magmas, hydrothermal fluids, gases, etc.), coming from the interior of the earth, seek their stability through processes of migration to zones of stability of low pressures and temperatures, using faults, dikes, fissures, caverns, channels and cracks. Statistically the opportunities that the liquids would have to find the conditions where to generate these sound-hydraulic phenomena, may be associated with mineralogical, litho-geochemical, geochemical or geophysical phenomena associated with the reduction of the diameter of their migration

channels, or by sudden, permanent clogging or intermittent of them, as well as obstacles in the path of their migration.

These hydraulic phenomena can generate relevant acoustic consequences, such as waves with harmonic or chaotic tones. Indirectly, they violated the order or disorder at atomic levels and consequently crystallographic, thus contributing, together with pressure, temperature, viscosity, magnetism, among others, in the speed of the polymorphism of its crystalline forms, denoting elasticity.



Rochelle crystals (supersaturated solution of salts that crystallize by evaporation), grown by the author in different environments, from the same solution divided into two parts: the one on the left with strident music and the one on the right in complete silence.

Could we alter the mechanical, physical, electrical, chemical - chemical properties of matter with sound in the future?

By manipulating the acoustics in manufacturing in general, would we find the appropriate frequencies to align the molecules of the materials and thus modify their properties?

Something like if with the sound we began to dance with the particles of matter!

It would be possible to introduce sound and vibration in the industrial processes, perhaps making sure that known materials acquired some different special characteristic, obtaining formidable tension, ductility, flexibility or resistance, by musically

manipulating the structural arrangement of these materials. To some extent confirming the idea of Doctor Nicola Tesla, who said: “To understand the universe, one would have to think in terms of energy, frequency and vibration.”

I invite you to surf the waves, the “Waves of Matter”!



Jimmy Rotlewicz