

Syntropy and Water

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Abstract

The relativistically invariant wave equation, which can be considered the fundamental equation of the universe, has two solutions: one which describes *retarded waves*, which diverge from causes placed in the past, and the other which describes *advanced waves* which diverge from causes placed in the future. Studying the mathematical properties of these two solutions, Luigi Fantappiè discovered that the retarded waves are governed by the law of *entropy*, whereas the advanced waves are governed by a symmetrical law which Fantappiè named *syntropy*. In the macrocosm the law of entropy prevails and time moves forwards, as a consequence of the fact that the universe is expanding. In the microcosm, the subatomic level, expansive and cohesive forces are balanced and time is unitary: past, present and future coexist. Luigi Fantappiè showed that the properties of life coincide with the law of syntropy and arrived at the conclusion that life feeds on syntropy. However, as a consequence of the fact that syntropy is available in the subatomic level, in order to feed on syntropy life needs a mechanism which can allow syntropy to flow from the subatomic level to the macroscopic level. The anomalous properties of water, and especially the hydrogen-bridge, suggest that water can provide the mechanism which allows syntropy to flow from the subatomic to the macroscopic levels, and that for this reason it is so essential for life. The anomalous properties of water provide an interesting explanation of homeopathy in terms of retrocausal effects.

Introduction

In July 1942 Luigi Fantappiè presented at the Pontifical Academy of Science the “*Principals of a unitary theory of the physical and biological world based on quantum mechanics and special relativity*” in which he showed that *retarded waves* (diverging waves), with causes placed in the past, correspond to chemical and physical phenomena governed by the law of *entropy*, while *advanced waves* (converging waves), with causes placed in the future, correspond to a new category of phenomena governed by a law which is symmetrical to entropy and which Fantappiè named *syntropy*. Analyzing the mathematical properties of the advanced waves Fantappiè arrived at the conclusion that these properties coincide with the qualities of living systems: finality, differentiation, order and organization.

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The second principle of thermodynamics states that in each transformation of energy (for example when heat is transformed into work), a part of energy is dispersed in the environment. Entropy measures how much energy has been dissipated in the environment. When energy is distributed in a uniform way, for example no variations in heat exist, a state of equilibrium is reached and it is impossible to transform energy into work. Entropy, therefore, measures how much a system is near to the state of equilibrium and the degree of disorder in the system. Entropic phenomena show the following characteristics:

1. *tendency towards homogeneity*: entropic phenomena tend to level out in the sense that they evolve from differentiation to homogeneity, from complex to simple. With time homogeneity and the uniformity of the system grow: the entropy of the system increases.
2. *Causality*: diverging waves cannot exist in the absence of causes which have generated them.

The qualities of syntropic phenomena are the following:

1. Entropy diminishes.
2. Syntropic phenomena are anti-dissipative and attract. Converging waves concentrate energy and matter in ever smaller spaces.
3. Because the concentration of matter and energy cannot be indefinite, entropic phenomena should compensate the concentration of energy and matter. In syntropic phenomena an exchange of matter and energy with the environment is expected.
4. Syntropic phenomena are generated by “final causes”, attractors, which absorb converging waves. These “final causes” are strictly connected with the existence of the syntropic phenomena: in this way it is possible to introduce a concept of “scientific finalism”, where finalism is equal to “final cause”.

As a consequence of the fact that the universe is expanding, macrocosm is governed by the law of entropy which forces time to flow from the past to the future (Eddington, 1927) and causes to precede effects (mechanical causation: cause → effect). On the contrary, in the atom expansive forces (entropy) and cohesive forces (syntropy) are balanced, and time and causes flow in both directions (cause → effect ← cause), giving way to syntropic processes. Einstein’s famous *Übercausalität*: supercausality.

The law of entropy implies that systems can evolve only towards disorder and destruction of all forms of organization; for this reason several biologists (Monod, 1974) have reached the conclusion that the properties of life cannot originate from the laws of the macrocosm, as these are governed by entropy and evolve towards heat death, disorder, and the annihilation of all forms of organization. Supercausality, and especially syntropy, which is observed in the microcosm, imply the qualities of order, organization, and growth, which are typical of living systems.

Consequently Fantappiè suggests that life qualities could be a consequence of the properties of the subatomic level, of quantum physics. But, as soon as the syntropic system grows into the macroscopic level it starts conflicting with the law of entropy, which governs the macrocosm level and tends to the destruction of any form of organization and structure. In this way the fight for survival, in the form of conflicts with the law of entropy, begins.

The conflict between life and entropy is well known and it has been discussed continuously by

biologists and physicists. Schödinger (Nobel prize 1933 for physics), answering the question about what allows life to contrast entropy, concluded that life feeds on “negative entropy” (Schödinger, 1944); the same conclusion was reached by Albert Szent-György (Nobel prize 1937 for physiology and discoverer of vitamin C) when he used the term syntropy in order to describe the qualities of negative entropy as the main property of living systems (Szent-György 1977). Albert Szent-Gyorgyi states that “*it is impossible to explain the qualities, organization and order of living systems starting from the entropic laws of the macrocosm*”. This is one of the paradoxes of modern biology: the properties of living systems oppose the laws which govern the macro level of reality.

The hypothesis of a fundamental conflict between life (syntropy) and environment (entropy) leads to the conclusion that living systems, in order to survive, need to acquire syntropy from the subatomic level. In order to acquire syntropy from the subatomic level, a mechanism which can operate as a bridge is needed. Fantappiè recognized in water the qualities of this mechanism, concluding that water is essential for life because it allows syntropy to flow from the quantum subatomic level to the macroscopic level of life.

Water and syntropy

Compared to other liquids, water shows various anomalous properties, among which (Ball, 1999):

1. When it freezes it expands and becomes less dense. Other liquid's molecules, when they are cooled, vibrate more slowly, concentrate, solidify, become more dense and heavy and sink. With water exactly the opposite is observed.
2. In liquids the process of solidification starts from the bottom, since hot molecules move towards the top, whereas cold molecules move towards the bottom. The liquid in the lower part is therefore the first which reaches the solidification temperature; for this reason liquids solidify starting from the bottom. In the case of water exactly the opposite happens: water solidifies starting from the top.
3. Water shows a heat capacity by far greater than other liquids. Water can absorb large quantities of heat, which is then released slowly. The quantity of heat which is necessary to change the temperature of water is by far greater than what it is needed for other liquids.
4. When compressed cold water becomes more fluid; in other liquids, viscosity increases with pressure.
5. Friction among surfaces of solids is usually high, whereas with ice friction is low and ice surfaces result to be slippery.
6. At near to freezing temperatures the surfaces of ice adhere when they come into contact. This mechanism allows snow to compact in snow balls, whereas it is impossible to produce balls of flour, sugar or other solid materials, if no water is used.
7. Compared to other liquids, in water the distance between melting and boiling temperatures is very high. Water molecules have high cohesive properties which increase the temperature which is needed to change water from liquid to gas. The attraction forces among water molecules are ten times stronger than the van der Waals force which keeps together the molecules of other liquids.

The anomalous properties of water are a consequence of the *hydrogen bridge* mechanism: instead of creating a tie with the oxygen atom, the hydrogen atom links to the electrons, forming in this way a bridge between the subatomic level (electrons) and the atomic level (hydrogen atom). This bridge

between the inner level of the atom (micro) and the outer level of the atom (macro) allows syntropy to flow from the micro to the macro level.

The hydrogen bridge makes water totally different from other liquids, mainly by increasing its cohesive forces (syntropy).

Water is not the only molecule with hydrogen bridges. Also ammonia and fluoride acid form hydrogen bridges and these molecules show anomalous properties similar to water. However, water produces a higher number of hydrogen bridges and this determines the high cohesive properties of water which link molecules in wide dynamic labyrinths.

The anomaly of water can be attributed to its strong cohesive properties. Other liquid molecules, with hydrogen bridges, do not reach these strong cohesive forces and do not produce large scale structures. Hydrogen bridges provide water with qualities which influence its physical properties of density, heat capacity and heat transmission.

It is interesting to note that when water is supercooled to the experimental limit of -38°C , its heat capacity increases dramatically. At the theoretical limit of -45°C the heat capacity of water would be infinite; water could absorb infinite quantities of heat without increasing its temperature. At this theoretical limit even the slightest increase in pressure would make water disappear, similarly to what happens with black holes in which the reversal of the time arrow makes matter disappear.

When water freezes hydrogen bridges stop existing and the flow of syntropy from the micro to the macro level stops, leading life to death. This is one of the reasons why, when blood freezes, life stops.

The anomalous properties of water allow syntropy to flow from the micro to the macro level, turning water into an essential molecule for life; water is the lymph of life, feeding life with syntropy. Water is the most important molecule for life, which is necessary for the origin and evolution of any biological structure; if life could ever start on another planet, water would certainly be present.

Water and retrocausality: the example of homeopathy

The hydrogen bridge mechanism and the anomalous properties of water suggest that water reacts constantly to causes located in the past (classical causality) and causes located in the future (retrocausality). This would explain why it is so difficult to explain the behavior of water, also within a glass of water.

These retrocausal properties of water would allow a new explanation of homeopathy, a discipline which has always been refused by classical science because its effects cannot be traced back to a cause.

Homeopathy is a form of therapy formulated by the German physician Samuel Hahnemann (1755-1843) in 1796. The system is based on the so called *law of similar*, according to which remedies are based on substances which cause similar symptoms in healthy individuals. Homeopathic remedies are prepared by diluting the active substance. The higher the dilution the stronger is the remedy. This technique leads to the paradox that the stronger remedies are those in which the active substance has

been diluted to the point that it is practically impossible that a single molecule is still present in the remedy. Consequently, having removed the active substance, through dilution, classical science states that the effects which are observed are placebo effects and cannot be attributed to the efficacy of the remedy, since no molecule of the active substance is present.

The fact that homeopathic remedies are based on water suggests a new type of explanation based on retrocausal mechanisms. It is plausible that the active substance, once it is inserted in water, establishes retrocausal links, with causes located in the future. Removing the substance, thanks to dilution, the retrocausal links remain; however they are no longer bound to the active substance and are now free to act on other structures. Furthermore, as this mechanism is based on retrocausality, the substance which causes the symptoms in the future would eliminate them, healing in this way the subject.

Classical medicine refuses homeopathy altogether since its effects cannot be traced back to a cause, and because the cause (the active substance) is removed from the remedy thanks to dilution. However the therapeutic effects of homeopathy are strong and homoeopaths have been searching for a model which could allow an explanation. However, the searched for these explanation is made in the field of classical causality, such as the model of the memory of water, in which causality moves forwards, from the past to the future. These models have proved to be inadequate and have not explained the effects observed in the clinical practice of homeopathy.

The anomalous and syntropic properties of water suggest that it might be possible to fully understand the mechanism of homeopathy using retrocausal explanations, since water is essential for life and for the preparation of the homeopathic remedies.

Conclusions

Similarly to what Chris King (1986) and Luigi Fantappiè (1942) state for living systems, it might be possible to imagine water in a supercausal state which would force its molecules into a state of choice between information which comes from the past and information which comes from the future. As a consequence of this constant state of choice, water would show non-deterministic *chaotic* properties and it would therefore be difficult to forecast its behavior.

In 1963 the meteorologist Lorenz discovered the existence of chaotic systems which react, in each point of their states, to small variations. Studying, for example, a simple mathematical model of meteorological phenomena, Lorenz found that a small perturbation could generate a chaotic state which would amplify, making weather forecasting impossible (Lorenz, 1963). Analysing these unforeseeable events, Lorenz found the existence of an attractor which he named the “chaotic attractor of Lorenz”. This attractor causes microscopic perturbations to be amplified, and interfere with the macroscopic behaviour of the system. Lorenz described this situation with the words: “*The flap of a butterfly’s wings in Brazil can set off a tornado in Texas*”.

When attractors (syntropy) are inserted in chaotic systems, complex and ordered structures are generated: the fractal structures discovered by Mandelbrot. Fractals resemble in many ways the structures of life and probably guide the growth and evolution of living systems. Most likely, the

anomalous and retrocausal properties of water, associated with attractors and fractals, cause life, and guide it towards higher forms of complexity.

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