

QUANTUM JAZZ: LIQUID CRYSTALLINE WATER MUSIC OF THE ORGANISM

by Mae-Wan Ho, Ph.D.

ABSTRACT

Quantum jazz describes the quantum coherent organism in which every single molecular player is spontaneous and free, yet perfectly in step and in tune with the whole. This remarkable state of being depends on the liquid crystalline water matrix that enables each molecule to intercommunicate with every other, creating the most exquisite light and sound displays that span 70 octaves in all the colors of the rainbow.

The quantum coherence of organisms profoundly revolutionizes our concept of health and disease. Health is a state of quantum coherence reflected in the complex dynamics of body rhythms such as the heartbeat, the respiratory rate, and brain waves that are correlated like an exquisite symphony. Consequently, loss of coherence (disease) can be diagnosed with sophisticated mathematical tools. The organism coordinates its functions by quantum electrodynamical inter-communications, in which the quantum coherence of water plays a central role. That is why the organism is hypersensitive to weak electromagnetic fields and other subtle energy interventions.

KEYWORDS: quantum jazz, quantum coherence, Domo, closed-loop economy, consciousness, liquid crystal matrix, biology of free will, electromagnetic fields, water, bioenergetics, complementary medicine

Thank you so much for taking me to your hearts. I am so grateful and honored to be invited here, and I'm having a wonderful time.

I don't need to tell this audience that conventional medicine is dying, especially in the United States. It is getting so expensive that few can afford to pay even for health insurance, which is just as well, because it is also the leading cause of death (and injury) to its citizens, ahead of heart disease and cancer.¹

Health journalist and author Nick Regush sums it up starkly: "Medicine as we know it, is dying...The disease is caused by conflict of interest, tainted research, greed for big bucks, pretentious doctors and scientists, lying, cheating, invasion by the morally bankrupt marketing automatons of the drug industry, derelict politicians and federal and state regulators."

Regush and others have correctly identified the proximate causes conspiring in the demise of medicine. But these are all symptomatic of a deeper cause: the obsolete model that dominates not just medicine, but the whole of our lives. I call it Domo.

SCIENCE OF DEATH VS. SCIENCE OF LIFE, MECHANISM VS. ORGANISM

Domo – the dominant model – runs our economy, our industry, and lurks behind our political social and educational institutions, its tendrils woven into the fabric of our lives. So we accept it unquestioningly and we mistake it for inescapable reality. Whenever something goes wrong, we find

something, someone to blame. But that leaves Domo looming larger and bigger and stronger than ever before. Public debates on the cures and causes of AIDS, on GM foods, mobile phones, pesticides and more – these are in the service of Domo in a way, because they don't really get at the cause, and they leave Domo untouched in the process, and we leave Domo untouched in the process of destroying ourselves.

So I think it's time we blew its cover.

Domo is a seductively powerful view of the world as machine that can be taken apart, analyzed, controlled, and re-tooled to serve our every want, wish, and whim. It was the product of the European Enlightenment, which brought many good things too, such as the primacy of reason over received wisdom, and the transference of creation from God to nature, which we can now understand by scientific inquiry.

Scientific inquiry has its own momentum, and the mechanistic science of Domo was already becoming obsolete at the turn of the past century when the science of the organism emerged. In another lecture, I have outlined how the Domo economy of infinite unsustainable growth that depends on competition and profligate dissipation should be replaced with nature's own closed-loop economy, which minimizes wastes and thrives on reciprocity and cooperation.²

I first discovered this closed-loop economy in the organism, but soon realized it applies also to sustainable systems – especially agro-



Figure 1. Japanese rice farmer Takeo Furano runs a happy circular economy of ducklings in paddy fields that yields a diverse bumper harvest on his two-hectare farm every year.

ecological systems that can mitigate greenhouse emissions while providing food and fuel security for all. I will show you just one example from our comprehensive report.³

The very first organic farmer I ever met and interviewed and learned from is Japanese rice farmer Takeo Furano, who runs a happy circular economy of ducklings in paddy fields that every year yields a diverse bumper harvest on his two-hectare (or five-acre) farm: 7 tons of rice, 300 ducks, 4000 ducklings, countless fish and enough vegetables to feed 100 people. This is amazing (Figure 1).

Needless to say, plenty of fresh, organically grown food is a prerequisite for any nation's health and well-being.

In the rest of my talk, I shall outline how the science of the organism can replace Domo biology and revolutionize our understanding of health and healthcare.

Domo's influence in biology is especially profound and persistent. It presents the organism as a junkyard of molecular nuts and bolts subject to mechanistic principles of lock and key, push and pull, random collision, linear causation, controller versus the controlled, and so on. Diseases are largely viewed as "defects" in specific molecular mechanisms, and defined as such. This is the kind of thinking behind the human genome project that has all the signs of having run aground after decades of sequencing and dissecting genomes, and trying to identify the genetic defects that predispose individuals to different diseases.⁴

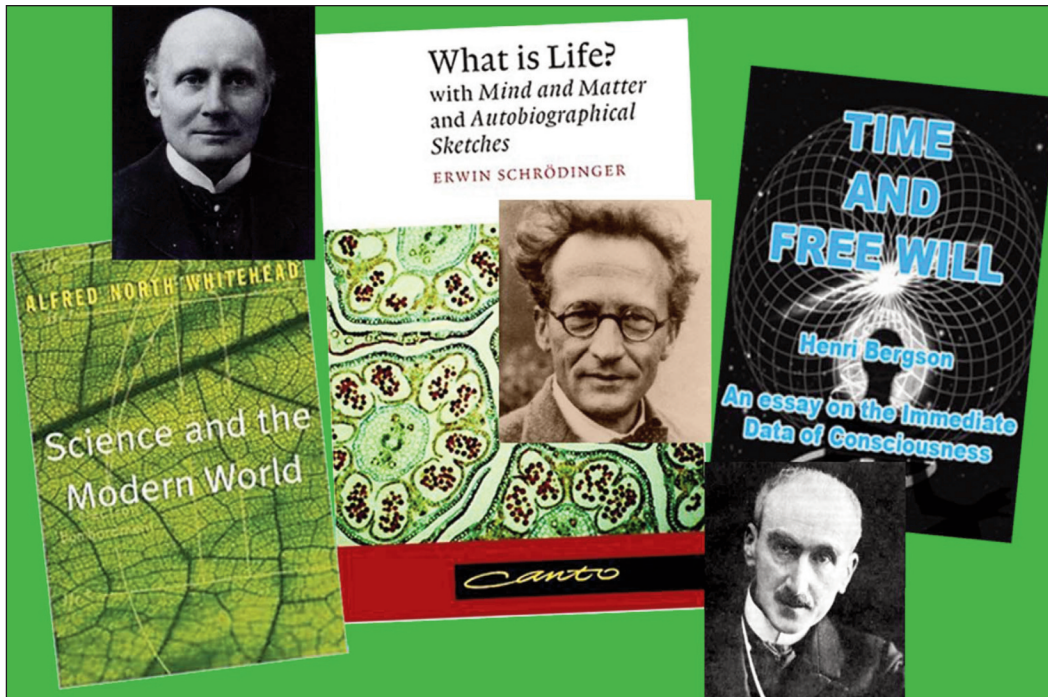


Figure 2. Influential books by Alfred North Whitehead, Erwin Schrödinger, and Henri Bergson

Together with the physical laws of equilibrium thermodynamics and statistical mechanics, Domo biology is essentially a science of death that has virtually nothing to say about life.

For decades, I was in the wilderness, both intellectually and emotionally, until I discovered the science of the organism.

Three books that influenced me the most were all inspired by the new physics, especially quantum theory, which contradicts every tenet of mechanistic science (Figure 2). Alfred North Whitehead's eloquent critique of the static, flat, soundless, and colorless Newtonian *Universe in Science and the Modern World* is all of a

piece with Henri Bergson's insistence, in *Time and Freewill*, that time is multidimensional and heterogeneous, giving unique qualities to our innermost experiences.^{5,6} Both of them speak from the heart *and* mind; they invite us to experience the organic world and organic space-time as multidimensional, non-local, mutually entangled and constantly evolving, much in the way a true artist and romantic poet would experience nature. Whitehead argues that we can never really understand nature except as an organism embedded *within* the super-organism of nature.

Erwin Schrödinger struggled against the Copenhagen interpretation of quantum theory, which insists on having nothing to

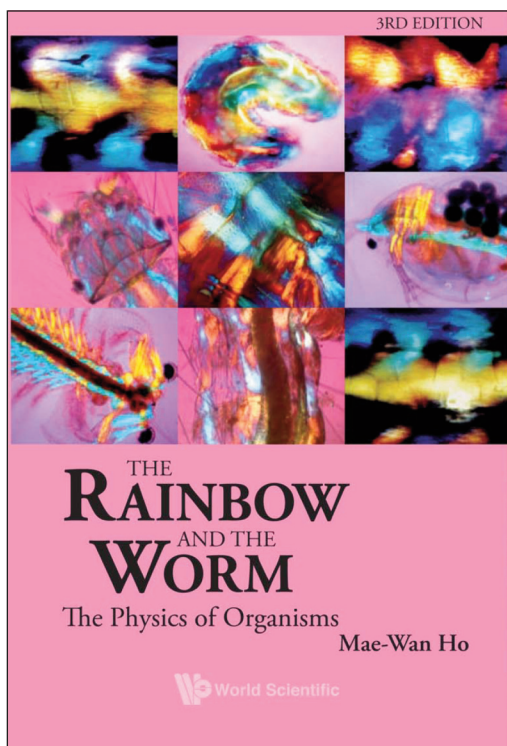


Figure 3. The molecular coherence of living organisms displayed on the cover of *The Rainbow and the Worm, The Physics of Organisms* by Mae-Wan Ho.

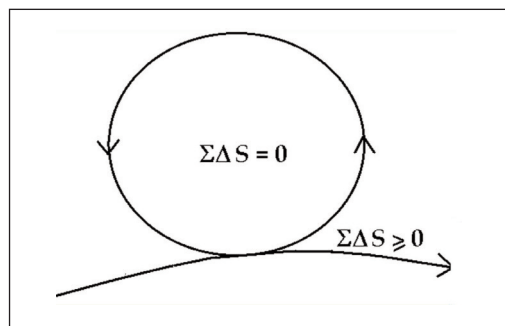


Figure 4. Nature's circular economy: zero entropy model

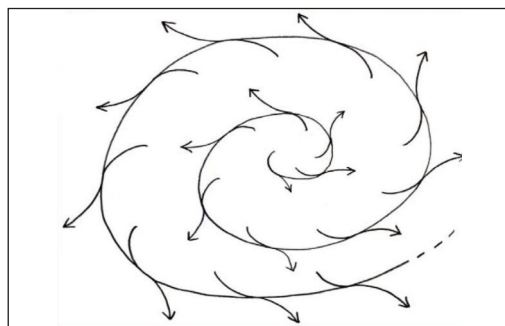


Figure 5. Domo economy: maximum entropy model

say about life, the universe, and everything.⁷ Instead, he speaks unapologetically of consciousness and the meaning of life.⁸ His book *What is Life?* is widely acclaimed for having predicted the genetic material DNA. What is much less well known and more significant, in my view, is that he also predicted the molecular coherence of organisms, which was discovered in my laboratory in 1992.

Living organisms have such a high degree of molecular coherence that they appear as dynamic liquid crystal displays under the

polarizing microscope that geologists use for identifying crystals. You can see these beautiful images on the cover of my book *The Rainbow and the Worm, The Physics of Organisms*, first published in 1993; it is now in its 3rd much-enlarged edition (Figure 3).⁹ It is also the first book about organisms that tries to tell you what it is to be alive.

One main reason the organisms are so coherent is that they use resources and energy in a circular way (Figures 4 and 5). This circular economy of the organism I call

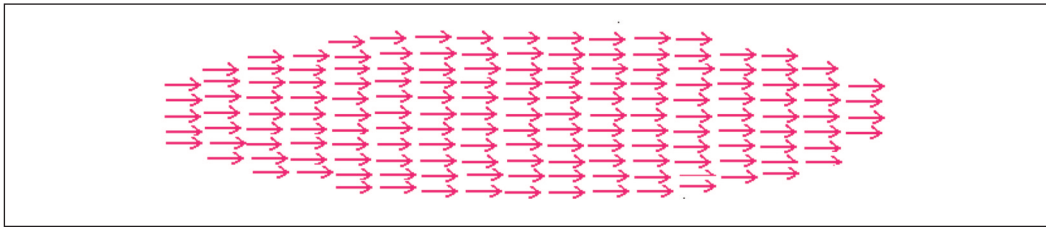


Figure 6. All the molecules in the body, including the water, are aligned in a liquid crystalline continuum, and moving coherently together.

the zero entropy model. Now, of course, this is an ideal. The closer you approach this ideal, the more coherent you are; if you were actually like this, you would never grow old and never die. And, of course, the more closely you approach it, the more slowly you grow old. That's wonderful, isn't it?

The reason it can do that is because of reciprocity and cooperation. The organism has structured cycles of activities spanning all space-time scales, and those yielding energy are directly coupled to those requiring it. Also, the giving and taking can be reversed, so *both material and energy are recycled*, which is why it's so successful.

This system recycles not only materials but also energy, and this is because it can store energy. Stored energy is coherent energy ready to do work, and it is tied to space-time. You have to think of this diagram as a fractal, as space-time is fractal, with self-similarity over many scales. In other words, if you magnify a small cycle, you get the same structure as the whole. Each of these entangled cycles within cycles is a domain of coherent energy storage, so the organism is filled with coherent energy on every scale, ready to be mobilized.

The other main reason organisms are so coherent is because they are liquid crystalline. That means all the molecules in their tissues and cells are embedded in a matrix of water, aligned according to their electrical polarities and furthermore, they are all moving coherently as a whole, including the water (Figure 6).

To see what live organisms are really like, watch them on the Quantum Jazz DVDs, which are video recordings set to music composed and produced in-house by the very talented ISIS bunch that I work with.

THE QUANTUM JAZZ PLAYER

What is quantum jazz? It is the radical wholeness or coherence of the organism that profoundly transforms our view of health and disease. It transcends the age-old opposition between “top-down” and “bottom-up” explanations, or holist versus the reductionist approach in Domo biology.

The organism is thick with coherent activities on every scale, from the macroscopic down to the molecular and below. I call the totality of these activities “quantum jazz” to highlight the immense diversity and multiplicity of players, the complexity and coherence of the performance, and above

all, the freedom and spontaneity. That is why I have presented quantum coherence of organisms as the biology of free will.¹⁰

The organism in the ideal is a quantum superposition of its coherent activities over all space-times, constituting a pure dynamic state towards which the system tends to return (Figure 7). In the language of quantum theory, it is a macroscopic quantum being, and has a wave function that never ceases to evolve by entangling other quantum organisms in its environment.

When I first proposed that organisms are quantum coherent in the early 1990s, very few people took it seriously. It was generally accepted that quantum coherence applied only to sub-microscopic systems, but that larger systems can only be classical on account of the “collapse of the wave function.” Since then, quantum coherence has been discovered in larger and larger systems as detection devices become more and more sensitive and non-invasive, such as the imaging technique we discovered. There is even evidence that the universe itself is quantum coherent. For an accessible account of this development please read “Nature is Quantum, Really” and other articles in the series exclusive to our quarterly magazine *Science in Society*.¹¹

Claude Swanson's excellent lecture yesterday showed torsion effects – and these torsion effects can only happen if the universe is quantum coherent. I asked him about this, and he agrees.

I'll try to describe what quantum coherence

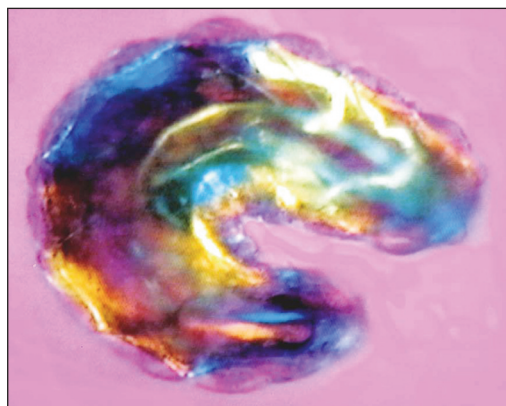


Figure 7. The organism is a quantum superposition of its coherent activities over all spacetimes, constituting a pure state towards which the system tends to return.

means for the organism. The quantum coherent organism plays quantum jazz to create and recreate herself from moment to moment.¹² Quantum jazz is the music of the organism dancing life into being.

Quantum jazz is played out by the whole organism, in every nerve and sinew, every muscle, every single cell, molecule, atom, and elementary particle, a light and sound display that spans seventy octaves in all the colors of the rainbow.

There is no conductor or choreographer. Quantum jazz is written while it is being performed; each gesture, each phrase is new, shaped by what has gone before, though not quite. The organism never ceases to experience her environment, taking it in (entangling it) for future reference, modifying her liquid crystalline matrix and neural circuits, recoding and rewriting her genes, as described in my

series of articles *Life after the Central Dogma of Molecular Biology*.¹³

The quantum jazz player lives strictly in the now, the ever-present overarching the future and the past, composing and rewriting her life history as she goes along, never quite finishing until she dies. But her script is passed on to the next generation – not just to her biological offspring, but the species as a whole. Each generation rewrites, edits, and adds to the score, making it unique. I'll say more about genetics at the end of my talk.

Quantum jazz is why ordinary folks can talk and think at the same time, while our lunch is being processed to give us energy. It is why some of us are Olympic athletes and Kung Fu masters, and maybe others are remote viewers.

QUANTUM COHERENT ORGANISM WORKS BY INTERCOMMUNICATION

Intercommunication is the key to the quantum coherent organism. It is done to such sublime perfection that each molecule is intercommunicating with every other in the entire body; so each is as much in control as it is sensitive and responsive. This is the ultimate molecular democracy of distributed control. There is no need for push and pull, because coherent energy is stored and available throughout the system. It explains why we *are* sensitive to the weak electromagnetic fields of the mobile phone and wireless networks saturating our environment, and not just us but all organisms, birds and bees.^{14,15} As I shall make clear later, the organism uses electro-

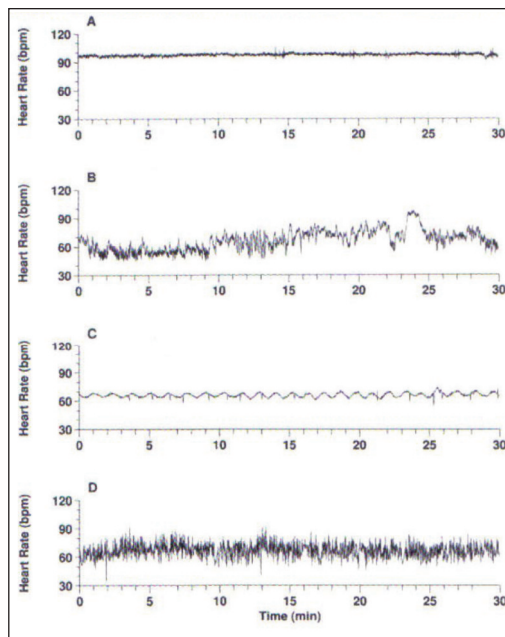


Figure 8. The variability of the healthy heartbeat, which paradoxically becomes much more regular in disease states, is evidence of the body-wide coherence of biological rhythms.

magnetic fields and electric currents for intercommunication.

The most accessible evidence of the body-wide coherence of biological rhythms comes from the variability of the healthy heartbeat, which paradoxically becomes much more regular in disease states (Figure 8). But when the variability was analyzed with appropriate mathematical tools, it exhibited fractal and multi-fractal structure with self-similarities on multiple timescales. This reflects an intricate phase correlation among all rhythms as the heart's own beat intermeshes and syncopates in symphony with the rest.¹⁶ In contrast, the diseased

heart is no longer communicating with the body and falls back on its intrinsic rhythm and becomes much more regular.

What this tells you is that the healthy heart is intercommunicating with the rest of the body, and so it reflects these rhythms within the body. It is syncopating, intermeshing with the rest of the rhythms. And that's why it's got this very beautiful variability, which is what music is all about.

So the heart is not a solo player, but is in symphony with the rest of the body. This state of coherence is very deep, and it really needs further study.

I'm so glad that Rollin McCraty is here. He's doing something wonderful with the Global Coherence Initiative. He's part of the Institute of HeartMath, where they are conducting ongoing research into heart-rate variability and autonomic function. This has opened up a whole new field of dynamic disease that can be diagnosed by mathematics, and possibly treated non-invasively by biofeedback techniques.¹⁷

The coherent organism is the unity of brain and body, heart and mind, an undivided bundle of intellect and passion, flesh, blood, and sinew that lives life to the full, freely and spontaneously, attuned not just to the immediate environment, but the universe at large. Quantum coherence is the "I" in everyone that gives unity to conscious experience.¹⁸ This ideal coherent whole, I suggest, is also the ideal of health.

WATER IS MEANS, MEDIUM, AND MESSAGE

Quantum coherence and quantum jazz are possible because organisms *are* liquid crystalline; the 70 percent by weight of water making up the tissues and cells is *the* matrix in which all the other molecules, large and small, are embedded, enabling rapid intercommunication to take place, whereby the organism can function as a coordinated whole.¹⁹ Quantum jazz is the diverse multiplicity of molecules dancing to the tunes of liquid crystalline water.

New research described in the latest edition of my book and successive issues of our quarterly magazine *Science in Society* show how this special liquid crystalline water in tissues and cells provide the means, medium and message for intercommunication.

WATER IS QUANTUM AND QUANTUM COHERENT

Water is the most abundant substance on earth, and very few molecules are simpler, yet its behavior is among the most complex and baffling.²⁰ The structure of liquid water, in particular, remains a matter of conjecture and debate. The generally accepted view is that water molecules in liquid form random clusters with hydrogen bonds linking on average one molecule to four others in a tetrahedral arrangement, but that these flicker on and off rapidly, so it is not the same neighbors involved at any instant (Figure 9).

There have been major discoveries within the past decade, practically all made by researchers working away from the

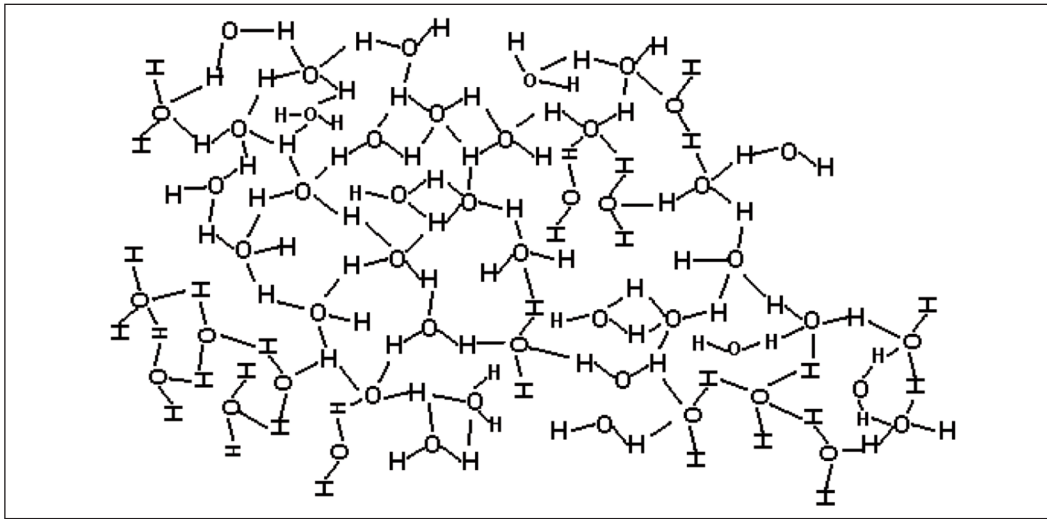


Figure 9. The structure of liquid water, with molecules forming random clusters with hydrogen bonds linking on average one molecule to four others in a tetrahedral arrangement, but these flicker on and off rapidly, so it is not the same neighbors involved at any instant.

mainstream, and which we have featured in our magazine.

Mainstream water researchers are by and large slow to catch on, but they've now discovered that liquid water has quantum properties even at room temperatures. Experimental data – especially from state-of-the-art neutron scattering and x-ray absorption and emission spectroscopy – cannot be reproduced by computer simulation unless quantum properties are taken into account. One manifestation is the distinctly different water structure in ordinary water containing hydrogen H, compared with water made from deuterium, D, an isotope of hydrogen with twice the atomic weight but the same atomic number.

Alan Soper at the ISIS Facility of STFC Rutherford Appleton Laboratory in Harwell, UK, and Chris Benmore at the

Argonne National Laboratory Illinois, USA, have compared D₂O and H₂O and came to the conclusion that their differences in bond lengths and bond strengths with oxygen are due to quantum properties of hydrogen as distinct from deuterium, thus resulting in different water structures.²¹

This does not come as a surprise to organisms; they cannot live without H₂O, and cannot live *with* D₂O. Pure D₂O is lethal to organisms.

Is liquid water quantum coherent? Since the 1990s, Warren Warren and his research team at Princeton University have discovered that intermolecular multi-quantum coherence can be detected in liquid water probed with magnetic resonance spectroscopy.²² These correlated nuclear spins are established in liquid water by dipole interactions over distances of 10

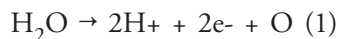
microns to a millimeter. Intermolecular multi-quantum coherence is being exploited in functional magnetic resonance imaging.²

If bulk water can be quantum coherent, we should not be surprised that water in confined spaces, like in organisms, is quantum coherent.

NO LIFE WITHOUT WATER

The liquid crystalline water is the ultimate source of protons (H+) and electrons (e-), positive and negative charges that zap through cellular compartments, between cells and tissues and the most distant parts of the body. They energize the organism, instantaneously coordinating its metabolism, growth, and other vital functions.

I brought this simple equation here for you:



Notice that in the process of getting protons and electrons from water, you also get oxygen, which green plants release in photosynthesis while using the protons and electrons to grab hold of carbon dioxide from the atmosphere, and reduce and fix carbon dioxide into carbohydrates. Oxygen is vital for all aerobic life, like us, and most of the animals that are most familiar to us. We use oxygen to oxidize carbohydrates that the green plants, thankfully, have made for us, back into carbon dioxide and to get our energy. There is now good evidence suggesting that failure in oxygen energy metabolism lies at the root of all serious diseases like heart disease, diabetes and cancer.²⁴

Also, animals use activated oxygen to oxidize water in order to produce reactive oxygen species that protect them from infectious microbes.²⁵ Without water, there would have been no life at all, and without cyanobacteria and green plants to split water, there would not have been the complex life that includes humans and all the animal species most familiar to us.

CARRIER OF ELECTRIC AND ELECTROMAGNETIC SIGNALS

The liquid crystalline water matrix pervades the entire organism from the extracellular connective tissues to the interior of every single cell, and is the carrier of electric and electromagnetic signals. Special membrane proteins have water-filled channels that cross the cell membrane, acting as “proton wires” to transport protons in and out of the cell.²⁶ This is a special instance of the proton jump conduction that’s much faster than ordinary electric currents through wires, and it could be happening all over the body, as I’ll explain later.

The same liquid crystalline matrix transmits the heart’s large pulsating electromagnetic field throughout the body, including the brain, which paces and intercommunicates with the myriad local rhythms. Within the cell, it transmits the much higher frequency electromagnetic waves emitted by molecules that depend on specific frequencies to recognize one another and coordinate their actions even at a distance.²⁷

The liquid crystalline matrix converts pressure and heat into electricity and vice versa, thereby coordinating the perfect

movements of both voluntary and involuntary muscles that enable some people to be concert pianists, Olympic athletes, or Kung Fu experts. The thermoelectric and piezoelectric effects, typical of liquid crystals, may underlie the therapeutic effects of massage and other “subtle energy medicine” as Jim Oschman made clear in his pioneering work, possibly by restoring coherence to the body.²⁸ And, we must not forget the coherent electronic and nuclear spins that Claude Swanson mentioned. Perhaps there is a balance of spins also within the healthy body?

Special water channels in confined spaces, which are many water molecules thick, and aligned by collagen fibers, have the potential to serve as superconducting proton cables, and may well correspond to the acupuncture meridians of traditional Chinese medicine, as David Knight and I suggested.^{29,30,31} The anatomical correlates of acupuncture meridians remain unknown to this day.³²

LIQUID CRYSTALLINE WATER AND BIOENERGETICS

The research team led by Gerald Pollack, bioengineer at University of Washington Seattle, has recently rediscovered the most astonishing thing about interfacial water, the kind that is ubiquitous in living organisms. They found that water next to charged hydrophilic surfaces form massive exclusion zones (EZs), consisting of water molecules millions of layers thick.³³ The water in the EZ not only excludes suspensions of microspheres just visible to the eye, but also proteins and small molecules. The

water molecules in the EZ are so highly ordered that they are literally liquid crystalline.³⁴

Most intriguingly, the EZ next to negatively charged hydrophilic (water loving) surfaces causes protons (hydrogen ions) to be expelled, as can be seen when a pH sensitive dye is added to the water, and is also excluded from the EZ. Pollack and colleagues discovered that the EZ had a different electrical potential from the rest of the water, by as much as 100 – 200 mV. What’s more, the EZ is formed under the influence of light, and charged up like a battery in the process, infrared light at 3 100 nanometers being the most effective.³⁵

What does this mean? It means this has caused charge separation in water, which is usually not easy to do. Remember the proton of the positive and negative electricity? So there is an excess of electrons in the exclusion zone, and an excess of protons outside it. So what you have is a battery. This is quite amazing, and what they found is the energy that caused this charge and separation actually comes from light.

The mechanism of EZ formation is still unknown. But the two wavelengths that expand the EZ most effectively may offer some hint.³⁶ There is a peak at UV 270 nanometers, which also corresponds to the unique absorption peak of EZ water, and is close to the 250 nanometers (~5 eV) required to ionize water under standard state conditions and taking into account the hydration of the resulting ions. The 3 100

nanometers peak, on the other hand, is close to the OH stretch of the ring hexamer identified as the most abundant species in water, which is also in ordinary hexagonal ice. These results suggest that photoexcitation of ring hexamers and photoionization followed by ejection of protons play synergistic roles in the assembly of the EZ phase.

Pollack and colleagues believe that the infrared radiation, though normally insufficient to break OH bonds, can nevertheless work via resonance induced dissociation of large hydrogen-bonded networks. How large are such networks? They could be quite large indeed, and non-random in structure. One study by Martin Chaplin at South Bank University London in the UK suggests an icosahedron consisting of 280 water molecules.³⁷

What do these findings mean outside the lab? The 3 100 nanometers IR source is about 0.6 percent of the sun's overall energy, $\sim 8.4 \text{ W/m}^2$. Chai Binghua, Yoo Hyok and Pollack speculate that nature may contain a whole lot more EZ water than most people think. In other words, an appreciable fraction of the sun's energy may be stored as charged EZ water. What this means for aquatic life is a big open question.

The earth is known to have a large negative surface charge, resulting in an electric field on the order of 100 volts per meter at the earth's surface. Perhaps this arises from the earth's surface water under the influence of radiant energy from the sun.

The widespread occurrence of EZ water within living cells and tissues is bound to have a profound effect on bioenergetics. After all, organisms are energized by nothing more than the exquisitely orchestrated flows of electrons and protons that enable them to do everything it means to be alive. When butterflies and lizards bask in the sun, are they charging up their batteries? And when we go sunbathing, are we getting more than just a suntan and vitamin D to help us fight against influenza?

If nothing else, it reinforces the emerging picture that water is the lead player in bioenergetics.³⁸ As Nobel Laureate Albert Szent-Györgyi remarked in his Nobel lecture in 1937, water is "the mother of all life."

Unfortunately, water is almost completely ignored in Domo biology and medicine, which is becoming more dangerous with gene medicines.

GENE MEDICINE BASED ON DOMO GENETICS

"Biologicals," genetically engineered protein drugs, the first of which was insulin, are now found to cause adverse events and death more frequently than synthetic chemical drugs.³⁹ This comes as no surprise, as genetic engineering is the epitome of Domo genetics that does not recognize the organic coherent whole where all genes and gene products are engaged in quantum jazz. You cannot just throw in an extra and hope it will slot into place like a missing Lego piece.

Domo genetics was already superseded by the genetics of the fluid genome as the first biological was commercialized, the fluid genome being part and parcel of the coherent organism perfectly attuned to its environment, constantly intercommunicating with it, altering gene expression and the genes themselves.⁴⁰ The fluid genome is part of the quantum jazz of life. That's ultimately why genetic engineering does not work. The rogue genes forced or insinuated into the organism cannot intercommunicate with the whole; they do not know the intricate score that has evolved to perfection over billions of years, written in the genes created from the life histories of all organisms in the species. Worse yet, the rogue genes have a tendency to run amok.

Decades of sequencing and dissecting the human genome in the hope of identifying genes for diseases have only served to confirm that the real causes of ill health are environmental and social.⁴¹ It is not the genetic messages encoded in genomic DNA, but environmentally induced epigenetic modifications that overwhelmingly determine people's health and wellbeing. Early nutrition and parental care play a large role in an individual's physical and mental health, and due attention must be paid to those aspects in delivering primary healthcare.⁴²

**DOMO MEDICINE MUST GO, BUT
BASIC RESEARCH IS NEEDED FOR
THE NEW ORGANIC MEDICINE**

Domo medicine is obsolete and doing more harm than good. That's why people are turning to complementary therapies.

In May 2009, 67 percent in Switzerland voted in favor of a constitutional article for complementary medicine.⁴³ The Swiss vote reflects the growing importance of complementary medicine in Europe. Some 65 percent of Europeans report they have used complementary and alternative medicine, with 30 to 50 percent using it as self-support and 19 to 20 percent having seen a complementary or alternative medical practitioner in the past year.

In contrast to the growth in popularity of complementary medicine, the science of the organism that could underpin it has languished, being valiantly pursued by only a few pioneers such as Jim Oschman, formerly a cell biologist.

I have outlined the basic physics of the organism and its potential connections to dynamic diseases and complementary therapies. A new "organic medicine" could combine the best in non-invasive, non-destructive approaches from both traditional medical systems and contemporary science that would also revitalize indigenous medicines in all cultures and provide affordable universal healthcare. This work is all the more urgent in view of the increases in diseases and infections that are forecast as a result of climate change. You, the members of ISSSEEM, hold the key to integrating energy medicine with the science of the organism.

Thank you.

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This paper is based on Mae-Wan Ho's address, presented at the Nineteenth Annual ISSSEEM Conference, Sacred Synthesis: Science with Heart (June 26 – July 3, 2009).

Mae-Wan Ho, Ph.D. is a geneticist, biophysicist and director of the not-for-profit Institute of Science in Society (ISIS), headquartered in Great Britain. She is known for her critical views on genetic engineering and the use of biotechnology. Ho has authored or co-authored a number of publications, including ten books, such as *The Rainbow and the Worm: The Physics of Organisms*; *Genetic Engineering - Dream or Nightmare?: The Brave New World of Bad Science and Big Business*; and *Living with the Fluid Genome*.

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