

Updated view about the rice experiments of Masaru Emoto

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Abstract

Masaru Emoto has carried to extremely interesting experiments with water at critical point against freezing. Emoto reports is that words expressing emotions are transmitted to water: the expression of positive emotions tend to generate beautiful crystal structures and negative emotions ugly ones. Also music and even pictures are claimed to have similar effects. Emoto has also carried out similar experiments with rice in water at physiological temperature. Rice subjected to words began to ferment and water subject to words expressing negative emotions began to rotten.

I have already earlier discussed a model for the findings of Emoto. In this article I update the model. I will also ask new questions. How emotions are communicated at the fundamental level and how a conscious entity can perceive the emotional state of another conscious entity and possibly affect it? What does emotional intelligence mean? How could one assign a measure of conscious emotional information to the emotional state? How certain sounds or gestures with emotional contents or even pictures can induce emotional response at the fundamental DNA level?

Contents

1	Introduction	2
1.1	Summary of Emoto's findings	2
1.2	But has anyone replicated the experiments of Emoto?	2
1.3	TGD view of the findings	3
2	Bioharmony and the genetic code	4
2.1	Basic ideas of bioharmony	4
2.2	The quantum realization of bioharmony	5
2.2.1	About the symmetries of dark codons	6
2.2.2	Does the notion of bioharmony relate to the ordinary notion of harmony	6
3	The interpretation of bioharmonies in the framework of the TGD inspired theory of consciousness	7
3.1	Empirical support for the notion of bioharmonies as correlates for emotions	7
3.2	Emotions are expressed and emotional expression induces emotions	8
3.3	How to perceive the bioharmony, resonate with it, and modify it?	8
3.4	Negentropy of bioharmony	9

4 How to understand Emoto's experiments with freezing water and rice?

10

1 Introduction

Masaru Emoto has carried out extremely interesting experiments with water at critical point against freezing. Emoto reports is that words expressing emotions are transmitted to water: positive emotions tend to generate beautiful crystal structures and negative emotions ugly ones. Also music and even pictures are claimed to have similar effects.

Emoto has also carried out similar experiments with rice in water. Rice subjected to words began to ferment and water subject to words expressing negative emotions began to rotten.

Remark: Fermentation is a metabolic process consuming sugar in absence of oxygen. Metabolism is a basic signature of life so that at least in this aspect the water+rice system would become alive. The words expressing positive emotions or even music would serve as a signal "waking up" the system.

1.1 Summary of Emoto's findings

The Wikipedia article about Masaru Emoto (see <http://tinyurl.com/pqy57jj>) provides a good summary of the experiments of Emoto and provides a lot of links so that I will give here only a brief sketch. According to the article Emoto believed that water was a "blueprint for our reality" and that emotional "energies" and "vibrations" could change the physical structure of water. The water crystallization experiments of Emoto consisted of exposing water in glasses to different words, pictures or music, and then freezing and examining the aesthetic properties of the resulting crystals with microscopic photography. Emoto made the claim that water exposed to positive speech and thoughts would result in visually "pleasing" crystals being formed when that water was frozen, and that negative intention would yield "ugly" crystal formations.

In 2008, Emoto and collaborators published an article titled "Double-Blind Test of the Effects of Distant Intention on Water Crystal Formation" about his about experiments with water in the Journal of Scientific Exploration, a peer reviewed scientific journal of the Society for Scientific Explorations (see <http://tinyurl.com/ycsnu2oc>). The work was performed by Masaru Emoto and Takashige Kizu of Emoto's own IHM General Institute, along with Dean Radin and Nancy Lund of the Institute of Noetic Sciences, which is on Stephen Barrett's Quackwatch (see <http://tinyurl.com/y99ko12e>) blacklist of questionable organizations. PSs are the modern jesuits and for jesuits the end justifies the means.

Emoto has also carried experiments with rice samples in water. There are 3 samples. First sample "hears" words with positive emotional meaning, second sample words with negative emotional meaning, and the third sample serving as a control sample. Emoto reports (see <https://youtu.be/Wc-ZmvxfBxE>) that the rice subjected to words with positive emotional content began to ferment whereas water subject to words expressing negative emotions began to rotten. The control sample also began to rotten but not so fast.

1.2 But has anyone replicated the experiments of Emoto?

Has anyone replicated the experiments of Masaru Emoto? This was the question posed to me by Alain Jutras on FB. In the research community very few people want to get a label of crackpot by trying to do something like this. The experiments are however simple and ordinary laymen can do the replication (for a successful replication see this).

When we are talking about Emoto's experiment we make head on collision with physicalism, which identifies as the core of scientific thinking the belief that consciousness has no causal effects so that our desires and intentions cannot have any effects on anything. Giving up this belief would of course pose strong challenges for experimentation: how can we know the desires of the experimenter have not affected the outcome of the experiment? For the skeptic, also free will is an illusion (this implies that also moral and ethics are illusory but usually even the most hardfore skeptics avoids saying this aloud). Some extremists believe that even consciousness is an illusion.

Just for fun I looked at some URLs on the web and found that the typical reaction was that it does not matter whether Emoto's experiments can be replicated or not. Emoto must be a crackpot

of fraud. This is idiotism in the veil of scientific thinking and I have learned during years that it is useless to argue with an idiot.

There are of course numerous phenomena suggesting remote mental interactions, where skeptics are forced to give up logical thinking.

1. For instance, in medical experiments, a placebo can produce the same effect as real medicine. For skeptics this shows that the idea about the mind-matter interaction is deadly wrong. Skeptic does not (want to) realize the very placebo effect proves that mind can affect matter!
2. The so-called experimenter effect is well-known and well-documented and is an example of the effect of the desires of experiment on the results (very probably) involving no fraud. In the development of a new medicine the test results can be phantastic but when the tests are repeated years later there is no effect. The reason could be that the interest of experimenters has already faded, and their desire to get nice results has vanished. The nice results were the outcome of desire, which is just the remote mental interaction!
3. Some experimenters get fantastic results from tests of some paranormal effect but it turns out that the results cannot be replicated. The very fact that this could well be the case without fraud shows the existence of remote mental interactions but skeptics manage to not notice this in their arguments. And of course, there is always the easy explanation: an experimenter is a swindler or crackpot or something like that. The researchers of paranormal phenomena are martyrs of modern science!
4. Water memory and homeopathy is a further example: Nobel level scientists have demonstrated it but have been labelled either swindlers or fools. The attitudes to "cold fusion" is a further example of anti-intellectualism in the veil of scientism.
5. The final example is skeptic himself: at least outside the academic environment he believes that he has command of his actions over his body. Why should he have this belief if it is a mere illusion? This question skeptic manages to unask.

The Emoto experiments are especially vulnerable against the attacks of skeptics. First of all, the experimenter must be able to take seriously the idea that the system studied can have emotions, he must be able to perceive the emotional state of the system and be even able to affect it.

The attempt to affect water at freezing point or the rice in a water bottle requires remote mental interaction: one might say that at the level of conscious experience one must be able to fuse with the water. This kind of ability, emotional intelligence, probably requires an empathetic personality and also a long period to develop since developing a deep emotional relationship with a rice bottle is not a one-night stand. If a skeptic (usually not a very empathetic person) tries to replicate the experiments, he probably fails since he wants to fail and because for him the rice is dead matter (as also other people and skeptic himself, if he thinks completely logically).

There is no way to prove to skeptics that these effects are real since in his world view these effects are impossible. Therefore I think that there is only one way to proceed. A new view of fundamental physics based on good philosophy respecting internal logical consistency, consistent with existing physics, solving the anomalies of the existing physics, and predicting a lot of new phenomena is the only way to proceed. Even skeptics must eventually bow to the power of logic.

This theory must explain what consciousness and life are and must provide an elegant identification for emotions as a universal panpsychic phenomenon appearing already at DNA level. This theory must explain emotional intelligence as the ability to sense the emotional state of another system and explain how emotions are expressed, transferred and induced. If this kind of theory exists, there are hopes that human kind eventually gains the ability to study consciousness instead of denying it.

1.3 TGD view of the findings

In the sequel I will consider the working hypothesis that the effects are real, and develop an explanation based on TGD inspired quantum biology [K5, K4, K3]. I have developed a model for the findings of Emoto already earlier [L4] [L5] but the updated version of the model involves new elements related to the progress of TGD.

I will also ask new questions. How emotions are communicated at the fundamental level and how a conscious entity can perceive the emotional state of another conscious entity and possibly affect it? What does emotional intelligence mean? How could one assign a measure of conscious emotional information to the emotional state? How certain sounds or gestures with emotional contents or even pictures can induce emotional response at the fundamental DNA level?

The basic ingredients of the model are following: magnetic body (MB) carrying dark matter as $h_{eff}/h = n$ phases of ordinary matter; communications between MB and biological body (BB) using dark photons able to transform to ordinary photons identifiable as bio-photons; the special properties of water explained in TGD framework by assuming dark component of water implying that criticality for freezing involves also quantum criticality; the special properties of water at the quantum criticality for Pollack effect at physiological temperature, and the realization of genetic code and counterparts of the basic bio-molecules as dark proton sequences and as 3-chords consisting of light or sound providing a universal language allowing universal manner to express emotions in terms of bio-harmony realized as music of light or sound.

The entanglement of water sample and the subject person (with MBs included) realized as flux tube connections would give rise to a larger conscious entity expressing emotions via language realized in terms of basic biomolecules in a universal manner by utilizing genetic code realized in terms of both dark proton sequences and music of light of light and sound.

2 Bioharmony and the genetic code

The notions of genetic code and bioharmony have evolved gradually during years. The following gives a brief summary of the basic ideas.

2.1 Basic ideas of bioharmony

1. The notion of bioharmony is based on the observation that 12-note-scale could correspond to a Hamilton cycle at an icosahedron containing 12 vertices [L1, L6, L7, L8, L12]. The scale would correspond to a Hamilton cycle going through all the vertices just once. Quint cycle is a very attractive identification for the representation of the scale in the sense that neighboring points of the icosahedron correspond to scaling of frequency by factor $3/2$ and so that octave equivalence characterizing musical perception gives 12-note scale spanning a single octave.
2. For a given Hamilton cycle, the 20 faces of the icosahedron define 3-chords proposed to correspond to an icosahedral harmony. One obtains a large number of different Hamilton cycles characterized by a symmetry group which is either Z_6 , Z_3 or Z_2 , which can be generated by reflection or a rotation by π . There are also 6 Hamilton cycles with trivial symmetries (Z_1). Hamilton cycles without any symmetries have an interpretation as disharmonies.
3. The surprising finding was that the 3 icosahedral 20-chord harmonies: the unique Z_6 harmony, Z_4 harmonies and considerable larger number of Z_2 harmonies give rise to a partial representation of the genetic code in the sense that the orbits of these symmetry groups correspond to amino acids. The number of triangles at a given orbit Z_n is the same as the number of DNAs coding the corresponding amino acid.

4 codons from 64 codons are however missing. These are obtained by adding a tetrahedral Hamilton cycle with 4 chords and 4 vertices. The conclusion is that genetic code and music harmony might be deeply related.

4. Icosa tetrahedral hyperbolic tessellation [L12] emerges as a unique hyperbolic tessellation involving 3 Platonic solids tetrahedron, octahedron and icosahedron. The proposal is that it could provide a universal representation of the genetic code and associated bioharmony, which is not restricted to biology but applies to all kinds of systems in all scales. One could say that the tessellation is induced (projected) to the 3-surface at hyperbolic space H^3 (light-cone proper time constant surface in M^4 and defines a genetic code for almost any system.

The 3 Hamilton cycles as representations of 12-note scale give $20+20+20 = 60$ chords and the tetrahedral Hamilton cycle gives 4 chords. These 64 chords would correspond to genetic codons represented as faces of icosahedron and tetrahedron.

2.2 The quantum realization of bioharmony

How to realize bio-harmonies physically if the TGD view of dark matter residing at monopole flux tubes and controlling biomatter is assumed?

1. Dark genome at the magnetic monopole flux tubes paired with DNA and realized in terms of dark protons. Dark 3-proton triplets would represent the 3-chords of the icosahedron tetrahedral bioharmony. Chords would be assignable to cells of a unique hyperbolic icosahedron tetrahedral tessellation containing icosahedron, octahedron and tetrahedron as basic units. These three Platonic solids have triangular faces so that they can be glued together.

The icosahedron tetrahedral tessellation of H^3 would induce a tessellation of the 3-surface $X^3 = X^4 \cap H^3 \times CP_2$, where $X^4 \subset H^3 \times CP_2$ denotes the space-time surface [L12]. The octahedrons belonging to the tessellation would have naturally a passive role since all faces could be regarded as either icosahedron or tetrahedron. Codons would be realized in terms of dark proton triplets assigned to vertices of the triangular faces of the tessellation.

2. Dark photon triplets as cyclotron frequency triplets, 3-chords, induce transitions between the states of dark proton sequences. Differences of cyclotron frequency triplets would correspond to dark photon triplets which can induce transitions between dark proton triplets. This realization came rather recently and it is still somewhat unclear whether the chords correspond to the differences of the triplets or to triplets. Also pairs of frequencies and even a single frequency can induce transitions in which 2 or only one frequency of the chord changes.
3. TGD leads also to a speculative generalization of genes. Not only dark codons would be possible but also sequences of dark codons forming dark 3N-protons behave as quantum units, dark genes. They can emit and absorb dark 3N-photons inducing transitions between dark genes as 3N resonances.

For a given bioharmony, the dark codons and dark genes would effectively serve as addresses and given dark 3N-photon could induce transitions only between dark genes for which its 3N cyclotron frequencies would correspond to differences of the cyclotron frequencies.

Also partial resonance is enough and even a single dark photon can induce transition between two dark genes. Several transitions are possible if only a single dark proton makes a cyclotron transition. It is also possible that the transformed dark gene belongs to a different bioharmony.

This leads to a view of how dark genes control ordinary genes.

1. Dark biomatter as $h_{eff} = nh_0$ phases at magnetic monopole flux tubes of the magnetic body (MB) of the system should act as a boss receiving information from the ordinary biomatter controlling it. This strongly suggests that the dark and ordinary information molecules, in particular genes are paired and form helical structures. A rather detailed view of this idea was developed in [L12].
2. The control and communication between dark and ordinary genes would involve the transformation of dark photons to ordinary photons, possibly identifiable as bio-photons, or vice versa. This applies also to the communications of dark and ordinary counterparts of the other information molecules and would be essential in the processes like transcription and translation. Dark 3N-photons as quantum coherent units could decay to 3N ordinary photons. The communication would involve energy resonance but not frequency resonance since h_{eff} changes. A full 3N-resonance is not needed.
3. The resonance condition requires that the dark cyclotron energies and corresponding transition energies assignable to ordinary DNA are identical. The frequency increases since h_{eff}

decreases. The transitions of ordinary information molecules need not be cyclotron transitions but can correspond to ordinary chemical transitions. This gives a strong constraint to the values of h_{eff} . This poses strong constraints on both the ordinary and dark information molecules and could have led to a selection of the DNA, RNA and tRNA codons and amino-acids.

4. The original long held belief was dark genes as sequences if 6 bits are identical with the ordinary genes. There is actually no need to assume this. Both the bioharmony and bits can be dynamical. Even the bioharmonies of the dark codons can be dynamical and the dark bioharmony should be consistent with the transition energy spectrum of the ordinary genetic codons only during their mutual communications. 3N-photons of dark genes or their substructures should induce transitions of ordinary genes in order to make control possible. Dark genes pairing with DNA would make the DNA a cognitive unit consisting of units of 6 bits, an intelligent entity. It would also have emotions and perhaps also emotional intelligence due to the existence of several bio-harmonies.

2.2.1 About the symmetries of dark codons

Before continuing one must consider the symmetries of the bioharmony.

1. An open question is whether the dark 3-chords related by a permutations of vertices should be identified or not. If they are regarded as different, there are $(3!=6)$ non-equivalent chords). If a full permutation invariance is allowed, it does not make sense to speak of permutations of the vertices of F and the transitions inducing changes of the 3-chord would not be possible since they could correspond to vanishing energy change of cyclotron energy.
2. In the case of ordinary DNA the order of nucleotides matters and one has $3!$ different orderings. Now however the codons are quantum entangled units of 3 dark protons so that the situation is not so simple. If the cyclotron frequency spectra assignable to the vertices are not identical then one can say that dark protons are ordered. In this case either of these options is relevant.
3. An interesting possibility is that the 3-chords related by cyclic permutations are equivalent. There would be only 2 non-equivalent 3-chords with different total cyclotron energies and they would have opposite orientations which might be interpreted in terms of parity violation. This would double the number of physically realizable chords and the problem associated with the physical realization of the codons is that the number of codons is by a factor 1/2 too small for the simplest proposals.
4. If a full permutation invariance is allowed it does not make sense to speak of permutations of the vertices of F and the transitions inducing changes of the the 3-chord would not be possible since they could correspond to vanishing energy change of cyclotron energy. If only cyclic invariance is assumed, one can reach 2 vertices/notes from a fixed vertex/note of F by a reflection which permutes the vertices and changes the total cyclotron energy.

2.2.2 Does the notion of bioharmony relate to the ordinary notion of harmony

It would be nice to have a contact with the ordinary notion of harmony in which the numbers of chords are small and the 12-note scale is replaced by the 8-note scale or 5-note scale and one has minor and major scales or fusion of them to a scale containing 9 notes.

At the fundamental level music should induce transitions between the codons of a bioharmony so that it is natural to study the transitions changing the dark codons. Consider now the possible transitions changing the 3-chord represented as 3-proton state and induced by one or more dark photons.

1. For a given icosahedral triangular face F and given bioharmony, one can consider the neighboring faces of F, which have either 3, 2, 1 common vertices reachable by a transition induced by keeping the face/3-chord fixed, keeping one edge (2 notes) fixed, or keeping 1 vertex/note fixed. If there are no common vertices, the initial and final chords have no common frequencies. Also these transitions are possible.

2. For transitions leaving a single edge E/note pair fixed, there are 3 faces/3-chords reached by reflection with respect to E. One could call them inner faces/chords. There are 6 faces/chords reached by keeping a single vertex/note fixed: these faces/chords could be called outer chords.

The total number of faces/chords reached by edge and face preserving transitions is $6+3=9=10-1$, where 10 is half of the number of faces of the icosahedron. If the orientation of the face matters, 10 faces are reached. The faces belonging to the complement of these 10 faces require the change of all frequencies.

The inner $3+1=4$ faces define 4 3-chords and 6 outer faces define 6 3-chords: 10 chords altogether making 1/2 of all 3-chords. Could they be regarded as simpler sub-harmonies of the 64 chord harmony?

3. The Hamiltonian cycle has 12 vertices and 3 of them must belong to the complement of the reachable region and should define a triangle by the reflection symmetry of the icosahedron. One would have dual sub-harmonies. Could they somehow relate to the minor and major scales? Or could they relate to DNA strand and conjugate strand?

The outer faces contain 6 vertices, which do not belong to F so that the reachable region contains $6+3=9$ vertices. Could this have something to do with the 8-note scale which has actually only 7 notes by octave equivalence. The minor scale has two additional notes since the scale $(AHCDEF\sharp F\sharp A)$ differs from its reversal $AGFEDCHA$: this would make 9 notes/vertices. For a given base note the number of notes of minor and major scale is 9.

4. From a given vertex of F, one can reach $3+1$ outer vertices and 2 vertices of F if reflection symmetry is not true. Could the pairs formed by the fixed vertex of F and these vertices define 6 notes which define allowed changes of notes for a melody. Interestingly, the 8-note scale (C,D,E,F,G,A,H) allows 6 non-trivial intervals $(\{(C,D), (C,E), (C,F), (C,G), (C,A),(C,H)\})$.

3 The interpretation of bioharmonies in the framework of the TGD inspired theory of consciousness

The key idea is that music expresses and generates emotions. Harmony dictates the emotional tone of music and this suggests that bioharmonies are correlates for emotions and that emotions are realized already at the molecular level.

3.1 Empirical support for the notion of bioharmonies as correlates for emotions

There is empirical support for the idea that bio-harmonies correlate with emotions.

1. RNA seems to represent and transfer emotions [J1] (see <http://tinyurl.com/y92w39gs>) [L4]. RNA from the brain of a snail conditioned by a painful stimulus is transferred to the preparation made from neurons of sea slug. Neuron preparation in the Petri dish reacts to the conditioning stimuli as if it were itself conditioned.
2. Somehow RNA is able to transfer emotions. The TGD inspired proposal [L1, L11, L2, L7, L4, L3] is that dark DNA and RNA represent emotions as sequences of 3-chords made of dark photons of dark RNA form 3N-dark photons behaving like a single quantum coherent unit. The representation of the genetic code would rely on icoso-tetrahedral representation in which the 3-chords would correspond to triangular faces of icosahedron and tetrahedron to which 3-chords are assigned.
3. The first proposal was that the induction of emotions could take place by 3N-resonant cyclotron absorption of dark 3N-photons by dark genes represented as sequences of 3N dark proton triplets at monopole flux tubes of MB. Also the absorption of dark photon singlet or doublet by a dark codon is enough to induce transition between dark codons and therefore between dark genes. This would "wake-up" the dark gene and induce emotional response.

3.2 Emotions are expressed and emotional expression induces emotions

Assume that emotions reduce to the DNA level or at least, that they are realized at DNA and biomolecular level. One can pose several questions. What are emotions? How are they expressed? How does emotional expression induce emotions? How are emotions perceived?

1. The universality and uniqueness of the hyperbolic tetra icosahedral tessellation suggests that the notions of bioharmony and moods are universal and can be defined at the level of DNA and other bio-molecules and could even generalize to even larger structures by inducing the icosahedral structure to the 3-surface associated with the structure.
2. Moods at the bio-molecular level would correspond to bio-harmonies realized in terms of dark genes represented as sequences of dark codons representable as dark proton triplets. The dark genes would be dynamical unlike the ordinary genes and dark bioharmony would only correspond to the transition energies of DNA only during control and communications. Dark genes would therefore represent intelligence in both cognitive (bit) sense and emotional sense.
3. The basic idea is that music induces emotions and expresses them. How this would be realized at the level of bioharmonies. The first guess is that the emotional state is represented by 3N-chords defining a bioharmony and identified as dark proton triplets, dark genetic codons. The original proposal was that dark photon triplets define another representation of the dark code. This would not be the case: dark photon frequency triplets could correspond to differences of the frequency triplets assignable to dark proton triplets. With this interpretation the notes and chords of music would correspond to the differences of chords and notes for the bio-harmonies.

This interpretation also allows us to consider temporal patterns of dark codons defining a sequence of 3-chords as a kind of music piece. The dark 3N-photon triplets and also dark photon singlets and doublets induce cyclotron transitions between these triplets if the bio-harmonies of the sender and receiver are the same. Otherwise only some chords induce transitions or only some notes of a given chord. One can even consider transition of entire dark genes by using dark 3N-photons.

4. Systems A and B with the same bioharmony, have the same emotional state, can be in emotional resonance. Transitions between different chords induced by dark photon triplets generated by codon A induce transitions of codon B producing temporal sequences of 3-chords, music pieces!
5. The resonance can be also partial so that all notes of the dark codon are not affected. For instance sequence of notes can induce transitions between chords if the two chords belong to the same 20-codon bioharmony. This is the case always for the codons with Z_6 symmetry. A melody, which is consistent with a given bioharmony, involves only notes belonging to the chords of the harmony so that it can induce a transition at a level of single chords. The number of these notes should be maximal. An emotionally intelligent conscious entity should have a wide repertoire of bio-harmonies and be able to rapidly find a bioharmony to generate emotional resonance to the signals of another conscious entity.
6. Cyclotron transitions would form a representation of bioharmony analogous to music piece. Reading of a gene could give rise to a music piece as a sequence of 3N-chords. The interpretation as a melody consistent with given bioharmony should make sense.

3.3 How to perceive the bioharmony, resonate with it, and modify it?

In the sequel I christen the sender of emotional signal Alice and its receiver Bob since the world of physics contains only spherical cows besides Alice and Bob. Human interaction involves emotional aspects. In the ideal case, Alice and Bob are able to sense each other's emotional states and are able to communicate their emotions. Empathetic Alice with noble goals can even change the mood of Bob from confused or sad to vsl and happy. Empathy does not mean benevolence. Hitler was known as a very empathetic person. Empathetic but malevolent Alice can do the opposite. What could be the description of this at the fundamental level?

1. Even a single note of a melody can induce a transition between chords of a given bioharmony represented as dark codons if it corresponds to a difference of notes of two chords. Note or several of them can change the chord so that it does not belong to the same bioharmony anymore. This would tend to change the mood.

If Alice is an empathetic listener not trying to affect the mood of Bob, she must use frequencies, which resonantly induce transitions between the chords of the bioharmony of Bob. Alice and Bob must be tuned: i.e. they must have the same bioharmony with the same frequency scale.

2. The ability to resonate with Bob requires that the signal sent by Alice contains peak frequencies, which belong to the bioharmony of Bob. To be empathetic, Alice should be able to sense the frequencies associated with the chords of Bob's bioharmony. From these frequencies Alice might be even able to deduce the chords of the bioharmony of Bob.

If Alice manages to do this, she has the gift of empathy or emotional intelligence. Autists might be regarded as people with a low level of emotional intelligence and the reason might be that they are not able to perceive the needed frequencies. Perhaps mirror neurons play an essential role here in detecting these frequencies.

Empathy has nothing to do with the moral or ethical standards of Alice. Alice can do several things. She can generate resonant transitions supporting the bioharmony of Bob. She can also try to modify the mood of sad Bob, say comfort him. Alice can do this by generating frequencies which affect the chords of the bioharmony of Bob so that it changes.

If Alice is malevolent, she can modify the bioharmony of Bob so that his mood becomes sad or depressed. If Alice is a psychopath, she can even force a disharmony without any symmetries leading to a total emotional confusion. Basically Alice makes a choice between good and evil. Perhaps the ugly words do just this at the level of the DNA of rice in Emoto's experiments whereas nice encouraging words do the opposite.

How the voices or gestures of Alice are transformed to dark photons, their triplets or even dark genes?

1. The voice of Alice could be transformed to dark photons with the same frequency spectrum by a generalization of the piezoelectric effect (see this). These dark photons should affect the dark proton sequences of the MB of Bob at the biomolecular level in order to generate an emotional response.
2. The frequencies must be consistent with the bioharmony of Bob and define the emotional color of the speech of Alice, which can be warm or cold or lacking emotional content altogether if Alice and B are not emotionally "tuned". Also the gestures of Alice should be coded to the sequences of dark photons or even of dark photon triplets representing kind of emotional music pieces. The notes of the melody should correspond to differences for the chords of the bioharmony in question.

3.4 Negentropy of bioharmony

Dark genetic code consists of 6-bit units and this aspect corresponds to the ordinary DNA as a bit sequence. Besides this there is bioharmony which relates to the information represented as emotions instead of bits. Emotional intelligence measures the ability to perceive the emotional state. One cannot give a simple measure for this ability. One can however consider information measures for the bioharmonies.

1. One can assign to the bioharmony a measure of its algebraic complexity and information content. The value of $h_{eff} = nh_0$, where n is a dimension of algebraic extension involved, would define a kind of IQ and perhaps also EQ. One can also assign a negentropy to the bioharmony, which could measure its information content. Of course, the EQ characterizes the ability to perceive the emotional state, and is not a property of bioharmony.

2. The intuitive picture is that the negentropy of the bioharmony characterizes the symmetries of the bioharmony. For a given bioharmony, one has 3 icosahedral symmetry groups Z_6 , Z_4 , and Z_2 corresponding to the 3 20-codon bio-harmonies. The symmetry group of a given 20-codon icosahedral code has orbits such that each codon at a given orbit codes for the same amino acid. There can be several orbits coding for the same amino acid. The k :th orbit contains n_k codons.
3. Consider first the definition of the entropy. The expression for the entropy of given bioharmony could be defined by the probabilities that a given chord belongs to the k :th orbit with n_k chords. The 3 20-chord harmonies are independent and the icosahedral contribution to the entropy is the sum $\sum_{K=1}^3 S_K$ of the entropies S_K associated with them. Also the tetrahedral contribution is present. One would have $S = -\sum p_k \log(p_k)$. p_k would be given by $p_k = n_k/N$, where $N = 20$ is the total number of chords in the icosahedral case $N = 4$ is the total number of chords in the tetrahedral case.
4. One wants to assign an information measure, negentropy to cognition. p-Adic number fields serve as correlates of cognition. Formally the definition is similar to that for entropy: one sums over the contributions of 3 icosahedral harmonies and the unique tetrahedral harmony. For a given p-adic prime p , one can define p-adic negentropy $N_p = \sum p_k \log(N_p(p_k))$, where $N_p(p_k)$ is the p-adic norm of the probability. Rather remarkably, this negentropy can be positive unlike entropy.

One can also define the sum $\sum_p N_p$ of the p-adic negentropies as the total p-adic negentropy. This sum involves only a finite number of terms since the probabilities are rational numbers and the p-adic norm differs from unity only if p divides the numerator or denominator of p . In this way one obtains non-negative information measure. It can be shown that the difference N-S is non-negative.

4 How to understand Emoto's experiments with freezing water and rice?

In Emoto's experiments with water at freezing point and with rice the emotional tone of the spoken words has a surprising effect on the system. How to understand this? Water is fundamental for life and in the TGD based view of life is quantum criticality is fundamental for life and conscious intelligence.

Water makes possible quantum critical fluctuations involving large values of h_{eff} measuring the algebraic complexity of the quantum state and also serving as a kind of IQ. The criticality for freezing and also other phase transitions would be basically quantum criticality and could have been essential for the emergence of the primordial life. The ice crystals found by Emoto in the experiments could be corpses of small primordial life forms formed by water molecule clusters. They would especially favored at quantum criticality and would have dark genetic code which would make it possible for these life forms to experience emotions. The biochemical realization of the genetic code would have emerged much later but would not be essential for the conscious emotional experience.

In the rice experiments, the Pollack effect [I2, I1, I4, I3] could play a key role [L10, L9]. The physiological temperature would be the quantum critical temperature for the phase transition taking place in the Pollack effect. Pollack effect creates matter with a very large value of $h_{eff} = \hbar_{gr}$, where \hbar_{gr} is gravitational Planck constant introduced by Nottale [E1] characterizing the monopole flux tubes of the gravitational fields of the Sun, Earth and also other planets. In the Pollack effect, incoming photons kick protons to dark protons at the gravitational magnetic flux tubes. This gives rise to negatively charged exclusion zones characterizing cells and DNA.

Pollack effect would be associated with the sol-gel phase transition. Pollack effect is also essential for the metabolism and photosynthesis. Pollack effect requires energy feed and for instance solar radiation can provide it. Also the formation of molecules from atoms can liberate the needed energy.

The dark protons would be associated with the magnetic bodies of water molecule clusters. Water memory and homeopathy would involve Pollack effect and would be associated with pri-

mordial life forms formed by water clusters [K2]. Water memory would allow the magnetic bodies to recognize and mimic the magnetic bodies of the invader molecules as small life forms with the same cyclotron energy spectrum. This would make possible the evolution of the immune system and of chemical life.

Also the electric counterpart of the gravitational quantum coherence is possible in the long range classical electric fields of Sun, Earth and also of smaller objects is an essential element of life [L13]. The long range electric fields associated with the central nervous system might involve macroscopic quantum coherence with a large value of h_{em} .

An induction of emotions similar to that occurring in human interactions could take place in the experiments of Emoto and transform the words of the experimenter to dark photon signals affecting the DNA and RNA of the rice. It is the peak frequencies determining the emotional tone which matter, not the content of the words in the usual sense. If the emotions are indeed universal at the level of dark genes, the emotional aspects of voice would be emotional also from the point of view of rice in water.

The words with an unfriendly tone would change the bioharmony to a less negentropic one. Friendly words would cause the opposite. This would not be about a direct modification of the metabolic energy feed but about its utilization: depressed people lose their appetite and this leads to metabolic deprivation. The sum of p-adic negentropies provides a quantitative measure for the negentropy of the bioharmony and it also could also serve as a parameter characterizing the mood.

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