A. Tedeschi, Int. J. of Design & Nature and Ecodynamics. Vol. 5, No. 1 (2010) 60–67

IS THE LIVING DYNAMICS ABLE TO CHANGE THE PROPERTIES OF WATER?

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ABSTRACT

Water is the main component of living matter and is also the main responsible of its self-organizing capabilities. The interaction between water and biomolecules changes in turn the internal structure of water, so that living water has different physical properties than normal water. In the present paper experimental corroboration of this property is provided. Vegetal leaves are triturated and suspended in water; the irritation produced by the cutting induces an intense electromagnetic activity that transforms the structure of water, giving rise to the imprinting of the particular biological process that has occurred. Experimental evidence of the changes of thermodynamic properties of the imprinted water is presented. This property of water could play a role in ecosystem organization.
Keywords: ecosystem, electrodynamic coherence, negentropy, water.

1 INTRODUCTION

The important role of water in living dynamics has been recognized and has produced the conceptual framework for the holistic approach to biology [1–4]. Moreover it has been stressed [1, 4] that water within a living system could acquire different properties than normal water. According to the theory of electrodynamic coherence [4] liquid water is organized in coherence domains (CD) within which an electromagnetic (e.m.) field is trapped. The wavelength of this field is the size of the CD, whereas its frequency, which is different from the value assumed by the free field in the empty space, is related to the energy level of the ensemble of molecules. Consequently, any intake of energy from outside would change the frequency of the CD. A close interplay between biochemistry and electrodynamics therefore takes place. Biomolecules able to resonate with the frequency of the CD get attracted and become adble to interact chemically; the output energy of the chemical reaction is assumed by the CD, changing its frequency of oscillation, which in turn changes the attracted molecular species. A time-dependent biochemistry then arises. This scheme allows us to conceive a dynamics where the ordered ensemble of electromagnetic signals released during a biological cycle is imprinted, following the above scheme, into liquid water, which becomes the vehicle of the signals released in the original process to other organisms. In particular the biological cycle corresponding to an irritation compelling the original organism to produce an intense reaction is a good candidate to provide a water imprinting able to increase the adaptability of other organisms. A procedure for implementing the above suggestion is presented in this paper.

2 EXPERIMENTAL

In this paper an experimental procedure is presented where, in a controlled situation, water is subjected to the consequence of a dynamics of adaptive self-organization of living organisms. The procedure is the following: an ensemble of individuals belonging to a large number of vegetable species sensitive to light (algae, water plants, soil plants) suitably triturated is suspended into a dilute aqueous solution containing bicarbonates. This system is 'irritated' [2] by some 'environmental' accident able to induce a dynamic response based on adaptive self-organization.

The micro-environment where the play occurs produces a stimulation of the adaptive response of many vegetal species that have in common photosynthesis as the dynamic agent but differ among them with respect to the structure and the functioning.

ISSN: 1755-7437 (paper format), ISSN: 1755-7445 (online), http://journals.witpress.com
DOI: 10.2495/DNE-V5-N1-60-67

This system coincides therefore with the confined ontic open system (COOS) introduced in [1]. The living species, excited by the applied light, produce a dissipative structure having an internal time according to what Prigogine [5] has postulated for living organisms. Our system is just a transient COOS that starts-up, grows gradually until reaching a peak of adaptive capability [6, 7] and then decays and eventually dies. According to the recent findings of the group of Montagnier [8] and to the theoretical predictions of quantum electrodynamics (QED) [4] electromagnetic emissions (e.m.) are expected to appear in the system. Materials (glasses, plastics) that theoretical expectation [9] indicates as suitable to store this emission in their inner coherent structure are consequently used. The plausibility of such expectation should of course be checked by the eventual success of the procedure. Subsequently normal water is put in contact with such imprinted materials and some properties of water are checked before and after the contact. The surprising result is that changes are observed in the properties of water without any apparent exchange of energy or other physical variable. This anomalous outcome is understandable only by assuming that a flow of information has come out from the living system to the glassy material and subsequently from this one to the normal water.

The system is prepared as follows. 1 litre of commercial mineral water containing a fair amount of bicarbonates (about 150 mg/l) is taken. Subsequently plants belonging to the following species are collected:

- Water plants:
  Pawstri (BIA. VERDI)
  Clorophytum
  Dracena variegata
  Anubias barteeri
  Vausneria gigantea
- Dried sea algae:
  Undaria pinnafida
  Agar-agar
- Soil plants:
  Olea Europaea
  Lilium
  Hedera helix
  Laurus nobilis
  Vinca major
  Pyrus communis
  Pteridium aquilinum
  Aloe barbadensis (Miller)
  Rosa canina

Dried algae should be hydrated with carbonated water. The leaves of all the listed vegetables should be cut until reaching fragments having a size not larger than 1 cm. For each species 20 g of triturated leaves are selected.

The following technical instruments have to be used:

1. white bulb lamp having a tungsten filament [in the operation I use an optical fibre (Heine) lamp having a power of 150W];
2. transparent vessel;
3. plate made up of glass or plastic (Plexiglass) having sides of 10 and 5 cm and a depth of 1 cm.

The following operations are performed:

1. A litre of carbonated water enclosed in a 2 litre container is strongly succussed and agitated manually. This succussion is meant to get oxygenation and activation of water as discussed by Elia et al. [10].
2. Hydrated algae and triturated leaves are dropped in the succussed water.
3. The mixture of water and vegetables is succussed again 100 times while constantly illuminated by the light of the bulb lamp. Subsequently it rests for 45 minutes, still illuminated. This is the necessary time for the photosynthetic system to reach the peak of self-adaptation. The system produced so far is shown in Fig. 1 and is what ancient alchemists called Materia Prima (MP), namely the raw material. Plant trituration, water succussion and light stimulation are meant to be the irritation described in the introduction.
4. MP is poured in the transparent vessel. This system becomes the environment able to imprint the plate of glass or plastic. The imprinting is performed as follows. The plate is heated in an oven (up to 200°C in the case of glass and 80° in the case of plastic). The heated plate is hit by the lamp light beam, which has traversed the vessel containing the MP. The exposition is kept until the plate cools down to the room temperature (Fig. 2). This procedure is assumed to produce the imprinting, namely to induce the transition of the inner configuration of the plate to a coherent excited state.

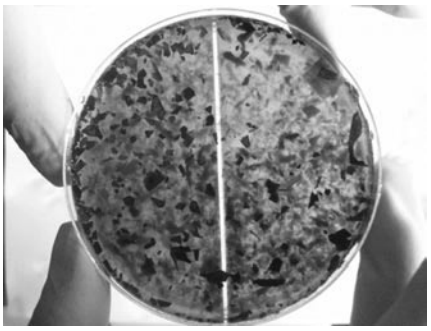

Figure 1: The picture shows what is named 'MateriaPrima' in texts namely the suspension of triturated plants in succussed water. This was taken 2 minutes before the start of the procedure.

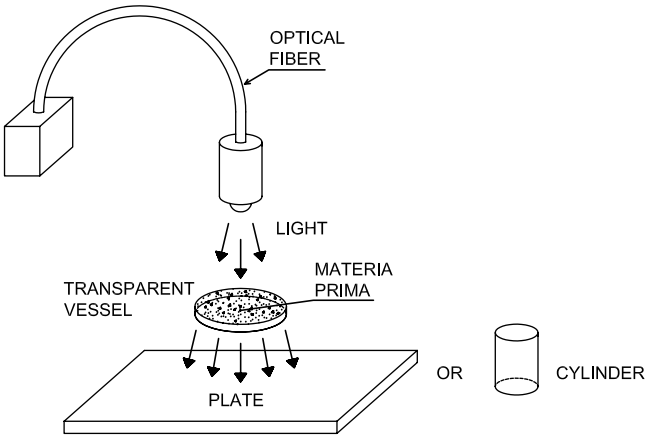

Figure 2: The graph shows the layout of the apparatus for the imprinting procedure.

According to the theory developed by Buzzacchi et al. [9] the electromagnetic emissions in a definite coherent state generated in the process of preparation are trapped into the glass or in the plastic generating a permanent coherent oscillation of the type described by Del Giudice and Pulselli [4]. Evidence of the existence of such emissions during biological processes has recently been presented by the Nobel laureate Luc Montagnier [8]. Montagnier assumes that in living organisms there should be aqueous microstructures as support of such electromagnetic emissions. Coherence domains of water are good candidates for playing such a role and it has been stressed by Del Giudice and Tedeschi [11] that they are actually also able to produce a self-organizing dynamics around them. Other liquids, such as glasses, are unable to do the same, but, nevertheless, could store such emissions passively and transfer these emissions to other resonators, such as water again.

The imprinted material becomes then a tool to transfer information from one living being to another. Therefore by using the imprinted glass plate one could transfer to the normal water contained in a vessel the same dynamics that occurred during the preparation in the vessel that has contained MP. In order to do that one can put for some minutes the vessel of normal water on the plate and subsequently supply the imprinted water to the living organism. Alternatively one could send to the living organism a beam of light that has traversed the imprinted material and has modulated its intrinsic oscillation with the oscillation going on in the material. In fact, if a cylinder made of plastic or glass is treated in the same way as the plate is, one obtains a cylinder to be used as the treated material that has to be traversed by light (Fig. 3). This light is named ‘informed light’.

In the present article the changes observed in liquid water after contact with the imprinted plate or the light are discussed.

3 OBSERVED CHANGES OF THE PROPERTIES OF WATER

Two physical variables have been checked:

1. heat of mixing with an alkaline solution;
2. rotational viscosity

Let us examine the two cases in detail.

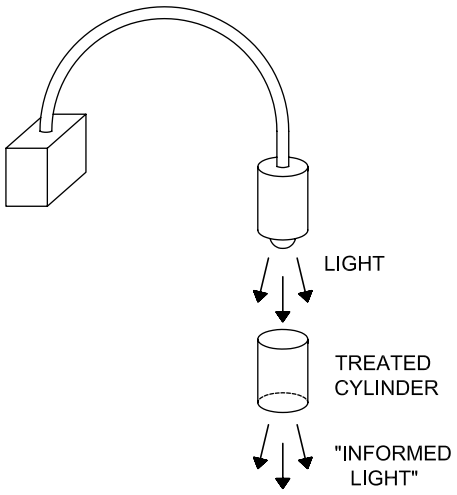

Figure 3: The graph shows the layout for imprinting information by light.

3.1 Heat of mixing with an alkaline solution

The measurements of the heats of mixing have been performed in the Department of Chemistry of Naples University in the laboratory of Prof. V. Elia by using flow-mix calorimetry (LKB standard flow microcalorimeter at 25°C with a sensitivity of 0.1 μW). Two vessels, one containing a solution of sodium hydroxide and the other containing demineralized water, are connected by a two-way peristaltic pump to the calorimeter where the two fluids mix in a cell whose temperature is carefully measured. The heat of mixing is derived from the observed variation of temperature. This procedure allows to have the value of the heat of mixing in real time. By observing this power–time graph we can see that in a normal case we have a transient phase and a stationary phase. If the instrument parameters don't change with time, the stationary phase is represented by a horizontal line that could last a very long time. A change in the nature of the tested liquid would imply a new stationary phase that would correspond to the heat of mixing of the new fluid. Should the two mixed fluids be identical, the power–time graph would coincide with the baseline.

The power–time graph of the outcome of our experiment is shown in Fig. 4. We start with normal demineralized water. Arrow 1 denotes the start-up of the experiment. As expected the first part of the graph shows the reaching of the stationary value of the heat of mixing of normal water. At the time marked by arrow 2 an imprinted plate is slipped below the vessel containing normal water, without the occurrence of any exchange of energy between the plate and the vessel. The graph shows an instant decrease of the heat of mixing, as if water had changed nature! At the time denoted by arrow 3, part of the water in the vessel is extracted by reducing its volume to 20 ml. A sharper decrease of the heat of mixing is obtained, indicating a new reorganization of water. This result is surprising since an intensive quantity as the molar heat of mixing seems to become an extensive one. A similar 'volume effect' has been observed by Elia et al. [12] on the electric conductivity of succussed water. In conclusion the observation can be summarized as follows: the heat of mixing decreases when water is in contact with the 'informed material', which means that presumably a flow of information and hence of negentropy has occurred. The amount of the decrease depends on the volume of water; this presumably means that, as in the case of [12], dissipative structures are at work.

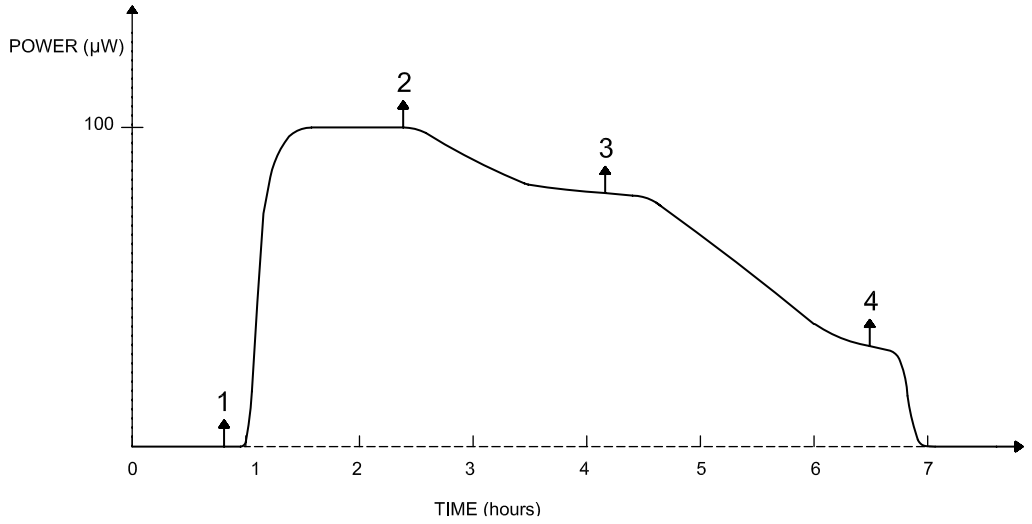

Figure 4: The calorimetric graph shows the evolution of the mixing heat in real time during the application of the imprinted plate on water.

As a control, at the time marked by arrow 4 the plate has been removed and the vessel of water has been replaced by a vessel containing the same titrated alkaline solution. The graph recovers the initial baseline showing that no variation has occurred in the sensitivity of the detector. It can also be observed that the sensitivity of the calorimetric device (0.1 μW) is very high in relation to the differences of the power values between normal and treated water (in the scale of 100 μW), as can be seen in the curve of the calorimetric graph; hence it can be assumed that the phenomenon is real.

3.2 Rotational viscosity

The rotational viscosity of a fluid is measured by performing an angular acceleration of a concentric cylinder that is submersed in a cylindrical vessel containing the fluid. The measurement device (HAAKE VT500 viscosimeter with microprocessor control working at 25°C) records the tangent force (Tau, measured in Pa) as a function of the instant angular speed (measured in 1/s) reached during the rotational acceleration. In this case we probe the standard water and the same water treated with a direct beam of 'informed light' for a time duration of 1 minute. The result of the measurement is shown in Fig. 5. The rotational viscosity of 'informed water' is more than three times smaller than

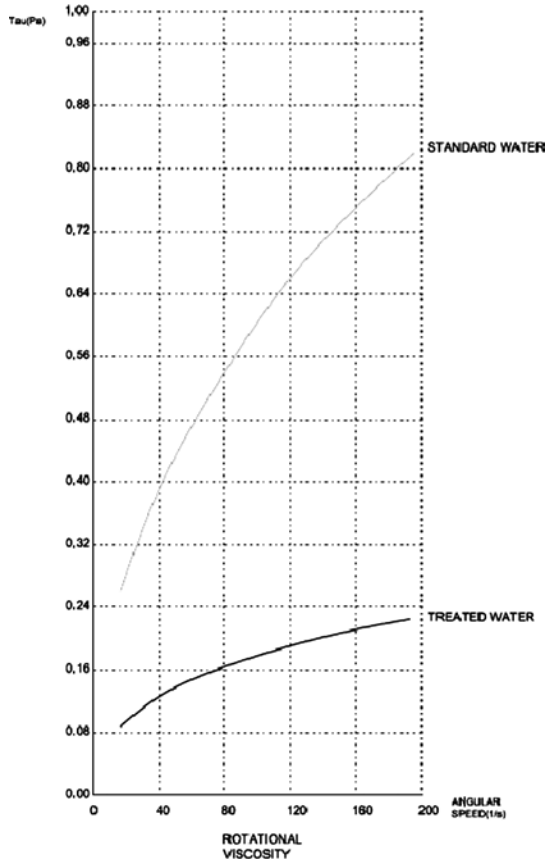

Figure 5: The graph shows the dependence of rotational viscosity on the applied torque in the two cases of normal and treated water.

the corresponding value of normal water. We observed that normal mineral water treated with the informed beam of light shows a lower value of the ratio between the tangent force and the rotational speed.

As a further control, succussed water poured in the transparent vessel to replace the MP as a 'filter' has no effect on the treated material. No variation of the rotational viscosity is detected in this last case.

4 DISCUSSION

Let us discuss briefly the reported observations. A change in the thermodynamics of water has occurred without any evident supply of energy! The contiguity with a treated glass has been sufficient to halve the heat of mixing of water with a specific titrated solution. Since there has been no flow of energy, information only could have been flowed from the plate to the water. In turn the plate has been kept in contact with a region where an intense living activity was going on. Could a flow of negentropy, originated in the living process, have been trapped in the plate and eventually transferred to the vessel of normal water? The experiment of Montagnier [8] suggests convincingly that biological activity, like that presumably occurring in the triturated leaves and algae of our MP, produce detectable electromagnetic fields. Moreover Prigogine (see the discussion in [1]) has shown that biological activity implies a strong decrease of entropy. Consequently one should admit that the e.m. fields could just be the agents of this decrease of entropy [13, 14]. The implementation of self-organization by means of an electromagnetic field, which is a physical object that can be stored within suitable structures, suggests, in agreement with the results of Montagnier, to conceive a procedure of transfer of biological information. This suggestion is also in agreement with the line of thinking inaugurated by Gurwitsch and that has brought to the discovery of biophotons [15, 16]. This possibility could be an element of the self-organization of ecosystems.

The appearance of anomalous values of the mixing heat and rotational viscosity in liquid water could be correlated with the onset of a coherence among the coherence domains of water (supercoherence) as discussed in references [4, 11, 13]. As a matter of fact the onset of a coherent dynamics determines the decrease of the energy level of the system that has become coherent. Consequently the water that, thanks to the exposition to a living dynamics, has become supercoherent settles in a lower energy state and therefore releases less energy when mixed with the titrated solution. It is interesting to observe that the variation of the mixing heat in the present case is the opposite of the variations observed by Elia [10] in the case of succussed water. As a matter of fact succussed water is an excited state of normal water, since coherence domains store the energy of succussion without still being able to release it. In our case, on the contrary, the stored energy is released so that the oscillation of the coherence domains can actually occur and the supercoherent regime, with the consequent decrease of the level of energy, takes place.

The decrease of rotational viscosity could be connected with the onset of vortices in the coherent structure of water that are the consequence of the onset of the supercoherence.

ACKNOWLEDGEMENTS

I wish to give special thanks to Vittorio Elia and Elena Napoli for their contribution to the calorimetric measurements that gave us an extraordinary overview of the phenomenon, Emilio Del Giudice for his breakthrough theoretical explanations, Vladimir Voeikov for the intriguing vision of life's biology and Enzo Tiezzi for the positive discussions about the coherent biological water and its role in the Prigogine's dissipative structures of the living systems.

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