

DISORDER, ORDER AND LIFE

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“And thy spirits fiery flight of imagination acquiesces in an image, in a parable”
—Goethe

Speculations regarding what life is, are always interesting, and very productive. The speculations are interesting because there is seemingly no answer to the question regarding life; they are productive since they produce more questions than answers! Each time there is a breakthrough in physics, the new insight is applied to biology in the fond hope the question “what is life?” could be settled. Thus we have concepts of power and energy as a basis of life after Newtonian physics; and presently, there are references to quantum physics, coherence and non-Hertzian physics as possible ways of explaining what life is

The famous biologist and Noble Laureate, Albert Szent-Gyorgy has spent much time and energy addressing this question. He says:

There is probably no biologist who has never asked himself, What is life? If Nature is silent, something may be wrong with the question. The question is wrong because there is no such thing as life—nobody has ever seen it. What we can see are only material systems which have this wonderful quality of being alive. Alive is a quality, and the question is, what quality.^{1(p.2)}

He then goes on to investigate the quality that makes life. All of us realize that even a cell has a life; however, body should have a quality to it to be called alive. That property that gives a cell its behavior that we call life is still elusive. Szent-Gyorgy says:

All living matter, be it your finger or the mouse's tail gives an ESR [Electron Spin Resonance] signal, and is thus paramagnetic.^{1(p.3)}

The living state is the electronically de-saturated state of protein.^{1(p.17)}

Taking out electrons irreversibly means killing.^{1(p.18)}

Thus, the living state is a state in which electrons are available for a biomolecule for interaction with the environment. Lack of interaction with the environment implies lack of quality of life, in Gyorgyian terms.

Now, searching for definitions of life from a physicist, we come to Erwin Schrödinger, the person who gave quantum physics its mathematical basis. His book *What is Life?* has the subtitle *Physical Aspects of the Living Cell*.² Before we analyze his ideas, the concept of entropy should be understood. Any system (for example, a cell, the whole body, the earth, the solar system etc.) tends to move towards disorder; things fall apart, the components of any system disintegrate, and ultimately reach a chaotic state. The system is said to go from low entropy to high entropy. Thus, entropy is a measure of disorder of a system. However, during life, the body avoids this natural tendency for increase in entropy. This is achieved by the intelligence of the body that takes energy in the form of food from the environment and maintains low entropy within the body so that life is maintained. Thus, struggle for survival is a struggle for maintaining this lowered entropy of the body.

The last statement introduces a relation between life and entropy. The less the entropy the more there is life. In other words, for life to be possible, entropy must be minimum. [There are no numbers given to entropy at this point for life to be possible; hopefully, some physicist will come with such a number so I could say, using an Entropy Meter, I am 35 per cent alive today so I am going home after 2 PM!] Actually, Schrödinger introduces a term negative entropy or negentropy referring to the constant battle an organism wages to maintain life by maximizing negentropy.³ Sunlight has enormous amounts of negentropy since all plant life sustains on this. We maintain our negentropy by assimilating foods that have high value of negentropy themselves such as plants. He says:

Thus the device by which an organism maintains itself stationary at a fairly high level of orderliness [life, in our parlance] really consists in continually sucking orderliness from its environment.^{2(p.79)}

Thus, it is likely the quality called life in a group of molecules could be understood based on negentropy. Further, as stated above, taking out electrons irreversibly means killing. Thus, it is likely that electrons are related to negentropy. In spite of all this, the quality of life still seems to elude the wise observations of these two scientists. Since it is likely that subtle energies are related to life, perhaps measurement of subtle energies could provide a means for understanding life itself. More about this later. Instruments and procedures that possibly measure subtle energy form the bulk of papers in this issue of the Journal. Let us review the high points of the papers presented herein. Curiously (or is it really) all the papers in this issue fall under the category Experimental.

The first paper in this issue, *Anomalous Environmental Influences on in Vitro Enzyme Studies*, by Michael Kohane and William Tiller, is a continuation of a paper published in the previous issue of the Journal. The devices are two identical electronic circuits having a memory component used in computers and an oscillator that could normally generate a sinusoidal voltage of desired frequency if activated by a battery. The circuits in these experiments however contain no batteries and no antenna. Thus they cannot physically generate a waveform nor interact in any known way with circuits outside. One of the devices has an intention implanted; the intention is to increase thermodynamic activity of an enzyme. The second device acts as a control. Interesting results are reported by the authors to further strengthen the outlook that mind-matter interactions are indeed possible under specific conditions. The question remains as to how we can bring about a controlled, dose-response type behavior in mind-matter interactions.

The second paper, *The Effects of Upledger CranioSacral Therapy on Post Traumatic Stress Disorder Symptomatology in Vietnam Combat Veterans*, by John Upledger, Barry Kaplan, Russell Bourne and Richard Zonderman, deals with intensive treatment for Vietnam veterans suffering from PTSD. Roughly one million military personnel are believed to have PTSD. This staggering number has created a near epidemic of this disorder needing immediate attention. Dr. Upledger has put together a combination therapy with CranioSacral leading the way. The therapy also includes energy cyst release, SomatoEmotional Release, imagery, spinal manipulation, massage, acupuncture and individual psycho- and hypnotherapy. A series of measures are administered to evaluate

the procedures. Two weeks of intensive treatment is found to be beneficial to the participants. This holistic approach could be a breakthrough in patients with PTSD with possibilities of rehabilitating a large number of veterans with this disorder.

The next paper is by Norman Shealy, Vera Borgmeyer and Paul Thomlinson titled *Intuition, Neurotensin and the Ring of Air*. Using a set of acupuncture points, transcutaneous electrical nerve stimulation [TENS] and low intensity microwave fields, neurotensin levels are raised in subjects, bringing increased mental lucidity and awareness. In some psychotic patients, neurotensin is found to be decreased. Thus, this work could provide a method of increasing the neurotransmitter and hence in the management of these disorders.

The fourth paper, *Treatment of Parkinson's Disease Using the Cayce Wet Cell Battery* is from Douglas Richards, David McMillin, Eric Mein and Carl Nelson who have been working with Edgar Cayce material for a long time. Cayce had recommended the use of a wet cell, a specially constructed battery-like device to be used in many neurological disorders. Parkinson's disease is a difficult condition to manage with conventional treatment. Using the wet cell, the subjects had slight to moderate improvement in their symptoms over a four month period. Many minor improvements (minor, from a clinical point) were also reported, such as regaining a sense of smell and improved color vision. While these may not seem dramatic, the improvement in quality of life for these patients should be an incentive to continue use of this procedure.

The last paper in this issue, *Deficient/Excessive Patterns Found in Meridian Functioning in Cases of Liver Disease* is by Hiroshi Motoyama, whose acupuncture instrumentation named AMI (Apparatus for measuring the Meridian functioning and their corresponding Internal organs) has undergone many trials in assessment of several clinical conditions. In this paper, Dr. Motoyama has used this instrument to study the deficient and excess activity of select acupuncture points in different types of liver diseases. In severe cases of liver diseases, the apparatus seems to effectively indicate the deficient energy circulating in specific meridians. Some of the observations also seem to coincide with acupuncture theory. These points make the instrument of interest in monitoring some disorders. More importantly, this instrument seems to record changes in acupuncture activity on a short term basis (of the order of half an

hour); this means this instrument could be useful in monitoring subtle energy changes in a person as the person undergoes healing.

Last, but not the least is the cover art. The art titled *Celebration* by Paul Bennett is of great significance today when we are going through much trauma, financial distress and mental burden. The artist's rendering integrates celebrating the land, the environment and the spirit in this cover art.

REFERENCES AND NOTES

1. Albert Szent-Gyorgyi, *The Living State: With Observations on Cancer* (Academic Press, New York, NY, 1972).
2. Erwin Schrödinger, *What is Life? & Mind and Matter* (Cambridge University Press, U.K., 1967).
3. Note: Entropy = chaos; hence, - entropy (or, negentropy) = - chaos = order.

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