

COHERENCE AND PATTERN: SCIENTIFIC AND AESTHETIC

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The concept of coherence in biological systems—like many new ideas that pervade the subtle energy paradigm—is far from being accepted. However, new theories emerging in physics postulate matter as conceived of an array of coherent domains connected in special ways.^{1,2} A biological system of molecules could be considered as an array of many microscopic components interacting through coherent chemical reactions. Many physical fields, such as electromagnetic fields, are coherent and thus, an interaction between biological systems and electromagnetic fields has been proposed in the above papers which could be very important in clarifying concepts in the ongoing controversy in this area. It is likely that the concept of coherence could lead us to an understanding of “life” itself.

It was Professor Herbert Frohlich who, way back in the early 1970’s, started to formulate the theory of coherent excitations in biological systems as a consequence of electric dipoles that oscillate in phase at the cellular level. Many biomolecules are polar in nature, with electric dipoles coupled together to manifest a macroscopic chemical activity and large distance ordering. Anomalous diamagnetic effects have been observed in cell cultures providing support to the early theories of possible existence of superconducting volumes within a cell.³ *This superconducting effect takes place at body temperature, which is way above temperatures achieved in any laboratory for superconduction.*

It is clear from the brief summary above, that coherence is an important property of biological systems. Dr. Cyril Smith, one of the leading scientists working in this area at the University of Salford, England says: “Much of the

apparent randomness in nature is because we are not measuring it with adequate precision.”⁴ We might even postulate that coherence phenomena (along with other characteristics, of course) reflect fundamental life processes. Classical physics describes an *incoherent* system dynamics wherein each particle is a separate, localized entity interacting with each other through collisions and other energy exchanges. They require an external “agent” to become ordered. On the other hand, says Dr. Emilio del Giudice “. . . in the ‘coherent regime’, particles lose their individual identity, cannot be separated, move together as if performing a choral ballet, and are kept in phase by an electromagnetic field which arises from the same ballet.” Further, “. . . in the ‘coherent regime,’ each particle moves together with the others, and because of them its motion is the same, and not, as in the incoherent case, a motion in spite of that of others. Very strong forces are generated in the coherent regime that may be involved in the phenomena of cold fusion as well as biological self-organization.”⁵

Quite apart from all that has been said above, the concept of coherence is an interesting one for the holistic and subtle energy fields. Dr. David Peat, a long time associate of Dr. David Bohm, has written eloquently about this in the previous issue of this Journal. Discussing coherence, he summarizes “. . . one can recall this principle by different names, antisymmetry, synchronicity, nonlocal connectivity, global form, dynamical order, yet all point in the direction of correlation that transcends anything known in the classical world.”⁶ Writing about the circulation of subtle energies maintaining homeostasis in the body, Dr. Peat continues, “The key to this process, as with the laser, is a global correlation or circulation operating at an extremely subtle level through the operation of what could be called, metaphorically, a highly intelligent application, or highly sophisticated, active information. The key to this healing would therefore be a circulation of some sort of global, non-local correlation that operates throughout the body, a circulation that may even extend into the group, nature and the cosmos.”⁶ There is indeed scientific rigor and poetic quality in the writings of the two physicists quoted above.

This leads us to the contents of this issue of the Journal. The papers deal with balance, coherence and pattern that emerge in certain clinical and mental activities of the human brain. Indeed, all three technical papers deal with the interactions of the human brain at many levels: within a person, between people and last but not least, interaction between the brain activity and the physical environment.

In the first paper, Meg Patterson, M.D., reports a series of clinical trials in addiction disorder, using extremely small amounts of electric currents transcranially. The currents are below the sensory threshold of most people and is used continuously for 7 to 10 days. The paper reports elimination of withdrawal symptoms, craving and anxiety. The procedure, done under medical supervision, seems to be very effective. Similar results have been reported by other doctors working with addiction disorders and using cranial electrical stimulation.⁷

The second paper deals with coherence in EEG spectra of two individuals who are in *direct communication*. In extensive trials conducted in Mexico by Jacobo Grinberg-Zylberbaum, Ph.D. and his colleagues, two persons sit inside a Faraday cage, in *direct communication* with each other, in other words, not communicating through any sensory modality. After a short period of such direct communication, one person moves to another, neighboring Faraday cage. When a flash of light is given to the first subject, the EEG of the second subject shows an evoked potential (called “transferred potential” by the author), *in synchrony with that of the first person*. The waveform morphology and statistics indicate a strong correlation between the two persons’ brain waves. This study introduces a scientific basis for an ancient concept of *direct communication* between individuals that seem to transcend sensory interactions.

The third paper, by Edwin May, Ph.D., and Larissa Vilenskaya, takes us to the realm of mind/matter interactions. The authors studied parapsychological research in some laboratories in the Soviet. The methods used and the results reported by different research groups are discussed in the area of anomalous mental phenomena. While some experiments could be termed preliminary, there is a wealth of information in the Soviet in the area and it will be interesting if these experiments could be replicated in other parts of the world.

In the Perspective section, Larry Dossey, M.D., discusses the concept of *energy* in relation to consciousness and healing. He argues for the study of “limit cases” in healing much the same way as limit case studies are used in physics. He comes up with a koan for subtle energy: “who is it that is *doing* the work?”

Last but certainly not the least, is the cover illustration for this issue. It depicts a beautiful view of a crystal of Vitamin C in all its microscopic splendor. Beauty is not only in the eye of the beholding camera, but in the thing itself, without reference to anything else. A crystal is a coherent structure; it has a specific pattern. It creates an order around itself. It can decompose a complex structure (such as white light), or it can bring together disparate components into unison. Every great Master is a crystal; in clarity and in bringing unity. Let us be crystals unto ourselves and to the world.

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REFERENCES AND NOTES

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2. Emilio Del Giudice, "Magnetic Flux Quantization and Josephson Behavior in Living Systems.," *Physica Scripta* 40 (1989), pp 786-791.
3. Cyril W. Smith, "Superconducting Areas in Living Systems," in *The Living State - II*, (Ed) R. K. Mishra, Wiley Eastern (1987), pp. 404-418.
4. Cyril W. Smith, "Generalities: Living Systems and Dielectrics," *Energy Transfer Dynamics*, (Ed) T. W. Barrett and H. A. Pohl, Springer (1987), pp. 313.
5. See reference above pp. 19
6. F. Davit Peat, "Towards a Process Theory of Healing: Energy, Activity, and Global Form," *Subtle Energies* 3, 2 (1992), p 21 and p. 18
7. Robert I. Picker, "Cranial Electrotherapy Stimulation," *Bridges* 4, 4 (1993, in press).

COVER ART

The cover image is a photomicrograph of a crystal of Vitamin C revealed by the technique of differential interference contrast microscopy. Pure solutions of inorganic salts were prepared and allowed to crystalize on glass plates in order to develop natural form. The microscopic technique involves the manipulation of light through the specimen using polarizing filters, beam-splitting prisms, and lenses of a microscope before exposing film in an attached camera.

The photographer, Dr. Vic Eichler, is a research biologist. In recent years structures which intrigued him as objects of scientific interest have reemerged in color, form and texture as objects of art. He has received national awards in medical art photographic competition.

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