Search for the Rosetta stone of teleportation: Insights for the next millennium

Z.W. Wolkowski
(dr.hab.sc.phys., dr.hab.lett.sc.hum.)
University of Paris 6
(BC 64)
4 place Jussieu
75005 Paris, France
E-mail: zww@ccr.jussieu.fr

Introduction

The underlying, yet often unstated question in biological research is: "what is life?". Since the exact sciences validate and direct advances in biological sciences, and delineate genuine areas of investigation, modern definitions increasingly reflect progress in solid-state physics, bio-electronics, submolecular and quantum biology (1). They lead to a description of the living state which underlines the complementarity of its chemical and electromagnetic natures. The study of coherent excitations in biological systems, including the possibility of DNA as a source of several coherent phenomena, justifies such an approach and warrents the extension of the analogies(2). Recent advances in fields such as far from equilibrium thermodynamics, lead to new forms of dialogue between science and the humanities, while the vision of nature is at present undergoing change toward the multiple, the temporal and the complex(3).

The study of the historical development of science indicates a shift from a mechanistic (circa 1600 AD), through a chemical (1800 AD), to the current informational model (since 1950)(4). This mutation or metamorphosis is a synergy in itself, since the previous methods are successively integrated. This evolution of conceptual models from material to increasingly immaterial, corresponds to a larger mutation of paradigm in the domain of science itself(5).

The electromagnetic nature of living systems

Over the previous fifty years, there have been striking developments in both theoretical and experimental physics. However, there is a time lag before these new concepts are accepted in biology. At present, a satisfactory theoretical biology requires the same complementarity between field and particles, as found in physics. The field appears to be the unit of biological form and organization, while molecules and cells are units of biological composition.

The transfer of these advances from physics has given rise to bio-electronics, sub-molecular, supra-molecular and quantum biology(6). The search for a better answer to a not so trivial and pertinent question, namely "what is life?", is moving investigation into domains of elementary particles (mainly electrons and protons), but also photons, electromagnetic and related fields(7). These electronic proceses are, next to biochemical transformations, a complementary reality of life. Both are coupled, and therefore the description of life in terms of electronic acceptors and donors, electromagnetic wave emittors and receivers, of photon exchange, opens up a fascinating horizon for research on health and disease, on life and death.

Apart from its obvious existence as a chemical substrate, living matter has a characteristic property of receiving and emitting physical fields, and specifically information-carrying fields, or phorons(8). In particular, biophoton emission is becoming increasingly accepted as a fundamental

property of living matter, and the coherent nature of these phenomena amount to the existence of biological lasers(9). The conclusion is that all living organisms emit relatively stable ultraweak photons in the UV and near IR spectral regions. The parameters of this emission (intensity, kinetic pattern and decay constant) change dramatically when bio-homeostasis is perturbed. Application of this method for the evaluation of an organism's adaptation abilities, resistance to external stress factors, and for an auxiliary rapid biomedical diagnosis of pathological states has been suggested(10). The implications of the electromagnetic description of living systems are far-reaching and open new horizons in every area of biology.

Possible relationship to the mechanism of image formation on the Turin Shroud

The scientific investigation of a unique piece of cloth, known as the A Turin Shroud, dates from the first photograph, taken in 1898: the first century of this research has just arrived (11). Perhaps the most important outstanding problems pertain to the image transfer mechanism. "Briefly stated, we seem to know what the image is chemically, but how it got there remains a mystery. The dilemma is not one of choosing from among a variety of likely transfer mechanisms, but rather that no technically-credible process has been postulated that satisfies all the characteristics of the existing image"(12). No single image-formation hypothesis accounts for all the observations, although it has been concluded that the image is the result of some cellulose oxidation-dehydration reactions and not an applied pigment. The application, transfer or recording mechanisms of the image onto the cloth are still not known. There has been speculation of a short burst of high-intensity radiation which might produce effects on the cloth that resemble the Shroud image(13). However, reported experiments with intense flash lamps, ultraviolet, visible and infrared lasers have not successfully reproduced the color density and distribution observed on the Shroud(12): so far the results suggest that the so-called "Flash of light" hypothesis is difficult to support. There appears to be a consensus among the majority of researchers, that the image was not man-made by "homo faber"(14), and that it had enclosed a human body(15). Because the Shroud is unique, every hypothesis of image formation must involve a set of unique conditions, and none can be rejected on this basis alone.

In conclusion of this topic, it should be noted that so far the investigation of the Shroud has ignored the mounting evidence on the electromagnetic nature of living systems, including biophoton emission and the existence of biological lasers, which have been briefly summarized here, and for which basic references are given. Laser physics was initiated less that half a century ago, and the fact that a Shroud-like image has not been successfully reproduced by man-made lasers is not a sufficient basis of rejection for a radiation-source hypothesis.

Modern science has hardly begun to explore the electromagnetically coded description of living systems, the quality and characteristics of their possible emissions and interactions. In due time, this new evidence may shed light on the mechanisms of the image recorded on the Shroud. Although unique, the further investigation of this image may enhance our comprehension of the living state itself.

Search for new principles and new resonances in physics

The fundamental principles of conservation in physics, obeyed by all known physical laws, are related to electrical charge, baryonic number, energy/mass, and angular momentum. At the turn of a millennium, it may be appropriate to ask what may be the new principles for an emerging organic (or cybernetic) physics? What will be the new resonances? Will they be related to information, asymmetry, form, similitude?

Quantum teleportation

Teleportation has until recently been considered as an impossibility, but with the advent of quantum teleportation there seems to be a new perspective: "it is the disembodied transport of an unknown quantum state from one place to another". It was predicted theoretically by an international team led by Charles Bennett of IBM's T.J. Watson Research Center in New York in 1993 (16).

They made use of the most unusual aspect of quantum mechanics, the Einstein-Podolsky-Rosen (EPR) correlation, first described in 1935, more commonly known as entanglement. Albert Einstein himself was quoted as describing this effect as "spooky" because of its very nature: altering one particle of an entangled pair causes the other to be affected, a highly correlated way without any communication between the two.

The first experimental quantum teleportation was achieved in 1997 by Anton Zeilinger and his team at the University of Innsbruck (17). A subsequent first unconditional quantum teleportation was realized in 1998 by H.J. Kimble and co-workers at the California Institute of Technology(18), where every state entering the device is actually teleported.

Quantum teleporation is a striking application of the holistic nature of the physical world, revealed by quantum mechanics. It is expected to have uses in quantum computers, much faster than the classical computers, and quantum cryptography, the ultimate means of encoding. It is bound to feature in the continuing discussion about reality, locality and whether there really is what Einstein called "spooky action at a distance". It has opened many doors in science and technology, including to the understanding of the true nature of the universe.

Possible relationship to the Turin Shroud

There appears to be consensus among the majority of researchers, that the Turin Shroud enclosed a human body, the mechanism and specifics or its displacement are yet unexplained(14)(15), and represent a major outstanding problem. Although no existing laws of physics prevent teleportation from being carried out at microscopic levels, it is extremely unlikely that this scheme be extended to macroscopic objects, because the uniquely quantum properties (such as entanglement), that make teleportation possible, quickly break down as objects scale up. Such is the state of the art today.

Conclusions

The transdisciplinary and futuroscopic investigation of the Turin Shroud in the next millennium open the possibility of new insights not only for the life sciences, but perhaps also new horizons for physics, cosmology and epistemology.

References

1. A. Szent-Gyorgi, Bioelectronics, Academic Press, New York (1968)

2. H. Frohlich, Coherent excitations in biological systems, Springer Verlag (1983)

3. I. Prigogine, The rediscovery of time, Zygon, 19(4), 433-447 (1984)

4. Z.W. Wolkowski, The field concept in physics and biology, in Synergy and Coherence in Biological Systems, 1983-1984, Paris. ISBN 2-904414-02-9

5. A.S. Pressman, Electromagnetic signaling in living matter, Moscow (1974)

6. E.T. Kulin, Bio-elektretnyi effekt, Minsk (1980)

7. Z.W. Wolkowski, Utility of bioelectronics in the study of biological terrain and its equilibrium, in Proceedings of International Symposium on Wave Therapeutics, Versailles, 1979. ISBN 2-904414-00-2 Paris (1983)

8. Z.W. Wolkowski, in Atti Congresso Nazionale Studi della Sindone, Siracusa, 1987, p. 206-213, Edizione Paoline, Milano
- Sur l'evolution de certains concepts physiques dans les sciences de la vie, Revue Internationale de Systemique, vol.2,4 p.459-477 (1988), Dunod, Paris
- The concept of coherence considered as a systems isomorphism, Systems Research, 9,4 p. 61-66 (1992)
- Recent advances in the phoron concept: an attempt to decrease the incompleteness of scientific exploration of living systems, p. 33-51, in Biophotons, non-equilibrium and coherent systems in biology, biophysics and biotechnology, Moscow, Bioinform Services (1995) Ed. L. Beloussov, F.A. Popp ISBN 5-85691-046-X

9. P.S. Callahan, Applied Optics, 16,3098(1978)

10. J. Slawinski, Necrotic radiation and the electromagnetic theory of life, J. of Near-Death Studies (1987)
- Present status and prospects of photon emission from biological systems, Polish Academy of Sciences, Published by World Scientific Press, Singapore (1987)

11. W. Meacham, The authentificationof the Turin Shroud, an issue in archeological epistemology, Current Anthropology, 24(3), 283-311 (1983)

12. L.A. Schwalbe et al., Physics and chemistry of the Shroud of Turin, Analytica Chemica Acta, 135, 3-49 (1982)

13. K.F. Weaver, Nat. Geogr. Mag. 157, 730 (1980)

14. Reference (11) and bibliography within

15. W.D. Edwards et al., On the physical death of Jesus Christ, Journal of the American Medical Association, 255(11), 1455-1463 (1986)

16. C.H. Bennett et al., Teleporting an unknown quantum state via dual classical and EPR channels, Phys.Rev.Lett. vol 70, 1895-1899 (1993)

17. D. Bouwemeester et al., Experimental quantum teleportation, Nature, vol.390. 575-579 (l997)

18. A. Furusawa et al., Unconditional quantum teleportation, Science, vol. 282, 706-709 (1998)

Vai alla pagina dell'indice - Go to the index page