Foreword

It from bit symbolizes the idea that every item of the physical world has at bottomat a very deep bottom, in most instancesan immaterial source and explanation; that which we call reality arises in the last analysis from the posing of yes-no questions and the registering of equipment-evoked responses; in short, that all things physical are information-theoretic in origin and that this is a participatory universe. John A. Wheelers words, which resonate across a century that has been violently reshaped by developments in quantum mechanics, have been echoed in one form or another by almost every physics luminary of the 20th century, from Planck and Eddington to Wigner and Bell. In Wigners view, it was not possible to formulate the laws of quantum mechanics in a fully consistent way without reference to the consciousness." But that vision, shared with a similar sense of awe by these founding fathers, was never pursued past the threshold: while its applications have exploded and revolutionized the physical world we inhabit, a deep silence has fallen over the question that went to the very heart of reality.

The interaction between physical and mental processes has proven to be such a phenomenally difficult challenge that this fundamental theoretical aspect of quantum mechanics has remained virtually at a standstill for most of the last century, despite the Wests increasing fascination with consciousness. This could not be in sharper contrast to the empirical side, where the last half of the century saw an explosion of interest in controlled laboratory studies of anomalous consciousness phenomena , with hundreds of experiments and dozens of academic laboratories providing robust demonstration of mind-to-mind (ESP) and mind-machine interactions, as well as precognitive phenomena and remote healing [J5, J13, J14, J15, J19]. The outcome of this stark differential between the theoretical and empirical staging has been an unprecedented level of fact suppression, editorial censorship and academic ostracism, affecting hundreds of researchers around the world, from graduate students to top tier scientist such as Robert Jahn, Dean of the Princeton University School of Engineering, and physics Nobel Prize winner Brian Josephson.

In the 1980s, a little-known physicist at the University of Helsinki became interested in a new way to represent fundamental interactions by looking at space-time as 4-surface structures in 8-dimensional imbedding space, leading to a generalization of quantum measurement theory to a theory of consciousness. Topological Geometrodynamics, as his theory is now referred to, gradually evolved into something much more powerful than that: over the past thirty years, Pitkänens model revealed profound symmetries and mirroring dynamics between physical reality and cognitive representations, seen as occupying a geometrical space of their own in this higher-dimensional reality, including transformations which for the first time begin to provide a theoretical foundation for the baffling but statistically undeniable phenomena of mind-matter interactions.

In TGD, life resides at the intersection of real (physical) and p-adic (cognitive) domains, therefore playing a critical role in the transfer of information between the two. The fractal symmetries and entanglement-favoring dynamics offered by TGD are a supremely elegant solution to the essential problem of finding key organizational principles in living systems, principles which must scan the full spectrum from inexplicably fast and coordinated intercellular communication [J17, J18, J7, J8] to animal swarm intelligence and human collective consciousness phenomena including extrasensory perception, archetypes, dream telepathy and now the seven-sigma results of the Global Consciousness Project [J4, J9]. Since 1998 this world-spanning network of random event generators designed at the Princeton Engineering Anomalies Research Lab has been monitoring the effects of globally shared emotion and cognitive states [J3], including massive natural disasters, world-wide celebrations and the death of major public figures.

The correlations between these mass consciousness events and synchronized deviations in the output of the REG nodes pose a fundamental challenge to our classical models of reality, a challenge that is beginning to spill into our carefully engineered scientific method, revealing problems like the decline effect in replication large-scale randomized clinical trials [J11, J12] and the massive rise in placebo threatening to become a full-blown crisis for the pharmaceutical industry [J2, J21]. However, the same phenomena derive naturally from the dynamics of the TGD architecture, which is built on a scaffolding of entanglement topological bridges, shared mental images (stereoscopic consciousness) and continuous transformations between cognitive and physical spacetime sheets. The canonical insistence that the nonlocal correlations of quantum entanglement are restricted to subatomic systems and virtually irrelevant to biological systems has been eroded and finally supplanted by the experimental and theoretical advances of the past decade, which have demon-

strated beyond a doubt that this fundamental property of quantum mechanics is in fact critical to life processes from photosynthesis and DNA regulation to avian navigation and brain computational dynamics [J10, J6, ?, ?, J22, J23, J1]. One of the overarching evolutionary pressures of TGD, the Negentropy Maximization Principle, now finds an echo in the words of Vlatko Vedral, one of the leading researchers heading this quantum biology revolution: Could it be that life does not just keep its entropy low, but rather, also aims to keep its quantum entanglement high? [J22].

In TGD, quantum computation is generalized to topological operations between real and p-adic (mind-like, or cognitive) spacetime sheets, where the non-dissipative flow of dark photons along magnetic flux tubes (corresponding to entanglement bridges) is responsible for control and communication between isolated subsystems, subsequently decaying to the biophoton signatures measured at the ends of the flux tubes. That is precisely what has been found in study after study of distant mental interactions with living systems (DMILS), where such changes in biophoton emissions are typically measured at the target end of the senders intent [J9]. Although TGD predictions have been supported by countless independent data points, from neuroscience and biochemistry to cosmology and genetics, nothing is probably as significant as the realization that such photon signatures may represent a universal currency of entanglement transactions that could be used to study the intractable interactions between mind and matter, in a way that no previous technology has allowed us to. Furthermore, recent advances in photobiology suggest a photon-mediated quantum computational architecture of subtle information and energy exchanges between the trillions of cells composing our brain and body quantum effects that play a profound role in global regulatory functions, including genetic expression [J9]. Together, this evidence begins to coalesce into a much larger picture of nonlocal, entanglement-based communication ranging from inter-cellular to planetary scales, perhaps representing an evolutionary pathway of self-organization and binding from the simplest informational quantum to ever increasing levels of cooperation and complexity.

As discussed above, the theoretical significance of TGD is that it connects a broad spectrum of empirical results and provides us with falsifiable models for some of the most baffling evolutionary and consciousness-related processes we have observed to date. But to unseat an incumbent paradigm and replace it with such a radically different vision, truth alone does not offer sufficient leverage.

The practical value of TGD is that in a world increasingly connected and dominated by information, the realities of subconscious information flow, interference and impact on random or sufficiently complex physical systems may no longer be as subtle or innocuous as seen so far and TGD may hold the key to understanding how to control these large-scale information dynamics [J4]. Is the widely spread decline effect showing up in experimental trials across science fields [J21, J16, J20] a first noticeable sign of such emerging effects? As Jonathan Schooler states, we cant rule out the possibility that there could be some way in which the active observation is actually changing the nature of reality [J2]. But that intuitive realization, which is merely a re-formulation of our starting quotes, has up to now been intractable to experimental approaches, leaving us trapped in a no mans land between macroscopic classicism and microscopic quantum effects, mental qualia and their physical correlates. The beauty and promise of topological geometrodynamics is that it seamlessly integrates all these world domains into one truly unified, powerful theory spanning the full spectrum of our experience.

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REFERENCES

Neuroscience and Consciousness

[J1]

[J2] The Decline Effect and Scientific Truth. On the Media. NPR On the Media (2012).

[J3] The Global Consciousness Project. `http://noosphere.princeton.edu/`.

[J4] The tip of the iceberg: placebo, experimenter expectation and interference phenomena in subconscious information flow. *Journal of Nonlocality*, II(1), 2013.

[J5] C. Carter. Parapsychology and the Skeptics: A Scientific Argument for the Existence of ESP. 2007.

[J6] E. Gauger et al. Sustained Quantum Coherence and Entanglement in the Avian Compass. *Phys. Rev. Lett.*, 106, 2011.

[J7] F. Popp et al. Biophoton emission. New evidence for coherence and DNA as source. *Cell Biophys.*, 1984, March.

[J8] F. Popp et al. Cancer growth and its inhibition in terms of coherence. *Electromagn Biol Med.*, 28(1), 2009.

[J9] R. Bajpai et al. Tinkering with the Unbearable Lightness of Being: Meditation, Mind-Body Medicine and Placebo in the Quantum Biology Age. *Journal of Nonlocality*, II(2), 2013.

[J10] A. Olaya-Castro F. Fassioli. Distribution of entanglement in light-harvesting complexes and their quantum efficiency. *New J. Phys.*, 12, 2010.

[J11] J. Ioannides. Contradicted and Initially Stronger Effects in Highly Cited Clinical Research. *JAMA. http://jama.jamanetwork.com/article.aspx?articleid=201218*, 294(2):218–228, 2005.

[J12] J. Ioannides. Why Most Published Research Findings Are False. *PLoS Med. http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0020124*, 2(8), 2005.

[J13] R. G. Jahn and B. J. Dunne. The PEAR Proposition. *Journal of Scientific Exploration. http://www.icrl.org/pdf/PEARproposition.pdf*, 19(2):195245, 2005.

[J14] R. G. Jahn and B. J. Dunne. *Consciousness and the Source of Reality: The PEAR Odyssey.* Princeton: The ICRL Press, 2011.

[J15] R. G. Jahn and B. J. Dunne. *Quirks of the Quantum Mind. Princeton.* Princeton: The ICRL Press, 2012.

[J16] J. Lehrer. The Truth Wears Off. *New Yorker*, 2010.

[J17] F. Popp and an Z. Jinzhu. Mechanism of interaction between electromagnetic fields and living organisms.

[J18] F. Popp and L. V. Beloussov (ed). *Integrative Biophysics: Biophotonics.* Springer New York, NY, 2010.

[J19] D. Radin. *The Conscious Universe.* Publishers New York, NY, 1997.

[J20] J. Schooler. Unpublished results hide the decline effect. *Nature*, 470(437), 2011.

[J21] S. Silberman. Placebos Are Getting More Effective. Drugmakers Are Desperate to Know Why. *Wired Magazine*, (17.09), 2009.

[J22] V. Vedral. Quantum physics: Hot entanglement. *Nature*, (468):769–770, 2010.

[J23] V. Vedral. Living in a Quantum World. *Scientific American*, June 2011.