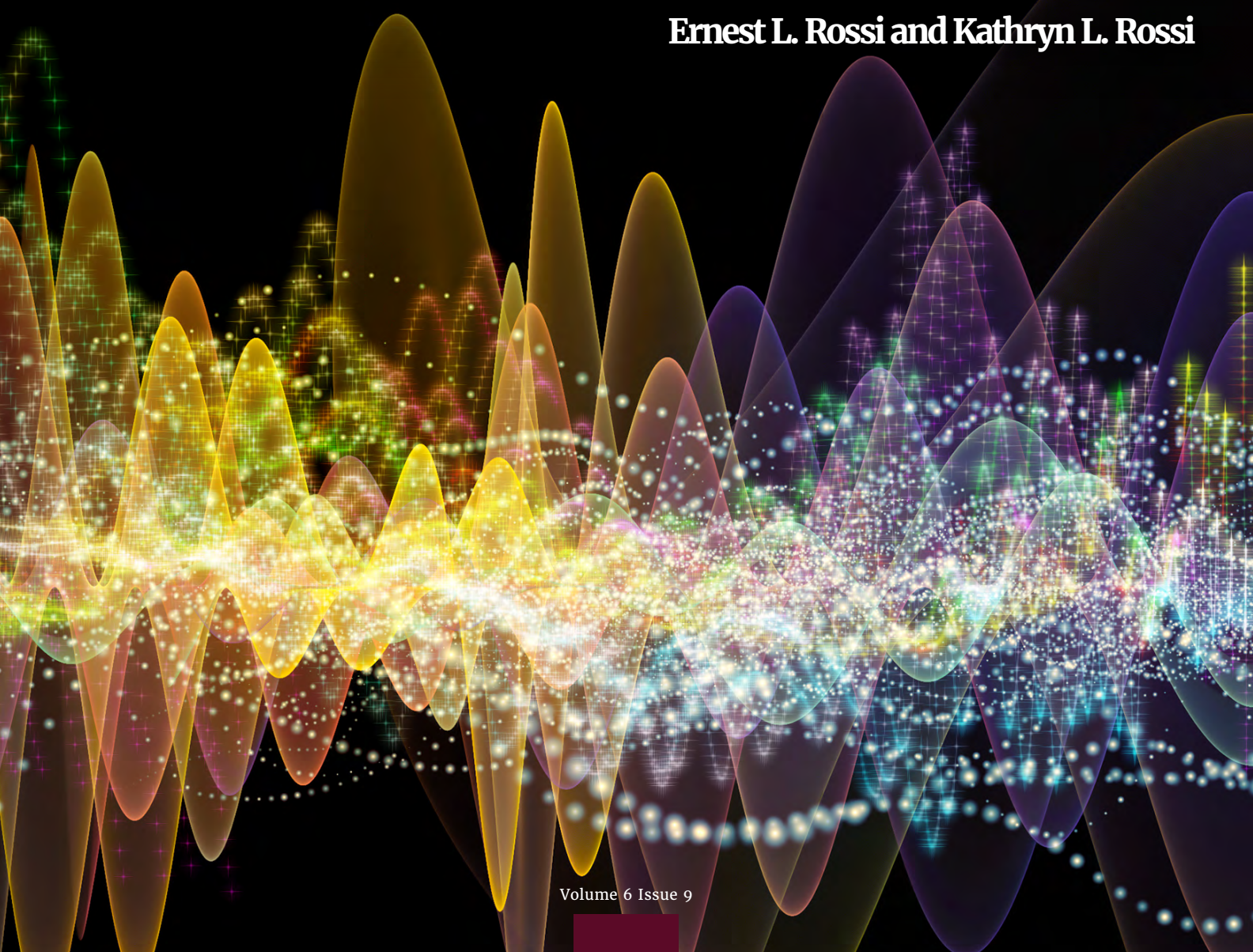
THE LEADING EDGE

Quantum Physics and the Science of Psychotherapy

Cosmic Consciousness, Stress, and Therapeutic Cognition

Ernest L. Rossi and Kathryn L. Rossi



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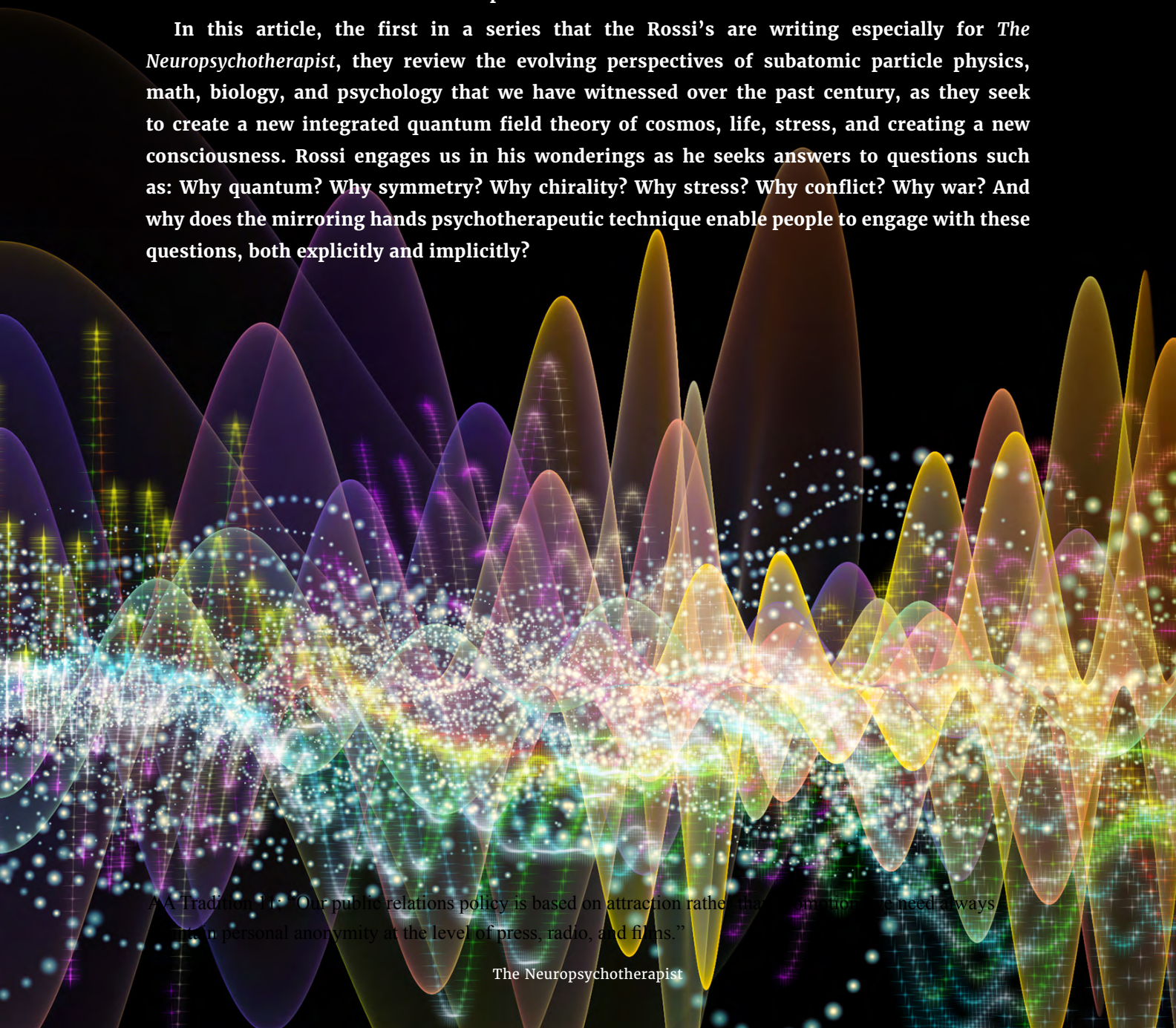
EDITOR'S INTRODUCTION

Ernest Rossi has been one of the great innovative thinkers of the past 50 years. He and his wife and colleague, Kathryn Rossi, have continued this work together for the past two decades. His prominence began to emerge from his work with the famous psychotherapist and clinical hypnotherapist Milton H. Erickson. Their 8 years of work together in the 1970s produced a set of books and papers that have become seminal volumes in the field of mental health and recovery. Rossi's books after Erickson's death have sought to engage our understanding of being human at the cutting edge of science. He was writing about the relevance of gene expression to the practices of psychotherapy and hypnotherapy in the 1990s. Over the past decade the inclusion of quantum physics in his books and lectures has been a steadily developing theme. In his introduction to this series, however, we can see that these ideas entered his thinking long before. We have a lot to do to catch up.

In this article, the first in a series that the Rossi's are writing especially for *The Neuropsychotherapist*, they review the evolving perspectives of subatomic particle physics, math, biology, and psychology that we have witnessed over the past century, as they seek to create a new integrated quantum field theory of cosmos, life, stress, and creating a new consciousness. Rossi engages us in his wonderings as he seeks answers to questions such as: Why quantum? Why symmetry? Why chirality? Why stress? Why conflict? Why war? And why does the mirroring hands psychotherapeutic technique enable people to engage with these questions, both explicitly and implicitly?



Ernest Rossi (personal communication) notes:

> Children are naturally curious about their life experiences and learn to play with them in their imagination. Does quantum physics provide a new perspective for the general public as well as serious students of science and natural philosophy that ranges from ancient times to the modern meandering mind of discovery and self-creation?

I, for one, am eager to read how the Rossi's address this curiosity. It is with great pleasure that I introduce this series on the quantum dynamics of psychology, therapeutic consciousness, and cognition for *The Neuropsychotherapist*.

"Does quantum physics provide a new perspective for the general public as well as serious students of science and natural philosophy that ranges from ancient times to the modern meandering mind of discovery and self-creation?"

INTRODUCTION: WHY QUANTUM? THE CONNECTION BETWEEN COSMOS AND CONSCIOUSNESS

I was a shoeshine boy about 11 or 12 years old when I first noticed a small public library where I stumbled upon a strange, dusty old book titled *Cosmic Consciousness: A Study in the Evolution of the Human Mind* by Dr. Richard Maurice Bucke (1901) who was formerly the medical superintendent of the asylum for the insane in London, Ontario, Canada. Bucke believed that the insane were heroic pioneers of humanity who failed in their life struggle for higher consciousness. Those pioneers who succeeded in this quest were the storied heroes of human cultures in the spiritual, scientific, humanistic and poetic domains (e.g., Buddha, Dante, Walt Whitman, Francis Bacon, Henry Thoreau) who had experienced "cosmic consciousness". Bucke presented brief vignettes of their lives and recommended that everyone study the creative breakout moments of these cultural leaders. Many years later I was entranced to learn that this book was written in the same historic period when many Nobel prize-winning physicists and mathematicians—Albert Einstein, Max Planck, Erwin Schrödinger, Niels Bohr, Werner Heisenberg, Paul Dirac, and others—were introducing the quantum revolution in science, with profound implications for all the arts and humanities, the psychological evolution of the self-observing mind, therapeutic consciousness, and cognition itself.

QUANTUM APPROACHES TO SELF-REFLECTION IN DREAMS, CONSCIOUSNESS, AND CREATIVE COGNITION

A surprising experimental result of research with quantum implications about the entanglements of cosmos and consciousness centers around Rossi's self-reflectiveness scale in dreams and waking consciousness, which was published by a team of academic researchers at Carleton University of Ottawa in Canada (Purcell, Moffitt & Hoffman, 1993; see also Rossi 1972/1985/2000). Moffitt, the team leader, described their research program as follows:

> To make Rossi's seven-step scale useful in an experimental context, we expanded it to nine steps by breaking down his seventh category into more finely graded steps. Our seventh category was devoted to the emergence of multiple perspectives in the dream—in particular, the emergence of the awareness of bizarreness by the dream ego within the dream. Category eight was concerned with the appearance of control over the content of the dream by the dream ego, and category nine concerned the emergence of lucid dreaming, an awareness of dreaming while dreaming by the dream ego. The other categories of our self-reflectiveness scale were left as Rossi had developed them. The resulting scale is presented in Table 1.
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> We found that the average self-reflectiveness score of dream reports from REM sleep were slightly but significantly higher in stages 2 and 4, which did not differ. Similarly, the average self-reflectiveness score of dream reports from frequent recallers was slightly but

TABLE 1: DREAM SELF-REFLECTIVENESS SCALE CATEGORIES

1. Dreamer not in dream; objects unfamiliar; no people present
2. Dreamer not in dream; people or familiar objects present
3. Dreamer completely involved in dream drama; no other people
4. Dreamer present predominantly as an observer
5. Dreamer talks over an idea or has definite communication with someone
6. Dreamer undergoes a transformation of body, role, age, emotion, etc.
7. Dreamer has multiple levels of awareness; simultaneously participates and observes; notices oddities while dreaming; experiences dream within a dream
8. Dreamer has significant control in, or control over, dream story, can wake up deliberately
9. Dreamer can consciously reflect on the fact that he/she is dreaming; lucid dreaming

significantly higher than infrequent dream recallers. There were no gender differences. I use the phrase 'slightly but significantly' because the absolute differences in the group averages mentioned above were in fact very small, amounting to less than a single category. . . . More importantly, all types of self-reflectiveness of the dream ego as scored by the self-reflectiveness scale were found. The most frequently occurring scale category in Table 1 was 5, indicating single-minded, active involvement of the dream ego in the dream without concomitant thought or speech. The next most frequent self-reflectiveness category was 3, indicating single-minded involvement in the dream but *with* accompanying thought or speech. According to Rossi, these dreams need to be distinguished from those in category 3. Although the dream ego is still single-mindedly involved in the dream, the presence of language in the form of thought or speech is an important aspect of the emergence of self-reflectiveness:

> *The discriminating power of the word evolves from the imagery of the dream drama and greatly enhances the clarity and significance of self-reflection. Verbal associations form cognitive networks binding more autonomous processes of emotion and imagery for the construction and stabilization of new forms of awareness.* (Rossi, 2000, p. 139)

These researchers found an unusual distribution of scores about self-observation in dreams, illustrated in Figure 1. In the typical distribution of scores measuring such psychological experiences one would expect to see a normal bell-shaped curve rather

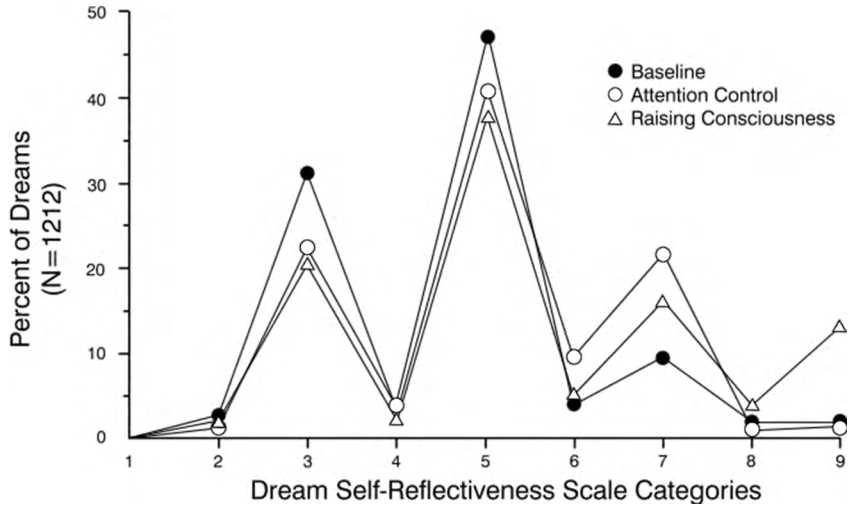

Figure 1. The interference pattern of the Dream Self-Reflectiveness Scale categories: the actual distribution of dream (%) scores in college students across the nine categories of self-reflectiveness. Note the similarity of this distribution of scores to the interference pattern of quantum physics introduced in Figure 2. From "Waking, Dreaming, and Self-Regulation" by S. Purcell, A. Moffitt, and R. Hoffmann, 1993. In A. Moffitt, M. Kramer, & R. Hoffmann (Eds.), *The Functions of Dreaming* (p. 228). Copyright 1993 by SUNY Press.

than the jagged-edged tooth, diffraction-like pattern found.

What could account for this quantum-like pattern that is highly characteristic of the double-slit experiment on the quantum physics of light? Two different explanations have been offered by scientific observers. One explanation, based on classical statistical theory, suggested that Rossi's original seven stages of self-reflection might simply be placed in the wrong order. Alan Moffitt (personal communication, 1997) proposed another approach to "correct and normalize" the unexpected dips in stages 4, 6 and 8, based on the way the stages were originally defined by Rossi. While this post hoc explanation seems plausible, it involves second-guessing the original hypotheses upon which Rossi's self-reflectiveness scale was based, the way the research was conducted, and the data found. What if we had the scientific courage to take the honest data of Figure 1 at face value and accept that it represents the objective facts? Rather than try to bend these facts to match the expectation of what a normal statistical distribution of scores should look like, what kind of a new theory would we have to construct to provide a more fitting context for these facts?

The classical theory of cognitive dissonance developed by Leon Festinger (1970), a leading academic psychologist during the 1950s, played an important role in current approaches to cognition and behavior. Our understanding of attitude formation in children, message transmission, motivation, music appreciation, sensation, perception and social dynamics, as taught today in standard textbooks of psychology, depend upon Festinger's cognitive dissonance theory (Festinger, 1970). More recently, however, Merim Bilalić and Peter McLeod provided a database for exploring the implications of a quantum theory of psychological experience, published in *Scientific American* (Bilalić & McLeod, 2014). In brief, psychological experiences on a phenomenological level—such as thought, attitudes, emotions, sensation, perception, dreaming and certainly behavior—can interfere with each other just like physical quanta (e.g., subatomic particles and photons) interfere with each other in the classical double-slit experiment. (For an explanation of Thomas Young's famous 1801 experiment, see "Thomas Young

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and the Nature of Light" by the American Physical Society, 2008). Bilalić and McLeod's quantum theory of cognitive dissonance provides a context on the psychological level for interpreting the interference pattern of self-reflectiveness scores as mirroring the general interference phenomena of quantum mechanics.

The interference experiment diagramed in Figure 2 has been used in quantum physics to illustrate the apparently paradoxical dual nature of light and subatomic particles. Light may exist as discrete particles, or quanta, shot from an electron gun (light source going through a double-slit screen) and detected as separate spots on a detector in Part (b) of Figure 2.

Light, however, also exhibits a quantum interference pattern of hills and valleys when quanta passing through the double slit apparently interact to form the wave-like interference pattern illustrated in Part (c) of Figure 2. This similarity between the interference patterns of light and self-reflection scores illustrated in Part (d) of Figure 2 could be interpreted as evidence consistent with a quantum theory of thought, consciousness and cognition as proposed by many scientific workers. The quantum physicist Fred Alan Wolf, for example,

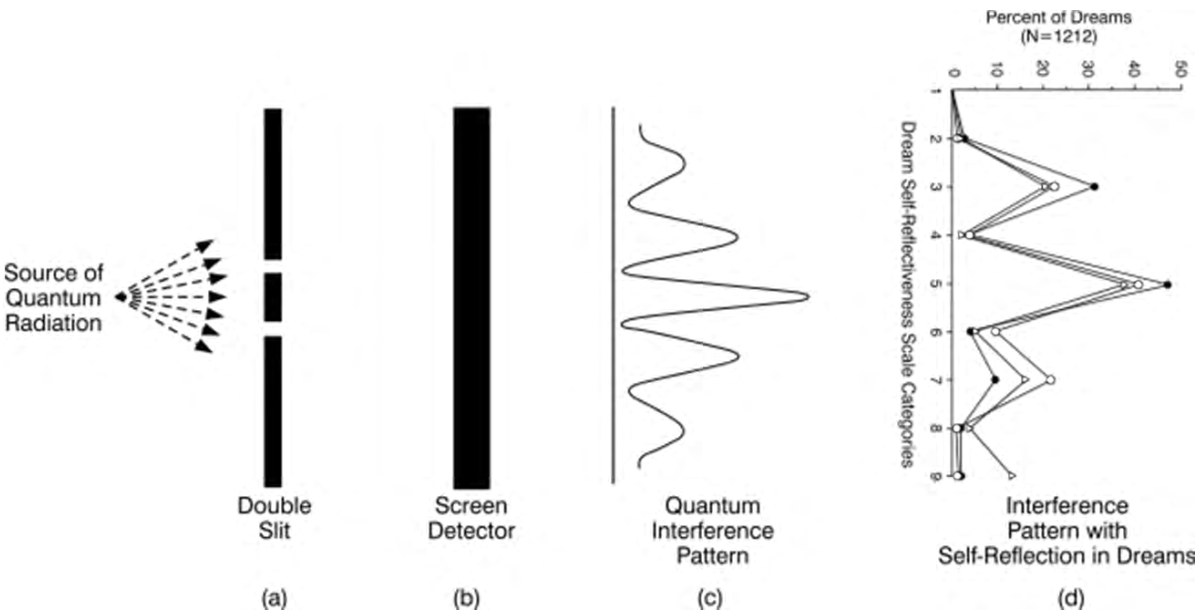

Figure 2. Is there a relationship between quantum physics and the science of psychology? An illustration of the similarity between the interference pattern of the classical double-slit experiment by Thomas Young in 1801 and self-reflection in dreams (d). A source of quantum radiation such as light photons passing through a pair of appropriately spaced slits (a) onto a screen detector (b) yields a quantum interference pattern (c) that is very similar to the interference pattern of self-reflection scores found in human dreams (d). From "Waking, Dreaming, and Self-Regulation" by S. Purcell, A. Moffitt, and R. Hoffmann, 1993. In A. Moffitt, M. Kramer, & R. Hoffmann (Eds.), *The Functions of Dreaming* (p. 228). Copyright 1993 by SUNY Press.

proposed a quantum theory of dreaming and consciousness that is consistent with these interference patterns.

> Dreaming is like observing an interference pattern in the famous double-slit experiment in physics. And waking is like adjusting the distance between the slits so that the interference effects begin to wash out. . . . If we look at all events in consciousness in this manner, we would be looking down on a pond that has many pebbles bombarding it and sending out many, many waves. Now if we look at any two of the pebble sites events, something rather marvelous happens. The waves tend to reinforce themselves in the space between the events and during the time between events. . . . The greater the match, the greater the reinforcement between the events and the greater the cancellation outside of events in much the same way that a radio-station wave is modulated by the information that is put on it from the broadcasting studio. . . .
>
> This produces the probability field of quantum physics. Now all physicists know that you must multiply these two waves together modular style. . . Now suppose this mechanism occurs throughout the universe and suppose that our cognition depends upon this process. . . . Consciousness is the relationship via this . . . quantum-physical mechanism. . . . I suggest that the conscious field is the product of these two quantum waves . . . and this product appears as a probability field that exists everywhere, not just in the brain, but everywhere.
>
> The richer the number of neural events there are, and this now gets into the neural-network models, the more meaningful the initial event becomes. Thus, a rich probability field is built up around an outside stimulus, and that density of the probability field is what we mean by consciousness, provided the second event is occurring that can correlate with the primary event. This is what constitutes an act of consciousness

Wolf (personal communication, 1998) has commented on the possible relevance of the Dream Self-Reflectiveness Scale research illustrated in Figures 1 and 2 for an empirical approach to a quantum field theory of consciousness and cognition as follows.

> If there is a wave interference phenomenon occurring, then what would the wave be in your model? What would the slits correspond to? As one moves from 1 to 9 in Table 1, human dreamers are moving through a space-time experience of lesser to greater relative self-awareness. Does the graph indicate that dreams are events where there are certain states of alternating forbidden and allowed self-awareness, or if not forbidden and allowed, of less probable and more probable self-awareness?
>
> I may offer this suggestion. Experimental results based on Rossi's dream scale could correspond to the presence of thoughts as a cognitive modality in the dream. The cognitive wave passing means that two

> thoughts or word sequences are causing an interference pattern analogous to the double-slit experiment with light. Possibly our dreams are interrupted by such double thought streams of experiencing during self-reflection. . . . The key idea is the number and complexity of the thought-stream images making up the self-reflection. The greater the number of these images the higher is the index of self-reflection but the weaker the effects in terms of lucidity.

Wolf's speculation that dreams are interrupted by multiple words and thought streams that result in self-reflection when they overlap is consistent with Festinger's classical theory of cognitive dissonance in human experience (Festinger, 1970). It will be a challenge for future research to sort out the relative roles of the similarity and difference between the various levels of emotions, imagery and cognition in the process of self-reflection. Wolf's use of the concept of *complexity* in assessing Purcell and Moffitt's research (Purcell, Moffitt, & Hoffmann, 1993) is in keeping with the view that quantum field theory (or *adaptive complexity* theory) are leading candidates for understanding the striking physical and phenomenological analogies between massless light photons and the spectrum of consciousness and therapeutic cognition (Hill & Rossi, 2017; Rossi, 1972/1986/2000).

A more detailed exposition and demonstration of the striking physical and phenomenological analogies between light, consciousness, and the 4-stage creative cycle has been published previously by Hill and Rossi (2017). The quantum field theory of cosmos and psychological experience that appears to be emerging is consistent with what people report when they try to make sense of their dreams. Meaning seems to emerge when the quantum field of dream experience interacts with the conscious field of our early-morning thoughts with a *numinous* (fascinated, mysterious and tremendous) sense of significance (Hill & Rossi, 2017). This quantum field theory, integrating cosmos and consciousness, is consistent with what happens in the 4-stage creative cycle when people experience the spontaneous intuitions and insights that pop up—like *quantum jumps*—into consciousness from preconscious levels of implicit (unconscious) processing during creative cosmic consciousness, cognition, and dreaming.

To Be Continued ...

FURTHER READING

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