Notes

1. George Greenstein and Arthur G. Zajonc, *The Quantum Challenge: Modern Research on the Foundations of Quantum Mechanics*, 2nd ed. (Boston: Jones and Bartlett Publ. Inc. 2006).
2. George Greenstein and Arthur G. Zajonc, *The Quantum Challenge*, (2006), p. 184.
3. "It is sown in weakness, it is raised in power. It is sown a physical body, it is raised a spiritual body." (I Corinthians 15:43-44, NRSVA)

ERIC HEDIN

Eric R. Hedin earned his doctorate in experimental plasma physics from the University of Washington, and conducted post-doctoral research at the Royal Institute of Technology in Stockholm, Sweden. He has taught physics and astronomy at Taylor University and Ball State University in Indiana, and at Biola University in Southern California. At Ball State, his research interests focused on computational nano-electronics and higher-dimensional physics. His BSU course, The Boundaries of Science, attracted national media attention. Dr. Hedin's recent book, *Canceled Science: What Some Atheists Don't Want You to See*, highlights scientific evidence pointing to design.

Source: https://evolutionnews.org/2024/01/incompleteness-theorems-point-to-a-hidden-realm/

(Available to download in PDF format at https://agape-biblia.org/literatura/#incompleteness)

Incompleteness Theorems Point to a Hidden Realm

Eric Hedin, Ph.D.

Evolution News, January 17, 2024, 6:20 AM

In a recent article here, Denyse O'Leary wrote about mathematician Kurt Gödel's "defense of the immortality of the soul."O'Leary summarizes Gödel's views based on a series of letters that he wrote to his mother, as brought to light by researcher Alexander T. Englert of the Institute for Advanced Study in Princeton.

Gödel is best-known for his incompleteness theorems, which, as O'Leary puts it, destroy "the materialist atheist hope that mathematics could be

self-consistent without any external origin." Englert explains:

> *The incompleteness theorems proved (in broad strokes) that, for any consistent formal system (for example, mathematical and logical), there will be truths that cannot be demonstrated within the system by its own axioms and rules of inference. Hence any consistent system will inevitably be incomplete. There will always be certain truths in the system that require, as Gödel put it, 'some methods of proof that transcend the system.'*

Gödel's incompleteness theorems allow and even demand that within the physical reality of this universe there exist truths that cannot be derived from physical reality. Gödel realized that these truths include the immaterial aspect of the human mind and the immortal nature of the human soul. Englert wrote:

> *From [his Incompleteness Theorems], Gödel concluded that the human mind transcends any finite formal system of axioms and rules of inference.*

show results that cannot be predicted except as probabilities, and light has momentum and particles behave as immaterial wave-functions, can we not conclude that even nature points us to something beyond nature?

Gödel, whose incompleteness theorems canonize the absolute reality of truths that cannot be mathematically or scientifically proven, was convinced that our rational minds and our human nature must necessarily extend beyond the boundaries of space and time. Gödel found common ground in the New Testament with his insights derived from mathematics and philosophy. Englert summarizes Gödel's conclusions as consistent with the Apostle Paul's statement[3] on the immortal nature of the human soul. Death, rather than being complete annihilation, opens the door to an existence in which we mature into the fullness of our designed nature. As Englert puts it:

> *Our lives and bodies in this lifetime are only seeds, awaiting their destruction, after which we will grow into our ultimate state of being.*

is *non-locality*, in which a particle-wave unequivocally exists in more than one location at the same time. This would be like a student leaving a classroom through two different doors at once. For quantum entanglement of particles, the only way to correctly describe their behavior is as a single thing, even when they are physically separated. As described by Greenstein and Zajonc,

> *This thing, for which there is no classical counterpart, exists at many different locations at once. Its attributes are in some sense mingled together. The different locations over which it extends are in a strange intimate contact — a contact that carries neither messages nor physical causation, but that always exists and can lead to instantaneous correlations….Hidden behind the discrete and independent objects of the sense world is an entangled realm, in which the simple notions of identity and locality no longer apply.*[2]

The Nature of Reality

A “hidden realm” behind the common-sense realm of “local realism” — this is the actual nature of the reality in which we live. If mathematical truths exist but cannot be proven, and physical measurements

An Ultimate Reality

The transcendent realm that harbors the “methods of proof” for truths within our own realm must itself necessarily contain truths that cannot be proven within that realm, but depend upon yet a higher realm for their method of proof. The logical extension of Gödel’s incompleteness theorems therefore describes an infinity of progressively higher realms of reality. These conclusions, I believe, point to an ultimate reality that is unlimited in every sense, consistent with the Judeo-Christian idea of an eternal God.

The nature of physical reality offers us additional examples of “incompleteness” that may indicate the existence of a higher reality. One famous example from the realm of quantum mechanics[1] became the focus of contention between Albert Einstein and Niels Bohr. Einstein’s discontent with the innate uncertainty of measurements in a quantum system led to his argument for the existence of “hidden variables” that, if discovered, would allow for a complete description of the observable variables of the system, without uncertainty. Einstein published his contention with two collaborators in 1935 (the EPR Argument).

Bohr, however, felt that the quantum description was complete, and that uncertainty was unavoidable. The issue remained unsettled until John Bell published theorems (in 1964 and 1966) that allowed researchers to experimentally decide whether hidden variables actually existed or not. Experimental results conclusively demonstrated that quantum mechanics was complete, hidden variables didn't exist, and uncertainty was an unavoidable part of reality.

Matter, Energy, and Experimental Measurements

These results constitute an intriguing extension of the conceptual form of Gödel's incompleteness theorems into the realm of physics, dealing with matter, energy, and experimental measurements. We know that reality exists — measurements give definite results — but the "incompleteness" of reality as available to us prevents any absolute prediction of results. One may conjecture, however, on the existence of a transcendental realm in which uncertainty vanishes and predictions of outcomes can be definitely determined. As Gödel's views suggest, certain truths require "some methods of proof that transcend the system."

Our view of the nature of light and of particles also "suffers" from an apparently unresolvable paradox —

commonly known as wave-particle duality. Centuries ago, scientists debated whether light was a wave or a stream of particles (Isaac Newton's view). Then in the early 1800s, optical interference experiments gave results that consistently supported the wave nature of light. Fast-forward another hundred years, and Einstein showed that the photoelectric effect could only be explained by assuming that light consisted of particle-like packets of energy (photons) that could kick electrons off a metal surface, like a BB-gun shooting tin cans off a fence post.

Einstein's Special Theory of Relativity

Worse news for the classical distinctions between matter and energy, waves and particles soon came to light. Einstein's Special Theory of Relativity (1905) revealed that mass could be converted to energy, and energy could "condense" into matter. Then, the de Broglie hypothesis (1924) boldly claimed that particles, once regarded as little solid bits of mass, should exhibit wave-like natures. This remarkable, but somewhat unsettling, proposal was experimentally verified just a couple of years later in a *diffraction* experiment (only possible with waves) carried out with electrons!

One of the more unnatural consequences (to our classical sensibilities) of the wave nature of particles