

Perspective

THE SCIENCE OF CONNECTIVENESS

PART I: MODELING A GREATER UNITY

W.C. Gough & R.L. Shacklett

ABSTRACT

This is the first of a series of three articles that will outline a proposed scientific model with the goal of stimulating a new vision toward resolving the Mind-matter question and acknowledging an underlying connectiveness in the universe. Scientific is defined to mean that the “parts” or links already exist as useful concepts in the scientific community. The model being proposed assumes that everyday reality is not simply “out there” nor is it “within.” Rather, it is suggested that everyday reality is a “perception” we construct from aspects of the “unity” within which we are immersed. The background of the authors is in physics, engineering, and mathematics. It will be from this perspective that the relationship to psychology, the healing arts, linguistics, metaphysics, and religion will be developed. The implications to the fields of subtle energy and energy medicine will be emphasized.

The genesis of the concepts presented first appeared in a report entitled *The Unification of Mind and Matter: A Proposed Scientific Model*.¹ The report is a written documentation and extension of invited presentations by the two authors at the 1st ISSSEEM Conference held in June 1991. In addition, the articles reflect further insights gained from an interdisciplinary working meeting entitled “Seeking a Common Basis for Language, Mathematics, and Physics”² and from research for the talk “Physics and the Power of Symbols”³ presented at the 3rd ISSSEEM Conference. A summary of the concepts was first published as a three part series⁴ in *The Journal of Religion and Psychical Research*. The three ISSSEEM articles will closely parallel the copyrighted JRPR articles and are being published with the kind permission of The Academy of Religion and Psychical Research, Bloomfield, CT.

Part I presents the basic assumptions of the model and introduces the model by exploring aspects of a reality that extends beyond our limited concepts of three dimensional space plus time. The phenomena of non-locality in quantum physics and the theory of archetypes in depth psychology are two features with important implications for the model. Part II will discuss the quantum feature of non-locality as it relates to the interface process between Mind and the material world and will conclude with a description of the dynamics of the process—how the interplay takes place and works. Part III will explore the relationship of the model to human experience. The power of symbolic patterns in the physical for serving the role of mediator between the happenings in the physical (or outer reality) and the mental (or inner reality) will be expanded upon.

KEYWORDS: Archetype, connectiveness, consciousness, metaphysics, mind, non-local, physics, quantum, reality, symbol

INTRODUCTION

This three part series of articles will explore the scientific basis for considering that “reality” extends beyond the space-time of the physical. Our model hypothesizes 1) that the space-time of physical reality emerges (unfolds) from that portion of reality beyond space-time which includes a mental realm wherein we assume “mind” resides, and 2) that an interconnection and feedback exists between the physical and mental realms that results in a “co-creation” process for physical reality. Specifically, *we propose that a connection exists between the realms of Mind and matter and that this connection can be understood in terms of existing scientific concepts without invoking any new interactions or particles in the 3-dimensional world.*

We need to explain just how we are using the term “model.” A model is a suggestion or proposal on how to *think* about some complicated relationship, process, or mechanism (“system” for short). It shows how the system can be broken down into “parts,” each of which can be understood in conventional and less complicated ways. When thinking about the original, complex system, one mentally replaces it with the model, i.e., the parts and the relationships between the parts, thereby eliminating or reducing the complexity and permitting some degree of “understanding.”

It should be obvious that there are different models possible for any given system depending on the kinds of explanatory devices that are considered “conventional” by a group or society. A scientific model, for example, would be of little interest to a group accustomed to explaining natural phenomena in terms of the actions of one or more deities. It follows that as a model becomes more widely accepted and utilized by a group (having been properly “tested”), the “parts” of the model go beyond being merely a guide to thinking and begin to take on a “reality” of their own.

Gary Zukav has a rather pithy description of this reality building process:⁵

“Reality” is what we take to be true. What we take to be true is what we believe. What we believe is based upon our perceptions. What we perceive depends upon what we look for. What we look for depends upon what we think. What we think depends upon what we perceive.

What we perceive determines what we believe. What we believe determines what we take to be true. What we take to be true is our reality.

BASIC ASSUMPTIONS

At the core of our model for exploring beyond the physical are a series of basic assumptions.

1. The 4-dimensional space-time physical world is the “lowest” of a hierarchy of levels. We view them as nested in a “Chinese box” or “Russian doll” configuration rather than arranged in a tree structure or pyramid.
2. Current physics provides an adequate description of the “inanimate” physical world. The four fundamental forces of physics—gravity, electromagnetism, the strong force, and the weak force—account for the interactions of matter, with the Principle of Least Action governing the dynamic processes involving these forces. There is no necessity to introduce any new forces or entities into the model.
3. The level adjacent to the physical is the mental realm, designated herein as Mind (with a capital M). Individual minds (with a lower case m) are sub-units of (Universal) Mind. The mental realm is different from the physical world, i.e., of higher dimensionality. It is intrinsically spaceless, timeless, and non-material, i.e., physical concepts of three dimensional space, clock time and physical matter are too limiting. Its contents are essentially archetypal patterns, i.e., higher dimensional or formless “patterns” that are the ordering factors for both mind and matter. Aspects of the archetypal patterns can be accessed via two or three dimensional symbols, for science these are “mathematical” symbols. Figure 1 illustrates the way the levels relate to each other.
4. Space-time provides an interface between the physical and mental realms. The interface occurs at the edge of the quantum vacuum, i.e., at the Planck length of 10^{-33} centimeters. Space-time forms the “stage” or foundation upon which physicists build mathematical symbolic structures representing matter and its dynamic interactions. Figure 2

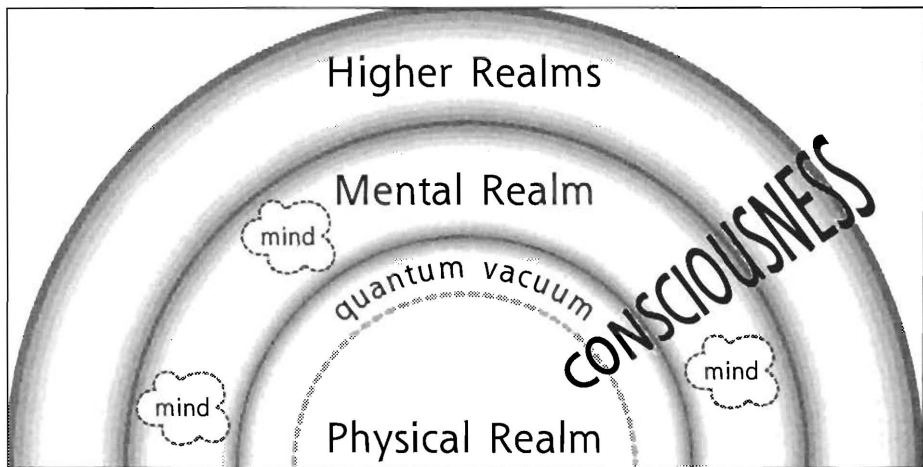


Figure 1. Relationship between the various interconnected and nested realms in the model.

illustrates the limits of space-time. At the Planck length the concept of location loses its meaning due to quantum uncertainty and fluctuation, thus the nature of the physical world as we know it ceases to exist.

5. Consciousness is common to all levels of the hierarchy. The entity called the “self” or “I” is an individualization of Universal consciousness. Its boundary in the physical appears well defined but becomes more diffuse as the self extends beyond the physical realm.

In connection with this last assumption, “consciousness” probably needs to be defined for the purposes of this paper. We find it necessary to go beyond the dictionary definition which tends to limit the meaning to a state of awareness. We define consciousness to include an *essence that is behind awareness—that which energizes or vitalizes an entity and provides its sense of being*. Consciousness at its core is ineffable to us because we are part of it.

It needs to be emphasized that, although the world view described above is open-ended with the number and extent of levels unspecified, our modeling will concentrate upon the connection between only the lower two—the physical and the mental.

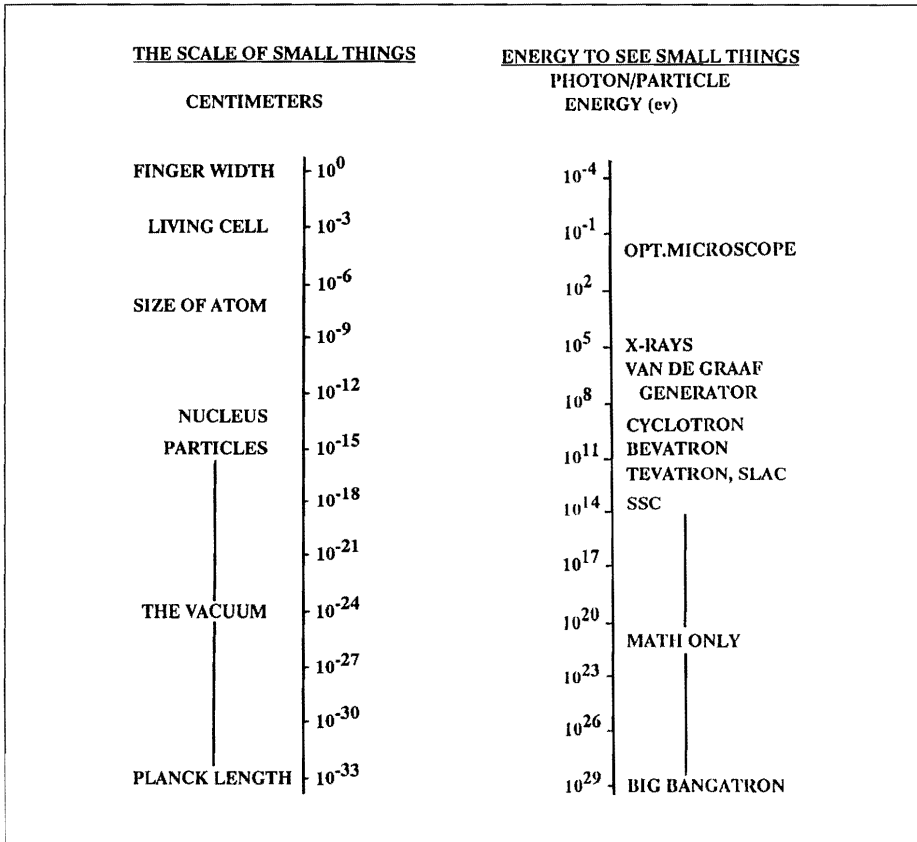


Figure 2. The limits of the Physical Realm: Beyond the Planck Length concepts of measure and length no longer have scientific meaning.

JUNG, PAULI, AND ARCHETYPES

Our initial focus has been to probe the Mind-matter boundary of space-time from the side that physics is concerned about. We have been careful to point out that in the scientific process we are using the mind to operate a tool—mathematical symbols. We emphasized (in our original report)¹ how the boundary at the quantum vacuum is permeable, more like a sponge than the solid wall that classical science has believed in for so long. It is appropriate at

this juncture to take a look from the other side, realizing, of course, that this time we have very little scientific tradition on which to base our argument that Mind has any connection at all to space-time and, hence, to physical matter. It is therefore incumbent upon us to build the case by the logical use of evidence. And just as is done in the courtroom, the individual strands of evidence, while unconvincing alone, when skillfully braided together become highly persuasive.

What can be said about what lies beyond space-time and its relationship to our lives in everyday “physical reality?” In exploring this question we encountered an interesting connection between one of the important contributors to quantum physics in its developing stages, Wolfgang Pauli, and the founder of depth psychology, Carl Jung.⁶ Pauli’s quest was very similar to ours, namely, the relationship between mind and matter. Working together with Carl Jung he perceived parallelism between quantum physics and Jung’s depth psychology and the two eventually published a joint book on aspects of their ideas.⁷

Jung, as early as 1919, had developed the theory of archetypes, the ordering factors in the collective unconscious, i.e., in the mental realm. In the following decades, Jung constantly deepened and broadened the theory. Pauli’s contribution was that he considered it necessary to include in any unified conception of the cosmos *both* the world of physics and the “ordering operators,” i.e., the archetypal “patterns” of the mental realm. Jung was profoundly influenced by Pauli’s formulation and finally came to view archetypes as the ordering factors of both mind and matter. Jung applied the term *unus mundus* to denote a spaceless-timeless realm that encompasses the physical. Jung stated that his idea of an *unus mundus* is founded “on the assumption that the multiplicity of the empirical world rests on an underlying unity, and that not two or more fundamentally different worlds exist side by side.”⁸

From the 1920’s on, Jung had been impressed by the many instances of synchronicity in his own and his patients’ lives. Synchronicity was defined as “the meaningful coincidence or equivalence (a) of a psychic and a physical state or event which has no causal relationship to one another . . . or (b) of similar or identical thoughts, dreams, etc. occurring at the same time in different places.”⁹ As time went on, and with the urging of his colleague, C. A. Meier,

he came to view this kind of notable event as only a particular instance of a general “acausal orderedness” in nature.¹⁰ These insights were of great consequence in the further development of Jung’s theories.

Connection had now been made with the phenomena of quantum physics, especially the phenomena of non-locality, and with the theory of archetypes. Jung had found that archetypes were regularly activated in synchronistic events and accounted for their meaningfulness. So it was evident that archetypes reach across the boundary (or what we have called the “sponge”) between the mental realm and the sphere of matter. In our model it is the feedback linkage across the “sponge” that creates the dynamism of the whole.

The possibility was raised by Jung and Pauli that there exists an ordering process beyond space-time.¹¹ We, too, assume that the archetypes represent units of ordering in this spaceless-timeless reality and that new orderings result in acts of creation in space-time. This latter point has been addressed by quantum physicist, Dr. Henry Stapp, who presents a process formulation of quantum theory. He has called the ordering in the spaceless-timeless reality “process time.” He distinguishes it from the ordering in space-time which he refers to as the “Einstein time” of today’s physics. “Process time” is “the time associated with a cumulative process whereby things gradually become fixed and settled.” Thus, this “allows quantum theory to be regarded as a theory describing the actual unfolding or development of the universe itself.”¹² However, there is no *a priori* requirement that the sequence of the ordering in the spaceless-timeless reality would result in a linear time sequence of events in our space-time reality.

We are assuming that there exists a hierarchical structuring of “ordering” patterns at the archetypal level in a nested mode similar to the hierarchical structuring of patterns in the physical world. Thus, in the physical world we are aware of the nested patterns of bodies, organs, cells, molecules, atoms, particles, etc. In an analogous manner we could ascribe in the spaceless-timeless realm of Mind a hierarchy of archetypes to mammals, primates, humans, male/female, race, culture, family, etc. Just as in the physical body there exists feedback among the nested hierarchy of parts, so too at the higher dimensional archetypal level we are assuming that there is a similar feedback among the nested parts.

We suggest that there may exist within this archetypal hierarchy in the spaceless-timeless realm fundamental “elements”—akin to the atomic elements from which the physical world is built and derives its structural order. The fundamental archetypes represent units or elements of ordering in the spaceless-timeless realm and new orderings result in acts of creation in space-time. Late in his life Jung had the conviction that “natural integers contain the very element which regulates the unitary realm of psyche and matter.”⁸

We agree with Jung, and assume that the symbols we use in our physical world that represent “number” evolve from (and thus are representations of) these most fundamental archetypes for the order beyond space-time. Hence, these representations of the “number” archetypes serve the role of mediator between the happening in the physical or outer reality and the mental or inner reality. Jung contended that “number serves as a special instrument for becoming conscious of such unitary patterns” beyond space-time.⁸ Pauli held similar beliefs and stated that the concept of archetype “should be understood in such a way as to include the ideas, among others, of the continuous series of whole numbers in arithmetic, and that of the continuum in geometry.”⁸

The archetypal hypothesis developed by Jung and Pauli and its relation to number was extended by a colleague of Jung, Dr. Marie-Louise von Franz.⁸ Dr. von Franz was also one of Pauli’s analysts and had great influence on his inner development.¹³ Based upon von Franz’s research this more general archetypal hypothesis has been summarized as follows:

1. All mental and physical phenomena are complementary aspects of the same unitary, transcendental reality.
2. At the basis of all physical and mental phenomena there exist certain fundamental dynamical forms or patterns of behavior called number archetypes.
3. Any specific process, physical or mental, is a particular representation of certain of these archetypes.
4. In particular, the number archetypes provide the basis for all possible symbolic expression.

5. Therefore, it is possible that a neutral language constructed from abstract symbolic representations of the number archetypes may provide highly unified, although not unique, descriptions of all mental or physical phenomena.¹⁴

Many different symbols and formats of symbols can be used to access and describe a given archetype. The primary archetypes have been represented by the symbols for numbers (Arabic, Roman, etc.) and by letters (Hebrew, Greek, Arabic, etc.) as we will discuss in a later section. Thus, one can envision symbolic representations of aspects of archetypes 1) as one-dimensional such as strings of numbers or of letters as in sacred texts, 2) as two-dimensional such as the matrices of quantum physics or the Chinese matrices used to represent “the total archetypal order of the *unus mundus* and all its conceivable contents,”⁸ and 3) as three-dimensional such as the knots of knot theory. Any pattern in the physical world such as geometric figures, mandalas, sound/music, or language can be transposed into a number sequence format. Modern technology uses this principle in our compact disks and computer technologies. Hence, art, music, and poetry may be viewed as representations of levels of complexity in archetypal patterns beyond space-time.

Both Western science and the ancient cultures used matrices, rectangular arrays of numbers, as representations of an aspect of reality. A matrix is a generalization of the concept of “number” in the sense that an ordinary number is a 1 x 1 matrix and is therefore a special case of a general $n \times m$ matrix. Matrices are a representation of the abstract group which is the mathematical theory of symmetry and are of critical importance to Heisenberg’s formulation of quantum mechanics. A very significant difference between matrices and simple numbers is that matrix multiplication is in general non-commutative, i.e., $a \times b \neq b \times a$. In fact, Heisenberg’s uncertainty principle “follows quite logically once matrices are chosen as the natural language for quantum physics.”⁶

However, there exists a basic difference on how “numbers” are viewed when used by modern Western scientists versus ancient scientists. In modern science, the numbers that make up the matrices are each considered only to represent a *quantity*. Yet, in the early Western science of the Greeks, “Number is a living, qualitative reality which must be approached in an experiential manner—

Number is seen not only as a universal principle, it is a divine principle as well.”¹⁵ For example, in a Chinese matrix like the Lo-shu, each single element of the matrix is regarded as a *quality* of a “field” with each number functioning as a hierarchically regulating element. “The single numbers of the matrices are not subdivisions but illustrations of the ‘phases of transformation’ that form the time-bound aspects of the whole.”⁸

The foundation of modern physics is mathematics, a symbolic language. But what is the foundation of mathematics and why does it work? If we cannot answer that question then science is based ultimately upon things we do not understand.¹⁶ However, if we accept Pauli’s contention that certain mathematical structures rest on an archetypal basis, then the observed isomorphism of mathematics with certain outer-world phenomena is not so surprising.⁸ This view is also supported by Bertrand Russell in his *Introduction to Mathematical Philosophy* where he denies number’s aspect as a mere “quantity” and describes it, rather, as an ordering factor. Thus, modern science may work because it is unconsciously making use of the same patterns of order, the number archetypes, that the ancients recognized as being revealed by the “gods,” i.e., originating beyond our space-time reality.

Over the centuries, symbols have been used extensively throughout all of human culture and have had specific qualities associated with them.¹⁷ *It is our premise that the patterns for all symbols in space-time have their base in archetypal patterns that are beyond space-time. Thus, symbols can be considered archetypal representations in the physical world.*

Every symbol has potential meaning for an individual. Through relationships that we will discuss later, the accompanying emotion can release energy stored in the body. The meaning and hence the amount of potential energy to be released is individualized, i.e., it is different for each person and under different circumstances can be different for the same person. The amount of potential energy associated with a given symbol depends upon one’s past experiences including culture, family, and individual experiences. To release this potential energy one need only focus attention upon a relevant symbol. The act of mental attention connects one to the corresponding archetypal pattern existing in the spaceless-timeless realm. Because of the way our brain/body functions, the sharper the focus of attention and the longer its duration, the greater depth into a given hierarchical structure of the archetypal pattern one can penetrate.

When an archetype is activated from the physical space-time level by an individual, there is a connection to its next more encompassing level beyond space-time, i.e., to a wholeness greater than the original archetype. This new level of “wholeness,” in turn, manifests as feedback from the spaceless-timeless realm to the physical space-time realm. This feedback is experienced in the individual’s body as emotions and feelings to which we ascribe meaning. The *emotions* are a person’s internal releases of energy. They denote releases of energy stored in the body due to the chemical/electrical response of the brain/body. Whereas the *feelings* are our assessments about something and can be without emotion.

In his discussion of archetypes, Carl Jung uses the term “numinosity” where “numen” means godlike or a characteristic of or befitting a deity. Jung states: “I must stress one aspect of the archetypes which will be obvious to anybody who has practical experience of these matters. That is, the archetypes have, when they appear, a distinctly numinous character which can only be described as ‘spiritual,’ if ‘magical’ is too strong a word. Consequently this phenomenon is of the utmost significance for the psychology of religion. In its effects it is anything but unambiguous. It can be healing or destructive, but never indifferent, provided of course that it has attained a certain degree of clarity.” At another point he states: “The archetypes have about them a certain effulgence or quasi-consciousness, and that numinosity entails luminosity.”¹⁸

Normally we are unaware of the existence and effects of archetypes in our everyday life. However, when an individual undergoes a major disruption due to a loss of a loved one, a life’s job, a near death experience, etc., there appear changes at the archetypal level that reflect to the physical. The person may undergo a period of transition from one stable state via chaos towards a new stable state. These inner messages from the spaceless-timeless reality of the unconscious can be received directly as dreams or can be made accessible through one’s expressions in art, dance, music, poetry, etc. often with the help of persons skilled in such therapy. A pattern emerges as these symbolic messages unfold over time. When deeply understood and empowered by personal energy, the result is a restructuring of the person’s psyche and a restoration of balance between body, mind and spirit. Failure to successfully make the transition can lead to disease and sometimes death.

Our modeling would predict that the fundamental “number” archetypes permeate every level of the physical and mental hierarchies. To better appreciate

the concept of “number” archetypes, let’s explore how they might be operating in the pervasive *attraction* between “opposites” that characterizes much of the phenomena of matter and mind. At the most basic level of matter is the attraction between negatively and positively charged particles. Then on up through the hierarchy—the *attraction* of adenine for thymine and guanine for cytosine in the DNA molecule. It’s as if they *have* to find each other and marry. Then the *attraction* of the sperm and the ovum. Why does that sperm go on an incredible hero’s journey to reach the ovum? Then all through the animal world there are unbelievably complicated ritual approaches necessitated by the attraction between the female and the male. Of course, look what happens to us human beings when we are overtaken by the force of attraction! Even in the human mind the opposites are in constant play.

Both the ancient literature and the work of Jung and von Franz are in good agreement on the “qualities” inherent in the first five “number” archetypes.^{8,19} The first numeral, one, is unity—an archetype and attribute of God. The first distinction breaks it into opposites—the inside and the outside. This is how a “one” gets to know itself and why self-reference and feedback permeate the universe. The even numbers represent archetypes that can be divided into two equal parts and have the female attribute of receptiveness. The odd numbers are masculine, active and disharmonic. Five is the union of an odd and an even number. To the ancients it symbolized light, health, and vitality and a connection to the spiritual realms—to the spaceless-timeless realms. This connection energizes a new archetype that results in a manifestation or creation in space-time—in the physical.

The “two” represents polarity; it has to exist, but Nature did not intend it to exist forever. The division appears necessary to establish a limited power of discrimination—an ability to learn. “The individual creations must of themselves search out their reunion. Creation is a process of division within unity, and evolution is finally a uniting of separated parts.”²⁰ Hence, every part of duality must labor to restore unity—this *attraction* would seem an inherent quality of the “number” archetypes. The name given for the all encompassing organizing power of the unity is love—and is why love has such great power to heal and restore wholeness. This is an important point and we will elaborate more fully on love as a basic organizing principle in Part III.

Although these points may appear rather abstract and metaphysical, on the contrary, they may relate to rather fundamental mathematical concepts based upon the notion of “distinction.” These concepts are receiving increasing attention in the fields of form dynamics and knot theory. They are being applied to a wide range of phenomena in mathematics, physics, linguistics, perception, and thought.^{21,22}

In summary we assume that 1) there exists a reality beyond space-time to which *everything* in the physical world is linked, resulting in a connectiveness that negates the apparent separateness of our space-time reality, 2) there exists an ordering principle and associated dynamics in this spaceless-timeless reality that affects processes and patterns in the physical world, 3) number archetypes are the fundamental elements in the dynamics of this ordering process, and 4) because of the linkage, humans interact in a feedback manner with the reality beyond space-time and thus can alter aspects of the ordering process while seeking balance with the whole.

The feedback process between the patterns of the space-time physical world and the archetypal patterns of the spaceless-timeless world of Mind can be viewed as a mirroring or self-referencing process in both directions. The process results in a cosmos that can be considered as a self-organizing system of continuous creation—a “Living Cosmos.”²³

MATHEMATICS AND THE MENTAL REALM

Mathematics is the study of pure patterns. Since everything in the cosmos can be considered a kind of pattern, mathematics is the study of this language of nature.²⁴ A preliminary step will be to elaborate further on Assumption 3 where we stated that the contents of the mental realm are essentially patterns—archetypal patterns that include those that are accessed by mathematical symbols.

That mathematics is a mental activity seems self-evident, but where is the locus of the *objects* that mathematicians work with? The mathematician, Dr. Morris Kline, after quoting a number of mathematicians on the *objectivity* of mathematical material, concludes:

These assertions about the existence of an objective, unique body of mathematics do not explain where mathematics resides. They say merely that mathematics exists in some extrahuman world, a castle in the air, and is merely detected by humans. The axioms and theorems are not purely human creations; instead, they are like riches in a mine that have to be brought to the surface by patient digging. Yet their existence is as independent of man as the planets appear to be.²⁵

If this testimony from practicing mathematicians strongly suggests that the mathematical “landscape” is there to be explored by anyone so inclined, then the story of the Indian genius, Ramanujan,²⁶ should be even more convincing. This young man’s dramatic emergence into mathematical prominence in 1915 was preceded by only the barest exposure to elementary mathematical concepts in his very limited formal schooling. Yet his formulas and theorems went far beyond the ability of advanced mathematicians of his day to prove and are only now being proved using methods completely unknown to Ramanujan.

His biographer makes this comment on Ramanujan’s philosophy regarding mathematical reality:

In the West, there was an old debate as to whether mathematical reality was made by mathematicians or, existing independently, was merely discovered by them. Ramanujan was squarely in the latter camp; for him, numbers and their mathematical relationships fairly threw off clues to how the universe fit together. Each new theorem was one more piece of the Infinite unfathomed.²⁶

How can the individual mind explore this landscape which gives every indication of being “public?” Penrose suggested that one’s consciousness breaks through into this world of ideas and mathematical concepts and makes direct contact with it. He also felt that even though different mathematicians may come out with different mental images, they are able to communicate with each other about them because they had been in contact with the *same* externally existing world.²⁷

It is clear that both Penrose and Kline have refrained from going as far as we have in our model in which we propose that the phenomenon of mathematics,

described so clearly by these writers, is possible because the mathematical “public landscape” and the “private mind” of the mathematician are **both** aspects of one and the same Mind or mental realm. No journey to an “extrahuman world” or a “castle in the air” is required. The entire landscape is present and available to each and every mind that is disposed to explore it, because that mind is in the landscape and the landscape is in that mind.

Einstein once said, “The most incomprehensible thing about the universe is that it is comprehensible.” We now have a basis for explaining this “puzzling comprehensibility”: Matter, and thus the universe, is a manifestation of basic mathematical patterns. The human mind is capable of apprehending these patterns because it shares the same realm. Therefore, humans “understand” nature by experiencing it through those mathematical structures which harmonize or “resonate” with the patterns of nature.

The language of nature may be mathematics but it is the job of the scientist or engineer to write the script, i.e., to understand the constraints of the system. By the term “constraints” we refer to those parts of a system which represent an energy barrier which would have to be overcome to modify the behavior of the system. Once these constraints are put into mathematical form, we can determine how nature’s patterns unfold over time. Mathematics then becomes a true representation of reality. This is why discoveries in mathematics have enabled us to predict and learn to use radio and TV waves which our normal senses do not perceive; and to discover particles too small to be “seen” by any existing technology.

Our contention is that our scientific symbol system known as mathematics when it is applied to the higher dimensional symmetry spaces is in fact mapping characteristics of the archetypal order beyond space-time. Thus, the abstract spaces of mathematical physics are not really “abstract” but correspond to a reality that we can experience via mind and spirit. A key goal of our model is to demonstrate that a mathematical, and hence symbolic, basis already exists in mainstream physics for unfolding the physical world of space-time from this “reality” beyond space-time.

The major issue confronting a hypothesis that a “reality” exists beyond the physical world of space-time and that it encompasses mind and spirit is the

question of “proof.” Our model states that this “proof” can never be *direct* since both the experiments and their mathematical description must be represented by patterns/symbols that of necessity have to be in two or three dimensional form. Thus, we are restricted to “indirect” or “secondary” observations of higher dimensional “realities” and, hence, we are limited on what can be “proved.” We are dealing with a wholeness—a wholeness which can’t be analyzed (in a strict scientific/objective sense) because we are a part of it.

Although not generally admitted, we believe that science has already confronted the existence of such limitations. First, we note that a central concept at the heart of quantum physics is the principle of “complementarity” which states that there exists pairs of quantities that describe a whole only when taken together, but which are mutually exclusive in that they can never be measured simultaneously.²⁸ This leads directly to the well-known uncertainty principle that asserts that there are fundamental limits on the accuracy obtainable in simultaneous measurements. There also exists a generally accepted “uncertainty” principle for the world of mathematical symbols—one that challenges basic assumptions underlying much traditional research in mathematics and logic. It is called Godel’s Proof and states that in some cases, mathematicians will not be able to decide whether a theorem *can or cannot* be proved.²⁹

LANGUAGE AND THE MENTAL REALM

Numbers and letters are intimately connected. For the Hebrews, Arabs, and Greeks, the letters of the alphabets were also the symbols for numbers. Thus, these languages and their alphabets are particularly intertwined with the numerical, mathematical and algorithmic thought of these ancient peoples. In addition, ancient cultures claim a universality or sacred status for traditional alphabets (Sanskrit, Islamic Arabic, Hebrew, Greek, Tibetan, etc.). In studies of the Norse people’s Runic characters and the Celtic symbols, anthropologists find that the symbols of alphabets appear to have served sacred and mystical purposes hundreds of years before they find evidence of their application as a written language for the general society.³⁰

We are suggesting that the “hidden meaning” of the letter/number symbols of the ancients is really the fact that the ancients knew that numbers/letters were

symbols linked to an aspect of a universal idea or quality beyond the physical, i.e., connected to “number” archetypes in the spaceless-timeless realm. Thus, numbers/letters could be used as elements in a hyperdimensional map of that higher reality. These symbols for universal patterns—whether we see them, hear them, or feel them—are received by our sensory system and are mapped upon our brain/body. In the brain a comparison process and feedback to the mental realm occurs. However, there exists within the brain a filtering process as demonstrated by positron electron tomography (PET) scans. Such PET scans of the brain show that when we receive words or near words the brain “lights up” in recognition. However, when symbols or sequences of letters that are not “relevant” to a person are received by the brain, there is no indication that an active mental process occurs.³¹

What research evidence do we have that letters/numbers are symbols that connect us to fundamental archetypes associated with a universal idea or quality? We have not found such evidence in mainstream linguistics but rather in exploratory research that leans heavily upon the wisdom and religious literature of the ancients. Two examples mentioned briefly here are discussed in greater detail in our original paper.

The first example is a commercial computer software application based upon a patented new linguistic and cognitive theory named READWARE. The theoretical foundation for READWARE was developed from a study of Arabic and the text of the Holy Quran.^{32,33} The underlying hypothesis is that the letter symbols have inherent meaning and “that each letter acts on our mind in a way that is different from every other letter.”³⁴ Thus, the assumption is that we *discover* letters and words—for they represent patterns in nature that serve as symbols for linking us to the archetypes of the spaceless-timeless realm. Because letters, or the sounds they represent, have meanings, the computer program may be applied across different alphabetical languages, without the need for translation.³⁵

An independent evaluation of the software’s performance stated: “I can attest that, even if you do not fully understand the theory behind this program, it does seem to work, often very well.” . . . “No conventional text-retrieval program could have found the text (The Research Assistant) RA did using the search terms employed in this exercise.”³⁶

The second example reports the discovery of a mathematical relationship between a sacred alphabet (Hebrew) and the sequence of letters in a sacred text (Genesis).³⁷ The letters of the Hebrew alphabet were recreated by projecting two dimensional shadows from a three dimensional form. Using a rotational algorithm, some of the letters even emerge in their appropriate order. From the same form, letters of the Islamic Arabic alphabet were also produced. Thus, according to this research, the sequence of letters in Genesis is just as determinable as the sequence of numbers in pi! This research by the MERU Foundation has not been subjected to wide review or criticism, therefore, its ultimate merit remains untested.

Nevertheless, this result could be explained if each letter/number symbol has associated with it qualities of a “number” archetype in the spaceless-timeless realm that provide it meaning. In effect, the predetermined text of symbols is writing its own story—a message from beyond space-time — the “word of God!” The reconstructed model of the ancients that has emerged from the MERU research presents a theory of creation from a spaceless-timeless realm and has many equivalences with our model that is based upon modern physics/mathematics.³⁸

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CORRESPONDENCE: William C. Gough • Foundation for Mind-Being Research • 442 Knoll Drive • Los Altos, CA 94024 • Robert L. Shacklett • Post Office Box 2128 • Aptos, CA 95001

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REFERENCES AND NOTES

1. R. L. Shacklett & W. C. Gough, The Unification of Mind and Matter: A Proposed Scientific Model, Dec. 29, 1991 *Report of the Foundation for Mind-Being Research* (442 Knoll Drive, Los Altos, CA 94024).
2. W. C. Gough, Interdisciplinary Working Meeting Seeking a Common Basis for Language, Mathematics, and Physics, Feb. 6-8, 1993 *Foundation for Mind-Being Research* (442 Knoll Drive, Los Altos, CA 94024).

3. W. C. Gough, *Physics and the Power of Symbols* (Presented at the 3rd Annual ISSSEEM Conference, Monterey, CA, June 27, 1993, Audio tape available from Sounds True Recordings, 735 Walnut St., Boulder, CO 80302).
4. W. C. Gough & R. L. Shacklett, *Physics, Parapsychology and Religion — Part I: The Reality Beyond Space-Time, Part II: The Quantum Linkage, Part III: The Human Implications*, *Journal of Religion and Psychical Research* 16, 2,3,4 (1993).
5. G. Zukav, *The Dancing Wu Li Masters* (Bantam Books, New York,1980), p. 313.
6. Werner Heisenberg announced his discovery of quantum theory in 1925. Later in his life, Heisenberg claimed “that his most important influence had not been university professors or textbooks, but his discussions with Pauli,” his friend and fellow student. [F. D. Peat, *Einstein’s Moon: Bell’s Theorem and the Curious Quest for Quantum Reality* (Contemporary Books, Chicago, 1990), pp. 31,39.]
7. C. G. Jung & W. Pauli, *The Interpretations of Nature and the Psyche* (Pantheon, Bollingen Series LI. New York, 1955).
8. M. von Franz, *Number and Time: Reflections Leading Toward a Unification of Depth Psychology and Physics* (Northwestern University Press, Evanston, IL, 1974, Translation of 1970 German edition).
9. C. G. Jung, *Memories, Dreams, Reflections* (Pantheon Books,New York, 1963), p. 388.
10. C. A. Meier, Science and Synchronicity—A Conversation with C. A. Meier, *Psychological Perspectives*, 19 2 (1988), pp. 320-324.
11. M. von Franz, Meaning and Order: Concerning Meeting Points and Differences Between Depth Psychology and Physics, *Quadrant*, 14 1 (1981), pp. 4-22.
12. H. P. Stapp, Time and Quantum Process, *University of California Lawrence Berkeley Laboratory Report No. LBL-17576* (March, 1984). Also published in *Proceedings of the Physics and the Ultimate Significance of Time Conference*, Claremont,CA (1983), pp. 264-270.
13. H. Van Erkelens, Wolfgang Pauli’s Dialogue with the Spirit of Matter, *Psychological Perspectives*, 24 1 (1991), pp. 34-53.
14. C. R. Card, The Archetypal View of C. G. Jung and Wolfgang Pauli — Part I, *Psychological Perspectives*, 24 1 (1991), pp. 19-33.
15. *The Pythagorean Sourcebook and Library: An Anthology of Ancient Writings Which Relate to Pythagoras and Pythagorean Philosophy* (Compiled and translated by Kenneth Sylvan Guthrie, Grand Rapids, Michigan: Phanes Press, 1987), p. 21.
16. J. D. Barrow, *Pi in the Sky: Counting, Thinking, and Being* (Claredon Press, Oxford, 1992) pp. 1-2.
17. J. E. Cirlot, *A Dictionary of Symbols* (Philosophical Library, New York, 1971, Translated from the 1962 Spanish edition by J. Sage.)
18. C. G. Jung, *On the Nature of the Psyche* (Princeton University Press, New York, 1973), pp. 115, 101. Extracted from *The Structure and Dynamics of the Psyche*, Vol. 8 of the *Collected Works of C. G. Jung* (Bollingen Foundation, New York, 1960).
19. M. P. Hall, *The Secret Teachings of All Ages: An Encyclopedic Outline of Masonic, Hermetic, Qabbalistic and Rosicrucian Symbolical Philosophy* (The Philosophical Research Society, Inc., Los Angeles, CA, 1988), p. LXXII.
20. M. P. Hall, *On the Pythagorean Philosophy of Numbers,Lecture Notes #307* (The Philosophical Research Society, Inc., Los Angeles, CA, 1984).
21. L. H. Kauffman & F. J. Varela, Form Dynamics, *Journal of Social and Biological Structures* 3 (1980), pp. 171-206.
22. L. H. Kauffman, *Knots and Physics* (World Scientific, Singapore, 1991).

23. D. Elgin, *The Living Cosmos: A Theory of Continuous Creation*, *ReVision*, 11 1 (1988), pp. 3-22.
24. R. Rucker, *Mind Tools: The Five Levels of Mathematical Reality* (Houghton Mifflin Co., Boston, 1987).
25. M. Kline, *Mathematics and the Search for Knowledge* (Oxford University Press, New York, 1985), p. 200.
26. R. Kanigel, *The Man Who Knew Infinity* (Charles Scribner's Sons, New York, 1991), p. 66.
27. R. Penrose, *The Emperor's New Mind: Concerning Computers, Minds, and The Laws of Physics* (Oxford University Press, New York, 1989), p. 428.
28. M. Kafatos & R. Nadeau, *The Conscious Universe: Part and Whole in Modern Physical Theory* (Springer-Verlag, NY, 1990)
29. E. Nagel & J. R. Newman, *Godel's Proof* (New York University Press, 1958).
30. B. Branston, *Gods of the North* (Thames & Hudson, London, 1980), pp. 5-6.
31. S. E. Petersen, P. T. Fox, A. Z. Snyder, & M. E. Raichle, Activation of Extrastriate and Frontal Cortical Areas by Visual Words and Word-Like Stimuli, *Science*, 249 (1990), pp.1041-1044; also discussed in Brain Images Reveal Key Language Areas, *Science News*, 138 (1990), p. 134.
32. T. Adi & K. Ewell, *Letter Semantics in Arabic Morphology: A Discovery About Human Languages* (Presented to the Linguistic Society of America, Stanford University, CA, July, 1987).
33. K. Ewell & T. Adi, *Natural Language is as Natural as Natural Phenomena* (Presented at the AI EAST Conference on Artificial Intelligence, Atlantic City, NJ, October, 1987).
34. T. Adi and K. Ewell, *A New Mathematical Model of an Ancient Paradigm for Information Processing* (Presented to the 54th American Society for Information Science Annual Meeting, Washington, DC, October, 1991).
35. T. Adi, *Method and Apparatus to Identify the Relation of Meaning Between Words in Text Expressions* (United States Patent number 4,849,898, July 18, 1989), p. 15.
36. C. Urr, Software Reviews of Text Search and Retrieval Program—Research Assistant, *Library Software Review* (July-August 1991), pp. 301-304.
37. S. Tenen & W. C. Gough, *MERU Project: Origins of Ancient Alphabets and Sacred Texts* (March 1989).
38. S. Tenen, *Geometric Metaphors of Life*, video tape of lecture presented on Feb. 16, 1989, *A Coat of Many Colors*, a supplement to the preceding video tape, 1990, *A Matrix of Meaning for Sacred Alphabets*, a video tape of lecture presented on Jan. 10, 1991, and *Dance of the Hebrew Letters*, a video tape of lecture on Mar. 10, 1992, MERU Foundation, P.O. Box 1738, San Anselmo, CA 94979.