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Single Field Unification and ‘Quantum’ Consciousness
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Within a few years of Albert Einstein’s initial development of General Relativity (GR), Theodor Kaluza extended the theory to include electromagnetism. Kaluza’s work has generally been regarded as the first hyperspatial theory of the single field. Hermann Weyl first attempted to extend GR by enriching the field with a gauge structure, but his theory retained the original four-dimensional space-time. Both theories have a long history and have added a great deal to our overall knowledge and understanding of nature, but neither line of development was very successful or popular in a scientific community more enamored with the quantum and atom.

Thomas Appelquist and his colleagues recently ‘rediscovered’ an earlier paper in which Gunnar Nordström used an extra dimension of space to develop a new theory of gravitation. Nordström’s theory preceded GR by two years. Since the theory of Special Relativity (SR) that Nordström used as the basis of his gravitational theory was essentially an electro-dynamical theory, it could be argued that Nordström’s theory was a single field theory. However, the real progenitor of all such theories was William Kingdon Clifford who stated publicly that matter was no more than curved space and ‘matter in motion’ no more than variations in that curvature. These statements came in 1870 before the Cambridge Philosophical Society. Many scholars later credited Clifford’s statement as a ‘precursor’ or ‘forerunner’ to Einstein’s GR, but Clifford went much further.

Clifford died young and is thought to have never published or developed his theory of space curvature. He ‘purportedly’ left no followers to carry his theoretical research forward. These beliefs are simply and emphatically untrue. It is true that Clifford’s theoretical model of space did not directly influence Einstein, but Clifford did popularize the concept of a real hyperspace characterized by curvature resulting in specific physical consequences in our normal physical space. Because Clifford’s previous work opened the door to the possibility of a real physical hyperspace, Einstein’s GR fell into the lap of a scientific community in which a large segment was already sympathetic to such ideas. GR was thus accepted more readily than would have been the case otherwise.

Clifford did not use a Riemannian structure to explain gravitation, as did Einstein. Instead, Clifford cast his friend James Clerk Maxwell’s recent theory of electromagnetism into a four-dimensional framework of space. His ultimate goal was to include gravity in his geometrical structure of space after he fully explained electromagnetism. In fact, he planned to explain all of the various motions of matter in terms of space curvature. Clifford intended to reduce three-dimensional dynamics to four-dimensional kinematics within a geometrical structure where all kinetic energy would merely be a case of potential energy of relative position in a four-dimensional ‘elliptic’ space, or what we would today call a ‘Riemannian’ space. Time was not a part of Clifford’s four-dimensional structure, but a separate element in the overall structure of physical reality. This approach makes Clifford the real ‘father’ of all later attempts to base a ‘theory of everything,’ our modern TOE, on the field concept. Clifford even claimed he was “solving the universe,” an apt description of today’s efforts to develop a TOE.

Modern attempts to unify all of physics within a single field structure differ from their nineteenth century counterparts by their denial that the fifth dimension of space is physically real, what is today called an embedding space. Clifford and his followers interpreted space curvature as an ‘extrinsic’

property of three-dimensional space, even though the concepts of 'extrinsic' and 'intrinsic' properties of space had not yet been developed. The qualified and rapid success of GR using a mathematical system that did not differentiate between the intrinsic and extrinsic aspects of space-time curvature fostered the misconception that only four dimensions were necessary to give a complete view of physical reality. Einstein, Kaluza and later theoreticians, at least for the most part, considered curvature an 'intrinsic' property of space-time so there was no physical need of a higher-dimensional embedding space. The mathematical or geometrical structure of space-time in GR need not refer to the number of spatial physical dimensions in the manifold. Even Kaluza's theory only gave mathematical significance to his five-dimensional extension. This oversight leads to the most severe of the major criticisms of his theory.

Since Kaluza placed no physical significance in his fifth dimension, using the concept only as a mathematical tool by which to derive his goal of unification, he opened his theory to excess criticism. It was severely criticized by some for going too far just by introducing the fifth dimension and by others for not going far enough by adding some physical interpretation to the fifth coordinate once it was used. Other criticisms were leveled concerning the variable representing the purely five-dimensional characteristics of space-time, $(_{00}$. Setting this variable equal to +1 seemed either unnecessary or unwarranted. Both 'A-cylindricity' and the correlations drawn by Kaluza between the field constants in his model and the known field constants of electromagnetism also seemed artificial in many respects. Thus his theory seemed rather *ad hoc* to the scientists of his own day and the next few decades. Kaluza's theory was further criticized for not making any predictions that would allow it to be tested. It merely reproduced electromagnetism without expanding or adding anything to the already existing Einstein-Maxwell equations. Yet all of these criticisms are indirectly concerned with the question of the reality of the fifth dimension, a fact that was hotly debated before the birth and success of GR. The only significant criticism that was ever leveled against Kaluza's theory dealt with his adoption of the fifth dimension even though all physical evidence implies a four-dimensional space-time.

To his credit, Kaluza did successfully unify GR and electromagnetism within the structure of a single field. Unfortunately, the scientific community paid very little attention to his accomplishment. Einstein and a few others attempted to extend the theory during the 1930s and later while H.T. Flint and his colleagues in England followed a similar and related five-dimensional path to unifying GR with quantum theory. In each of these instances, very little was ever said about the reality of the fifth dimension even in those cases where such a reality seemed to have been taken for granted. Einstein's own work on the five-dimensional unified field theories ended in the middle 1940s. Einstein's final comment regarding this approach to unification was given in the final edition of *The Meaning of Relativity* before Einstein's death. He simply stated that a hyper-dimensional hypothesis could only be considered a valid theoretical option if and when it could be shown why all empirical data leads to a strictly four-dimensional world. (Einstein, 1956, 166) Scientists could not legitimately apply a five-dimensional geometry unless there was an overwhelming reason to do so in the absence of any observational or experimental evidence of the existence of a fifth dimension. Any scientist developing a five or higher-dimensional theory must not only contend with this problem, but also justify the basic assumption of the higher dimension by demonstrating that this hypothesis and only this hypothesis could account for observed natural phenomena.

In the Kaluza model, a special form of line, the 'A-line,' which extends orthogonally into the fifth dimension, replaced each point in our normally sensed three-space. The length of every A-line in the universe is both 'constant and equal.' Kaluza thought that this restriction would guarantee the fact that we cannot perceive the fifth direction only if the length was extremely small. The A-lines form small closed loops around the fifth dimension. In other words, they formed small cylinders in five-space corresponding to material particles. This structure was referred to as 'A-cylindricity' or the 'cylindrical condition.' Oskar Klein then used Kaluza's 'A-cylindricity' to naturally incorporate the quantum of action into the overall space-time structure of the world and thus completes the unification. Klein reasoned that the circumference of the cylinders were in the quantum range of values. His version of Kaluza's theory

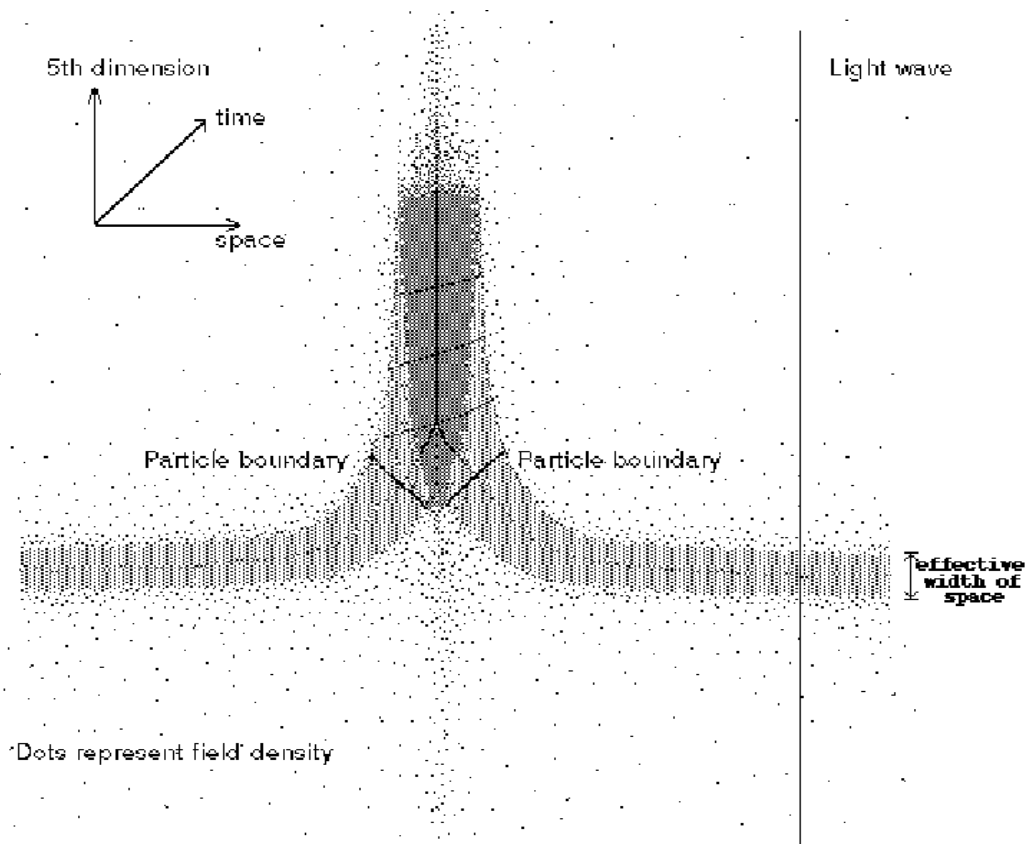
became popular in the 1980s and presently serves as the basis of superstring theory.

On the other hand, if the fifth dimension is given a physical reality as it was before GR, a completely new and different theory of the 'single field' evolves. In this case, the theory not only unifies quantum theory and relativity, but it accounts for all four of the fundamental forces (interactions) of nature. So scientists can neither ignore nor deny the theoretical and practical consequences of accepting a real fifth-dimensional extension of our four-dimensional physical reality. The recent development of superstring theories proves the utility of hyper-dimensional theories even though they are based upon an over-restrictive interpretation of Kaluza's five-dimensional model. In the superstring models, the fifth dimension is wrapped up in the minute cylindrical structure, so still more dimensions have become necessary to increase the number of degrees of freedom that have been lost by overly-restricting the constant length of the A-lines. Ten or more dimensions are used to mathematically account for normal physical phenomena in the superstring model. We can neither detect nor perceive the higher dimensions because they were 'compactified' shortly after the 'big bang.' The superstring theories are thus susceptible to the same problems that have plagued other hyper-dimensional theories. Scientists have no idea how to picture or deal with higher-dimensional spaces. Since we have no intuitive or experiential feel for a higher dimension of space, the physical laws, principles and theories that we accept as valid and accurate descriptions of nature must act as our guides to determining the true structure of this five-dimensional space-time.

The extremely small scale of 'A-cylindricity' is not the only possible interpretation of the simple conditions that Kaluza set on the mathematical model to explain why we fail to experience or perceive the fifth dimension. The fifth dimension can be a much greater extension of our four-dimensional physical world if our normal everyday space-time was a very thin 'sheet' curved in the fifth embedding dimension. If the 'sheet' were thin enough, we would never normally sense the fifth dimension. We would be constrained to live out our lives and our whole 'physical' existence within the confines of the 'sheet.' Since the 'sheet' is continuous with its extension in the fifth dimension, it would need a very small fundamental 'effective width' in the fifth direction. The fundamental 'effective width' would be smaller than even the sub-atomic realm. All matter would then be no more than curves of the 'sheet,' so all physical interactions of matter would be limited to action within the confines of the 'sheet.' Therefore, we would not 'normally' sense or perceive the fifth dimension in the same manner that we sense and perceive the material world. This does not mean that we could 'never' sense our extension in the fifth dimension, only that any perception of the fifth dimension would be radically different from our perceptions of the material world as mediated by our five senses.

Circles cutting across a common sphere will fulfill Kaluza's 'constant and equal' condition for the A-lines just as readily as circles cutting across a cylinder. The great circles of a Riemannian sphere fulfill this condition. On the other hand, there is nothing in Kaluza's theory that requires that the universal or single field density along the A-line is constant as is assumed in the 'cylindrical' model, so what is modeled as a 'sheet' corresponds to the densest portion of the single field within the fifth dimension. This highly dense portion of the single field would need to have a uniform length in the fifth direction, which would constitute the fundamental 'effective width' of the 'sheet.' The A-lines themselves have no more physical reality than Michael Faraday's "lines of force" in electromagnetism. The A-lines are a geometrical device that allows the mathematical development of the single field model just as geometrical points have allowed the mathematical modeling of normal space.

In this model, the primary elementary particles range from extended physical 'points' of local curvature up to folds in the space-time sheet. These curves and folds can be viewed as 'singularities' in the four-dimensional portion of the single field. But from the five-dimensional perspective, the 'singularities' are just denser portions of the single field. Discrete material particles are just an illusion of the four-dimensional perspective from within the 'sheet.' The proton, electron and neutrino represent the three different degrees of curvature of the 'sheet.'



This diagram represents a proton. The dots are not discrete 'sub-particles,' but merely depict the density of the single field in the fifth dimension.

The proton is a fold in the 'sheet,' the electron is the maximum curvature before folding and the neutrino is the minimum local curvature that is independently distinguishable. The neutrino is small blip or 'burble' in the 'sheet.' On the other hand, a neutron is a compound particle formed from an electron and proton stacked one atop the other in the fifth dimension. As such, the neutron is an individual particle with a distinct curvature, but it can decay into a proton and electron under the proper conditions within the 'sheet.'

Gravity is still be explained by GR with no significant changes. Gravitational forces would still reduce to relative positions along the curved space-time 'sheet.' However, electromagnetism occurs within the 'effective width' of 'sheet.' Gravity is an 'extrinsic' effect of the 'sheet' while electromagnetism is an 'intrinsic' effect of the 'sheet.' The permittivity and permeability constants associated with electromagnetic theory are connectivity constants between points in space and the universal gravitational constant is a connectivity constant between material particles. The major problem that scientists have traditionally faced during their attempts to unify gravitation and electromagnetism within a single field structure reduces to the inability of scientists to express the difference between the

‘extrinsic’ quality of gravitation and the ‘intrinsic’ qualities of electromagnetism relative to the space-time ‘sheet.’ The internal structure of space-time and thus matter is electromagnetic in nature as suspected for more than the last century.

This single field model yields some very interesting features of common physical phenomena and solves many rather complex problems in science. Every point in space-time extends into the fifth dimension (orthogonally) along an A-line. An electromagnetic wave corresponds to an A-line, but it is a substantial instead of a purely mathematical entity. A purely mathematical A-line corresponds to the virtual particle of quantum mechanics. An electromagnetic wave extends equally along a great circle of the five-dimensional Riemannian sphere that cuts across the four-dimensional ‘sheet’ at one and only one point. The part of this electromagnetic A-line cutting across the ‘effective width’ of the ‘sheet’ is the photon and the rest of the electromagnetic A-line constitutes the wave portion. When electromagnetic A-lines interact with other electromagnetic A-lines across their total length in the fifth dimension, they display the purely wave characteristics of interference, refraction, diffraction and reflection. When electromagnetic A-lines interact with matter within the ‘effective width’ of the ‘sheet,’ they display the particulate nature of light and thus act as photons. In the final analysis, wave-particle duality disappears as it reduces to a wave-particle ‘singularity’ which stretches along a single A-line in five-space.

Similar conditions govern material particles, which are also ‘singularities,’ at least in GR. They are called ‘divergences’ in the ‘quantum field’ extension of ordinary quantum mechanics. There is actually no such thing as a ‘quantum field,’ since the quantum represents a discrete point or particle and the field is characterized by continuity. The phrase ‘quantum field’ is therefore an oxymoron. What we detect as discrete matter in our four-dimensional space-time continuum is just continuity without any disruptions from the five-dimensional point of view. The whole paradox of wave/particle duality reduces to the act of differentiating between that portion of light or a material particle which cuts across or exists within the confines of the fundamental ‘effective width’ of the ‘sheet’ and the remaining portion of the wave or particle which exists external to the ‘sheet,’ and constitutes the substance of the singularity. The very notion of a distinction between the ‘sheet’ portion of the A-line and the rest of the A-line is reflected in Kaluza’s original mathematical model. Kaluza used a ‘cut-transformation’ to yield the electromagnetic properties of matter, isolating the extended wave portion of the A-line, and a ‘four-transformation’ to yield the common relativistic and mechanistic properties of matter, the particle portion of the A-line across the ‘sheet.’

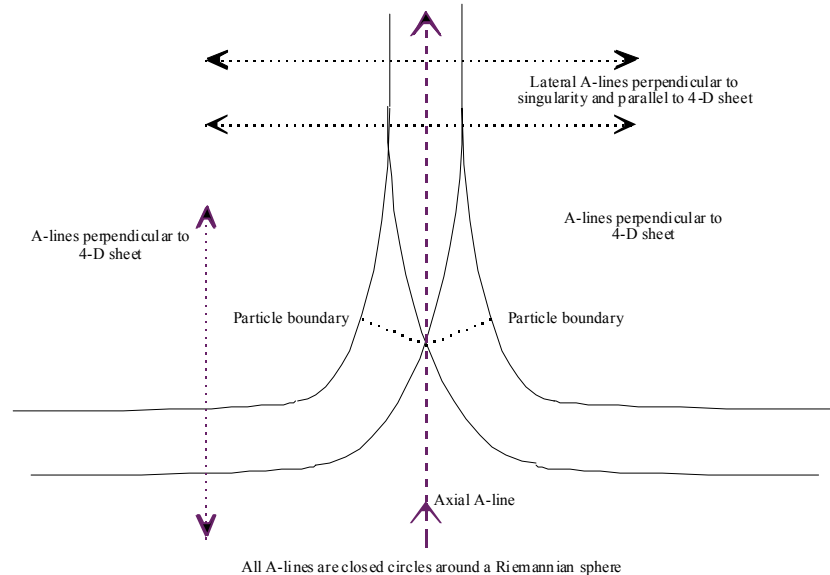
The portion of a material particle existing outside of the sheet, the ‘singularity’ portion, also corresponds to the Schrödinger wave function. The R function of wave mechanics is just the five-dimensional volume of the particle. William Wilson first expressed this interpretation in 1928. Wilson demonstrated that the R function could be viewed as a five-dimensional volume and derived the Klein-Gordon equation based upon that assumption. The ‘point’ particle of quantum mechanics is no more than the point where the ‘axial A-line,’ about which the five-dimensional volume of a particle is extended, intersects the central ‘plane’ of the uniform ‘sheet.’ Great care must be taken while trying to visualize this geometrical structure since three-space and time have been reduced to a two-dimensional ‘plane’ or ‘sheet’ for mathematical purposes. There may be a tendency to regard the ‘sheet’ and A-lines as the reality when in fact the universal single field and the variations of single field density are the true reality. A variation of this mistaken identification was the major problem confronting hyperspatial theories during the late nineteenth century and hastened the differentiation between the ‘extrinsic’ and ‘intrinsic’ properties of space.

The ‘axial A-line’ is also a particle’s axis of symmetry in the fifth dimension. It is the linear extension of a particle’s common space ‘center of mass’ in the fifth orthogonal direction. The probability associated with the R function in quantum mechanics is no more than an expression of function of the linear single field density which is stretched along the ‘axial A-line’ in the fifth dimension. In this capacity, the probability corresponds to (but is not the same as) the five-dimensional volume of the particle and thus the wave function. The ‘axial A-line’ can be considered the center of single field density

for each and every material particle in the universe.

When a particle moves at high speeds relative to other particles in the ‘sheet,’ it experiences a Lorentz-Fitzgerald contraction in the direction of motion in three-space. This contraction corresponds to a proportional lengthening of the particle in the fifth direction, or rather the center of single field density along the ‘axial A-line’ shifts further away from the ‘sheet’ in the fifth direction. The five-dimensional volume of the particle is conserved which is to say that the R function is constant over the whole range of possible speeds. This last statement constitutes a new expression of the conservation of mass and energy. As a particle approaches the speed of light, it acts light-like in that it tries to mimic a light wave by spreading its single field density equally over the whole length of the ‘axial A-line.’ However, the particle can never become truly light-like because it is only contracted in the direction of motion, so it is still extended as normal in the other two directions of three-space. All of the other mechanical effects and formulas of SR are easily explained within this five-dimensional framework, but several far more profound and unexpected effects emerge from the consideration of SR within the five-dimensional model, such as physical explanations of life, mind and consciousness. The emergence of consciousness as a result of SR is quite profound since consciousness and mind are only associated with some interpretations of quantum mechanics in normal physics.

According to Kaluza’s orthodox view of the fifth dimension, A-lines correspond to points in four-dimensional space-time that are perpendicular to the ‘sheet’ and extend in the fifth direction. However, when space-time folds over to create a particle or a ‘singularity,’ an extension which is itself perpendicular to the ‘sheet,’ this structure is altered in a new way. A-lines associated with the folded portion of the ‘singularity’ extend laterally across the fifth dimension and parallel to the space-time sheet.



These ‘lateral A-lines’ emanate from all material particles and stretch across five-dimensional space. They give form, in a sense, to the probability distribution of quantum mechanics. In other words, they correspond to the ‘quantum field’ in so far as such a phrase can accurately describe a real physical

situation. The 'quantum field' has no more physical reality than the A-lines that are purely mathematical entities.

The 'quantum field' is a mathematical concept or device that can be used to model the continuous and real single field in four-dimensional space-time with a great deal of accuracy. So quantum mechanics is no more than a very accurate approximation of the single field. The Heisenberg uncertainty principle merely marks a limit beyond which space and time cannot be regarded as independent from each other within the continuous 'sheet.' The 'lateral A-lines' connect each and every material particle or 'singularity' within the four-dimensional 'sheet' with all other material particles or 'singularities' in the universe. This structure yields an intimate and real 'connectivity' between all bodies of matter throughout the universe. This new 'connectivity' goes beyond the normal connection between particles via mutual gravitational attractions. This 'connectivity' is known as 'entanglement' in the most recent interpretations of quantum theory, however this concept of 'entanglement' goes far beyond the concept used in quantum theory because the 'entanglement' is a constant feature of the space-time 'sheet.' This model comes very close to David Bohm's model of the implicate and explicate orders. In fact, the two models are quite intimately related. The space-time 'sheet' itself corresponds nicely to Bohm's concept of a 'quantum potential field,' but there are differences.

Since the 'lateral A-lines' exist only in five-space, anything following these paths will not be restricted by physical limits such as the speed of light. The speed of light is a limit to motion or variation of position within the 'sheet,' not external to the 'sheet.' The existence of a system of 'lateral A-lines' can be used to explain non-local quantum interactions and the quantum tunneling effect as well as other physical occurrences such as psi (paraphysical) phenomena. In fact, there are four basic areas where the five-dimensional single field theory expands on previous physical theories of nature. (1) It can account for paraphysical or psi phenomena. (2) It can be used to explain life, mind and consciousness, which are also paraphysical in nature. (3) A new theory of the atomic nucleus evolves from the new geometrical structure of space-time. And, (4) the spiral shape of galaxies and related phenomena can also be explained. While the first two categories are paraphysical in nature, the last two are usually covered by theories in normal physics and thus mark a wholly new approach to physics, the explanation of normal physical phenomena by paraphysical means. Paraphysical phenomena are real natural phenomena that are governed by actions 'beyond' or 'outside of' the 'sheet' and thus wholly within the fifth dimension. But actions outside of the 'sheet' can also affect normal physical events and phenomena within the 'sheet.' This is just the case for both the nucleus and the spiral formation of galaxies.

For the case of an atomic nucleus, the structure of a neutron acts as the best guide. One of the oldest principles in nature is expressed in the fact that two particles or material bodies cannot occupy the same space. This is equally true for particles in the 'sheet,' but under proper conditions particles can be stacked in the fifth dimension and thus 'above' a single point in the 'sheet.' The neutron consists of an electron and proton stacked in the fifth dimension. The nucleus of an atom occurs in the same way. Protons and neutrons are stacked 'above' the same point in space-time. In this manner, they form a 'singularity' but still manage to remain as independent particles within the nucleus. This model shares characteristics with both the 'shell' and 'fluid drop' models of the nucleus and can account for many properties of the nucleus that have previously gone unexplained.

At the opposite end of the scale of nature, it is quite well known that the universe is expanding as a whole. Within this model, the expansion must occur in the fifth dimension. So the basic spiral form of galaxies reduces to a simple torsional or Coriolis effect caused by the four-dimensional 'sheet,' our normally sensed universe, expanding outward in the fifth direction. This new type of Coriolis effect does not act at the galactic scale alone. It acts on all sizes and scales of matter. The structure of star/planetary systems, minute precessions and wobbles in individual planetary rotations and even the weak nuclear force are all related and can be explained by the same Coriolis or torsional effect. The explanations of these purely physical phenomena are all the more important since they provide the means for the falsification and physical verification of the single field model.

On the other hand, purely parapsychical phenomena can also be explained rather easily within this theoretical framework. In fact, psi phenomena as well as life, mind and consciousness become direct consequences of the physics of this five-dimensional space-time continuum. When the relative speeds of particles change, their 'lateral A-lines' communicate, in a mathematical sense, the resulting alteration or variation in the single field throughout the whole field. It must be remembered that the A-lines are mathematical devices rather than real entities. They merely represent possible paths within the single universal field. The field and variations in field density are the reality. A-lines only make sense because the field is continuous.

All matter in the universe can be categorized as either animate or inanimate. Normal physics does not distinguish between the two. However, physicists seek to reduce all phenomena to 'matter in motion,' so the two types of matter can be simply distinguished by the fact that animate matter is self-motivating while inanimate matter is not. Inanimate matter reacts to gravitational, electric and magnetic fields, but animate matter can either react to or 'choose' not to react to physical fields and the resulting forces of nature. In other words, a fifty-kilogram animal and a fifty-kilogram rock both fall from a ten-meter high cliff in the same manner, but the animal made a choice to throw itself over the cliff and the rock did not. Living matter is also negentropic. A living organism orders and organizes its internal material constituents in specific patterns while matter in the non-living world moves naturally toward greater disorder. Living organisms are islands of structure and order moving with purpose and intent through a disorderly and chaotic sea of randomly moving particles. The non-living world is governed by entropic action according to the laws of thermodynamics, as is the world as a whole, living and non-living bodies together. On the other hand, animate matter acts negentropically through self-motivation, so the two are intimately related.

These unique qualities are embodied in the complex chemical reactions and interactions that characterize life. They differ from the ordinary chemical reactions in non-living bodies because they act continuously throughout the life of the organism. This is true no matter how simple the organism. During the chemical interactions associated with life, energy is transferred from one particle in a molecule to another. The energy transfer alters the velocity of the particles involved. The normal chemical interactions associated with life are duplicated throughout an organism and this repetition establishes a harmony or 'resonance' while the organism is alive. Perhaps the word resonance is not exactly accurate, since the important part of the effect actually happens in the new extended spatial dimension rather than the material four-dimensional space-time 'sheet,' but the idea is at least similar to the classical concept of a resonance. The continual transfer and exchange of energy causes a variation of single field density along the 'axial A-lines' of the particles involved. These variations are 'communicated' via the 'lateral A-lines' to other particles. Since the same interactions occur in many other particles a pattern of coupling or special 'entanglement' is established which is the 'resonance.' Other common chemical interactions within the living organism establish other patterns. Eventually the patterns themselves form or evolve a higher-level pattern of interactions and single field variations as characterized by the 'lateral A-lines.' This higher level of coupling or entanglement of 'lateral A-lines' is the extra something that distinguishes a living organism from a simple Newtonian mechanism. These 'entanglements' are the "life force," "vital force" or "elan vital" that scholars and philosophers have sought for many centuries.

The complex variations in single field density, which constitute the non-mechanistic quality of life itself, exist in the 'entangled' pattern of 'lateral A-lines' in the fifth dimension. Everything that occurs in the fifth dimension corresponds to a physico-chemical or electro-mechanical event within the 'sheet' and vice versa because the fifth dimension is an extension of the four-dimensional sheet rather than something separate from the 'sheet.' So specialized organs within a more complex living organism correspond to specialized patterns of field variations in the fifth dimension. This is equally true for the brain, which is the electro-chemical and thus mechanical control organ for living bodies.

Even the simplest living organism requires a control mechanism to react to its environment. As the organism evolves ever more complex chemical interactions, the control mechanism of the organism

evolves to a point beyond which it 'interacts' with the organism's immediate external environment rather than just reacting to it through physical stimulation. The control mechanism, no matter how simple it may be, is still a brain and the brain is a specialized mechanism interacting through and within the four-dimensional 'sheet.' At the point where the brain first 'interacts' with the local environment outside of the body a new higher complexity has evolved which is the mind. So the simplest form of mind is at least the five-dimensional extension of the brain, although it can be much more under the proper conditions.

At the five-dimensional level of life, the complex patterns of 'lateral A-lines' eventually begin evolving into a pattern of patterns. The patterns representing life itself entangle themselves in a higher order pattern, which can be called mind. This higher level pattern evolves at the same moment that the physical brain and mind become aware of themselves and body's immediate environment and begin interacting with and manipulating their local environment. Mind is the control of life at the five-dimensional level just as brain is the control of body at the four-dimensional level of the 'sheet.' Mind has evolved as the brain's awareness of itself and its local environment at the four-dimensional perceptual level. However, awareness can only be explained in physics as a higher point of view or perspective, which can only come from a higher dimension of space-time. It is from the perspective from the fifth dimension, and only from that perspective, that the extended awareness of the whole body and local environment can take place.

The negentropic process of evolution does not necessarily end with the development of mind. As the mind and brain interact more with their environment they learn and form new memory patterns. On the level of the brain, these memory patterns may be physico-chemical or electrical in nature, but they mark a further complexity of patterns in their five-dimensional equivalent extensions. The brain and mind learn of and begin to interact with a larger and more comprehensive environment, the non-local environment. The brain becomes aware of a much larger world than just its immediate environment in both space and time. This awareness corresponds to an even higher level of patterns of 'lateral A-lines' extending from the mind to other physical objects, both animate and inanimate. The mind thus becomes aware of a greater totality of connection between itself and the whole of the space-time 'sheet.' This newly evolved set of patterns of mind, an entanglement of local and non-local extensions of matter in the fifth dimension, is the beginning of consciousness.

Once again, from the point of view and methodology of physics, such an awareness can only come from the higher and more comprehensive view from the fifth dimension. So the physico-chemical traces of consciousness in the brain correspond to an extension of mind outward into the fifth dimension via the mind's 'lateral A-lines.' A great deal has been said and written about consciousness and the 'collapse' of the wave packet in modern physics. Consciousness can 'collapse' the 'wave packet,' at least in so far as that interpretation of reality bears some resemblance to the five-dimensional model, by either local mechanical means within the 'sheet,' physical experiments, or non-locally via the 'connectivity' between particulate matter along the 'lateral A-lines.' Consciousness is a higher-level complexity or connectivity of mind, which extends beyond the physical confines of the body. Mind is more than just a five-dimensional extension of brain since it also includes an awareness of life itself and the body as perceived from its higher-dimensional perspective.

The fifth dimension is the playground of mind because mind corresponds to a four-dimensional extension of the brain. So mind normally operates according to the confines of the four-dimensional body. The brain motivates the body or otherwise moves the matter of the body through electrical signals and mechanical means, all things within the space-time 'sheet.' On the other hand, mind is also a complexity of 'lateral A-line' patterns resulting from the whole body and thus extends across the fifth dimension beyond the mere extension of the brain alone. The mind may act 'physically' through the brain, but it is neither 'physically' confined to nor located within the brain. Mind operates directly on the 'axial A-lines' that mark the material body's extension into the fifth dimension and thus mind is the highest 'normal' level of self-motivation in the complete living organism. Mind is the evolutionary product of the negentropic structural tendency of all living matter.

Two basic and opposite principles seem to have emerged at the birth of the universe, order and disorder. Expansion of the universe as a whole then gave rise to increasing disorder, which we call entropy, but that was balanced by increasing order, which became the evolutionary process toward life and beyond. Since the universe expands as a whole, independent of the existence of life, then the universe as a whole displays a tendency toward greater disorder as expressed in the laws of thermodynamics. In other words, entropy increases on the whole. This raises a question, which cannot be answered at present, whether the balance between order and disorder is merely qualitative or completely quantitative. Even so, since life is a direct product of the tendency toward greater order then the evolution of life is both natural and normal in our universe.

At a still higher level of evolution which still acts according to the negentropic tendencies of living matter, the complex of patterns and single field variations itself becomes so complex that a further complexity of 'resonances' develops. The various couplings themselves become entangled. Since the fifth dimension is a point by point extension of the four-dimensional 'sheet' or the space-time continuum, everything that occurs in the fifth dimension corresponds to some occurrence in the four-dimensional sheet and vice versa. So, at the point where the complexity of patterns that forms the mind evolves to a still higher order of complexity and entanglement, there must be a correspondence on the four-dimensional level of the thinking being. At this point, a being with mind becomes aware of mind itself, life itself, the body, interactions of mind, brain and body, as well as interactions with the local and non-local environment. In other words, the mind becomes aware of its whole and complete existence. This awareness is called consciousness. It is an expansion of mind into a new physical realm. Consciousness is not separate from mind just as mind is not separate from brain.

Consciousness is the mind's growing awareness of the totality of lower dimensions and their five-dimensional extension. We act in the higher dimension by the perceptions that we normally call memory, thought, feelings, emotions and other parapsychical 'things' although we mentally interpret these qualities according to their four-dimensional space-time equivalents, or rather the electro-chemical processes that characterize them with the 'sheet.' Feelings and emotions are especially susceptible to variations in the single field because they represent complex chemical actions and interactions within the body. Since the body acts like an 'antenna' to extra-dimensional field variations and communications, any intense change in normal baseline body chemical action establishes greater variations in single field densities which are more easily communicated via shifting 'lateral A-line' patterns across the fifth dimension. Upon receipt of this type of information from other bodies, our brains reduce the 'signals' to four-dimensional biochemical and electro-physical interactions. While the local portion of the fifth dimension is the arena or stage upon which simple mind interacts and where mind has at least the possibility of an awareness of all local events and happenings in four-dimensional space-time, the 'physical' arena or playground of consciousness must be the whole of the fifth dimension.

Consciousness marks a spreading or growing of mind outward from the individual throughout the fifth dimension. Science and philosophy attempt to extend human knowledge via logical reduction 'within' our four-dimensional continuum while mystics attempt to extend our growing expanse of knowledge via direct intuitive intervention 'within' the fifth dimension itself. These two methods supplement each other and cannot exist, one without the other. They are analogous to the necessity of both software (intuition of a higher dimension) and hardware (the logical explanation of mechanical space-time) to make an effective computer. Science itself has evolved to the point where these factors must be taken into account, which now marks a distinct shift in the basic methodologies and foundations of science itself.

At the lowest level of consciousness, there is only a minimal awareness of mind and its non-local connections within the five-dimensional environment. The mind has just been opened to the higher 'physical' dimension. However, mind begins to learn how to interact in the higher dimension and manipulate its extension within that dimension. It is at this point that psi, as studied by parapsychologists, enters the five-dimensional model of physical space-time. Psi is merely a communication between a

subject and other events, bodies, organisms and beings via the systems of 'entangled lateral A-lines' in the fifth dimension. If the communication is from past to present it is called retrocognition. If this form of communication occurs between living beings, it is called telepathy. If the communication originates from a body or event in the present it can be either clairvoyance or remote viewing depending on the conditions of the communication. From a future event, person or body, the communication is a precognitive event. All of these forms of psi are passive, however, psi becomes active when the subject manipulates the environment by communicating changes in the single field density, i.e., 'collapsing' the wave packet (in quantum terms) at non-local positions within the space-time continuum of the 'sheet.' This type of active manipulation constitutes psychokinesis and various types of 'healing' when it is done 'consciously' and Poltergeist activity when it occurs 'subconsciously.'

Since simple mind corresponds, in a sense, to the whole body rather than just the brain, the whole body can be viewed as a receiver antenna for psi communication and the interchange of information through the natural five-dimensional connections and entanglements between material particles. In other words, the body detects the variations in single field density, which corresponds to non-local events as a whole. The whole living body or organism reacts physiologically or emotionally to the psi communication. The brain interprets the actual non-local event, so the brain is analogous to a tuner/amplifier in a common radio. This model of psi can account for all the various forms and manifestations of psi as well as the physical and physiological properties of psi. Psi has emerged from the physics, which is scientifically and philosophically preferable to shaping and manipulating physics to account for psi.

As consciousness continues to grow, by either understanding our physical world through science, logic and experience or through a direct and greater understanding of our extended 'physical' presence in the higher fifth dimension, a new level of patterns emerges. Direct knowledge of the higher dimension usually comes from intuitive introspection and direct intuitive leaps (enlightenment). In either case, new 'entanglements' form between the individual mind and the external patterns of single field variation or coupled 'lateral A-lines.' The patterns, which grow from the increasing conscious awareness of the 'connectivity' of all things, should eventually reach a level of complexity whereby they form super-patterns of super-complexity corresponding to a still higher level of consciousness. This new super-consciousness could only correspond to a far more complete awareness of the whole of the fifth and lower dimensions. This new super-consciousness could only be explained from the physics perspective by the existence of an even higher extended or embedding dimension to our physical reality, a sixth dimension. The very concept of a sixth dimension is far from new in physics. In 1921, at approximately the same time that Kaluza first published his own theory, Edward Kasner began publishing papers suggesting that the five-dimensional solar field must be embedded in a sixth dimension.

It is rather curious that Buddhist thought and other mystic traditions strive for higher 'levels' of enlightenment. These higher 'levels' probably correspond to the varying degrees of direct individual conscious awareness of the higher spatial dimensions explained by physics. Buddhist doctrine also contains examples of events and phenomena that would be classified by western science as psi phenomena. The various physical manifestations of psi, categorized as ESP (extra-sensory perception) and PK (psycho-kinesis), are believed by Buddhists to occur at the lowest level of enlightenment. In the terms of the present model of space-time, these phenomena represent communication along the paths of 'lateral A-lines' extending through the fifth dimension. The Buddhist characterization of events at the lowest stage of enlightenment fits quite well with the physics of psi as represented in the single field theory. In the single field theory, psi is a form of communication via the 'lateral A-lines' in the fifth dimension where consciousness resides. This communication can be visualized as a 'resonance' of sorts between different gross material bodies, although the term 'resonance' is not completely or rigorously accurate. So consciousness in this theory corresponds directly to the lowest level of Buddhist enlightenment.

Even the properties of near death experiences (NDEs) and out-of-body experiences (OBEs) can

be easily explained as the conscious awareness of five-dimensional physical extensions emanating from the physical bodies of the experiencers. Skeptics of NDEs claim that the perceptions of death experienced by patients who have been revived after clinical death, the white light and long black tunnel, are only the bio-chemical reactions of the brain as it shuts down at death. However, these bio-chemical interactions are the real physico-chemical and thus four-dimensional traces of a patient's awareness of mind and consciousness interacting within the fifth physical dimension at the time of bodily death. So skeptic's claims which purportedly disprove the existence of NDEs neither 'prove' nor 'disprove' anything. The reported chemical interactions in the brain are consistent with reported NDE experiences. The perception of a white light or tunnel is easily explained as the brain's and mind's physically and experientially limited interpretation of the five-dimensional conscious event, the beginning awareness of a far vaster universe than a person's limited knowledge and understanding of the immediate physical world can cope with.

Buddhist and other mystical disciplines teach their practitioners not to dwell on the paranormal phenomena that occur at lowest level of enlightenment lest they become stuck at that level. They should bypass these obstacles and progress to even higher levels of enlightenment and consciousness. If a person seeking 'enlightenment' dwells on the paranormal or parapsychical, just those effects which occur 'physically' in five-space, they become side-tracked in the fifth dimensional mode and cannot strive directly toward the higher levels of enlightenment that in all probability correspond to the sixth and higher 'physical' dimensions of our space-time. Once again, these higher levels of enlightenment and consciousness can only be explained from the logical perspective of physics as an increasing awareness of still higher dimensions of the space-time continuum, which represents our normal everyday world. Many modern physicists and scholars have introduced the example of modern computers to help clarify issues in the debate over the relationship between physics and consciousness, so it is worthwhile to cast this notion of consciousness in similar terms. Within this context, Buddhists and other mystics try to solve the riddle of reality using 'software upgrades' in the mind while science and western philosophy attack the problem by 'extending the hardware' within the brain. The 'software' solution corresponds to the intuitive exploration of consciousness within the fifth dimension while the 'hardware' solution corresponds an exploration of our four-dimensional space-time continuum by the logical reduction of our material existence. Ultimately, solving any problem with a computer requires both software and hardware, just as "solving the universe" requires both the intuitive and logical capacities of the human mind.

The single field unification expressed in this document is purely a theory of physics that must be put to rigorous testing as required by the scientific method. The theory is falsifiable and leads to testable results, although it may not be evident from this short exposition of the subject. The theory is based upon one, and only one, assumption that has a long scientific history: The physical reality of a fifth dimension that is continuous with and exists as an extension of our four-dimensional space-time continuum. Once that assumption has been made, the various physical phenomena experienced in nature and the laboratory can be 'reduced' or explained within the context of the basic hypothesis. The physical explanation of life, mind and consciousness that evolve from the physical considerations of living matter are not merely speculations, but rather logical conclusions drawn from the physical model of the original five-dimensional hypothesis. The fact that these conclusions so closely resemble what mystics have concluded is no coincidence, but an added feature of the theory. It should be suspected that the intuitive methods of the mystics and the logical methods of scientists come to the same conclusion at some point in time because both groups are seeking a knowledge of the same 'physical' reality by utilizing the same basic tool, the human mind.

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