

SCIENCE AND UNIFICATION THOUGHT

by **Alison W. Byer**

MODERN PHYSICS

Science has changed very much in the last few decades. Newton's machine-like universe in which everything followed laws in a predestined fashion is no longer acceptable. Quantum Physics introduced at least an element of uncertainty, and Einstein's General Relativity gave science new insights into the nature of time and space. Much progress has been made in studying elementary particles, and the nature of time and space, since the early half of this century.

Our ideas of the nature of matter have been changed from the model of solid (if small) billiard balls to essentially mathematical entities. Matter is mostly space, in fact relationships imposed on space and time. The relationships are more fundamental than the particles themselves.

Einstein's insights about time essentially caused the idea of an outside observer to be abandoned. Previously people had thought of God as being within time looking down from some privileged overall vantage point at the universe. But now that concept is essentially gone from physics. The universe is everything and is to be observed from within the cosmos. Unificationism can accept this as expressing the fact that God relates to creation through man, not directly. The universe cannot be "seen" from outside. If something is done to the universe, it must be done from within. God's design should be imprinted in some way which does not require disobeying laws and principles established by God.

Cosmology today progresses mostly by scientists creating mathematical models of the universe, and then trying to devise some test to

measure the predictions of their model against the real universe. There are many theoretically possible models, but they are of course not all relevant for our universe. General Relativity for instance is one of a whole family of models. So far, experiments have been able to rule out many of these models, but by no means all, in favor of Relativity.

WHICH MODEL FOR THE UNIVERSE?

Unification Thought teaches us to look primarily at the purpose behind things, not just the things themselves. If we apply this to the universe, then we can see the order and design in the universe as being the result of a definite choice made by God, out of all the different possibilities.

Recent scientific theories have explored a wide range of models, but found no reason why the universe should be of any particular design. Each seems as good as the other without some idea of a purpose to be fulfilled. Indeed, it is considered a respectable idea in scientific circles to suppose that universes of all possible designs exist in parallel with our universe, only we are unable to observe or communicate with them. The universe we see has the special characteristics which enable life to exist only because in any other universe we would not have evolved in order to be making observations.

ORIGIN OF THE UNIVERSE

In science today there are two theories of the origin of the universe, the Steady State theory and the Big Bang theory, and the evidence points almost overwhelmingly in favor of the latter. The Steady State theory is an attempt to regard the universe as having been internally existent in the state in which we now see it, thereby avoiding the need to explain an origin or beginning point. From a philosophical point of view, there would be no reason for the existence of the universe apart from its purpose as a home for mankind, therefore we can suppose that God created the universe and it immediately entered a preparation period ready for the emergence of man, just as the evolution process for living things can be seen as a process of preparation for the emergence of man. There would be no reason for the universe to have existed eternally.

The Big Bang theory states that the universe did in fact have a beginning point. There is good evidence for this beginning point, or big bang; in particular the fact that the galaxies are all moving away from us with speeds proportional to their distance from us, thereby allowing us to extrapolate backwards in time to a point when all the matter in the universe would have been contained within a very small volume of space. There is no the-

oretical reason why in fact we cannot extrapolate back to the time when all the matter would have been within the "event horizon" of a black hole. Thus all matter, energy, forces, even time and space themselves, emerged from a single point, a cosmic singularity. The discovery of the "microwave background," the radiation left over from the big bang, now cooled to a very low temperature, essentially clinched the argument for most scientists.

Not only have experiments confirmed the idea of the universe expanding from an initial point, but also Einstein's General Relativity theory had given theoreticians a way to understand such a "singularity," and the most natural solution to Einstein's equations was that of an expanding universe. At that time, no one had really considered the universe to be expanding, so Einstein was not confident of his solutions, but soon afterwards, observations began to show the expansion, dramatically validating General Relativity.

Unification Thought can accept that God created the universe as an environment in which his children could live. Thus God created the physical world from essentially within his own being. Not only did he create matter, but also he created time and space, everything originating from a single point. The exact design that God used for the universe is being investigated now by scientists, and still Einstein's theory of General Relativity seems to be the best theory, although Unification Thought would say that it cannot be a complete theory as it stands, since it does not explicitly predict the creation and existence of the spirit world.

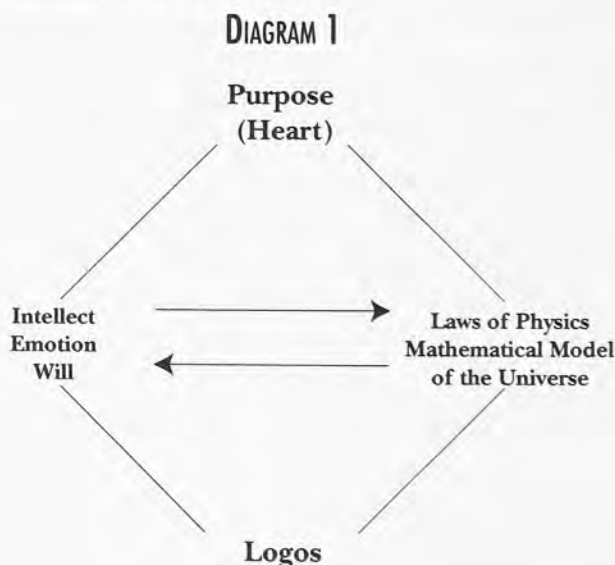
This is potentially Unificationism's main contribution to today's scientific understanding, that there is also a spirit world, probably created together with the physical world. It is indeed not within the physical world, therefore not within time as we know it. We will discuss later how to approach scientific models for the spirit world, but science has progressed now to the point where scientists are proposing the existence of parallel universes, so the idea of a spirit world should not be too alien to scientists. However, the idea that another universe should prove to be precisely the universe of eternal life that religion has always had some notion of may be a very big surprise.

God created a universe in order to give man an existence separate from his own. Man was placed into a world where he truly has dominion and responsibility. Without some bodily form, man would exist only in the mind of God. If we try to think of a mathematical model for God, we cannot suppose that it would be of finite dimensionality, and yet there are a finite number of dimensions in the physical world. Thus God has

created a realm which is limited, and therefore different from himself, and yet is within his own being and reflects his own nature. Using this same argument we can say that the spirit world must also have a finite number of dimensions, otherwise we would lose our independent existence, as is the goal of Buddhism. Nirvana describes reabsorption into the mind of God—perhaps not a bad fate, but not one that will fulfill God's desire to have an eternal relationship with his children.

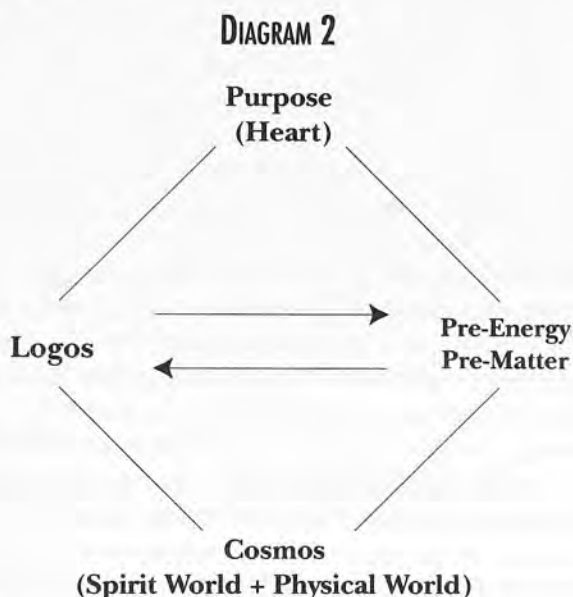
THE TWO-STAGE STRUCTURE OF CREATION

Through the interaction of the Inner *Sung Sang* and the Inner *Hyung Sang* of God, the logos is produced. With his intellect, emotion and will, God creates some vision of a universe which is to be home to mankind. This is all centered on the purpose within God's heart, which centers around perfect man, out of God's yearning to have an object for his love. This vision contains specific laws and principles, expressed mathematically as a theoretical model of the universe. Of course there are an infinite number of models that God could consider, but from those models he chooses the one which enables the purpose within his heart to be fulfilled. With his intellect he makes a specific plan, then modifies this plan until it is satisfactory to his emotion.



So far this is exactly the same process as that followed by a scientist, except that the scientist is not trying to actually create a universe, but is rather designing models in the hope of discovering which model best describes the real universe.

The next step, however, is unique to God. Now, with his will, God decides to realize his plan. He is starting not with matter to be shaped according to his will, but with his *Hyung Sang*, his ideas, his consciousness, and the force of love. The logos shapes the *Hyung Sang* of God, giving rise to the universe.



The *Hyung Sang* of God is called pre-matter and pre-energy in Unification Thought. The pre-energy and pre-matter exist within a single point, a cosmic singularity. Within this singularity the density of matter and energy is infinite, a situation unknown in everyday physics. This point is the potential source of the whole cosmos.

Physics has come to the point of understanding that matter can be created out of a vacuum, given the truth of the laws of physics, and given a force field acting on that vacuum. Without the force field, only “virtual” matter is created, essentially a conceptual reality since it never manifests substantially. However, this matter can become substantial if a force field acts on the virtual particles, essentially allowing them to pick up the energy from the field. This is not exactly the situation around a black

hole, but virtual particle pairs can also be produced around a black hole.

The vacuum is within space and time, but such a process must occur if the laws are true, therefore if within God's mind he created space and time then matter must follow. To give this matter substantial reality we must postulate that the force involved is the force of God's consciousness, or the Prime Force, which is manifested in the physical universe as the forces between objects, or the Universal Prime Force. Unification Thought understands this Prime Force to be the acting energy within God's *Hyung Sang*. Therefore, the forming energy within the *Hyung Sang* of God must be the spacetime manifold from which matter is produced.

It is known from Quantum Field Theory, and confirmed by experiment, that the forces in nature are mediated by particles, so it is not really valid to regard matter and forces as totally different entities. The force between two particles is mediated by the exchange of another particle between them. In the weak and strong interactions, particles with integral spin, or bosons, are exchanged between the interacting fermions, and in the electromagnetic interaction, photons, or light particles (also bosons), are exchanged. By analogy, then, it is assumed that in the gravitational interaction, particles known as gravitons are exchanged, but so far it has not been shown either theoretically or experimentally that the gravitational interaction is really similar to the other forces.

Pre-energy and pre-matter are not completely separate. They are two aspects of the same thing. Matter and energy are interchangeable, and even the forces in the universe can be described in terms of particles of matter.

This spacetime manifold initially exists only in potential within God's mind because everything is contained within a single point. There is no separation. In longing for another being to relate to, God is conceiving of separation, and this concept translates into separation between points in space, once the universe begins to expand from the initial singularity in which everything is contained. Conceiving of the idea of gradual development, to allow man responsibility, God also creates time. Linear time, which progresses in a certain direction, is necessary for causality as we experience it, and to be responsible for our own growth towards maturity, we need to experience achieving goals through our own conscious will. Without effect following cause we would experience only confusion.

Thus time and space are based on concepts within God's mind, concepts which are in a sense outside of God because they are different from

God. God is wholeness, not separation. But God desires relationship. God is perfect maturity, not development towards maturity. And God desires to give man the responsibility of achieving his own perfection or maturity. God must create a realm where immaturity can exist.

Thus given the conceptual reality of a spacetime manifold, the system of relationships between points of space and time imposed according to God's plan and design, and the force of God's conscious will, the universe comes into being. Space, time, matter, energy, forces are created. The universe, in a critical sense, depends on God's continued investment of love, heart and mind, because if God decided to stop thinking about the universe, then it would immediately collapse into nothingness. On the other hand, God relates to the universe throughout the consciousness of man, since he does not directly relate to something that is other than himself.

As well as creating the physical universe, God also created the spirit world. The design is different since the purpose is different. The spirit world is a realm where man exists eternally in a relationship of love with God. God still wants to keep the concept of other, since his whole purpose is to create a being to relate to, but now there is no longer any need for development towards maturity, so the concept of time can be different. Time in the spirit world is most likely circular. We will discuss this later.

REAL AND IMAGINARY

The universe would remain a wonderful theoretical abstraction in some supermind if it were impossible to transform the virtual or imaginary into the real. The force behind this is the force which leads us to God. All the forces we see reduce to the conscious will of God, or alternatively, to the force of love within God's being. The design and logos existing in the mind of God are brought into substantial reality by the force of God's conscious will. We see forces in the universe separated into the four fundamental forces, the gravitational force, the electromagnetic force, the strong interaction and the weak interaction. However, in the Big Bang all these forces were one, the conscious will of God.

Let us draw an analogy with virtual and real particles coming into existence through vacuum fluctuations.

Simply the fact that the laws of Quantum Physics are true inevitably means that within a vacuum, spontaneously, pairs of particles and antiparticles are formed at random. These are called virtual particles. If real particles were formed then the law of energy conservation would be violated, but due to the Heisenberg Uncertainty Principle we can avoid this.

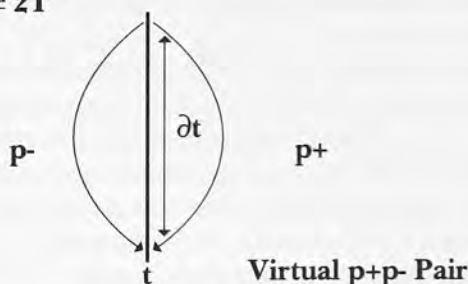
This principle can be expressed as

$$\partial E \cdot \partial t \leq h$$

This means that if the lifetime of the particles is less than $h/\partial E$, where ∂E = total energy of the particles, then the particles cannot really be said to either exist or not exist, and we call them virtual particles. Therefore, the particle/antiparticle pairs will recombine within a time $h/\partial E$, without violation of the law of conservation of energy. This process unavoidably and unpredictably occurs within the vacuum, so we see the vacuum to be a very active and exciting realm, in potential.

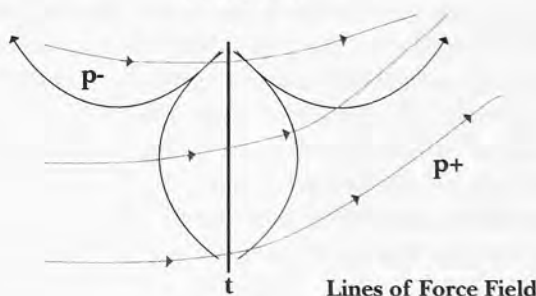
DIAGRAM 3

$$p^+ p^- \rightleftharpoons 2T$$



To transform this particle/antiparticle pair into real particles, we must separate them before they recombine. This occurs if the pairs are produced within a force field. The linking between the particle fields and the force field gives a real existence to the particles, which then follow the force lines, separating from each other and becoming separate real particles.

DIAGRAM 4



Force Field + Vacuum → Matter

THE UNIVERSE AS A VACUUM FLUCTUATION

The net energy of the universe is very close to zero, which means that the mass energy of the universe is almost cancelled out by the enormous amount of negative gravitational energy the universe contains. Thus we could even imagine the whole universe to be a quantum fluctuation in a vacuum, since given

$$\partial E \cdot \partial t = h$$

then since ∂E is very small or even zero, ∂t can be very large or even infinite.

POSSIBLE MODELS FOR THE SPIRIT WORLD

The spirit world has different properties from the physical world. In the spirit world, for instance, we would not expect to see decay and death, because they are phenomena of the physical world. Thus thermodynamics is very different, the law of entropy being vital in our everyday experience. Also, we would not expect that the speed of light should be a limiting velocity. Travel is instantaneous in the spirit world. The relationship between consciousness and spirit matter seems to be much more obvious in the spirit world. One's consciousness creates one's environment. We use physical matter to cloak our thoughts and emotions in the physical world, but in the spirit world they cannot be hidden.

It would seem that we cannot hope to describe the spirit world without a theory of the relationship between consciousness and matter. In the physical world, whatever effect our consciousness has on matter occurs without our awareness, but this cannot be so in the spirit world.

Mathematically we find evidence for the existence of further dimensions, in phenomena of Quantum Physics (for example, spin occurring in abstract mathematical spaces, rather than in physical spacetime). It is possible to imagine that if we explore higher dimensional theories we could come across a theory that is capable of describing also the spirit world. Scientists have been doing this in their theories of "superspace." The mathematical tools of abstract non-Euclidean geometries and functional analysis have given physicists tools to explore all sorts of theoretical models.

The fact that the universe is expanding, but that the center of expansion cannot be found within the physical universe suggests the idea of the universe expanding within a space of higher dimensionality.

Current theories are following two different approaches to understanding the nature of matter and its relations to space and time. String

theory takes the approach of requiring a higher dimensional space for the origin of the universe and matter. It even can lead to the possibility of a universe of “shadow matter” existing in parallel to our own. The other approach has been to extend the dimensions of space into the complex realm (complex numbers are an extension of ordinary numbers obtained by including the number $i = \sqrt{-1}$). This is the basis of the twister theory of Roger Penrose, and the Complex Relativity of Jean Charon.

It is possible that these two approaches can be merged into a unified understanding. Certainly either or both give us promising avenues of research into possible models for the spirit world. We would however have to account for the meaning of as many as twenty-six dimensions were we to adopt string theory—but there are many good and convincing reasons to take it very seriously, not the least being the fact that the shadow universe is based upon a breaking of symmetry at the origins of the cosmos.

This shadow universe gives us matter existing within the same space-time as the physical universe, but interacting only through the gravitational interaction, which explains why we have not seen such a universe. Shadow matter can interpenetrate physical matter.

SYMMETRY AND SYMMETRY BREAKING

God is a being of symmetry and balance. God’s essence contains masculinity and femininity, completely harmonized. Positive and negative are harmonized within God. In the universe, however, they are separated, but there is a strong tendency to reunite. They are separated by an input of energy, but this separation is balanced by their attraction.

Mass is not something which is simply measured as a property of an elementary particle, but mass is a number assigned to a particle or family of particles from some theoretical derivation, based on the symmetry imposed on the theory. This is very different from our naive way of thinking about mass and the nature of matter.

Scientists grouped together the elementary particles according to underlying patterns or symmetries. These symmetries were mathematical symmetries, which behave similarly to the familiar spatial symmetries we see around us. However, even though theories suggested that particles in the same group should have the same mass, in fact in nature that is not found to be exactly so. Scientists have tried to explain this by saying that the laws of nature have a deep underlying symmetry, but the actual particles have undergone some symmetry breaking in which their masses are changed. Even though there is still some confusion, the

notions of symmetry and symmetry breaking are central to modern physics.

We would suppose that in creating the universe God had to allow a departure from exact symmetry, otherwise everything would essentially have recombined to create nothing again, but still the symmetry within God is reflected in the universe to a large degree.

LINEAR AND CYCLICAL TIME

In our everyday experience, even though we undoubtedly live in linear time (time that goes in one direction) we do see some aspects of circular time. For instance, the seasons constantly repeat themselves. The earth rotates about the sun once a year. Each new generation undergoes the cycle of birth, life and death.

Time in the spirit world has been described as "being here now," the eternal now, even timeless. Since there is no striving to reach "perfection" in the spirit world, and indeed the Unification Principles tell us that to grow, a person in the spirit world must work through someone on earth, then time is different, and it seems to be consistent with the mathematical idea of circular time. It is not easy for us to imagine what this is like.

Circular time occurs in physics. For instance, in solving the equations (from Einstein's Relativity theory) for a black hole, there are actually two solutions, one within time as we know it, and the other within circular (imaginary) time. There was even some speculation that it might be possible to enter into another universe through the vicinity of a black hole.

CONCLUSION

There are many avenues to be explored in physics today which could lead us to a model for the spirit world. It could have been discovered in the middle of this century, but since then our increasing mathematical sophistication has tended mainly to obscure the issue. There are just too many universes now!

A movement known as "the New Physics" has grown up in recent years, centered around Ilya Prigogine's work on far-from-equilibrium systems and spontaneous self-organization. The problem of evolution of living organisms is probably deeply connected to the evolution of the universe itself.

The tools already exist in physics to make a breakthrough in our understanding, and a concerted effort by people from many fields could lead to a science that can incorporate the spiritual aspect of reality within the near future.

ACKNOWLEDGEMENTS

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