

Microvita: Cosmic Seeds of Life

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Chapter 1. The Riddle of Life

We are living in an age of science. Every week there are new scientific discoveries that are broadening our understanding of ourselves and our universe. Breakthroughs in molecular biology have already made the manufacture of new forms of life in laboratories a reality. But despite many new and important discoveries and practical achievements, science has still not shown human beings how to live in harmony with themselves, their fellow human beings, animals, plants and their physical world. The result is frustration, dissatisfaction and lack of meaning in the lives of many people who are materially well off. At the other extreme there are suffering, disease, ignorance and despair in the great majority of humanity who lack

even the basic minimum physical necessities of life. Part of the problem is that scientists as well as the general public still do not really understand what life is and what are its potentialities. With such basic ignorance, how can we expect people to know how to realize these potentialities in their own lives.

To understand the nature of life itself would be a big help in understanding life's meaning and purpose. Such new understanding would help us to restore a happy balance among the fields of individual, social, economic political, cultural and spiritual life that is so glaringly absent in the world today. The secret of the nature of life itself and how to develop it and keep it properly balanced in all spheres has eluded human beings throughout history. But now it seems that humanity is on the verge of a breakthrough in the scientific understanding of life. This breakthrough will help to usher in a whole new era of human history based on knowledge of the secret of life and how to apply it to develop the whole of creation. This new era is fast approaching. The first rays of humanity's bright new dawn are already starting to illuminate the eastern horizon.

Solving the Riddle of Life

Despite all the recent fundamental research and scientific breakthroughs in biology and the other life sciences and despite all of the promising as well as disturbing new developments in genetic engineering resulting from such research, scientists have not yet been able to give a satisfactory answer to the fundamental question, "What is the nature of life?" The answer to this question will have a revolutionary effect on the whole range of knowledge and awareness about ourselves, our society and our universe. Included in the question of what is the nature of life are various sub-questions that science has also not yet been able to answer. They include the following questions:

How did the universe come into existence?

How did the universe evolve to its present state, with all its galaxies and stars?

How did life first evolve from matter?

What is the relationship among matter, life and mind?

How did the different types of living beings such as bacteria, plants, animals and human beings come into existence?

How does a single fertilized egg develop into a mature adult organism?

What is the root cause of diseases such as cancer and AIDS and what is their cure?

Can life be created artificially in scientific laboratories?

Is there life after death? Before birth? What is death?

What is the purpose of life?

Is there a smallest fundamental particle in physics, and if so, how is it related to the nature of life?

Are ecosystems alive?

Do societies have a collective mind?

A comprehensive, rational theory of life should give clear answers to these and many other questions about the nature of life. The answers to these questions will require a synthesis of spiritual and material science that is now in the process of being born. For without a doubt, the era of materialistic domination of science and society is near an end.

Developing A New Worldview

A new worldview of life is now in the making, based in part on a revolutionary concept called microvita. According to the propounder of this new concept, microvita (plural of microvita) are the inner secret of life. They are the link between the cosmic creative intelligence and its creation, our vast universe. Microvita are literally the cosmic seeds of life.

The theory of microvita, when further developed and established by experimental scientific research, should also help supply many of the answers to the above questions about the nature of life. Several hypotheses about the relationship of microvita to energy and vital energy, the origin of life, the origin of species, the development of living beings, the nature of cancer and AIDS, and the relationship of harmony to health all are explored in a preliminary way in this book.

The scientific creation of life in a laboratory may also be closer than we think. For the propounder of microvita predicted in January 1988, that life will be created in scientific laboratories in the near future. The microvita theory will probably guide the way.

Because of its novelty and its possible broad range of application in various scientific and practical fields, the concept of microvita deserves to be explored thoroughly, and research on them commenced immediately. But first one block to scientific research on microvita has to be examined so that it can be cleared away. This block is dogma.

Dangerous Dogmas

Before introducing the subject of microvita, it is important to say a few words about the nature of dogmas and the importance of overcoming them. For one of the main obstacles to the acceptance of the theory of microvita will be that it goes against certain dogmas prevailing in the scientific world today. In order to even be able to accept the possibility that the microvita theory is correct, it will be necessary to break through some of the barriers to understanding that have been constructed by our present-day scientific

culture, which is itself a reflection of our materialistically dominated world culture. It is such barriers of dogma that are directly or indirectly responsible for the dangerous condition that human civilization finds itself in today. Now it is a social necessity to remove these barriers to knowledge on a massive scale, so that science can move ahead in new directions beneficial for humanity.

These barriers to knowledge take the form of dogmas. A dogma is any rigid, established idea that sets boundaries beyond which the mind is not allowed to move. Dogmas are illogical and irrational. They close off the possibility of open discussion of ideas of critical importance to humanity. Dogmas weaken and paralyze the mind, whose inner nature is to continually expand its arena of movement through the vast Cosmos of inner and outer space. The human mind wants to free itself from all limitations, to attain unlimited happiness and infinite peace. Dogmas take many forms. There are religious dogmas, materialistic dogmas, social dogmas, economic dogmas and scientific dogmas. The result is always mental suppression and a channeling of the mind towards limitedness and narrowness, in thought and in action. Such mind-numbing dogmas must be shattered if human beings are to express their full potentialities. The slogan of human beings today should be "Dogma, no more!"

The interesting thing about dogmas is that historically, opposition to one dogma has often led to its replacement by another dogma. Marx, in responding to the dogma of capitalism, created the dogma of communism. Scientists trying to be free from religious dogmas accepted the dogma of materialism. It is a case of "Out of the frying pan, into the fire." Human beings should be free from all dogmas, not trade one for another. It is only through experience, through one's individual efforts to root out dogmas affecting one's own life, and through collective efforts to root out the dogmas infecting society, that human beings can become truly free and reach their full human potential.

The Cure for Dogmas

How can one root out dogmas in all spheres of life? One way is to accept the guidance and assistance of great spiritual personalities who are themselves completely free from dogmas. Spirituality is one of the best weapons for fighting dogmas.

Why spirituality? Because real spirituality, as distinct from religion, is the practical science of removing dogmas and other limitations from the mind in order to develop one's full potential. Spirituality always opposes dogmas that restrict the mind, and, naturally, the forces of dogma always oppose real spirituality. But the light of knowledge can never be completely extinguished by the darkness of dogma. Spiritual personalities express the path to knowledge and true happiness in forms appropriate to the development of

the human mind. Dogmas do not have this creative flexibility, because of their inherent rigidity and static nature. So spirituality always defeats dogmas in the end. We have seen this in the past and we are seeing it today, as the world is becoming polarized between the forces of dogma and narrowness and the forces of spirituality and the real scientific spirit.

The fight against entrenched dogmas can be aided by a strong spiritual personality. Such a spiritual personality is with us in the world today. P. R. Sarkar, the originator of the concept of microvita, has taken the lead in the fight against all dogmas subverting human intellect. He has reintroduced genuine spirituality into human society, after a decline in spiritual knowledge, practices and values during the past several thousand years.

Many dogmas, both scientific and religious, have prevented a clear understanding of the nature of the creation of life. By properly applying the new theory of microvita and its accompanying systems of Neo-Ethics and Neo-Humanism, humanity will be able to free itself from these dogmas that have suppressed the human mind for centuries. There will be many practical applications of this new knowledge about life in the sciences, in the fields of physical, mental, and social health and in the creation of life itself in scientific laboratories. Sarkar has already outlined the beginnings of the theory of microvita, and has called on others to take up the task of developing the theory in detail through intensive research. This research must be undertaken immediately if many pressing problems of humanity are to be solved in a nice way.

To better appreciate the ideas of microvita, it is first useful to give an overview of the theory of the cosmic cycle of creation of the universe, life and mind. To more fully appreciate Sarkar's theory of the cycle of creation and the theory of microvita, materialistic dogmas will have to be replaced with a comprehensive, non-dogmatic view of reality. The cycle of creation forms a context in which microvita can be better understood and appreciated.

Chapter 2. Materialistic Science: A Sinking Ship

Today materialistic science is in trouble. One of the toughest problems scientists and philosophers have struggled with over the centuries is to understand the nature of matter, life and mind. There has been no fully satisfactory answer to these questions up until now, although progress in understanding inanimate matter has progressed the most. Because of this relative success, scientists have also tried to explain life and mind in a materialistic framework. But there have been several promising recent developments in the fields of physics, biology and artificial intelligence that hint that all is not well with purely materialistic explanations of matter, life and mind found in the present physical, biological and psychological sciences.

One block to the creation of a new science of life integrating physical, psychological and spiritual aspects of existence has been the scarcity of solid, unambiguous scientific evidence for an alternative to the materialistic view. In many cases, materialistic explanations of life and mind are insufficient to explain certain observed physical and biological phenomena, yet the materialistic view still prevails in science. One reason is that, for dogmatic reasons, many orthodox, mainstream scientists refuse to even consider the evidence that does exist that undermines the materialistic view. Because of the prevailing materialistic dogmas in orthodox science, non-materialistic explanations for observed phenomena are usually ignored, suppressed or rejected as if they could not possibly be correct. It is a clear-cut case of the operation of dogma in present-day science. The mind that has succumbed to the influence of materialistic dogmas refuses to go beyond the limits or boundaries set by those dogmas. It is similar to Galileo's time when some people, under the domination of religious dogmas, refused to look through the newly invented telescope at the moon and planets, which Galileo said could be seen to be not so perfect as prevailing religious dogmas claimed they were.

Why does the scientific establishment insist so strongly on materialistic explanations for physical and biological and even psychological phenomena? Partly it is for practical reasons, since rapid scientific progress historically resulted from such an approach. Another reason is that the materialistic approach keeps religious dogmas at a distance. Religious dogmas have often suppressed the progress of science and humanity in the past. To admit non-materialistic explanations into science would, it is feared, open the door to the reassertion in science of religious dogmas, from which science has so recently freed itself, at least to a large extent. A third reason for the insistence on materialistic theories is the belief that nonmaterialistic theories cannot be tested scientifically, that they fall outside the range of science. But this fear reflects a too narrow view of science. We shall see that science can

be guided by theories that go beyond the traditional materialistic view, without surrendering to dogma.

There is in recent years a slow but steady accumulation of evidence--experimental, mathematical and inferential--that non-materialist explanations may be necessary for certain observed physical and biological phenomena. It has gotten to a point that some of the most compelling evidence can no longer be completely ignored. But orthodox science is still extremely reluctant to accept the implications of such evidence for a less than completely materialistic view of reality.

Materialistic science is like a sinking ship in shark-infested waters. The sailors can see that the ship has developed some serious, perhaps fatal leaks, but they do not want to jump in the water and be eaten by the sharks. The ship is rotten and cannot be saved. The ship is the structure of materialistic dogmas supporting orthodox science. The sharks are religious dogmas ready to devour the sailors if they jump overboard. What are the sailors to do? What they need is a sturdy lifeboat that will allow them to abandon the sinking ship without being eaten by the sharks. So today's scientists need a new scientific paradigm, a more comprehensive worldview that will save them from the defects and perils of both materialistic and religious dogmas, while allowing them to make progress to their goal of more deeply understanding the nature of reality.

Before presenting the outlines of one possible new scientific paradigm that appears to transcend materialistic and religious dogmas, it is useful to summarize several of the recent scientific developments pointing to the need for a new, more integrated understanding of matter, life and mind. All but the first are described in more detail in *Beyond the Quantum*, by Michael Talbot. The reader can get full details by going to the original sources.

Does Water Have Memory?: A Controversial New Scientific Experiment

A revolutionary research report was recently published. On June 30, 1988 a prestigious international science journal called *Nature* published a remarkable report. While publishing the report, the editors of the journal were openly skeptical about the validity of the results. If the results are correct, according to a *Nature* editorial, they fundamentally challenge two centuries of scientific thinking about physical phenomena. The experiment was repeated at five other laboratories, giving basically the same results each time, before the journal agreed to publish the new discoveries. Finally, the editors published the article after getting agreement from the chief experimenter to have the experiment performed before the eyes of one of the editors and an investigative team.

Immediately after publication, the scientific article created a tremendous stir. It received widespread news coverage around the world. What was this

scientific breakthrough that was so upsetting to conventional science and scientists? The experiment was titled "Human basophil degranulation triggered by very dilute antiserum against IgE". The principal investigator was Jacques Benveniste, a French chemistry researcher. In the experiment a particular kind of antibody, a type of protein, was diluted 10 to 1 or 100 to 1 and shaken vigorously for at least 10 seconds. This diluting and shaking process was repeated so many times that not a single molecule of the antibody could remain in the solution. Yet this very dilute solution could still produce the biochemical effect of the original antibody on certain blood cells. Furthermore, with still further dilutions, the power of the solution continued to decrease and increase in a cyclic manner. There is no known physical explanation for these remarkable results, which is why the editors of Nature were so skeptical. The editors suggested that, since long held theories about physical matter could topple if the experiments are correct, prudent scientists should wait and see if the results stand up to further examination. One month later, the investigative team published its report stating that the evidence was not strong enough to support the claims being made by the researchers. In an accompanying article, the chief investigator however rejected the criticisms of the report and said that only further experiments by competent investigators would ultimately determine whether the observed effect is valid or not.

The water memory mystery case still remains very much open. The original experimental report is very important because it met high experimental standards, was carried out in six laboratories in four countries with similar results in a highly controlled way, and presents an experimental result for which there is no current scientific explanation and which challenges scientific orthodoxy. The results of the experiment also lend support to the practice of homeopathy, a medical treatment system in which medicines are prepared by the repeated diluting and shaking of small amounts of chemical substances similarly to the way that the "highly diluted" antibody-free solutions were prepared in the "water memory" experiment described in the 30 June 1988 Nature report. There is no scientifically accepted explanation of why homeopathy works, although its supporters invoke the concept of vital energy in the medicines and in the body and the interaction between them in the cure of disease. The concept of vital energy is not accepted in present-day science.

The haste with which the original report, based on five years of research, was subsequently debunked by the same journal that published the original report, hints at how uneasy the journal editors were with the original results and how quickly they wanted to try to put them to rest. But only time will tell if the original results will survive further, even more carefully controlled investigation.

The Quantum Theory of Reality

A quantum physics experiment in 1982 led by Alain Aspect in Paris, while confirming some of the predictions of quantum mechanics, seemed to prove that one of the following two possibilities must be accepted. Either objective reality does not exist and physical objects have no reality beyond the perception of an observer, or it is possible to have faster than light communication with the future and the past. This result follows from the quantum theory. In Aspect's experiment, quantum states of particles were found to be correlated in a way that cannot be explained by "communication" between the particles at speeds less than the speed of light. Although the experiment does not mean that faster-than-light communication between people is possible, it does indicate that the nature of physical reality is much more strange than common sense about the nature of physical objects would suggest.

Morphogenetic Fields

In 1981 Rupert Sheldrake published *A New Science of Life: The Hypothesis of Formative Causation*. In this book, Sheldrake claims that non-material fields called morphogenetic (shape-creating) fields or M-fields are necessary to explain certain experiments and other reports that are inexplicable by present physical theories. Examples are the apparently non-physical transmission of new crystal structures and new learned behavior patterns. For example, in an experiment by McDougall, 22 generations of rats were taught to solve a particular maze problem. The younger generations were found to take many fewer trials to learn the task than the earlier generations. But more surprising was that other rats of the same species that were not part of the first experiment also learned the task as quickly as the younger generations of the first group. The rat species seemed somehow to be collectively improving their ability to learn the task, even though only some were being actually trained.

According to Sheldrake, M-fields have the ability to cut across space and time, since M-fields of an organism in the past, according to him, have the ability to influence the behavior or form of an organism in the future. He thinks this is accomplished without any transfer of energy through the M-fields, so his theory is very controversial. An important aspect of the concept of morphogenetic fields is that it can be subjected to experimental test.

The Explicate and Implicate Orders of Existence

Physicist David Bohm does not think that M-fields necessarily involve energy transfers. Sheldrake has compared an organism to a television, while the morphogenetic fields are compared to the electromagnetic waves that carry the signal that is received by the television and used to make a picture. The electric current in the television is unformed but able to take form as the result of tiny electromagnetic signals received by the television from a

distance. These electromagnetic signals are much smaller than the electric currents that take form in the television as the result of electronic amplifiers in the television that amplify the tiny signals received by the television antenna.

Bohm compares the small electromagnetic signals to the subtle levels of an "implicate order" of existence that affect energies on a less subtle level, the observable level or "explicate order" of existence. These subtle energies, according to Bohm, may be similar to subtle energies that, he claims, allow subatomic particles to communicate with each other "non-locally", i.e. independent of separation in space and time, as seems to be demonstrated by the Aspect experiment mentioned above. David Bohm's ideas about the implicate order are developed in his 1982 book, *Wholeness and the Implicate Order*. Bohm's ideas about the existence of an implicate order that underlies the observed explicate order of things are thought by many scientists to be untestable, while Bohm says that his theory is still being developed.

Brain Research on Memory

After many years of research, brain researchers such as Karl Lashley were unable to find evidence for the storage of long term memories in the brain. Rather, if they are stored in the brain at all, memories seem to be spread out over large areas of the brain. Even with severe brain damage, rats, for example, can still perform certain tasks previously learned, although with lower accuracy. And some persons clinically shown to have only about 5% of the normal amount of brain tissue due to a brain disease causing excess fluid in their heads, still have above average intelligence. One Nobel Prize winning brain researcher, Sir John Eccles, claims to have located a part of the brain at which the non-material soul makes contact with and directs the physical brain. It is the Supplementary Motor Area of the brain, a part of the surface cortex, and becomes electrically active before a voluntary action is initiated or even "intended". But scientists who think that a non-material mind controls the brain and body are very much in the minority today.

The Anthropic Principle

Several physicists have pointed out that if the laws of physics were only very slightly different than they are, stars could not have formed and life as we know it would have never emerged. There is a long list of "coincidences" in physical laws that permitted the formation of the universe in a way that permitted the evolution of life as we know it. In fact the balance of physical laws necessary for life is so precise that it seems that coincidence alone cannot explain it. There is no current materialistic explanation for the existence of a universe so precisely constructed that it could allow life as we know it to evolve. The Anthropic Principle, first named by astrophysicist Brandon Carter in the mid-70s, states that it is human observations of the

universe that have helped to shape what we perceive as physical laws. Some scientists have concluded that the activities of observers have actually played a role in the self-organization and development of the universe throughout its history. But so far the Anthropic Principle has not actually predicted any physically observed result, so it cannot be given the status of a scientific theory. And it has also been criticized for being too "human-centered" an explanation for universal physical laws.

Creation and Evolution: Based on Cosmic Intelligence or Chance?

In the 1983 book, *God and the New Physics*, Paul Davies claims that the coincidences above that suggest to some scientists the workings of an Anthropic Principle, may also be used to support the idea of a grand design of the universe and the existence of a cosmic designer. This leads Davies to suggest that the universe is itself a mind, a self-observing and self-organizing system. Human minds could then be seen as islands of mind in a vast cosmic mental sea, a view very similar to that of Eastern mysticism.

Present evolutionary theory affirms that complex biological molecules emerged through random processes or by a "lucky accident" that formed proteins and DNA molecules and the genetic code in a manner necessary to create the first living organisms. But astrophysicist Fred Hoyle has insisted in *The Intelligent Universe* that the probability that chance processes created these molecules during the Earth's 4.5 billion year history is negligible. He concludes that some cosmic intelligence, in fact a hierarchy of cosmic intelligences, must have played a role in the creation of life. He feels that the universe is filled with living organic materials which seeded the Earth to create life here. The origin of that organic material is lost in the universe's distant past. He concludes that the universe is intelligent as it is able to create order out of chaos, since purely random processes tend to lead to disorder.

Life as the Creation of Order from Disorder

One of the main principles of the area of physics called thermodynamics is that energy and matter generally move from a state of more order (a lower entropy state) to more disorder (a higher entropy state). The principle embodying this idea is called the second law of thermodynamics. But living organisms are able to create highly ordered physical structures, such as a growing tree, from less ordered materials, such as the chemicals in the soil. If all sources of energy, such as sunlight, are included in the analysis of the growth of plants, it appears that the second law of thermodynamics is not violated since overall entropy, or disorder, increases even if it decreases in a local area. Still, the ability of living organisms to self-organize from materials around them has never been fully explained. It is this apparent self-organizing character of living systems that appears to differentiate them

from non-living matter, according to Erich Jantsch's book, *The Self-Organizing Universe*. From this point of view, any material system that shows the quality of self-organization could be accepted as being alive, such as a galaxy, an ecological system, or even a crystal. But the faculty that gives organisms the ability to self-organize has never been explained.

In 1985 the chemist Ilya Prigogine described in *From Being to Becoming* a new mathematical theory that predicts how a disordered chemical system can under certain non-equilibrium conditions move from a state of disorder to a state of higher order. And some chemical systems have actually been found that show this predicted behavior. One such chemical reaction is called the Zhabotinsky reaction. When certain chemicals are mixed in a liquid solution, the solution is observed to oscillate back and forth between one state and another. This can be expressed, for example, as a periodic altering of the color of a solution from red to blue. Somehow the molecules in one part of the solution are able to rapidly communicate with those in another part so that all can switch states in a short time.

The new structures created in this way are called dissipative structures since they must dissipate or get rid of greater energy, matter or information to remain stable, once created from fluctuations in the previous, more disordered, state of the system. Prigogine's work was a major development in the physical sciences, as it indicates that the Second Law of Thermodynamics is not the last word in describing the changing order of a physical system, particularly an open system which allows energy and information exchange with the environment. Disorder is not the ultimate fate of matter, but rather can lead to the generation of order. This work won Prigogine a Nobel Prize. The theory of dissipative structures has been found to apply to a wide variety of physical and chemical situations, and shows promise of being relevant to understanding the emergence of living biological organisms. The theory illustrates certain self-organizing properties of material systems. Prigogine believes that reactions such as the Zhabotinsky reaction represent a kind of halfway point between non-life and life. In a second book, *Order Out of Chaos*, co-authored by Isabelle Stengers, Prigogine concludes, based on his understanding of self-organization of material systems, that matter is not inert, but is alive and active. Biological life is embedded in a living universe. Every particle of the universe is involved in the dance of life.

Is the Earth Alive?: The Gaia Hypothesis

In 1979 James Lovelock proposed in *Gaia - A New Look at Life on Earth*, that the Earth can itself be seen as functioning as if it were a giant living organism. Like many other natural cybernetic or self-regulating systems, the Earth appears to regulate itself. As Lovelock portrays it, the different life forms, the climate, the atmospheric, soil and ocean chemistry and many other factors work interactively to make the Earth hospitable to life. For

example, while the Sun's energy output has reportedly increased significantly in the last four billion years, the temperature of the Earth's lower atmosphere has apparently not risen correspondingly. Gaia is the Greek name for the Greek goddess of the Earth.

The Functionalist View of Life and Mind

A view of life and mind that has received support among some workers in artificial intelligence is that if any functioning system, no matter what it is made of, acts like it has mind, then it does have mind. This is called the functionalist view. In this view, mind is viewed as the "computer software" of the system and the body is seen as the "hardware". The functioning of the system cannot be easily understood without knowing the "program" that is running the system.

One such functionalist view is described by Douglas Hofstadter and Daniel Dennett in the book, *The Mind's I*. They compare the functioning of mind and body to two languages--a language of pure information and a language of physical interactions--describing the same overall system. But this view does not accept that something immaterial can act on something material. Even a computer program must be embodied in some physical medium if it is to cause a computer to run and accomplish some physical action. So while the concept of functionalism is quite progressive in that it may be useful in attempting to recognize the existence of mind in various entities, it does not imply that the mind is non-physical. Hofstadter and Dennett believe that there is no presently undiscovered "semantic potential" which can alter the path of physical particles and make them act differently from what would be predicted by present-day physics. The functionalist position, while apparently neatly avoiding the problem of mind-body dualism and interactionism, does not however deal with the way living systems become self-organized in the first place.

Life as Information

In a 1980 book *Life Beyond Earth*, Gerald Feinberg and Robert Shapiro proposed that both self-organization and the amount of order or information present among the parts of a system are the defining characteristics that differentiates living from non-living systems. In this view, the indicator of life is not matter or energy, but the amount of pure information contained in the structure of the system. The most intrinsic difference between an egg and a mango is not the difference in their matter and energy content, but the difference in the information that describes their different physical and chemical structures. And information is something that itself seems nonphysical, though it requires some physical medium to express itself. So the question remains as to how something non-physical such as information can affect something physical like a physical body. Scientists have not yet given any clear answer, although David Bohm's ideas about an implicate

order of existence producing the expressed or explicate order, seem to be on the right track. But Bohm's ideas about the implicate order of existence need to be made more rigorous if they are to be subjected to experimental test.

Towards a New Paradigm of Science

Most of the above mentioned ideas and experimental results about quantum reality, and the nature of order, life and mind, if taken separately, might not radically alter the current scientific worldview about the nature of matter, life and mind. Inferences about non-physical reality, cosmic intelligences and the universality of life, drawn from physical experiments and logical and mathematical analysis, can be easily ignored (and in fact are by many scientists) without any loss to the present materialistic way of thinking and acting in day-to-day scientific work. But such "leaks" in the ship of materialist orthodoxy, when taken together, can indicate that a major revolution in scientific thought is in process. In the words of Thomas Kuhn, author of *The Structure of Scientific Revolutions*, a major paradigm shift may be underway. A paradigm is a scientific "worldview" in which scientific work is done. The paradigm can only shift, according to Kuhn, when a new, more comprehensive scientific worldview replaces the old one after much scientific conflict between old and new ideas.

The present paradigm of materialistic science, where mind and vital force are allowed no role as causal agents or explanatory factors in physics and biology, is now under siege from many directions. But the old materialistic worldview will not collapse until there is a new, more comprehensive scientific structure and worldview to replace it, no matter how "leaky" the old scientific ship is.

The new ideas about microvita, and the philosophical system in which they are embedded, may lead to exactly the new scientific paradigm and worldview that is needed to bring down the old worn-out materialistic paradigm and replace it with one more in keeping with the latest scientific advances and thinking about the nature of matter, life and mind. At least Sarkar thinks this is the case, as he talks about the Age of Microvita that will replace the current era of materialistic science, and be a golden age of material, intellectual and spiritual progress and well-being. Sarkar has emphasized that research to develop the theory of microvita must be started immediately, so that many of the current problems facing humanity can be solved.

In order to see how microvita can be the key to the next scientific paradigm shift, it is necessary to see some of the things that Sarkar has said about microvita and their relationship to matter, life and mind. To better understand the philosophical framework in which concepts of microvita are embedded, it is also necessary to look briefly at Sarkar's description of the cycle of creation of the universe, matter, life and mind. They we can see

some of the directions that scientific research on the subject of microvita can take. It will be emphasized that the theory of microvita must be a scientifically testable theory. Experimental support for the theory could lead to a radical shift in the present materialistic outlook of modern science.

References

David Bohm, *Wholeness and the Implicate Order*, London, Routledge and Kegan Paul, 1981.

Brandon Carter, "Large Number of Coincidences and the Anthropic Principle in Cosmology," in M. S. Longair, *Confrontation of Cosmological Theories with Observation*, Holland, Reidel, 1974.

Paul Davies, *God and the New Physics*, London, J. M. Dent and Sons, 1983.

John Eccles and Daniel N. Robinson, *The Wonder of Being Human*, New York, Macmillan, 1984.

Fred Hoyle, *The Intelligent Universe*, New York, Holt, Rinehart and Wilson, 1984.

James E. Lovelock, *Gaia - A New Look at Life on Earth*, New York, Oxford University Press, 1979.

Gerald Feinberg and Robert Shapiro, *Life Beyond Earth*, New York, William Morrow, 1980.

Douglas R. Hofstadter and Daniel C. Dennett, *The Mind's I*, New York, Basic Books, 1981.

Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Chicago, University of Chicago Press, 1970.

Ilya Prigogine, *From Being to Becoming*, San Francisco, Freeman, 1980.

Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos*, New York, Bantam Books, 1984.

Rupert Sheldrake, *A New Science of Life - The Hypothesis of Formative Causation*, London, Blond and Briggs, 1981.

Michael Talbot, *Beyond the Quantum*, New York, Bantam Books, 1988.

Chapter 3. The Cosmic Cycle of Creation

The human mind is always seeking explanations. We want to know not only what exists in our universe, but why. This ancient search for the causes of the observable world and the causes of our own experience led early human beings to seek an ultimate cause of all existence. Such an uncaused First Cause was said by the authors of the Vedas (ancient Eastern scriptures) to exist and to emanate the whole existing world from Itself. Later, various philosophies developed in an attempt to explain the nature of this First Cause and the action of its creative power in creating the universe and all beings, animate and inanimate. Other cultures also evolved various religious, mythological, philosophical or scientific explanations of the origin of the world and of life.

The cosmic cycle of creation described by P. R. Sarkar is perhaps the most recent of such attempts to explain the origin of the world and life. It may be the most logical, rational and comprehensive philosophy of creation so far. The ideas about microvita are still very new and are still being introduced by Sarkar. The theory of microvita is in the process of being developed and integrated into the cycle of creation.

The cycle of creation refers to the general nature of the creation of the universe, life and individual minds by Cosmic Mind. The theory of microvita explains the particular method of creation of life and individual minds by Cosmic Mind and describes the potentiality for the creation of life in scientific laboratories by human beings. The following description introduces the main ideas of the cycle of creation to the reader. For more details, the reader should consult Sarkar's writings, especially *Idea and Ideology* and *Ananda Marga Elementary Philosophy*.

The cosmic cycle of creation (which Sarkar calls Brahmachakra, or the Cycle of the Great) is a description of the evolution of the Cosmic Mind, the universe, life and individual minds from a state of Pure Consciousness, and the return of individual minds to that same state of Pure Consciousness after further evolutionary development of those individual minds. Everything that exists is moving in some part of that cycle of creation--galaxies, stars, planets, rocks, bacteria, plants, animals and human beings. The Cosmic Mind, within which the whole universe is a thought projection, is also moving. And everything is vibrational, having various wavelengths and existing in various degrees of relative crudity and subtlety. Nothing can move uniformly forever. There is always alternating relative speed and pause in the movement of every object in the universe.

The state of Pure Consciousness from which all else evolves is not accurately describable, because of the mind's inability to comprehend it. It is a state of infinite bliss, beyond the arena of all mind, individual or cosmic. Its existence can be inferred by human beings only from the waves of bliss one

experiences mentally when, after having merged one's mind into that state, one later regains one's individual mind and is again capable of mental experience.

Pure Consciousness has an infinite creative power which is inseparable from it. It is through this creative power that Pure Consciousness metamorphoses a portion of itself and gives itself qualities. When that infinite creative power is inactive, Consciousness exists in an equilibrium state and no qualities are expressed. When that creative power starts to express itself, the original equilibrium is lost and the creative process begins which results in the creation of the universe.

The creative power of Consciousness is composed of three opposing forces, a sentient force, a mutative force and a static force. Everything that is created from Consciousness by the action of its creative power is colored by these three forces in various combinations. The difference between different objects is a reflection of the relative activities of these three forces on the original Consciousness from which the different objects were derived. The sentient force gives a quality of purity, calmness and peacefulness to an object. The mutative force gives the quality of change, motion and energy. The static force gives the quality of inertia, dullness, and immobility. The state of one's mind at any time is a reflection of the relative activity of these three forces in the mind. When one's mind is peaceful, the sentient force is dominant. When the mind is restless, the mutative force is dominant. And when one's mind is dull and sluggish, the static force is dominant. Some combination of these three forces exists in all objects, living and non-living, since all objects are derived from Pure Consciousness by the action of its creative power on itself that gives objects these qualities.

The Creation of the Cosmic Mind

The objects of creation are derived from the state of Pure Consciousness in stages. In the initial stage, when the cosmic creative power is inactive, not even Cosmic Mind exists. The sentient, mutative and static forces are in a state of equilibrium. When this equilibrium is lost, the first force that is applied to Consciousness is the sentient force. As a result, a feeling of "I exist" is created. A portion of Consciousness is transformed into this state, which we can call the first level of Cosmic Mind. It is a purely subjective state of existence.

At the next stage, a portion of the first level of Cosmic Mind is transformed by the action of the mutative power of the cosmic creative force. As a result, a feeling of "I do" comes into existence and the second level of the Cosmic Mind has been created. It is also a subjective state, as no objective reality has yet been created.

In the next stage, a portion of the second level of Cosmic Mind is transformed by the action of the static power. A state of "Done I" comes into

existence. This state is called the objective portion of Cosmic Mind, as it has the potential for the creation of objective reality. The three levels of "I am", "I do" and "Done I", created by the sequential action of the sentient force, mutative force and static force of the cosmic creative power on Pure Consciousness are collectively called Cosmic Mind.

The Creation of the Five Fundamental Material Factors of the Universe

The Cosmic Mind starts thinking as soon as it comes into existence. Its thought waves create a flow of imagination in its mind. That flow of imagination of the Cosmic Mind brings the physical universe into creation in stages. We can say that the universe is an internal thought projection of the Cosmic Mind, as the universe exists as an imaginary flow of thought waves within the Cosmic Mind. The Cosmic Mind maintains the existence of the universe by its continued imaginary flow of thought as well. Nothing exists outside of this flow of imagination of Cosmic Mind. Only the differences in wavelengths create the differences in objects. To the human mind created much later in the cycle of creation, the physical world exists as an external objective reality, but to the Cosmic Mind, everything is internal.

As a result of further action of the static force on the third or objective level of Cosmic Mind, a portion of that third level is further transformed. Its wavelength is shortened, and the first of five fundamental physical factors comes into existence. This first physical factor is called etheric factor. It has the ability to transmit the vibration of sound.

Then a portion of the etheric factor is further crudified as a result of the continued action of the static force to produce the second fundamental physical factor--aerial factor. Aerial factor has the capacity to transmit the vibrations of both touch and sound. Because of their greater crudity (shorter wave length), aerial waves can be penetrated by etheric waves, but not vice versa. In general, subtler waves can penetrate cruder waves, but the opposite is not true.

The third fundamental physical factor--luminous factor--is created when a portion of aerial factor is further crudified by the continued action of the static force. Luminous factor transmits the vibrations of form as well as touch and sound. Waves of luminous factor can be penetrated by waves of both aerial and etheric factor.

Liquid factor, the fourth fundamental physical factor, is created by the further action of the static force on a portion of luminous factor. Liquid factor transmits the vibrations of taste as well as form, touch and sound. Its waves can be penetrated by the waves of luminous, aerial and etheric factor. Solid factor, the fifth fundamental physical factor, is created by the crudifying effect of the static principle on a portion of liquid factor. Solid factor transmits the vibrations of smell as well as those of taste, form, touch and

sound, and can be penetrated by the waves of liquid, luminous, aerial and etheric factor.

The above description of the creation of the five fundamental physical factors may seem a bit abstract. The interpretation of the different fundamental physical factors and their interactions is a matter for much further research. Here the main idea to remember is that the different material factors result from successive crudification of the third level or objective portion of Cosmic Mind by the static force, resulting in different physical factors with successively shorter wavelengths and differing abilities to transmit the five sensory vibrations of sound, touch, form, taste and smell. This whole process is part of the thought process of the Cosmic Mind, and remains within the Cosmic Mind as well.

Exactly how these five fundamental material factors relate to the matter and energy described by physics is a subject of some debate. The five sensory qualities of sound, touch, form, taste and smell mentioned above do not all necessarily have a close correspondence to the corresponding sensory qualities of our everyday experience. For example if etheric factor corresponds to the vacuum state of "empty" space in physics, then the sound that travels through this subtle material factor is not the vibrations that are transmitted by air molecules which our ears receive and our brains interpret as sound. And aerial factor seems to be not molecules of air such as oxygen and nitrogen, but a subtle energy called prana. In a living body, organized prana or vital energy helps coordinate the vital functions of that body, as we shall see below.

The Creation of Life

The solid factor is the densest physical factor that can be created by the crudifying effect of the static force on Consciousness. A physical structure may be created by a combination of the five fundamental factors. If the fundamental factors are not in a suitable combination, the crudifying effect of the static force creates a tremendous pressure on the structure, resulting in a reaction within the structure and the structure explodes with tremendous force. This process happens in dying stars. Some of the cruder factors in the structure are converted back into subtler factors and the materials of the former structure are thrown violently into space, to be used again in the evolution of other physical structures. If this process of breaking down occurs gradually in part of a structure rather than the whole structure, it is called normal "wear and tear" of the structure.

But if a physical structure is able to form and maintain its existence, it is as a result of inward or internal forces within the structure that are larger than any outward or external forces within the structure that would cause the structure to break apart. These internal and external forces within a structure result from the external pressure of the static force which is attempting to

crudify the structure further. These internal and external forces within a structure, that affect the stability of physical structure, are creations of the aerial factor, i.e. energy or prana.

If the sum of all these internal and external forces acting on a structure produces a resultant force that is directed internally, then the structure remains stable, and that net internal force on the structure is called its vital energy. When that vital energy creates a nucleus within a solid body and maintains structural solidarity using this nucleus, then life is said to exist within the structure. Each of the five fundamental factors in the structure is then coordinated through a separate nucleus, and a single nucleus provides overall coordination of the vital forces of the structure. But this life can only come into existence when the five fundamental physical factors are present in the correct proportions, such that a congenial environment exists for the expression of life.

The metamorphosis of Pure Consciousness through the three different levels of Cosmic Mind and then through the five fundamental material factors constitutes the first half of the cosmic cycle of creation. It is described as the extroversial or centrifugal phase of creation. It is a movement from subtle to crude, where Consciousness comes under greater and greater influence of its own creative power. But the ability of the cosmic creative power to limit Consciousness reaches its maximum with the creation of solid factor. After the creation of life, the effect of the creative power over Consciousness begins to gradually decrease. The creation of life is the beginning point of the second half of the cosmic cycle of creation, which is the gradual return of the transformed Consciousness to its original state, through the creation and evolution of individual minds.

The Creation of Individual Minds

At the stage where life is created in an individual physical structure, an amazing thing happens. In a proper physical environment, a portion of the solid factor of the structure becomes powdered down as a result of the interplay of forces within the structure. This portion of the structure becomes subtler than even etheric factor. It becomes the beginning stage of individual mind within the structure.

Just as in the first half of the cycle of creation, the stage of Cosmic Mind before the creation of etheric factor is the objective portion of Cosmic Mind, the first stage of mind created in the second half of the cycle is the objective portion of individual or unit mind. The function of this objective unit mind is to coordinate the vital energy of the physical structure of the organism and to express instincts of the organism for the maintenance of its existence. In this primitive state, the individual mind has no will of its own, and so is guided in all its activities by the Cosmic Mind.

Due to physical clash of primitive organisms with their environment, psychic clash within the organisms with their different instincts, and an attractive force towards their evolutionary goal (the attraction of the Great), the minds and physical structures of primitive organisms continue to evolve. Unicellular organisms and undeveloped plants and animals have this primitive stage of mental development.

As mental development continues, the volume and mass of the objective unit mind increases and more instincts develop. Due to further clash and cohesion within the organism, subtler mind starts to develop. Instead of only a primitive "done I" feeling, a portion of the mind is converted to a state having the feeling of "I do". So individual subjective mind starts to form. More developed animals and plants can have this level of development of their individual minds.

With still further development of the individual mind due to physical and psychic clash and attraction of the Great, a portion of the "I do" part of the mind becomes transformed into a stage where the "I exist" feeling appears and is actively expressed. This stage can exist even in highly developed plants and animals. And when the individual mind develops to a stage that it can act independently, the stage of human mind has been achieved.

At the stage of existence of human mind, the independence of the mind means that the mind can make choices that either advance or retards its further evolutionary development towards its ultimate goal. Positive actions are those which further its evolutionary advancement as well as the advancement of other created beings, while negative actions are those which retard or reverse its progress or that of others toward the ultimate goal.

With further mental progress of the human mind, a person gradually gains awareness of the ultimate goal of life and the necessity to take concrete steps to reach that goal. Spiritual practices of concentration of the mind and meditation on the ultimate goal of life are started that focus the mind on its goal and increase the speed of one's mental evolutionary progress. Finally a stage comes when the objective portion of the individual mind merges into the subjective portion of the individual mind, and the subjective portion of the individual mind merges into the Cosmic Mind. Here a state of "I exist" remains, but it is the "I exist" feeling of the Cosmic Mind itself. Finally even this cosmic "I exist" feeling is merged back into Pure Consciousness, and the final goal of individual life is achieved. The second half of the cosmic cycle of creation is completed for a particular individual mind.

So according to the cosmic cycle of creation, life is a coordination existing between the individual mind and its physical body that allows the mind to continue its evolutionary journey while maintaining adjustment with the objective physical world. Vital energy, an expression of the aerial material factor, maintains that coordination with the guidance of the mind. Life exists

as long as a particular parallelism between the waves of the mind and the body is maintained. Death normally occurs when that psycho-physical parallelism is lost due to a serious defect in the mind or the body, and the mind separates from the body. If the evolutionary journey of the mind is not complete, the mind finds another suitable physical structure with which it develops a new psycho-physical parallelism, and the evolution of the mind continues in association with a new body. This cycle of birth and death continues until the mind reaches its final evolutionary goal.

With this brief introduction to the cosmic cycle of creation complete, we can now introduce some of Sarkar's ideas about microvita. The above explanation treats the origin of life in a quite abstract way. The theory of microvita brings the creation of life to a more detailed and practical level, but must be taken in the context of the more general description of the cosmic cycle of creation. For it is microvita that are one media of the Cosmic Mind for keeping the cycle going.

Chapter 4. Microvita, the Root Cause of Life

Science has up until now failed to explain the cause of life, or to create life artificially in scientific laboratories. It is known that certain organic molecules such as amino acids and chemical bases necessary for the manufacture of proteins, DNA and RNA (chemicals encoding the order of amino acids required for building various protein molecules required for life processes) can be created by applying electric sparks to mixtures of gases such as carbon dioxide, methane and ammonia, earlier thought to be present in the earth's early atmosphere. But to get from a few amino acids and bases to living cells is a big jump. Some scientists speculate that these and other molecules somehow manage to join together as a result of random interactions until somehow more complex structures develop that are able to reproduce themselves, obtain energy from their surroundings, and, over eons of time, evolve into living cells.

According to the currently prevailing ideas in biology, all of the different proteins and other chemical machinery for manufacturing them systematically and with very few errors by means of a genetic code via DNA and RNA, arose by these chance interactions. A process of "natural selection" supplemented this random process in order to generate increasingly complex and adaptable structures, which later became the first living cells. "Natural selection" is however not really a selection process but an expression of the fact of different survival and reproductive rates, for whatever natural causes, of different structures in a particular environment. This process of random change and natural selection is also invoked by most biologists in describing the evolution of species as well as the evolution of the first living cells.

The materialistic trend of modern biology has been to avoid attributing any underlying purpose to the origin of life and the evolution of different species. Explanations of the origin of life involving supernatural causes are not considered scientific, particularly when the explanation of the origin and evolution of life by random interactions and natural selection seems to avoid the need for invoking principles of supernatural causation. The success of the "new biology" in delineating many of the molecular mechanisms of cellular functioning has reinforced this materialistic bias in biology, even while materialistic bias seems to be decreasing a bit in the area of modern physics, as physicists are faced with the question of explaining the origin of the universe itself.

But the fundamental mechanism of the origin and evolution of life has still eluded biologists. It is one of the basic unsolved problems in biology today. To solve that problem will not only be a tremendous scientific achievement, but will also have many practical implications for the future of humanity as well as plant and animal life. For once the cause is known, human beings will

start trying to create living beings from non-living substances in scientific laboratories. Even now new life-forms are beings created by modifying presently existing animals and plants by genetic engineering techniques. Knowing how to create life itself will give human beings powers previously thought to be reserved to the gods or to God.

Now the secret of means of the creation of life may be gradually becoming known. P. R. Sarkar, a spiritual master in the tradition of tantra yoga, has started given discourses on the subject of Microvita, which he calls "the mysterious emanation of Cosmic Factor". The Cosmic Factor is the Cosmic Mind. According to the microvita theory, the cause of life is microvita, mysterious emanations from a cosmic intelligence vastly beyond the scope of the human mind. According to the cosmic cycle of creation, described by Sarkar, the universe itself is an internal thought projection of the Cosmic Mind. Now Sarkar is providing an explanation of the means by which the vitalizing of this internal thought projection is taking place.

Where does Sarkar get his information? It seems that he draws it from the same intuitional source from which persons have drawn intuitional knowledge for thousands of years. While that source may be unknown to the normal human intellect, the knowledge itself can be tested by the practical value it may have for human beings. Whether the reader accepts the existence of such a source of knowledge or not is not important here. Some information about microvita is now available to all, and it can be judged not by its source but by whatever light it sheds on our understanding of the nature of life.

Sarkar first introduced the subject of microvita on the 13th of December 1986 in a discourse entitled "Microvitum--The Mysterious Emanation of Cosmic Factor". He developed the subject further in a series of lectures published in "Microvitum in a Nutshell", in two more recent discourses entitled "Microvitum and Its Effect on Human Body and Human Mind" and "Mobility and Movement of Microvita", and in several other published discourses and unpublished statements. The information given about microvita up until now can serve at least as a starting point for further research to develop a scientific theory of microvita. Here is presented a summary of some of Sarkar's main ideas about microvita relevant to the origin and evolution of life. The reader is encouraged to go to the original sources for more details.

Microvita - A Nutshell Summary

Microvita are living entities which come within the scope of both physical and psychic expressions. Physically, they are smaller or subtler than atoms or electrons. In the psychic realm they may be subtler than ectoplasm, which is the subtle substance that composes the objective portion of the mind. "Microvita" in singular is "microvitum". Microvita are not protoplasmic in

nature. They are much subtler than carbon atoms, which are presently considered to be the starting point of life in the universe.

Physically, microvita are neither electrons nor ectoplasm, but are just between. Microvita are mysterious because their characteristics are not known to us. They are neither of protozoic nor metazoic structure.

There are three levels of subtlety of microvita. The least subtle come within the range of a powerful microscope. People give this type of microvita the name "virus". But "virus" is a vague term and the better term is "microvita". The next most subtle level of microvita come within the range of perception not directly but as a result of their actional expression or actional faculty. The subtlest level of microvita can only be perceived by a special type of perception which is actually the reflection of conception within the periphery of perception. This special type of perception can only be felt by persons having highly developed, spiritually oriented minds. A highly developed conceptual power is required in order to know the secrets of microvita, and this power can be developed through physico-psycho-spiritual practices or sadhana.

Microvita move throughout the entire universe. They pass without restriction through galaxies of stars and other celestial objects such as planets, satellites and meteors. Their movement is restricted by neither temperature nor pressure. They move unbarred throughout the universe.

Microvita are living entities. They exist, multiply and die. They require some medium for their movement, and can move through several media at once. They can move through sound, tactuality and forms. In the case of some diseases they move through smell. Subtler microvita can move through ideas. Directed by someone with a great, conceptually developed mind, microvita can also spread ideas throughout a planet or even the universe.

Microvita are the starting point of life or vitality in the universe. They are the carriers of life in different stars and planets, and not carbon atoms or carbon molecules. Microvita create both minds and bodies, and can destroy minds and bodies as well, anywhere in the universe. So the unit microvita is the root cause of life and not unicellular protozoa or unit protoplasmic cells.

Extensive research on microvita should be started immediately and without further delay, in order to solve many of the problems of society in a nice way. In the higher intellectual realm, research on microvita is extremely necessary. One day human beings will be able to control microvita properly.

Microvita exist as collective structures as well as individual structures. These collective structures of microvita may have both positive and negative effects on the human mind, ranging from increasing the desire to accumulate more and more wealth, to inspiring someone to leave their familiar surroundings in search of spiritual truth.

The crudest type of microvita were instrumental for the emanation of life from the Cosmos, by creating a stir of vitality in physical structures and by later causing changes in the evolving physical structures of plants, animals and human beings. The next subtler type of microvita, though they cannot be seen even in a very powerful microscope, functions within the world of perceptions or inferences of sound, touch, form, taste and smell. The subtlest category functions directly within the human mind.

Microvita cannot be created by human beings. Nor can human beings cause them to be released into the Cosmos. Only the Supreme Entity can emanate microvita.

Carbon atoms and non-carbonic atoms both get their atomic structure from microvita. Billions of microvita solidify to produce a single carbon atom. All kinds of atoms are the creations of microvita. So microvita are not of carbonic origin. Protoplasmic structures cannot be formed without carbon atoms. If the nuclei of protoplasmic cells are split, much more energy is released than in a nuclear explosion. So living bodies, possessing many protoplasmic cells, possess huge proportions of energy, beyond ordinary comprehension. This new understanding of microvita will create a revolutionary change in chemistry, bio-chemistry and all other associated branches of science. All formulas and theories followed up until now will have to be changed.

Every structure of carbonic origin has a mind, whether that structure is animate or inanimate. This mind may be expressed or unexpressed. The quality of the physical and mental foods or pabula of the mind determines whether the mind will become more crude or subtle. Negative microvita are attracted to persons of selfish mentality and these negative microvita intensify destructive and divisive activities of the mind such as imperialism in its many forms. Negative microvita can help to create a psychology of slavery, inferiority complex, pseudo-culture, psycho-economic exploitation, nihilism and cynicism.

In order to stop the negative effects of imperialistic psychology, Neo-Ethics will have to be adopted. This requires that the Macrocosmic Entity be accepted as the Supreme Desideratum in human life, and that there should be a happy adjustment and balanced blending between the different carbonic and non-carbonic pabula of the mind. This will lead to the multilateral salvation of human society. It will remove economic exploitation, political suppression, religious indoctrination, cultural imposition and social subordination. The Earth will become like a heaven.

The Universal entity uses microvita to accelerate the spiritual growth of individuals in different ways. The Supreme Guru is the only one who is conversant with the techniques of controlling microvita and can teach them to others.

Microvita can be positive or negative, as well as neutral. They may affect human beings both individually and collectively. Good people can take the help of friendly microvita to stop the degeneration of society as a result of the depraving effects of enemy or negative microvita. Even negative microvita can be beneficial if controlled by good people, just like a poison which is usually fatal can also act as a life-saving drug.

The crudest microvita occupy etheric space, the subtlest level of physical space. The next subtler microvita occupy psychic space, and the subtlest occupy supra-psychic space, at the border between the psychic and the spiritual worlds. Since microvita are creations of the Cosmic Mind, they do not function on the spiritual level. They cannot affect the spiritual structure, but can affect the physical and psychic structures, i.e. the body and the mind.

A few negative microvita entering the body will make a person feel uneasy. Millions of negative microvita entering an elephant can kill it in a few seconds. Neutral microvita don't create any particular feeling. Positive microvita entering the body or mind create a comfortable feeling. A few microvita entering the body or mind produce much change of feeling, but when millions enter it becomes very difficult for anyone to survive very long. Normally, microvita are more active at night when people are asleep.

The inner secret of life and vital progress in the fields of physicality, psyche and spirituality is the microvita. The theory of microvita--their denomination and emanation--must be established and propagated. It must not be neglected or ignored.

Chemical formulas will change as a result of further knowledge about microvita. The formula of a chemical will indicate the number and types of microvita associated with the chemical molecule, such as 20 million extra type B microvita per molecule.

In the microvita age, a scientist will not accept the carbon atom as the rudimentary factor for the emergence of life, since a carbon atom will be seen as nothing but billions of microvita getting solidified. Biologists will then say that protoplasmic cells are not composed of carbon atoms but are the collective solidified form of innumerable microvita. Big changes can be brought about in the human body by controlling the microvita in the protoplasmic cells. Mental qualities and capabilities can be increased by supplying sufficient quantities of microvita. So the theory of microvita has the potential for introducing many changes in human society. Changes in the ectoplasmic cells will also bring about changes in the endoplasmic coverage of the mind, so the mind will achieve better control over the body.

So the overall personalities of human beings will change as a result of the application of microvita. The appearance of the human body will also

change. In the first stage, human beings will become more psychic than physical. Later they will become more spiritual than psychic.

The growth of plants also depends on the amount and types of microvita in the soil. Fertilizers may differ in the number and types of microvita, even if the chemical formula remains the same. This gives rise to different quality and quantity of particular agricultural crops, such as jute or potatoes.

Various elements such as tin and copper can be created by using microvita to change the inner structure of atoms. Petroleum will also be artificially produced with the help of microvita. The scope for change will be greater in metals than non-metals. The field of pyrotechnology will be radically changed and much more powerful explosives will be developed in the future. Increasing the mobility of microvita in explosives will cause the explosives to be more powerful. The mode and speed of rockets will also be affected.

The different results sometimes obtained in chemical reactions in apparently constant conditions, are actually due to the differences in the microvita in the chemicals. The manufacture of medicines (pharmo-chemistry) will be greatly improved in the future by the application of the theory of microvita. The activity of a medicine depends on the number and type of microvita in the medicine. Medicines will be developed containing precise quantities of microvita for giving specific medical effects. The difference in effectiveness of medicines produced by different companies is also explainable by the different numbers and types of microvita in the medicines.

In the field of bio-chemistry, protoplasmic cells will be affected by bringing changes in the cellular nucleus with the help of microvita. The nucleus of the cell can be displaced and qualitative changes in its internal structure will be produced by microvita. So hormone production will be affected, leading to changes in the body's physical structure. Change can be made in the longevity of protoplasm, which is normally 21 days. A mango can be changed into an egg by changing the mass of the nuclei of the protoplasmic cells of a mango by utilizing the quantitative value of its microvita and inter-transmuting positive and negative microvita. By application of the theory of microvita, a caterpillar can even be changed into casein at normal temperatures by changing the pressure and the number of calories.

Microvita's Effect on the Human Body and Mind

In the context of explaining the effects of microvita, Sarkar gave new English names to the various plexuses or chakras of the human body described in the philosophy of yoga. The new names of the seven main chakras, starting from the lowest at the base of the spine, are the basic plexus, the fluidal plexus, the solar plexus, the aerial plexus, the physico-psychic plexus, the lunar plexus and the multipropensive plexus at the crown of the head. Another plexus associated with the multipropensive plexus is the occult plexus. The first five plexes coordinate the solid, liquid, luminous,

aerial and etheric physical factors of the body respectively, and control the expression of 48 main instincts. The sixth plexus or lunar plexus, associated with the pituitary gland, controls the mind and has two main instincts, making 50 main instincts in all. The seventh plexus, associated with the pineal gland, connects to the spiritual world.

Positive microvita start their action at the lunar plexus and can either move up or down to other plexuses. Negative microvita normally cannot move above the physico-psychic plexus and move only downward. Positive microvita cause particular instincts or mental propensities to be channelized in a subtle direction, making the body and mind more subtle. Negative microvita channelize the same instincts towards a cruder direction. Life requires a balanced interplay between positive and negative microvita on the various plexuses. When positive microvita dominate over negative microvita, there is all round progress both in the individual and society. But the predominance of negative microvita leads to both individual and social degeneration and possibly destruction.

Negative microvita cannot act directly on the lunar plexus, but can act indirectly by affecting the five lower plexuses. Psychic diseases such as schizophrenia, mania and melancholia are caused by a great predominance of negative over positive microvita, with the negative microvita acting indirectly on the lunar plexus. But a person doing meditation or spiritual sadhana cannot be attacked by negative microvita. To fight the effect of negative microvita on the lunar plexus requires right thinking and meditation.

But even positive microvita cannot reach up to the multipropensive plexus. One must get the help of a great personality or the Supreme Consciousness for that, and must do spiritual sadhana. Only in this way can the pinnacled goal at the multipropensive plexus be reached.

Human beings must do something concrete to save society from the depraving effect of negative microvita, which are dominating in the world today. Otherwise the future of humanity and all other living beings is dark. So human beings should take the help of positive microvita for this work. They should become more active and work with maximum speed and zeal to restore the predominance of positive microvita in society and bring new speed and progress to human society.

The Mobility and Movement of Microvita

Microvita exist at the borderline of the inanimate and animate worlds. Everything in the universe moves with various speeds, so microvita also move. The movement of microvita is systaltic, with alternating relative speed and pause. This movement is not in a straight line, but to some extent angular. When the speed is not predominant, positive microvita can have a

bit of circular motion, but the motion of negative microvita is always angular.

When negative microvita move systaltically, they create angles. When the speed is faster these angles are smaller. Negative microvita can only move freely in the physical world but cannot enter the psychic world. Positive microvita can move freely in both the physical and the psychic worlds. For positive microvita, their movement in the physical world also creates angles, but in the psychic world their movement is a bit circular. If one's mind is engaged in elevating thoughts, that movement creates angles in the sentient portion of the structure.

A physical structure consists of sentient, mutative and static portions, depending on which of the three creative forces of the cosmic creative power is dominant in different portions of the structure. The effect of the angles of negative microvita is to maintain an adjustment with the static portions of the physical body and the physical world. But if they enter the mutative portion of the body or the world, the tendency of the angles of negative microvita is to crudify these portions, decreasing their size and increasing the size of the static portion of the body. As a result, the sentience of the sentient portion of the body and the physical world also decreases. So one should try to be pure in both body and mind. Degenerate thinking invites negative microvita, whereas good company, good books, good songs and spiritual songs elevate the mind by attracting positive microvita. With positive thoughts and actions, negative microvita cannot easily touch the mutative and sentient portions of the body.

The angles created by positive microvita have an opposite effect. These angles maintain an adjustment with the sentient portion of the body, so positive microvita don't touch the static portion of a structure. The mutative portion neighboring to the sentient structure is influenced by positive microvita and becomes more sentient. The static portion then also loses its staticity to some extent.

Positive microvita benefit the physical body and the mind, and assist in spiritual elevation, not only of human beings but of any living body. They help in the animate portion of the Supreme Consciousness' thought wave in creating a better world. Positive microvita help in the all round and integrated development not only of human bodies and other living bodies, but also in the all round development of all existing things. That is, everything that exists is benefited by positive microvita.

Positive microvita cause inanimate objects to become animate. Carbon atoms sleeping in an inanimate body get life, get a stir of vitality in them. Slowly those vitalized atoms are transmuted into huge living structures like human beings. So positive microvita should be invited for the all round advancement and elevation of all beings, animate and inanimate. The

advancement of negative microvita should be prevented, because they are detrimental to the creation of a sweet and beautiful universe.

Recent Notes on Microvita

The following notes and ideas are from Acarya Vimalananda Avt., a global coordinator of microvita research. They are based on recent comments Sarkar made to him in late August 1988 about microvita. They are included to bring this book up to date, but have not yet been integrated into the following chapters. The reader should keep them in mind while reading the remainder of the book.

Do more sadhana (meditation).

Scientists should learn meditation to increase their observational capability. Observers must raise their level of consciousness.

When solid matter explodes at the atomic level billions of microvita that have solidified to form the atom may awaken. Microvita are dormant in the atom and very small. When jadasphota (a type of explosion that may be violent or cause normal wear and tear in a structure) occurs microvita awaken and take on a different structure. If the environment is changed, microvita change to suit the environment. That is how a tiny microvita can change and become so large that it can be seen through a microscope.

Microvita when awakened develop a personality that depends upon the environment. If jadasphota takes place in a solution of Fe_2O_3 you will get one structure. The structure will be different in different environments. If it is in another structure such as Fe_3O_4 it will be different. As the environment will affect the structure of microvita, that structure will keep changing as microvita move through different environments.

When a microvita has been awakened and enters a cell, a virus adapts to the environment of the cell. You get a virus when a microvita has entered a cell and developed.

The RNA and DNA of a particular virus is unique to that virus. Particles of Cosmic Citta (Objective Cosmic Mind), when microvita are emanated from Cosmic Mind, already contain the information for RNA or DNA. This information is there but not seen until microvita is awakened, and when it is in virus form then we can detect it.

Ectoplasm will affect what is going to happen to microvita in the area. As microvita enter the space of another person's ectoplasm (thought waves) then microvita can be changed. A microvita can be changed when it is affected by a person's thought waves.

The Western scientific mind is asking what and how. Science is not asking WHY. The place to look for microvita is in WHY.

Microvita are taking place within Cosmic Mind before the etherial level. Cosmic citta is needed first before it can conceptualize microvita.

What happened to microvita between Cosmic Mind and becoming a virus...did it go through Saincara (the extroversive phase of the cycle of creation) or did it skip this? What happened between the point it came from cosmic citta and became a virus...did it go through all the stages of saincara to get there?

Suggestions for Microvita Research

Sarkar recently suggested several areas where experimental research can demonstrate the effect of microvita and thus convince scientists of their existence.

1. In a chemistry experiment, if two test tubes with the same contents are heated using two different gases (one heated with coal gas and the other with butane gas) the results of the experiment will be different due to the different fuels being used.
2. Find out why there is a difference in the temperature and salinity of different oceans, although they have been connected for millions of years? If you mix two glasses of sea water, they eventually blend. Why haven't the oceans blended?
3. If two cells come from the same area of one living creature are put into identical cultures at the same temperature, with the same nutrients and all other conditions are the same, still after some time the quantity of cell culture will be different.
4. Find out why unusual things happen in the Bermuda Triangle.
5. If two Guinea pigs of identical weight, living in the same environment, etc., were administered the same quantity of poison, they would not die at the same time. Why?
6. Radioactive elements that decay to lead, such as radium and uranium, etc., release radiation in the process. a) Why is radiation released? b) By reversing the process many problems may be solved, i.e. cleaning up radioactive waste. Learn how to reverse this process.
7. Halogen elements such as fluorine, bromine, iodine, etc. are powerful non-metals. Fluorine is very strong. Find out why there is such a difference between them. (Note - there is a reference to negative charge.)
8. If the highly conductive liquid mercury can be changed from liquid to solid it becomes a great superconductor.
9. What makes the different blood groups and types? Explore the reasoning behind it. The answers will lead to solving many medical problems.

10. Collective human psychic force brings changes in different experiments. Collective human psychic strength controls certain microvita. I.e. one state may be psychically different from another, leading to different results from a particular experiment conducted in two different states.

Sarkar has emphasized that microvita research should be started immediately. Still, in some of the above suggested research areas, it is not immediately clear what research approach should be used to show that microvita and not some other causes are responsible for the observed phenomena. The following chapter takes up the general topic of starting microvita research, and gives several general suggestions as to how one might proceed. Then some steps are given towards developing a general theory of microvita, and the theory is applied to several areas of physical and biological research.

Chapter 5. Starting Microvita Research

In 1958 Wolfgang Pauli, one of the founders of quantum mechanics, gave a lecture about a new addition to the theory developed by him and Werner Heisenberg, another of the founders of Quantum Mechanics. The lecture was attended by Niels Bohr, another great physicist who had shown 40 years earlier how atoms were built. After the lecture there was some discussion of Pauli's lecture, mostly unfavorable. Finally Niels Bohr stood up and said that all were agreed that Pauli and Heisenberg's theory was crazy. Where they were divided, Bohr said, was on whether it was crazy enough!

Modern physics is filled with "crazy" ideas that have come to be accepted as scientific fact: anti-matter, particle-waves, black holes, superconducting matter, an expanding universe, the relativity of space and time, atomic energy, and many more. Based on the history of scientific discoveries, only a fool would claim that there are no more revolutionary new discoveries to be made in the physical and life sciences.

Now P. R. Sarkar has described an important and unifying object in the physical sciences and life sciences--the Microvita. He says that microvita are living creatures that create both physical bodies and minds. But physically, they are smaller and subtler than ordinary matter--protons, electrons, etc.--while mentally they may be subtler than the ectoplasm composing part of the minds of living beings. Millions of microvita form a single electron, while billions compose an atom. When something exists, but people do not know its characteristics and other particulars, it is said to be mysterious. So microvita are a mysterious emanation from Cosmic Factor.

But these microvita are extremely important because they are the root cause of life in the universe, and not the chemistry of carbon atoms, as is generally believed by scientists. The least subtle of three types of microvita can be seen in a highly developed microscope. They are related to viruses. They can travel unrestricted throughout the universe, and travel through different sensory media such as sound, touch, form and smell.

A more subtle kind of microvita can use ideas as its medium of travel. These microvita can help spread the ideas of persons who understand the secret of controlling them. They inhabit psychic space and can be perceived only indirectly as a result of their actional effects on the material world.

The third and subtlest kind of microvita can only be perceived by conceptually developed, spiritually-minded persons through a special kind of perception which is more like conception than normal perception. These microvita inhabit supra-psychic space, at the boundary between the psychic and spiritual worlds.

Who Should Do Microvita Research?

The subject of microvita is vast. We should start research on them without further delay, so that many problems of society can be solved. But who can perform the necessary research on microvita? And what type of research should we do? Sarkar suggests several areas in which microvita research can be started. People should start microvita research who think that microvita will provide a key to solving or shedding light on any of the mysteries or unsolved problems in their own areas of work, interest or research. Below are listed several kinds of researchers and other persons whose work could be affected by the theory of microvita.

Physicists. If microvita are entities which physically are subtler than ordinary matter composed of electrons, protons, neutrons etc., physicists would be extremely interested to know the properties of such entities and how they are related to ordinary matter and energy. If millions of microvita make up one electron, this means that many of the fundamental theories of physics will have to be revised.

Biologists. The fundamental mystery of biology is the origin of life. Microvita are the key. They move unbarred through the universe, and create both bodies and minds. They do not have a protoplasmic structure, but create and evolve protoplasmic structures.

Medical Researchers. Microvita can destroy bodies and minds as well as create them. The origin and action of viruses is a big mystery in medical science. AIDS, certain types of cancer, the common cold and many other virus-related diseases may be brought under control through proper understanding and control of microvita.

Mental Health Researchers. If microvita can destroy minds, then they must be the cause of many psychic illnesses that plague modern society. Controlling these microvita would bring a tremendous breakthrough in the field of mental health.

Psychologists. Microvita may be the key to understanding in detail the relationship between the mind and the body, as well as understanding ourselves better and improving ourselves individually and collectively.

Educators. The way that learning takes place is still a mystery. If Microvita can transmit ideas and also can travel through the medium of ideas, they may help to explain how learning actually occurs in the mind. Knowledge about microvita could then be used to greatly facilitate the process of learning. This knowledge could be applied to learning in both individuals and groups.

Historians, anthropologists and sociologists. Microvita can affect the collective psychology of groups of people, both past and present. Ideas that can create a healthy society as well as a sick society could be spread by

microvita. They could also be responsible for the introduction of new ideas and discoveries from other galaxies into human groups and societies.

Musicians, poets, dancers, writers, painters, singers and other artists. Some of the subtler microvita may inspire artists of all kinds in their creative processes. Control of these microvita could bring a renaissance of art and culture, and even open up new fields of creative artistic expression. Microvita could help artists transmit their artistic creations to the public mind as well.

Engineers, designers and workers in other applied arts. Creativity and the need for new ideas are not limited to the fine arts. Microvita could be an unending source of new ideas in many practical fields of work, from computer design to pottery making.

The Military. Control of negative or harmful microvita by honest and moral leaders and the military forces would make immoral leaders think many times before trying to exploit and oppress others. Microvita might also be used to make weapons which could neutralize atom bombs, so that the threat of atomic war could be removed forever.

Journalists. The spreading of ideas by subtle forms of microvita should be of great interest to journalists and others in the mass media, whose professional interest is in the spread of information, news and ideas.

Spiritualists. The subtlest microvita, moving through supra-psychic space, may carry moral and ethical values, cardinal human values, spiritual expressions, symbols and archetypes. They may help in spiritual development, and if utilized by spiritually-minded persons, could facilitate a global renaissance of spiritual and human values.

How To Start Microvita Research

Assuming that there will be many persons interested in researching microvita, how should they start? One approach would be to start study groups to read and discuss the topic of microvita. These groups could be of a general nature, or for persons sharing a common special interest, such as evolution or mental health. Members of study groups or research groups on microvita could learn physico-psycho-spiritual practices in order to further develop their conceptual powers, as mentioned by Sarkar. In this way they would be more able to learn the secrets of microvita. Study and research groups should also study Sarkar's writings on intuitional science so that they will understand the philosophical background which forms a context for understanding microvita. People may also do individual research and communicate their ideas and results to a network of other interested persons and microvita researchers.

Microvita researchers should, along with their studies, start developing experimental research strategies appropriate to the particular type or types

of microvita they are interested in investigating. These strategies will evolve in a natural way, and in general cannot be specified in detail in advance. For example, the recent controversial "water memory" experiment published in Nature on 30 June 1988 offers fertile ground for microvita research.

There must be a means for sharing ideas and research findings about microvita in a systematic way. An high quality international journal should be started immediately, devoted to the subject of microvita research. The subject of microvita is vast. But it will be explored step by step by persons desiring to use this knowledge about microvita for the benefit of humanity and all living beings. The journey of a thousand miles begins with a single step. So let us develop our microvita research activities in various areas immediately. When the first proof of the existence of microvita is scientifically obtained as a result of our collective efforts, it will be a great day for science and for humanity.

The following chapters represent a few attempts to develop some aspects of the theory of microvita and to apply the theory in various areas. It is hoped that they will stimulate others to jump into the field of microvita research so that progress can be rapid in this exciting new area of knowledge.

Chapter 6. Building The Theory of Microvita

According to P. R. Sarkar, "microvita is the inner secret of life, inner secret of vital progress in all the fields of physicality, psyche and spirituality." So it is very important to establish and propagate the theory of microvita. Included in the theory is the "denomination and emanation of microvita." "The entire world is waiting for you to bring all-round metamorphosis" of many structures in the universe as a result of the proper application of the theory of microvita.

So it is clear that the microvita theory will be used to modify many structures, both physical and mental. According to Sarkar, microvita are the key to the development, evolution and metamorphosis of structure. What is structure? It is the ordering or arrangement of the component parts of an object or the pattern of changes of those component parts in space and time. Here the object may be anything physical or mental--such as an atom, a song, a computer program, a solar system, a human being or community, an ecosystem, a memory, a thought or a dream--that can be viewed as a whole having describable relationships among its parts.

Microvita can create both bodies and minds, as well as destroy them. A physical body is a physical structure made of physical component materials. A mind is a mental structure having component mental parts. So the key idea about microvita is that they can create, metamorphose and destroy structures, both physical and mental.

According to Sarkar, a mind is associated with every structure of carbonic origin in the universe. That mind may be either expressed or unexpressed. An expressed mind has an endoplasmic coverage, while an unexpressed mind does not. Here Sarkar is using the word "endoplasmic" in a particular sense of a component of the mind, and not in the usual biological meaning of the term. The action of microvita on human beings will bring about ectoplasmic changes in the mind. Ectoplasm is the non-physical "stuff" of which the objective portion of the mind is composed. Changing the ectoplasm by the action of microvita will bring changes in the endoplasm also. "And thus the mind will be able to control the organism--the physical body--in a better way."

So the endoplasmic coverage is seen to play a special role in the control of the physical body by the mind. The theory of microvita should include the function of the endoplasmic coverage of expressed minds in the control of the physical structure. Presumably, if the mind is not expressed, there is no need for an endoplasmic coverage of the mind that exerts control over the physical structure. It can be inferred that an unexpressed mind contains ectoplasm even though there is no endoplasmic coverage, and that an unexpressed mind, lacking an endoplasmic coverage, does not exert any control over the physical structure.

According to Sarkar, atoms can themselves be living. As a result of the effect of positive microvita, "inanimate objects will become animate, carbon atoms sleeping in an inanimate body will get life, will get the stir of vitality in them, and that vitality is slowly to be transmuted into a gigantic living structure like a human being." So Sarkar claims that not only do all physical structures have a mind, but they can be living as well. It is the action of positive microvita that brings vitality, or life, to physical structures.

Generally, physical structures and the physical bodies of living beings are made up of a combination of the five fundamental physical factors--solid, liquid, luminous, aerial and etheric factors. The bodies of certain beings called luminous bodies are however composed of only luminous, aerial and etheric factors. A physical structure can only be formed or maintained when there is an interial force of prana or energy (aerial factor) that is larger than an opposing external force, also caused by prana, acting within the structure. The resultant interial force also therefore consists of prana or energy. When the five fundamental physical factors are available in the necessary proportions and a resultant interial force acts through a nucleus that is formed in the solid factor, then life is possible. That resultant interial force coordinates the five fundamental factors through five separate nuclei for the five fundamental factors in the structure. That resultant interial force is called vital energy or Pranah (This is the plural form of prana, since there are actually ten vital energies composing Pranah which regulate different physical and psychic functions of an organism.) We say that life is expressed in that structure. According to Sarkar, "Hence it may be concluded that the resultant interial force expressing itself into life under a congenial environment is what is known as Pranah or vital energy."

So whenever a structure maintains its existence there must be Pranah or vital energy acting in the structure to preserve the structure's existence. A separate nucleus will exist in the structure to control each of the five fundamental factors in the structure and one nucleus will give overall control of the vital energy in the whole structure. In human beings, the five lower chakras described in yoga philosophy are the controlling nuclei for solid, liquid, luminous, aerial and etheric factors, respectively. The vital energy (composed of aerial factor) for the whole physical body is controlled by the fourth nucleus--the anahata chakra or aerial plexus in Sarkar's terminology. So the microvita controlling the physical structure and functioning of the developed human body are located in the chakras of the body. The sixth chakra controls the mind, while the seventh chakra is the ultimate controller of all the propensities of the mind.

What is the relationship between microvita and the vital energy of a structure? Since positive microvita bring vitality to carbon atoms and give a stir of life to them, it means that microvita are able to organize vital energy from prana or aerial factor. Microvita organize a portion of the prana in some

region of space and produce an internal force so that a structure can be created. That internal force can then exert pressure on material composed of all five fundamental factors to bring them together to form a physical structure. So microvita are the organizers and controllers of the vital energy of a physical structure. A physical structure can neither be created nor maintained without the action of microvita which control the vital energy of the structure.

So we reach two important conclusions from the above analysis. First, since the vital energy of a structure acts through nuclei to control the structure, these nuclei of the structure must either be made of or contain the controlling microvita for the structure. So microvita exist at the nuclei of any physical structure and control and maintain the vital energy that maintains the existence and solidarity of the structure. The second conclusion is that without microvita, no physical structure can exist. This is because without microvita, energy or prana cannot be organized to become vital energy and create or maintain the existence of a structure. We can see the fundamental importance of microvita, therefore, in the creation and continued existence of any physical structure.

Sarkar said that microvita can create bodies and also destroy bodies. How could microvita destroy a body? If negative microvita have the effect of reducing the intensity of the vital energy or Prana in a physical structure, then this reduced resultant internal force or Prana may not be sufficient to keep all five fundamental factors of the structure in proper order. These negative microvita can cause the microvita in the nucleus of the structure to lose control of the vital energy of the structure. Vital energy may finally leave the structure or revert to ordinary prana or unorganized energy. If this happens, the structure loses its vitality or life and finally disintegrates. In the case of the human structure or body, death occurs when nine of the ten vayus or components of Prana leave the body, while the tenth vayu remains in the dead body until it is cremated or otherwise decomposes and finally loses its human form.

The analysis of the relationship among microvita, vital energy and structure above is quite general. It applies to every physical object in or organism in the universe, both naturally occurring or made by human beings (of course, human beings are also part of nature.) So we should expect to find microvita and vital energy maintaining the structures and relationships among electrons, atomic nuclei, atoms, molecules, living cells, plants, animals, human beings, families, societies, ecosystems, a planet, a star, a solar system, a galaxy, a cluster of galaxies, a supercluster of galaxies and finally the whole physical universe.

According to Sarkar, "In the Microvita age the biologist will say that the protoplasmic cells are not made of carbon atoms, rather they are the collective solidified form of innumerable microvita." The same type of

statement would apply to any of the above mentioned structures. So the microvita is the fundamental self-organizing or structuring entity in the universe. It is the medium through which the Cosmic Mind structures the physical universe and its parts and gives them life.

Microvita exist at the nuclei of every physical structure. So by changing the microvita at the nuclei, the physical structure will also change, as it is a creation of the microvita at the nuclei. So this is where the practical application of the theory of microvita comes in. The theory of microvita will be used to alter the quantity and type of microvita at the nuclei of various physical structures and so alter those structures in desired ways. And new physical structures may be created by creating new combinations of microvita as a new nucleus and then allowing that microvita nucleus to act on the five fundamental factors to create a new structure.

Microvita and Chemistry

According to Sarkar, the effect of microvita can be seen in chemical reactions. "During scientific experiments in chemical laboratories you have surely noticed that the results of chemical reactions are not always the same in spite of temperature, atmospheric pressure and condition remaining the same. This is due to the difference in number and denominations of microvita present in the samples." One sample of a chemical, calcium phosphate, may have for example 10 million more microvita in each oxygen atom than another sample of calcium phosphate, and this could cause chemical reactions with the two samples to vary.

Sarkar differentiates between the external structure and the internal structure of an atom or other physical structure, in relation to microvita. "An atom may be internally of both homogeneous and heterogeneous character and also externally of both homogeneous and heterogeneous character. Similar is the case with a molecule. But it is internally more of heterogeneous character and externally more of homogeneous wants. So an atom stands with its unitary glamour according to its internal homogeneity or internal heterogeneity." "Whatever may be the external chemical structure, the internal structure will be greatly changed due to increase or decrease in the number of microvita." And later, "By bringing changes in the internal structure of objects with the application of microvita, necessary elements can be created. In the same manner, petroleum can also be artificially produced with the help of microvita. This sort of change takes place with the change in the internal structure of objects." In biochemistry, "displacement of the nucleus can be brought about with the help of microvita, which will bring qualitative change in the internal structure. It will internally affect the hormone and thus externally, the corporal structure." A mango can be change into an egg "if a change is brought in the nuclear mass of the protoplasmic cell of a mango by properly harnessing the quantitative value of its microvita."

How are we to interpret the internal and external structure of a object, in Sarkar's terminology? The internal structure may refer to the structure of the collective microvita in the nucleus of the physical structure, while the external structure refers to the physical structure itself, composed of the five fundamental factors, that is created and maintained by the action of the collective microvita. Depending on the number and type of microvita added to the collective microvita nucleus of an atom, the atom may alter the properties of chemical or nuclear reactions, or even change from one element to another. Or alternately, the internal structure may refer to the structure of the physical nucleus, which contains the collective microvita nucleus, such as the physical nucleus of an atom or a protoplasmic cell, while the external structure refers to the remaining part of the physical structure. The first of the above distinctions is more clear cut, as it distinguishes between the collective microvita and the physical structure formed by the action of those microvita. In the biochemical example, a hormone may be thought of as one particular creation of the microvita in the nucleus of a protoplasmic cell.

Effect of Microvita on Mental Structures and Propensities

Sarkar has indicated that positive and negative microvita have particular effects on the mental propensities associated with the different chakras or yogic plexuses in the body. For example, in the lowest chakra, or basic plexus, "the desire to increase human longings is created or encouraged by both positive and negative microvita. But the encouragement of negative microvita is towards crudeness and that of positive microvita is for the conversion or transmutation of crude desires into subtler ones." Other mental propensities at the different yogic plexuses are channelized towards cruder expressions by negative microvita and towards subtler expressions by positive microvita.

Positive microvita can move freely in the physical world and any physical structure, and can move freely in psychic structures also. Negative microvita however can only move in the physical world and physical structures. But negative microvita can indirectly affect the psychic world by their effects on the mental propensities controlled by the five lower chakras. According to Sarkar, many mental illnesses such as schizophrenia, mania and melancholia are caused by the indirect effect of negative microvita on the sixth (ajina) chakra, or lunar plexus, the controlling chakra of the mind, according to yoga philosophy.

So positive and negative microvita have clear effects on the functioning of the mind. But what is their effect on the structure of the mind? Microvita can create minds as well as destroy them, according to Sarkar.

Changing the microvita in protoplasmic cells will bring ectoplasmic changes as well as endoplasmic changes in the mind. We saw earlier that a mind

consists of three parts, an objective portion that takes the shape of objects of thought, and two subjective portions responsible for the feeling of existence and the feeling of action. The objective portion is composed of ectoplasm. Sarkar refers to endoplasm as the "extro-psychic coverage" of ectoplasm. We mainly know so far that this endoplasmic coverage helps the mind to control the body, since one effect of microvita is to change the endoplasmic coverage to help the mind control the physical body in a better way. So there must be a close relationship between microvita and endoplasm. Sarkar has indicated that in living beings, microvita act on the endoplasmic coverage as well as ectoplasm, while in human beings microvita act on glands and subglands which give hormonal secretions.

What is the effect of microvita on ectoplasm? Certain microvita can be carriers of ideas and move through the medium of ideas. An idea is a particular mental structure. So these microvita create ideas in the mind. It means they vibrate the ectoplasm in such a way that a new thought or idea is experienced by the subjective portion of the mind. So these microvita captivate a portion of the ectoplasm of the mind and cause that ectoplasm to vibrate with a particular idea brought by particular microvita. In this way microvita transmit new ideas to the mind.

The function of the mind is not only to think but also to remember. How does the mind remember, after the vibration of the ectoplasm with a particular idea or thought has ended? If the ectoplasm is to be able to take new forms, it should be free from previous forms. So memories are not likely to be stored in the ectoplasm itself. So perhaps the endoplasmic coverage of the mind is where memories are stored. Scientific research on the brain has so far not discovered any physical mechanism for storing long term memories in the brain. Sarkar has stated that the brain does not have the physical capacity to store all the memories in the mind. So he calls memories stored outside the brain, extracerebral memories, such as long term memories and memories from past lives. If memories are not stored in the physical brain but in some part of the mind, this would explain the failure of brain research to locate "engrams" in the brain where long term memories might be stored. It would also explain why certain people can function normally with very little brain matter. They only need enough to transmit messages between the body and the mind and to perform necessary physical functions. This can apparently be done in persons with less than 5% of the normal amount of brain tissue.

At death, when the mind separates from the body, according to yoga philosophy, the ectoplasm cannot be activated because nerve cells are required for this. But all the memories stored in the mind, perhaps in the endoplasmic coverage, would remain with the subjective portions of the mind until a suitable new physical structure is found for the mind to express itself in. During their childhood children usually have memories of their

previous life, according to Sarkar. Then they gradually forget their past life. Samskaras or reactions in potential form resulting from a person's actions could also be stored in the endoplasmic coverage of the mind. Under certain circumstances some samskaras will ripen and vibrate the mind, causing the mind to experience the reaction or consequence, positive or negative, of some of its previous actions. In fact a samskara may be one kind of microvita produced by the vibration of the ectoplasm when the mind performs some action. That vibration is stored in a seed form as a samskara microvita in the endoplasmic coverage of the mind.

Thoughts, Memories and Microvita

Not only samskaras but all long term memories may be created by the same microvita that originally vibrated a portion of the mind's ectoplasm. Microvita that created a particular mental structure or idea in the ectoplasm could be retained in the endoplasmic coverage of the mind. At a later time, these microvita could be reactivated by some associated thought vibration in the ectoplasm. These memory microvita could then revibrate another portion of the ectoplasm with the same or a similar vibration to that which the mind experienced at an earlier time. This second vibration is the memory of the first vibration. Just as one type of microvita can construct or reconstruct a physical structure from the five fundamental physical factors, another type of microvita can construct or reconstruct a mental structure or thought in the mind's ectoplasm.

By analogy to the case of physical structures, we may infer that, just as no physical structure can exist without the presence and action of microvita, also no mental structure such as a thought or memory can exist in the mind without being created and maintained by the action of microvita. Without microvita, the ectoplasm cannot take any mental form, just as without microvita, the five fundamental physical factors cannot produce any physical form. Thought then is the mental process that combines mental vibrations created by microvita brought to the mind by the sense organs and the vital energy, with mental vibrations created by microvita from the endoplasmic coverage and from subtler layers of the superconscious mind beyond the conscious and subconscious portions of the mind. (According to Sarkar, only individual samskaras or as yet not experienced mental reactions differentiate the superconscious mind of an individual from the superconscious mind of Cosmic Mind.)

Towards a Microvita Worldview

If it is true that microvita are necessary to create all physical and mental structures in the universe and in individual and collective minds, then a new view of reality, a new worldview, begins to emerge. The present materialistic worldview, held by many scientists and accepted as scientific orthodoxy, is that matter and energy are all that exists in the universe, and mind and

consciousness are particular attributes of organized matter, having no independent existence from matter. Whatever doesn't fit into this framework is ignored, suppressed or ridiculed as nonsense by adherents of the materialistic world view.

The worldview based on the above concepts about microvita is quite different. Here the physical universe exists in a portion of the Cosmic Mind. While physical objects are external to the individual mind, they are internal to the Cosmic Mind. Physical objects are made up of five fundamental physical factors which are created as a result of the thought process of the Cosmic Mind. These physical factors can only be formed into physical structures when acted upon by microvita emanated from the Cosmic Mind. So microvita are the connecting link between the observed physical universe and individual minds on one hand, and Cosmic Mind on the other.

Individual minds are created from the five fundamental physical factors by a process that metamorphoses some portion of them into ectoplasm, a substance subtler than the five fundamental physical factors. Ectoplasm is the mental "stuff" from which all thoughts and memories are molded by microvita. In the microvita worldview, all that is necessary to change any physical structure is to change the microvita at the nucleus of the structure which control the existence of that structure. All physical objects and organisms are formed and maintained by microvita acting from various nuclei. All physical structures composed of the five physical fundamental factors have mind, which may be expressed or unexpressed. Long term memories are stored in the mind and not in the brain or the physical structure. Atoms may be brought to life by the action of positive microvita which add to the vital energy shaping their physical structures. Microvita exist independently of the five fundamental factors, though they require some medium for transmission, either physical, psychic or psycho-spiritual. The microvita is the minutest particle in nature. Millions of microvita combine to form an electron, and billions are necessary to form an atom. In this worldview, mind and consciousness are not attributes of matter but have independent existence and causal roles in the physical universe.

According to Sarkar, microvita are the key to the mystery of life. "Philosophy had its beginning in the distant past to find out and to realize the mysteries of creation. Various scholars in the branches of human knowledge built up various schools of philosophy in different ages. Some of these philosophies were idealistic, some of them materialistic. But what is the very purpose of philosophy? It is to find out the unmistakable link between the Creator and His creation. But the philosophers in spite of their sincere efforts could not build a bridge between the relative world and the absolute world. It seems philosophy has lost its way in a labyrinth of metaphysics. The defective conclusions of philosophies have made respective schools of philosophies dogma-based intellectual extravaganza. Regarding these types of

philosophies Lord Shiva says - "Loka vya'moha Ka'raka. That which causes a psychic disease." (*Prama*, p.8). If it can be proved that microvita are that "unmistakable link between the creator and His creation," then the materialistic philosophy embodied in the present materialistic scientific worldview can be discarded and the fundamental purpose of philosophy will finally have been achieved.

The above discussion, which integrates and elaborates some of Sarkar's statements about microvita and physical and mental existence, should be understood as one very tentative attempt to help build a framework for the theory of microvita. From a scientific point of view, the theory will remain unproved until its predictions can be tested scientifically. As the theory develops through the combined efforts of many persons it will be subjected to many scientific and logical tests and much modification and elaboration in the future. Sarkar's ideas about microvita are very revolutionary. It is extremely important to research them and develop the theory of microvita in order to see if the theory can be established scientifically. If it can be established through experimental research, it will bring about a new scientific revolution and new social era, the Age of Microvitum. It is important to clearly understand the fundamental importance that Sarkar gives to microvita in their relationship to matter, life, mind and spirituality. Sarkar's claim that "microvitum is the inner secret of life, inner secret of vital progress in all the fields of physicality, psyche and spirituality" is a strong one. Only time and many research efforts will tell if it is also a valid one.

Testing the Microvita Theory

Even at this early stage of development of the theory of microvita, some scientific predictions can be made and tested experimentally. Such tests of the theory will help to elaborate the theory as well, or modify it as necessary to fit the facts better.

One area where the theory can be subjected to immediate testing is related to the field of homeopathy. In the controversial "water memory" experiments published recently in *Nature*, a highly diluted antibody solution, so dilute that supposedly not a single antibody molecule remained in the solution, was able to have specific biochemical effects on certain white blood cells, similar to the effect of the actual antibody molecules on the blood cells. There is no known physical explanation for such a result, which is why the experiments are controversial.

Many solutions of "homeopathic dilution" contain no remaining dissolved chemical substances. They are diluted so many times that not a single molecule of an original dissolved chemical substance can remain. Vigorous shaking also accompanies the dilution process, since the solutions are not effective otherwise. A letter to *Nature* (Vol. 334, 28 July 1988, p. 285) by

David Taylor Reilly reports that "Now Franco Bruno of Citta Universitaria Rome has communicated (OMHI Conference, Rome, April 1988) apparent confirmation of earlier work (T.M. Young, J. Am. Inst. Hom., 68, 8-16, 1975) that the nuclear magnetic resonance spectra of homeopathic dilutions are altered" as compared to the spectra of the solvent alone. The letter further mentions that "Doctors already observe the altered nuclear spin of diseased tissue in their patients with magnetic resonance imaging." Nuclear magnetic resonance spectra measure subtle vibrational properties of the nuclei of atoms. So in some way the nuclei of atoms in homeopathic dilutions are different from nuclei in the pure solvent in which no substance has been diluted. Why should this be?

According to the microvita theory the antibodies in the "water memory" experiment contain millions of microvita that maintain the chemical structure of the antibodies. Vigorously shaking the solution could cause these microvita to reproduce (since they are living entities with this capacity). Then some of these antibody microvita could become released from the antibodies during the diluting and shaking process. Further shaking would also cause the released antibody microvita to continue to reproduce. This would allow the concentration of antibody microvita in the solution to remain high even though the concentration of the antibody molecules themselves is reduced to the vanishing point by the diluting process.

Where do these antibody microvita go in the homeopathic solution? Probably they go into the nuclei of the solvent molecules such as water molecules or alcohol molecules, since microvita are active in the nucleus of a structure. The antibody microvita cannot create new antibodies in the water, as the water lacks the necessary chemical building blocks for the antibodies. But in the nuclei of the water molecules, the antibody microvita will affect the vital energy of the water molecules and thus alter the structure of the water molecules in some way. So the reported change in nuclear magnetic resonance spectra of homeopathic dilutions may indicate the change in the nuclear structure of the solvent molecules as a result of the action of microvita from the original dissolved chemical, which is itself now no longer present in the solution. Further research along these lines with different homeopathic dilutions of different substances may add further support to this microvita hypothesis.

According to this reasoning, the "memory" of water for antibodies originally dissolved in it, resides in the atomic nuclei of the water molecules themselves, carried by antibody microvita. But this does not in itself explain how this water can then produce the observed chemical effects on the white blood cells. In the "water memory" experiments, the homeopathic dilution of antibodies of the immunoglobulin variety produced the same effect on certain white blood cells as the original antibodies, although the original antibodies were supposedly no longer present in the homeopathic dilution.

Could the antibody microvita actually create new antibody copies in the presence of suitable chemical components? The most straightforward interpretation of the experimental result (assuming that there was no contamination from the original antibodies) is that this is actually what happened. According to this hypothesis, antibody microvita in the homeopathic dilution, when added to the white blood cells, created new copies of the original antibodies from amino acid molecules and other chemicals near the white blood cells. Those newly created antibodies, identical to the original ones, then acted on the cells to produce the observed effect.

Interestingly, during an Israeli duplication of the phenomenon in 1987, when researchers examined one set of experimental test tubes of white blood cells that tested positive for the action of the "highly diluted" solution, immunoglobulins (the specific type of antibody used in the experiment) were found in the test tubes, as well as other proteins apparently identical with materials from the original undiluted antibody test tube (Nature, Vol. 334, 28 July 1988, p. 290). These results were considered to be proof of contamination of those white blood cell tubes by the original antibody solution during this particular test trial, and one of the participants in the experiment withdrew as a putative coauthor of the experimental report.

So a test of the hypothesis that new antibodies copies will always be found when white blood cells give a positive response to a homeopathic dilution of antibodies, could be carried out. If antibodies are always found and no contamination of the cells by the original antibodies can be proved, this would provide strong support for our homeopathic microvita hypothesis.

Another approach to testing this microvita hypothesis would be to add homeopathic dilutions of different substances to chemical reactions to see if the reaction rates or results change systematically. If systematic changes are found, this would also be strong evidence for the microvita hypothesis. Sarkar explained that unexplained differences in the results of certain chemical reactions are due to the action of microvita.

Other tests for physical or biological effects of homeopathic dilutions could also be devised, such as testing the effectiveness of homeopathic dilutions of certain chemicals as fertilizers. Observation of effectiveness of the homeopathic dilutions would give added support to the microvita hypothesis.

Microvita and Homeopathy

The method for preparing the highly diluted anti body-free solutions in the "water memory" experiment is essentially the same as that used for preparing the medical remedies in the practice of homeopathy. So the experimental results in the "water memory" experiments also give some support to this medical practice, whose validity has long been dogmatically rejected by allopathic medical practitioners because no materialistic theory

explains how homeopathy works. Homeopathic doctors explain that some subtle quality of the homeopathic dilutions acts on the vital energy of a person in order to produce a cure. But orthodox Western science does not acknowledge the existence of vital energy. The theory of microvita therefore could not only explain the "water memory" experimental results, but provide scientific evidence for the existence of vital energy and lead to an explanation of how homeopathy works as well.

The altered nuclear spin of diseased tissues mentioned above may be due to the presence of negative microvita in the nuclei of the atoms of the diseased tissues. Negative microvita would disturb the ability of positive microvita in the atomic nuclei of the tissues to help direct vital energy that structures the tissues in a healthy way. We must remember that positive microvita, according to Sarkar, have the capacity to bring vitality to carbon atoms, and to transform them into "gigantic structures like human beings". So positive microvita in atomic nuclei will help structure tissues and organs as well as complete organisms.

The effect of homeopathic medicines may be to provide microvita that are attracted to the negative microvita lodged in certain areas of the body due to similarity of vibration. Homeopathic medicines are often made from minute quantities of poisonous substances and create the same symptoms in healthy persons as the symptoms they are used for treating in diseased persons. According to Sarkar, "Microvita inimical by nature may become your friends if controlled by good people. Though poison is fatal for humans, it is also a life-saving drug. Even snake venom is recognized by all as a medicine." Microvita from the medicine then fight the negative microvita in these areas of the body. Because of the greater strength of the homeopathic microvita, they can displace or defeat the negative microvita in the body and then help mobilize the body's vital energy to restructure the tissues in a healthy way. Certain homeopathic medicines are applied directly to injured tissues as well as taken internally. The effect of homeopathic medicines on the altered nuclear spin of diseased tissue can be studied with nuclear magnetic resonance imaging as another means of developing the theory of microvita.

Chapter 7. Microvita, Energy and the New Cosmology

Microvita are subtle living entities recently described by P. R. Sarkar. They exist on the physical, psychic and psycho-spiritual levels of existence. In this chapter we will examine a few of the relationships among microvita, the five fundamental physical factors, the elementary particles of physics and the evolution of the universe. Hopefully, a clearer understanding of the cosmic role of microvita will emerge. In this way we can move a step closer towards the theory of microvita and a more comprehensive and holistic science integrating the physical sciences and the life sciences.

The Five Fundamental Physical Factors

According to P. R. Sarkar, the five fundamental physical factors are the etheric, aerial, luminous, liquid and solid factors. They are created in this order during the evolutionary crudification of the objective portion of Cosmic Mind, under the crudifying force of the static cosmic creative principle. (The other two cosmic creative principles are the sentient principle and the mutative principle.)

There have been a few attempts to understand more deeply the physical nature of these fundamental physical factors, notably as described in *Eternal Dance of Macrocosm* by Michael Bhaktaviirya Towsey. Here I wish to propose to extend that analysis in a way that I think is compatible with our current understanding about microvita.

Elementary Particles and The Five Fundamental Physical Factors

Since both modern physics and the cosmic cycle of creation purport to describe the same physical reality, there must be a link or correspondence between them. The approach in "Eternal Dance of Macrocosm" is to attempt to associate various elementary particles and quantum fields in physics with the five fundamental physical factors. For example, quarks (which make up protons, neutrons and other heavy particles) are associated with solid factor and electrons with liquid factor.

According to Sarkar, the microvita is the minutest and singular particle, more like energy in its nature. They compose other elementary particles. For example, he declared that millions of microvita make up a single electron, and billions make up an atom. If an electron is a structure created by millions of microvita, it is unlikely that the electron is a particle of a quantum field representing, for example, only liquid factor. Rather the electron would itself be a structure composed of five fundamental factors with a nucleus composed of millions of microvita. The microvita nucleus of an electron would organize aerial factor or energy to create the electron's structure. All other elementary particles would also be structures created by microvita from the five fundamental factors in varying proportions. So electrons, protons, quarks, mesons, gluons, neutrinos etc. would be various structures

formed ultimately by microvita. Each structure would be alive, having its own vital energy maintaining its structure and its own unit mind composed of ectoplasm. But for elementary particles the mind would be dormant and there would be no endoplasmic coverage of the mind, as the unit minds would be so undeveloped.

This being said, it still may be that in certain heavy nuclear particles such as the quark, the solid factor predominates in the structure while all four other factors are present in a quark in lesser amounts. In the electron, liquid factor could predominate, etc. In this view the elementary particle and fundamental factor analysis of "Eternal Dance of Macrocosm" is on the right track. Here we propose to modify that suggested correspondence in the light of microvita (which were not known about when the correspondence between elementary particles and fundamental factors was first developed).

Solid Factor

According to the microvita analysis, quarks (as well as protons, neutrons and other heavy nuclear particles composed of quarks) would be composed of all five fundamental factors, with solid factor predominant. Solid factor, according to Sarkar, transmits the vibrations of smell, along with the four subtler sensations of taste, sight, touch, and sound. Somehow, in a way not presently understood, solid factor gives rise to sensations of smell. Since the elementary particles composed mostly of solid factor are relatively heavy, they usually travel at much less than the speed of light.

Liquid Factor

Similarly, electrons and other lightweight particles or leptons are made predominantly of liquid factor, but also include four other fundamental factors. According to Sarkar, the vibrations giving rise to the sense of taste are transmitted by liquid factor, as well as the vibrations for sight, touch and sound. Taste results from a chemical reaction in the tongue. Chemical reactions are caused mainly by changes in the electrons when two chemical materials, such as the tongue and the substance tasted, come into contact. Electrons, like a liquid, can flow in certain materials, depending on the chemical and physical properties of the material. Electrons can also, according to nuclear physics, penetrate into the nucleus of an atom. (According to Sarkar, subtler waves can penetrate through cruder waves, but not vice versa, and liquid factor is subtler than solid factor.) Electrons, being much less heavy than protons, usually travel at faster speeds than protons, and can more easily reach speeds near, but always less than, the speed of light.

Luminous Factor

Photons would be composed mainly of luminous factor and less of the other four fundamental factors. Photons would also be structures formed by microvita. Photons make up light waves and all other electromagnetic

radiation. In a vacuum, photons always travel at the speed of light. Their wavelength decreases as their energy and frequency increase. Luminous factor transmit vibrations that correspond to the sense of sight in addition to sound and touch. Photons are more subtle than protons and electrons, and are created at high energy when a proton or electron is annihilated by its corresponding anti-particle, i.e. an anti-proton or an anti-electron (positron) in accordance with Einstein's equation, $E=mc^2$. "E" is the energy produced, "c" is the speed of light and "m" is the amount of mass that is converted into the energy of the photon. So mass is just "bottled-up" energy, according to this well-known formula.

Aerial Factor

According to Sarkar, prana, or energy, consists of aerial factor. When 10 different expressions of energy are coordinated in a physical structure through a nucleus and their resultant force is interial (towards the nucleus of the structure), then those 10 energies are called Prana or vital energy and life is said to exist in the structure (and mind is also created here). Those ten vital energies are also collectively known as the pranendriya (the "organ" of Prana). The impressions of hot and cold, rough and smooth, melodious or harsh are sensed through the touch or contact between the pranendriya and a object having that particular quality.

Energy as a "substance" is not well-defined in physics, although physics is the fundamental study of matter and energy and their interactions in space and time. Energy is said to be expressed in different forms, such as mass, light, and electrical and nuclear energy. There is a law of conservation of energy as one expression of energy is transformed into another. But as to what exactly energy is, physics remains silent.

According to Sarkar, energy or prana is a fundamental physical factor more subtle than luminous, liquid or solid factor, i.e. energy is aerial factor. But if one of the five fundamental factors is predominant in the photon, electron and proton, it is legitimate to ask if there is an elementary particle in which prana or energy is dominant. Let us assume there is and call that fundamental aerial particle, if it exists, the aerion for now, and try to determine what some of its properties might be. The aerion is different from and more subtle than all known fundamental particles, because it consists of mainly of aerial factor, while all the known particles, I suggest, consist predominantly of luminous, liquid or solid factor. The aerion is the particle from which all the "cruder" particles of such as photons, electrons, protons etc., are derived in the process of the extroversial phase of cosmic evolution before the creation of life. We will come back to this mysterious aerion in a moment.

Etheric Factor

According to Sarkar, the etheric factor is the subtlest form of matter. It is the subtlest medium through which sound can pass. Here, sound means the subtlest physical vibration, not the vibration of air molecules which is commonly connected with sound. According to modern physics, photons, electrons, protons etc. and their antiparticles can be produced directly from a vacuum state, according to the quantum field theory. So following our above analysis, the vacuum state would be composed mainly of etheric factor. Even the vacuum state could not exist as a structure, according to our analysis, until the creation of all five fundamental physical factors, which would then be structured by microvita to form the vacuum, with etheric factor predominant.

So the vacuum or space is a very subtle physical structure, created by the action of microvita acting at its nucleus. The vacuum state has in it, according to physicists, enough latent energy to create the entire universe. According to physics, undetectable "virtual" particles such as electrons and positrons are continually emerging from and disappearing back into the vacuum state without being detected, unless there is enough electromagnetic energy or another form of energy available to convert the particles from "virtual" to real, i.e. allow them to be detected by physical experiments. The structure of space-time itself is closely tied to the vacuum state, according to Einstein's theory of General Relativity. Condensed portions of the space-time field are what we call matter. The etheron, a particle mentioned by Sarkar, may be particle composed predominantly of etheric factor, but nothing is known about the etheron from a physics point of view.

Microvita and Aerions

Let us return to the aerion, the fundamental particle suggested above that is composed mainly of aerial factor or prana. The structure of aerions would be created by microvita at their nucleus, controlling the vital energy or Prana of the aerion. Two levels below aerial factor is liquid factor which chiefly composes electrons. And two levels above aerial factor is Citta or ectoplasm (composed of cittanu or "atoms of citta"), the "stuff" composing the objective level of the unit mind and the Cosmic Mind. So the aerion, in this sense, is situated just between the electron and ectoplasm. But according to Sarkar, "so far as physicality is concerned, the position of these microvita is just between ectoplasm and electron. But they are neither ectoplasm nor electron." Sarkar has said that microvita are energy-like. So it is reasonable to conclude that the aerion, composed chiefly of aerial factor, is closely associated to the physical nature of microvita, at least those that inhabit physical space.

So physically, microvita are closely associated with aerions. Aerions are made mainly of aerial factor, which composes vital energy or Prana. So there must also be a close connection with microvita and Prana, the mediating energy that maintains the parallelism between the mind and the body of a living biological structure.

Physical Properties of Aerions

What are the physical properties of aerions? Since aerions have not yet been discovered by science it must be due to some elusive properties they possess. As we go from proton to electron to photon, the speed generally increases and the particle becomes more subtle. So we would expect that the speed of the aerion to be greater than the speed of light (the known material particles have not been observed going faster than light). Microvita, even while associated with aerions, could still travel faster than the speed of light. Sarkar has indicated that microvita can travel faster than light. How else were negative microvita attracted from other stars after World War I to start a major epidemic, as Sarkar said, unless they traveled faster than light?

Physicists have speculated about the existence of particles that travel only at speeds greater than light, and have named them tachyons. There is no known physical law that prevents their existence, as long as they don't reach or cross over the light barrier to move at a speed equal to or less than the speed of light. It is only the known elementary particles, which have a certain "rest mass", that are not allowed to attain or exceed the speed of light, according to the theory of relativity. But so far, no tachyons have been detected experimentally.

Electrons and protons, etc. have electric charge, but no particles with magnetic charge (magnetic monopoles) have ever been observed. William Tiller, an American researcher in materials science, suggests (in his forward to *The Science of Homeopathy* by George Vithoulkas) that vital energy is more magnetic in nature and travels faster than light, while ordinary cruder matter is more electrical in nature and travels slower than light. It is therefore reasonable to suggest that aerions have magnetic charge but no electric charge. This would make them symmetric to particles on the other side of the speed of light which have electric charge but no magnetic charge. A vibrating magnetically charged aerion would give rise to electromagnetic waves traveling at the speed of light, just as vibrating electric charges do.

What is the mass of an aerion? Here we have to make some reasonable assumptions about the relationship of aerions to light. Let us assume that aerions have anti-particles called anti-aerions, and that when an aerion and its corresponding anti-aerion annihilate each other (similar to the annihilation of an electron with a positron) then two photons are created carrying the energy of the aerion and anti-aerion. The mass to energy

relationship would also be $E=mc^2$ as in other mass to energy conversions. What wavelength of electromagnetic radiation would be produced by the aerion-anti-aerion annihilation? It is reasonable to assume that the radiation produced may be visible light. Kirlian photographs of biological structures show patterns of visible light around the structures. This light could result from the conversion of a portion of Prana of the structure into electromagnetic radiation which is photographed as visible light.

So we assume that visible light may be produced when aerions are converted to photons (electromagnetic energy) from aerions, perhaps by annihilation of aerion-anti-aerion pairs. Let us take the example of blue light. Blue light has a wavelength of about 4000 Angstrom units or 400 billionths (thousand millionths) of a meter. To get two photons of this wavelength would require the annihilation (according to $E=mc^2$) of two particles each of mass about 5×10^{-33} grams. This is about 5 millionths of the mass of an electron, i.e. one electron has the mass of about 200,000 aerions. The mass of a carbon atom is about 20,000 times the mass of one electron. This means that the mass of one carbon atom is about 4 billion times the mass of one aerion.

Sarkar said that millions of microvita make up one electron. Since around 200,000 aerions make up the mass of one electron, we can estimate that something between 5 to 5000 microvita are necessary to create one aerion from the five fundamental factors, with aerial factor contributing the most. The mass corresponding to a single microvita could be somewhere between a millionth and a billionth of an electron mass (since millions of microvita make up one electron.)

So we conclude that aerial factor (energy or prana) is the predominant physical factor in aerions--subtle material quantum particles that may have a mass of about 5×10^{-33} grams (about 5 millionths of the mass of an electron), travel only at greater than the speed of light, may have magnetic charge (as magnetic monopoles) but no electric charge, and may annihilate in pairs to produce visible light (photons). This combination of properties of aerions would make them very difficult (though not impossible) to detect in a physical experiment, which is perhaps why they have not been detected until now.

Dark Matter and Aerions

As described in "Eternal Dance of Macrocosm", astronomers think that only about 1% of the mass in the universe is directly accounted for by known particles, while 99% is present but not visible. They conclude this because the rotational speed of certain spiral galaxies requires the gravitational attraction of about 100 times the observed mass in these galaxies. Also, the observable mass in the universe is apparently only 1% of the mass required to keep the universe from expanding forever, leading to a thermal death of

the universe. So astronomers have postulated the existence of "dark matter" to fill the gap and are trying to determine what elementary particle composes this dark matter, which does not give off observable light.

According to our analysis, this "dark matter" would be made up of aerions. Scientists do not think that the neutrino, a particle that travels at or very near the speed of light, is the particle responsible for dark matter. They are looking for a particle with more mass and slower speed. Our analysis suggests that they should be looking for aerions instead. We have suggested that aerions may have a magnetic charge (which may be positive or negative). But some may be also without magnetic charge, and so unable to annihilate easily with one another to give electro magnetic radiation in the form of visible light. These non-magnetically charged aerions may also compose part of the dark matter in the universe.

Aerions and the Cosmological Constant

There is a crisis in the world of fundamental physical theories today, as described in a recent issue of Scientific American magazine (May 1988). "The Mystery of the Cosmological Constant", by Larry Abbott, describes this crisis and indicates that its resolution could revolutionize fundamental physical theories. The aerion may be a key to the solution of the crisis.

The standard model of quantum field theory is extremely good in many ways. The theory predicts the existence and behavior of all the known physical particles in a general way. But there are many parameters in the theory that have to be determined by experiment, such as the mass of a predicted particle. A better theory is still needed that has more constraints in the relationships between the particles and fewer free parameters. The present theory however fails spectacularly at predicting the energy density of a vacuum. The theory gives a value that is about 10^{46} power too big! It is this failure of the theory which according to Abbott indicates that new understanding is needed. The new ideas that would correct this defect in the theory would probably revolutionize current physics in a similar way as Einstein's theory of relativity revolutionized physics early in this century. That theory followed Michelson and Morely's failure to measure a velocity of the Earth relative to the "ether", a hypothesized material substance, according to 19th century ideas, that supposedly filled all space.

The problem of the cosmological constant arises from the difference between the theoretically calculated and the experimentally measured value of the of the "vacuum energy density" which is proportional to this constant. The vacuum energy density includes the contribution of the vacuum itself plus the mass due to particle fluctuations in a vacuum, caused by elementary particles emerging as "virtual particles" from the vacuum and then disappearing before they can be detected. Since the existence of virtual particles violates the principle of conservation of energy, they are only

permitted to exist for a short time defined by the Heisenberg Uncertainty Principle.

The Uncertainty Principle allows less massive virtual particles to exist for a longer time than more massive ones before vanishing. The contribution of these fluctuations raises the value of the average energy density of the vacuum to a value much greater than the observed experimental value, which is not detectably different from zero. The cosmological constant is a measure of a particular type of distortion of space (different from the type of distortion of space produced by massive objects) in the observed physical universe. But no such distortion has been observed by astronomers looking out to a distance of 10^{23} kilometers in space (as far as telescopes can presently see in the universe.) The calculated theoretical value of the cosmological constant would produce such distortions of space at a distance of about one kilometer.

Our suggested resolution of the problem follows. The known physical particles do not actually emerge directly out of the vacuum state as virtual particles, and so there is no contribution of such fluctuations to the energy density of the vacuum? The only particle, or class of particles, that can emerge as a virtual particle from the vacuum state is the aerion. All the other virtual particle fluctuations are produced by particles coming from aerions. And aerions, particles with mass that travel at speeds much greater than the speed of light, can appear with vanishingly small energy and mass from the vacuum (above the speed of light, mass and energy of a particle decrease as its speed increases). Aerions with vanishingly small masses and energies (much less than the earlier calculated estimate of about 5 millionths of an electron mass) could emerge from the vacuum with lifetimes long enough to cross the entire universe many times without violating the existence time restriction imposed by the Heisenberg Uncertainty Principle. So the appearance of new aerions from the vacuum would also give a negligible contribution to the calculation of the energy density of the vacuum. Once in physical space, the new aerions could gain energy (and slow down), thus becoming detectable and no longer virtual, by interacting with more energetic aerions and other sources of energy already present in space.

When other particles apparently emerge from the vacuum as virtual particles, they are actually being transformed from nearly energyless virtual aerions into virtual photons, for example, or from virtual aerions to virtual photons to virtual electrons etc., following a hierarchical order of creation of elementary particles (see below). This appearance of other virtual particles from aerions will not occur uniformly throughout space, but mainly where aerions are concentrated. Aerions will be concentrated within and near massive bodies in space such as stars and galaxies, because of gravitational or other attraction to those massive bodies. Far away from massive bodies,

where there are relatively very few aerions, the appearance of virtual massive or energetic particles apparently from a vacuum would be negligible compared to what is detected in laboratories, which are in a part of space (near a star--the sun) where there is a high aerion concentration which would permit greater virtual particle creation. These virtual particle fluctuations of more energetic or massive particles would then only add a little extra mass to stars and galaxies, and not to the vacuum energy density itself, which would remain zero, as experimentally measured.

Why can only aerions emerge from the vacuum state? It is because there is a hierarchical order in the creation of elementary particles that determines which particles can be created from which others. The vacuum state is composed mainly of etheric factor. Its particle is the etheron. Only aerial factor can be created from etheric factor, according to this hierarchical pattern, described by P. R. Sarkar. The aerion is the only particle mainly of aerial factor, so aerions would be the first particles created from etherons. Aerions can then in turn give rise to photons (predominantly luminous factor). Photons can give rise to electrons (mainly liquid factor). Electrons can give rise to quarks (mainly solid factor) which compose protons, neutrons and other heavy particles.

The idea of hierarchical creation of elementary particles is not a new one in particle physics. One recent proposal, called the Grand Unification Theory (GUT), proposes that neutrinos, electrons and quarks are different metamorphoses of the same particle, a hypothetical vacuum state particle. Scientists are not sure if a neutrino has a "rest mass" or not as it moves at or near to the speed of light. Its maximum estimated mass corresponds roughly to the mass calculated for the aerion above. It is possible that the neutrino is actually a slightly faster-than-light particle, the aerion. The hypothetical vacuum state particle could be the etheron. It would probably not be difficult to combine the Grand Unification Theory with the proposal for the aerion along with the hierarchical creation sequence of fundamental factors proposed by Sarkar. In this way the remarkable achievements of the standard model for quantum field theory would be saved, while fewer unspecified variables would remain due to the constraints imposed by the hierarchical order of particle creation and transformation (particles are not allowed to skip a level when transforming from one level to another, but must pass through transformations into particles of intermediate levels.)

Including a hierarchical creation structure and the aerion--a very-low-mass, magnetically charged, faster than light particle--into quantum field theory would almost certainly solve the mystery of the cosmological constant, as well as introduce a whole new area of experimental and theoretical research into physics (the physics of aerial factor). It would also make quantum field theory more compatible with ideas such as prana, vital energy and microvita that come from the yogic tradition and have their own subjective as well as

objective validities and practical consequences. The revolution in physical understanding likely to be produced by this new synthesis of Western and Eastern thought, should be both fundamental and wide-ranging.

Aerions and The Evolution of the Universe

The presently accepted theory of the origin of the universe is that it was created by a huge explosion from a point some 10 to 20 billion years ago. That primordial explosion is called the Big Bang. An alternative theory is that the universe exists in a Steady State, with new matter created between stars as the universe expands indefinitely. Sarkar's view is that huge explosions that evolve matter from Cosmic Mind in one portion of the universe are going on simultaneously with the evolution of life and mind back to Cosmic Mind in other portions of the universe, so that the universe as a whole never ceases to exist. So neither the Big Bang nor the Steady State theory is completely correct. Rather, the universe is punctuated by explosions of matter, life and mind throughout, without end. But for now, we will use the present Big Bang terminology in our descriptions of cosmological evolution.

The addition of aerions to the elementary particles present in the extremely hot material produced immediately following the Big Bang, introduces a new dimension to the evolution of the universe--the dimension of life. According to our theory, all five fundamental physical factors are evolved from Cosmic Mind at the time of the Big Bang. Then microvita are emanated from Cosmic Mind in order to give structure and shape to these newly evolved physical factors. First a vacuum state is structured by microvita. Then aerions, photons, electrons, quarks and other elementary particles form in a hierarchical order from the action of other microvita on the five fundamental factors. According to present cosmological theory, the existence of individual particles is initially unstable because of the extreme temperature and pressure. These particles gradually become stabilized as the soup of hot matter created in the explosion expands and cools. Protons and neutrons first separate out in a stable way. Then come electrons after one second. Helium nuclei (structures composed of two protons and two neutrons) form after four minutes. Complete atoms are formed after about 700,000 years. Stars begin to condense many millions of years later.

Microvita and aerions would have facilitated the creation of stable physical structures, from elementary particles to gigantic superclusters of galaxies of the newly created cosmic matter. Microvita emanated by the Cosmic Mind would direct aerions to mold the newly created matter into galactic superclusters made up of billions of galaxies each with billions of stars. The vital energy of all these cosmic structures, from atoms to galaxies, would be controlled by the Cosmic Mind, within which the primordial physical structure was created by a crudification of a portion of the thought waves of the Cosmic Mind. In this way a living cosmic body would be created from all the

newly created five fundamental factors in the universe. It is a small portion of that living cosmic body that we observe when we look at the stars at night.

One theory of galaxy formation, called the "cold-dark-matter" theory of galaxy formation, has recently been challenged by the discovery of an ancient and distant galaxy, number 0902+34, which apparently formed within a billion years of the Big Bang. This is about three or four billion years earlier than the galaxy formation time predicted by the "cold-dark-matter" theory, which explains galaxy formation as due to gravitational attraction alone acting on primordial matter, and requires four to five billion years. (See World Prout Express, 1 May 1988). If, according to the implications of this discovery of an ancient galaxy, gravity may not be a sufficient force to evolve a galaxy (even one consisting of 90% or so dark matter--aerions in our theory) then some force stronger than gravity might have been responsible for this more rapid galactic evolution. The cosmic vital energy, with an internal force created by the dark matter aerions, could have acted on the pre-galaxy matter to form the newly discovered galaxy more quickly (in one billion years) than gravity could do acting alone (four to five billion years). So already it may be necessary to explain rapid galactic evolution as due to the force of cosmic vital energy on primordial matter in the universe.

At each level of cosmic evolution the physical structures would be shaped and maintained by the cosmic vital energy of the living cosmic body, controlled by microvita at the nuclei of the various structures. A dead or dying star could explode into its constituent fundamental factors in a process Sarkar calls Jadasphota, making its materials available for other stellar evolution. The cosmic vital energy, under the direction of the Cosmic Mind through the media of microvita, would guide the evolution of the cosmic body to finally form stars with individual planets where the chemical pre-conditions for protoplasmic life could develop. At this point the Cosmic Mind would emanate microvita to create proteins, RNA, DNA and other chemicals necessary for the creation of protoplasmic life, and perhaps primordial RNA and DNA-containing viruses as well. The emanation of further microvita from Cosmic Mind would cause these structures to evolve into protoplasmic structures and then into more complex multicellular structures and finally up to the level of human beings.

Aerions and Vital Energy in Protoplasmic Organisms

How can particles surrounding galaxies on a cosmic scale and moving faster than light also be responsible for composing the vital energy of a living protoplasmic organism, which gives rise to a subtle sense of touch (in the way that the Pranendriya--the "organ of Prana"--responds to hot and cold, rough and smooth, melodious and harsh, etc.?) How will aerions even remain in an organisms physical structure while traveling at such speeds?

The solution may be that microvita direct positive and negative magnetically charged aerions to form stable physical structures, like subtle atomic structures, within which they revolve at faster-than-light speeds, creating very high frequencies of vibration within these subtle aerial structures. (A relativistic quantum-mechanical description of aerial atoms composed of magnetically charged aerions traveling faster than the speed of light could be developed to see what specific frequencies of electromagnetic radiation such aerial atoms could emit. If the aerions have a magnetic charge (as discussed previously), then their quantum jumps from one energy level to another within the aerial atoms would give rise to electromagnetic vibrations, just as is the case with ordinary atoms. One could then look for radiation at those frequencies experimentally as evidence to support the existence of such aerial atoms.)

All of the aerial atoms in an organism would be coordinated collectively through a controlling nucleus in the structure for aerial factor, which in humans would be the aerial plexus (in Sarkar's recent terminology) or the fourth, or anahata, chakra, in the more traditional terminology of yoga.

Guided by the mind, the vital energy maintains an association between the physical body, consisting of five fundamental physical factors, and the unit mind. When that vital energy is severely disturbed, the psycho-physical parallelism between the mind and the physical body is lost and death occurs. Nine of the ten vital energies leave the body at death and return to free space, while the tenth, Dhananjaya, remains with the physical body until it is cremated or completely decomposes. The unit mind, freed from its association with the physical body, is then directed by cosmic forces to a new physical structure where life can again develop.

Since the Prana or vital energy moves throughout the body, and particularly to the different chakras (psycho-physical plexuses located in the brain and spinal column) it is reasonable that these Prana will distribute microvita throughout the body and from one chakra to another. Sarkar speaks about the movement of positive and negative microvita from one chakra to another. The Ida, Pingala and Shushumna are three such channels along the spinal cord for subtle energy flows, and there are many lesser ones in the body, through which positive and negative microvita could flow, carried by the aerial atoms. Sarkar says that different microvita can travel through the inferential waves of different media, or several media at once. They are not restricted to aerial factor.

Conclusion

The creation of a unified scientific theory of cosmology and biology would be greatly advanced by the discovery of microvita and aerions, elementary particles of composed mainly of aerial factor, the fourth fundamental material factor. This particle is proposed to be a subtle type of elementary

quantum particle with a minute but variable mass (depending on its speed) and a magnetic charge (of +1 or -1, or zero), but without electric charge, that moves only at speeds greater than the speed of light and that may annihilate with its corresponding anti-particle to give visible light. The particle combines the properties of the tachyon and the magnetic monopole, predicted physical particles whose discovery has eluded physicists up until now. The relationship between microvita and the physical factors would also be further clarified if the existence of the aerion could be demonstrated experimentally. This would be another step in the development of the theory of microvita and its application for the all-round welfare of society.

References

Larry Abbott, *The Mystery of the Cosmological Constant*, in *Scientific American* magazine, May 1988.

P. R. Sarkar, *Microvitum in a Nutshell*, revised edition Oct. 1987, Ananda Marga Pracaraka Samgha, Tiljala, Calcutta-39, India.

P. R. Sarkar, *Idea and Ideology*, sixth edition May 1984, Ananda Marga Pracaraka Samgha, Tiljala, Calcutta-39, India.

Michael Bhaktaviirya Towsey, *Eternal Dance of Macrocosm*, 1986, P. O Box 177, Maleny, Queensland, Australia 4552.

George Vithoukas, *The Science of Homeopathy*, with Forward by William A. Tiller, Grove Press, Inc., New York, 1980.

The Microvita Revolution, published by Microvitum Sub-Committee, January 1988, Ananda Marga Pracaraka Samgha, Tiljala, Calcutta-39, India

World PROUT Express, Platanvej 30, 1810 Frederiksberg C, Copenhagen, Denmark, 1981.

Chapter 8. The Origin of Protoplasmic Life

The questions, "How did protoplasmic life begin?", "How did different living species originate?" and "How do living organisms grow and develop?" are three of the most fundamental questions in biology today. A successful theory of the nature of life should answer these three questions in a way that brings a new underlying unity and harmony to the field of biology and sheds new light on the whole process of the creation, evolution and development of life. We will start by seeing how the theory of microvita could apply to the origin of life. Next we will take up the question of the origin of species. Then we will take up the question about growth and development. We will see that the theory of microvita predicts that microvita play a crucial role in all of these processes. The theory of microvita poses a fundamental challenge to the currently accepted materialistic theory of evolution and development, the neo-Darwinian theory of evolution by random mutation and natural selection.

Materialist Views of the Origin of Life

Materialism takes the view that matter is primary in existence. There are two main materialist approaches to the origin of life. One view is called the Cartesian view after Rene Descartes, the 17th century French philosopher. Though Descartes was not a materialist, his views of the nature of life led to this first materialist approach. In this view an organism is a machine consisting of the sum of its physical parts and their physical relationships. Human beings have a soul that interacts with this body-machine, while animals do not. Life then consists of the proper mechanical working of the biological machine, such as a cell or organism. In this view, the concept "living" could apply to any sufficiently complex machine, such as a computer. No concept such as vital force is recognized in this view. The question "How did life originate?" becomes, in the Cartesian framework, "How did the chemical machine parts develop and become assembled to create the first living organism?"

The second materialist approach to the origin of life developed from the philosophy of dialectical materialism in the latter part of the 19th and early 20th century. In this view, matter itself has many potentialities, and the higher potentialities of matter develop in a natural way after the lower potentialities are expressed. So the origin of life in this view is a gradual unfolding of higher potentialities of matter and its organization. There is no exact dividing line between living and non-living matter in this evolutionary process of matter. The Russian biologist A. I. Oparin, who did much research in this century on the evolution of life during the Earth's early history, was a strong advocate of this view. This historical and evolutionary view of the origin of life has had much influence on current scientific thinking and research on the subject.

Oparin contrasted this more organic view of the origin of life with the previously described mechanical view of life, which he said overemphasized the mechanical and hierarchical relationships at the expense of the organic and holistic nature of material living systems. (See his *Origin of Life on Earth*.) In Oparin's view, life is an emergent property of matter, not fully explainable from knowledge of the physical laws of the component parts. In the mechanical view, life is explained in a reductionist way, as due to the combined interaction of component parts. In this view, no new physical laws are necessary for describing living organisms as compared to non-living matter.

The Idealist View of the Origin of Life

In this view, life is seen as an emerging expression of a transcendental idea through matter. Here idea is primary and matter is secondary. Plato represented this view when he spoke of physical forms being imperfect representations of an ideal form. Hegel took the view that ideas structure reality (the fundamental tenet of idealism). His thinking was directed more to the nature of society and individuality than to the origin of life. But his dialectical approach contributed to the evolution of Marx's dialectical materialism, on which Oparin's approach to the origin of life is based.

Vitalism

According to this view, living things contain something non-material that is fundamentally different from physical matter. Living things were said to contain some vital quality, essence or non-physical "spirit" which nonliving matter does not possess. Henri Bergson called it *elan vital*. Matter comes alive only when this vital substance or spirit enters it. Materialists didn't feel a need to invoke such an external agent of life--to them life was inherent in matter itself. The Greeks Democritus and Epicurius took this view. But no one was ever able to experimentally prove the existence of this vitalizing essence or substance in a manner satisfactory to regular materialistic science. This idea is currently rejected by the current materialistic scientific worldview.

The Idea of Spontaneous Generation of Life

From ancient times until the last century, it was universally believed that some forms of developed life, such as frogs, mice, snakes and flies, arose spontaneously from inanimate matter such as decaying wood, rotting meat, old clothes, sun-warmed mud and similar materials. The ancient Egyptians, for example, believed that frogs, snakes, toads and mice were generated by the sun's rays acting on the layer of silt left behind after the flooding of the Nile River. Some scientists even carried out experiments "proving" that the idea of spontaneous generation of life is correct.

It was not until the 17th to 18th centuries, when the Italian naturalists Redi and Vallisneri performed experiments that showed, for example, that

maggots do not appear on meat if flies are prevented from laying their eggs there, that learned individuals began to look for other theories to explain life and its origins. In the middle of the 1800s Louis Pasteur finally disproved the prevailing idea of spontaneous generation of developed life forms. He carried out a series of careful experiments that showed that living creatures did not develop spontaneously in a completely sterile environment. He showed that decay and rotting were themselves processes caused by the action of microorganisms, i.e. microscopic living creatures. It seemed that "life always comes from life" was the rule.

But while Pasteur's results seemed to disprove the idea of spontaneous generation of flies, maggots, etc. from non-living matter, the question remained as to how living things first did come into existence. With developing ideas about evolution of species, perhaps from a common ancestor, the question as to the origin of that common ancestor, i.e. the first protoplasmic life form, took on a greater urgency. If all present species have evolved from earlier ancestral species, what was the original ancestral life form, and how did that life form come into existence? Darwin suggested that a single act of divine creation of a single living cell was more plausible than many separate acts of creation. After that single act, then he thought that his evolutionary theory of variation and natural selection could account for most of the further evolution of life.

Little progress was made in solving the question of the origin of life until the 20th century. Then early in the century the Russian biologist Oparin, following the dialectical materialism line of thought of Engels and Lenin, supported the idea that life arose as an emergent property of matter. Matter, through a dialectical process of transformation, would change quantitatively and qualitatively until a stage would come where one could say that life had finally emerged. But there would be no abrupt dividing line, with non-living matter on one side of the evolutionary path, and living matter on the other. Oparin rejected the idea that some molecules were more important than others in living organisms. Rather, life should be seen organically, as a complex, wholistic emergent property of matter.

Oparin rejected the more mechanistic notion that life resulted from a mechanical interplay of particular molecules carrying out their functions like machines. Oparin proposed a series of stages of the evolution of matter in the Earth's early history, such as the evolution of the Earth's early atmosphere and other preconditions for the emergence of life, the formation of simple organic molecules, the formation of complex organic molecules, the formation of simple reproducing structures, etc. He proposed that each of these stages should be investigated scientifically to build up a more complete picture of the evolution of life from matter.

When greater understanding of the role of proteins and later DNA and RNA developed in the 1940s, 50s, and 60s, it began to seem that life processes

could be explained in a rather mechanical way. DNA carried a genetic code for the amino acid molecules that were built into protein molecules in a process that could be easily compared to the operation of a factory. DNA, presumed to contain the inherited genetic "blueprint" for developing an organism, stood at the top of the hierarchy of the molecular factory producing the molecules necessary for the life processes of a cell or an organism. The question "How did life begin?" became "How did DNA (or RNA) evolve?" and this is where it has remained.

One promising result developed from Oparin's evolutionary approach. Stanley Miller in 1953, working in the Chicago laboratory of Harold Urey, applied an electric spark, simulating a lightning flash, to a mixture of gases of hydrogen, methane, ammonia and water vapor, thought to exist in the Earth's early atmosphere. He found that amino acids, two of which are the chemical building blocks of proteins, were formed. Certain bases, parts of the chemical building blocks of DNA and RNA, have also been formed in a similar way.

But it is still a big step from the formation of amino acids and bases to linking them up in long chains with other molecules in a specific order to form the functional proteins, DNA and RNA necessary for life processes as we know them. The probability of the right combination of amino acids for proteins and nucleotides (a nucleotide contains a base, a sugar and a phosphate molecule) for DNA and RNA coming together by chance and remaining long enough to form a stable, reproducing living structure with other molecules similarly formed by chance is vanishingly small.

According to one hypothesis, the creation of the proper combination of molecules to form a living cell was a "lucky accident", perhaps happening only once in the history of the universe. But once was all that was necessary. A second hypothesis is that simpler self-replicating structures first evolved with more imprecise molecular machinery than exists today. According to this hypothesis, these proto-organisms would have gradually evolved their molecular machinery into that which we observe in all cells today. But there is no experimental evidence that supports this hypothesis. Even the most "primitive" bacterial cells existing today use the same genetic code as in human cells, and so are quite advanced from a genetic point of view. So how the present molecular machinery for the construction of proteins, DNA and RNA, found in all cells today, came to exist and be packaged in functional organisms is still an unanswered question.

Nobel Laureate Manfred Eigen of the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany, has considered what features a primordial protein-nucleic acid interaction must have in order to (1) self-replicate, (2) evolve through variation and selection, and (3) metabolize, that is, maintain an energy flow to keep itself from disintegrating. A chemical interaction meeting his criteria would then be self-perpetuating and "autocatalytic", and

life would begin to branch out from this primordial living chemical system. But how those first molecules of such a living chemical organism came into existence remains a mystery.

Microvita and the Origin of DNA, RNA and Proteins

The question of whether the first functioning proteins and DNA or RNA molecules could come into existence as a result of chance processes is still debated. According to astrophysicist Fred Hoyle's calculations such a chance occurrence is much too improbable, while the current orthodox scientific opinion is that it is not too improbable.

Could living organisms have evolved from the action of viruses, microscopic biochemical molecular structures which now only reproduce in living cells? We know that retroviruses (consisting basically of two strands of RNA, an enzyme called reverse transcriptase, and a protein coat) have the ability to transform their RNA into DNA, using an enzyme they carry with them, and insert this DNA into the existing DNA in a cell's nucleus and then reproduce themselves at a later stage. Perhaps the DNA of organisms could have been built up in this way. But the present retroviruses require other molecules found now only in a cellular environment in order to reproduce. So even for nature to first evolve retroviruses or other viruses would not solve the problem, in the absence of other molecules necessary for reproduction of the viruses. Viruses might be a way to distribute DNA to organisms, but they do not solve the problem of the origin of DNA itself as well as other necessary enzymes. Retroviruses use the same genetic code for creating proteins as do living organisms. So it is likely that their evolutionary histories are closely connected. Let us assume that we have figured out the simplest combination of DNA, RNA and proteins that can conceivably evolve into a reproducing biological system. It seems extremely unlikely that this combination of molecules will evolve by chance processes alone. Fred Hoyle calculates that the estimated age of the universe of 10 to 20 billion years is much too short for such an unlikely event to happen even once by chance. No one has demonstrated the alternative, that there is a high probability that these molecules were the result of chance interactions during a time period of several billions of years, even with the presence of the necessary chemical building blocks such as amino acids that have been demonstrated to arise by natural means.

Let us assume that we have all the chemical building blocks for the DNA, RNA and proteins available, produced by natural processes as described earlier. Only the proper, non-random ordering of these building blocks is necessary to construct our simple self-reproducing system. How could a disordered soup of these amino acids and nucleotides develop into highly ordered structures of biologically active proteins and nucleic acids like DNA and RNA?

According to the branch of physics called thermodynamics, the creation of an improbable event, such as the separation of a mixture of sand and sugar into one pile of sand and a second pile of sugar, requires two things -- information and energy. Information is required to tell the difference between a grain of sand and a grain of sugar. And energy is needed to move the sand or sugar grain, once identified, to the correct pile. (In order to mix sand and sugar together, no information is required, only energy.) In the biological case, information is required in order to select the particular amino acid or nucleotide that must be joined in the proper order to build the necessary protein, DNA or RNA. And energy is needed in order to apply the information and physically move the proper amino acid molecule or nucleotide molecule into proper position. In normal cells, particular molecular structures such as messenger RNA, ribosomes and transfer RNA carry out this information-carrying and molecular-moving process. But those structures do not yet exist in our example--one or more of them are to be created for the first time! According to the theory of dissipative structures developed by Ilya Prigogine, inorganic systems far from chemical equilibrium can switch from a less ordered to a highly structured state. But this capacity of certain chemical systems has not been demonstrated for creating proteins or DNA from their chemical building blocks. Rather, his work shows that even simple chemical systems can show some coordinated self-organising capacity. This capacity is seen to be a property inherent in matter itself and not limited to biological systems. Then how do proteins and nucleic acids like DNA and RNA self-organize themselves into existence?

The Role of Microvita

This is where microvita come in. P. R. Sarkar said that microvita are the root cause of life, and not carbon atoms. But how do microvita get the job done? According to Sarkar, carbon atoms can get life or vitality from positive microvita. These living carbon atoms, with their increased vitality, can evolve with other atoms into gigantic structures like human beings. But this is a big jump. First the carbon atoms, along with other atoms, have to form DNA, RNA and proteins. How do they do it?

According to the developing microvita theory, microvita organize energy or prana (the aerial fundamental physical factor) into vital energy or Pranah. When Pranah acts through a nucleus containing microvita, the Pranah can exert an organizing force on the five fundamental physical factors--solid, liquid, luminous, aerial and etheric--of a structure, to shape and stabilize it or to break down parts of it by a process of wear and tear. Microvita, originally emanated from the Cosmic Mind, will be attracted to the chemical building blocks when a proper physical and chemical environment exists to attract them, and further expression of their potentialities requires the addition of new vitality, brought by positive microvita.

So it is microvita that bring the information necessary for recognizing and selecting particular amino acids or nucleotides. The associated Prana, directed by microvita, will exert a centripetal force to bring the correct amino acids or nucleotides into position so that they join a growing chain of chemical building blocks in the proper order for making a biologically active protein or nucleic acid. In this way, step by step, the DNA, RNA and proteins necessary to form even the simplest replicating structure that can evolve to life as we know it are created by microvita. Having formed the DNA, RNA and protein components, other microvita, through the further action of Prana, organize them together so that a simple, self-replicating structure is created. Even after such a self-replicating structure is formed by the action of microvita, these microvita remain in the nucleus of the structure to control the Prana which maintains the further metabolic, replicative and evolutionary powers of the structure with the help of the evolved proteins, DNA and RNA in the structure.

So, according to the microvita theory, the secret of the non-random creation of the first living molecular structures is that microvita, working in association with prana, combine the information and energy necessary for the creation of highly improbable biological molecules and arrange them in the necessary way for them to become a simple replicating organisms.

Testing the Microvita and Prana Hypothesis of the Origin of Life

The above explanation for the formation of simple living biological structures from the action of microvita and prana on molecular building blocks may sound a bit far-fetched. Can the hypothesis be tested? If the hypothesis is found to be correct, it will revolutionize scientific understanding of the origin of life.

The controversial "water memory" experiment published in the June 30, 1988 issue of Nature gives a hint as to the direction to proceed in testing our microvita hypothesis of the origin of life. Antibodies from blood were so highly diluted in water that not a single antibody supposedly could remain in the solution. Yet when this highly diluted solution was added to certain white blood cells the cells responded similarly to the way they respond to actual antibodies. The most straightforward explanation is that new antibodies were actually created when the antibody-free solution was added to the antibody-free cells. Microvita from the original antibodies could have created the new antibodies. These new antibodies then act on the cells in the normal way to produce the observed result. This hypothesis can be easily tested by looking for new antibodies in the absence of contamination by the original antibodies. In one reported experimental test in Israel, when someone did look at test tubes where the effect was observed, antibodies were found. But at that time this result was taken as evidence for contamination of the particular experimental trial.

If the above test for the creation of antibodies from adding a microvita solution to cells is positive, it suggests that similar results would be obtained starting with other biological molecules, such as other proteins, DNA, RNA, or even whole viruses. It is only necessary that the liquid to which the highly diluted solution is added contains the necessary chemical building blocks for the DNA, RNA or whole virus as well as necessary chemicals that would speed up the process and provide energy. A solution of DNA-free water could be prepared by highly diluting and shaking an original sample of DNA so that no DNA remains in the solution. Then that same type of DNA should form again when the diluted solution is added to the solution containing the chemical ingredients for DNA. The same result is predicted for whole viruses. If copies of the DNA or virus are formed, it would mean that the highly diluted solution contains not only all the information necessary to construct a particular biological molecule or virus, but the ability to do it as well.

According to our hypothesis, certain microvita contain both the information and the organizing ability to create a biological molecule such as DNA or a protein. Prana associated with and directed by the microvita actually physically does the work of bringing the molecular building blocks together in the correct order. Of course, to prove in detail that this hypothesis is correct, the existence of prana will have to also be proved, and the relationship between microvita and prana will have to be studied in detail. The present proposed experimental test, if it came out positive, only would show that highly diluted solution containing water and no other biological molecules can create specific biological molecules from chemical ingredients. This by itself would be a major advance in scientific knowledge, going beyond the results of the original antibody experiment. And in the absence of any other theory to explain this result, the microvita hypothesis would be supported.

If the creation of biological molecules such as DNA and proteins from their components by the action of microvita can be carried out under laboratory conditions, the same result could also have happened under natural conditions during the Earth's early history, when the proper chemical components were first available from natural sources. The question then is, where did the original protein microvita or DNA microvita come from, since there were no DNA or protein molecules to furnish them? Sarkar says that microvita originated from the Cosmic Factor, i.e. Cosmic Mind. Their function is to further the evolutionary process of cosmic consciousness from matter (which is derived from cosmic consciousness) to individual minds and finally back to cosmic consciousness. If the experiments support the microvita hypothesis, it will mean that microvita are manifestations of non-protoplasmic intelligence. It follows that they must originate from some highly intelligent cosmic process, which we may call Cosmic Mind. With

further experiments with highly diluted chemical substances, greater insight into the origin of life may be found.

So the developing microvita theory makes testable scientific predictions relevant to the non-random origin of the first self-reproducing biological structures that we may say are alive. The mysterious origin of different species of life from the first living cell is a further area where the theory of microvita may shed some light. And the equally mysterious processes of growth and development of a complete organism such as a human being from a single cell or fertilized egg should also be clarified by understanding how microvita control physical growth and development by controlling the vital energy of a growing organism. The origin of species and the developmental process will also be seen to be closely linked through the theory of microvita. Let us now see how the theory of microvita can add to our understanding of the origin of species.

Chapter 9. The Origin of Species

On May 30, 1987, P.R. Sarkar presented some revolutionary new ideas on the origin of species. The ideas pose a direct challenge to the theory of the origin of species originated by Charles Darwin and accepted almost universally by biologists in a modified form called neo-Darwinism. If proven correct, Sarkar's ideas will have a profound effect not only on our understanding of the origin of species, but on the origin of life itself. There are practical implications, as well, for the genetic engineering of new forms of life to alleviate medical agricultural and environmental problems facing humanity.

The discourse is entitled "Four Dimensions of Micro-psychic Longings". In it, Sarkar indicates that a group of living beings may metamorphose its physical structures to bring a desired change in its instinctive, or psycho-physical, longings for physical objects. What this means is that members of a species of animals or plants, as well human beings, may transform themselves into another genetic variation or even a different species if the group collectively doesn't like the way its present instinctive longings are expressed. Sarkar indicates that this change is initiated by the collective self-controlling faculties of the species.

Sarkar does not describe precisely how such a self-induced metamorphosis takes place. But even in a general way, this new explanation for the origin of species clearly opposes the explanation for evolution offered by neo-Darwinism. According to that theory, species evolve due to competitive advantage gained from many small, essentially random modifications in their individual structures caused by genetic mutations over very long periods of time.

Here I will outline a more specific hypothesis of the origin of species that integrates some of the ideas Sarkar expressed on the subject of microvita in an earlier discourse "Microvitum--The Mysterious Emanation of Cosmic Factor" and in a subsequent lecture, "Neo-Ethics of Multilateral Salvation". Microvita, according to Sarkar, are tiny, subtle forms of living creatures currently unknown to science. They are, he says, the root cause of life, as opposed to carbon atoms. Billions of microvita (plural of microvitum) can solidify to form a single carbon atom. Yet certain collective structures of microvita provide the psychological cause for negative social phenomena such as imperialism. A microvitum is truly an amazing creature.

Our hypothesis for the origin of species resembles a hypothesis about species changes caused by viruses from outer space, described in a book *The Intelligent Universe* by the noted astrophysicist, Fred Hoyle. His provocative book claims that species could not have evolved from random mutations in their DNA. He calculates that the probability of new biologically active proteins evolving by chance, even over several billion years of Earth's

evolutionary history, is negligible. So Hoyle suggests that super-intelligent entities in the universe may be monitoring evolutionary processes on Earth and sending the necessary additional genetic material to create new species. This could be done, he suggests, by viruses which travel to Earth from outer space and transmit genetic information contained in their RNA, designed by the super-intelligent entities, to the appropriate animals and plants.

In a nutshell, our more detailed proposed hypothesis for the origin of species accepts that viruses carrying precise genetic information can "infect" a group of animals or plants and cause them to be genetically metamorphosed into a different species. But these viruses come, not from super-intelligent entities in outer space, as Hoyle suggests, but rather from the action of the self-controlling faculties of the species members themselves. The viruses have the effect of modifying species members' physical structures to express their instincts differently. These viruses are the creations of microvita. These microvita are originally emanated from the Cosmic Mind, to the chakras of living beings. By organizing vital energy, these microvita create molecular structures such as DNA, RNA or viruses that can modify the expression of instincts or propensities of a group of organisms by modifying the genetic material in their cells. Microvita are emanated from the Cosmic Mind to the chakras of living beings to aid their all round development.

The Self-controlling Faculties

According to Sarkar, "In each and every physical and psychic structure, there remain self-controlling faculties". This is also true of instinctive or psycho-physical longings for physical objects. These instincts may be either inborn or developed. "And in case of collective structures regarding these psycho-physical longings, if it is seen that the collective body of a particular nature of living beings or expressions do not like it, then the controlling faculty creates a sort of change and metamorphosis in the physical structure, and as a result the nature of longing also changes."

In the case of individuals, the efforts of the self-controlling faculties to advance are limited by the vital principles of the physical structure. Attempts to surpass these limits result in the decomposition of the physical structure. "But in the case of the collective body or the collective structure there may be a change, and that change may not go against the characteristics of physical structure if there remains a constant endeavor for such a change, rather for such a metamorphosis." "And in a collective body, the collective controlling faculty may create a sort of change in the physical structures if such a change is supported by Macrocosmic conation, otherwise not."

Primordial instincts and self-controlling faculties exist in both living and non-living structures. Sarkar indicates that only a collective body, i.e. a group of animals or plants can collectively change their structures through collective endeavor, but individual animals or plants cannot. When the change takes

place, it occurs in the whole group. As a result, a new species, or a genetic variant of the former species, is created.

It appears from Sarkar's discourse that for each instinct in an animate and inanimate structure, there is a corresponding self-controlling faculty. That faculty goads or guides the structure, whether human, animal, plant or inanimate object, in its expression of that instinct. In addition to psycho-physical longings or instincts, which are of two types--either inborn or developing later on--there are also micro-psychic longings for psychic pabula, or objects. This is the third dimension of micro-psychic longings. Finally there is apexed psychology or pinnacled psychology. Here the mental faculties as well as the controlling faculties move upward and are pointed, finally merging into the macrocosm or the supra-cognitive entity. This is the fourth and final dimension of micro-psychic longings.

One way to view a species is as a structural category physically objectifying the complete collection of micro-psychic longings possible for that species. In order to significantly change the expression of instinctive longings in a species, some members of that species must be metamorphosed into a new species, or at least a new genetic variety of the old species. The collective controlling faculties monitor the expression of particular longings. When dissatisfaction is continuously and collectively expressed by some members of a species about its instinctive longings, and there is a constant endeavor for change, the collective controlling faculties transform these members into either a new species or a genetic variant of the old species, with a new set of expressions of micro-psychic longings.

The physical structure of a species is encoded in the genetic information in the chromosomes of each member of the species. DNA is the double helix molecule that encodes this structural information precisely, according to the genetic code. So DNA encodes in a molecule the physical base for the expression of the micro-psychic potentialities of a species. To change the instinctive expressions of a group of living beings it is necessary to change the DNA in order to transform a group from one species or genetic variety into another.

What are these self-controlling faculties that can cause a group of living beings to metamorphose from one species to another? Clearly they are something beyond the range of current biological understanding. According to Yoga philosophy, in higher animals and plants and in human beings, the first five chakras control the five fundamental physical factors in the body--solid, liquid, luminous, aerial and etheric. They also control the expression of instincts associated with each chakra. These instincts are expressed with the help of secretions from glands associated with the chakras. The sixth chakra in human beings is the controller of almost 450 propensities, according to Sarkar. The seventh chakra is the seat in the human structure of Supreme Consciousness, the ultimate controller of all the micro-psychic longings of

the human being. So it seems that, at least for human beings and for higher animals and plants, the chakras are the self-controlling faculties referred to recently by Sarkar. If this is so, it means that the chakras, acting collectively, have powers of species transformation that were not previously suspected. It is little wonder that the actual mechanism of the origin of species has remained unknown to biologists until today.

Where do microvita come into the process of species transformation? According to Sarkar, microvita are emanations of the Cosmic Mind that guide the all round development of living beings. This includes physical and psychic development as well as spiritual development. Living beings will be affected by microvita sent to the chakras to enhance positive and negative propensities, or to reduce them.

So chakras are the controlling faculties of living beings, and microvita are the means of the macrocosmic conation to help these faculties. Furthermore, microvita that control and direct the vital energy of living beings are, we propose, located at the five lower chakras, which are the nuclei for controlling the five fundamental physical factors within an organism. But the chakras are also self-controlling faculties, they have a degree of autonomy to guide the expression of micro-psychic longings. As self-controlling faculties, the chakras, including the sixth chakra, which controls the mind, would monitor the level of satisfaction of the members of a species in relation to particular instincts. These self-controlling faculties would then initiate the process of creating structural changes necessary to modify instincts and increase the satisfaction of the species members. These structural changes, producing species transformation, must have the support of macrocosmic conation. This ensures that the changes will benefit not only the members of the species, but the collective well-being of all animals and plants affected by the changes.

How do the chakras attract the microvita necessary for the structural transformation of a species? And how do the microvita, once attracted, carry out this transformation? To the first question we can propose one possible answer. As mentioned before, there must be a very close connection between the instinctive longings of a species, and the DNA code for its physical structure. Changes in instinctive longings require changes in the cellular DNA. I suggest that the Cosmic Mind responds to these self-controlling faculties and emanates microvita that carry the genetic information that can bring about the desired changes. While this answer is not very satisfactory from a scientific point of view, it opens up the possibility that the microvita themselves, once emanated from the Cosmic Mind, can be studied to see how they then bring about the desired structural changes in the species members.

If microvita can be identified as the immediate causes of structural changes, i.e. if the changes can be explained by the microvita hypothesis and in no

other purely physical way, then the possible sources of the microvita can then be examined to determine if it is necessary to invoke a Cosmic Mind as their source. It should be mentioned that the microvita that bring these changes would contain the information in the genetic code. Otherwise how could they create molecular structures embodying the code? So microvita carrying specific genetic information would be emanated from the Cosmic Mind and directed to the chakra or chakras requiring it. These chakras would then utilize this genetic information to change the DNA of the species members. This brings us to the second question: how is this transformation brought about by the microvita?

Viruses and Species Transformation

When Sarkar discussed the crudest type of microvita, which he said can be seen in a very powerful microscope, he said that "virus" is a vague term, and that a better term would be "microvita". Microvita, he said can both create and destroy bodies and minds. Viruses are known for their ability to cause diseases in animals, plants and human beings. Why is "virus" a vague term? Because viruses must be able to do more than cause diseases. They must have another role to play in life processes--perhaps a more important role, even their main role--that of carrying new genes that transform species, to cells and organisms that require these genes. If viruses are one expression of microvita, then viruses should play a crucial role in the origin of species. What can that role be?

According to our developing microvita theory, certain microvita can organize vital energy that then creates complex biological molecules such as proteins and RNA from their chemical building blocks, which are formed by other natural processes. Viruses, which are structures of protein, DNA or RNA and several other substances, could also be evolved from the action of microvita. In the right chemical environment, those microvita would create the molecular viruses. So the essence of a virus is the microvita that create it and reside within in at its microvita nucleus, maintaining the structure of the virus by controlling its vital energy or Prana.

The basic ways viruses assist in both the creation of life and the origin of species may well be the same. Since viruses carry genetic information in the form of DNA or RNA, they could add genetic information to structures where none previously exists. This would permit the creation of living cells from non-living structures. Or viruses could add genetic information to living structures where there is already genetic information in the form of DNA. This could create a new species. The origin of the first living chemical structures by the action of microvita was previously discussed. Here we will focus on the evolution of new species by the action of microvita and viruses.

The main idea is that, by a biologically feasible process, a particular microvita-evolved virus could "infect" animals and plants of a single species and transform them into a new species. How could this happen?

According to our theory, the chakras--the collective self-controlling faculties of a species--may change the physical structures of the species, creating a desired change in the instinctive longings. Somehow microvita carrying the necessary genetic information are attracted to the chakras. What do these microvita do? They create viruses, probably retroviruses, whose RNA (enclosed genetic information) corresponds to the change in the DNA that is necessary to metamorphose the species into a new one.

A virus is a tiny structure that contains some DNA or RNA and perhaps some associated enzymes, surrounded by a coat of protein molecules. It is known from recent research that certain viruses, called retroviruses, may enter a living cell and by a process called reverse transcription, cause the viral RNA to be transformed into DNA. This DNA is then inserted into the DNA of the infected cell. The DNA produced by the virus is then an integral part of the DNA of the cell. With the AIDS virus, this process is known to occur. After an AIDS virus has acted on a cell, a later infection will stimulate the cell to make copies of the virus. Most of the cells infected by AIDS are killed in this process. This is what reduces a person's immune response. It is mostly cells of the body's immune system which are infected by the AIDS virus.

But there is no reason why viruses have to kill cells when they reproduce. Many viruses do not. A virus could insert DNA in a cell's DNA. The cell would then make copies of the virus, which would infect other cells and change their DNA also. The viruses could then leave all the cells, which would continue to function with modified DNA.

The difference between one species and another closely related species depends only on the difference in their DNA (actually the difference in the microvita within the DNA). Microvita attracted to an organism by the action of its self-controlling faculties could create the RNA needed for a species transformation. These new microvita would remain in the newly created RNA. The RNA would be packaged in a viral coat, also originally a creation of microvita. The viral packaging ensures that the RNA will get the widest possible distribution to target cells and species members, because of the reproductive capability of the virus in a cell and the ability of the virus to spread efficiently among species members. A particular virus could carry RNA that, by reverse transcription, would modify the DNA of the target cells of species members. When this modified DNA started functioning in all the affected target cells, a member of the first species would metamorphose its physical structure in way needed to alter its instincts in the desired way. If the viral DNA can be inserted into reproductive cells, so the changes become hereditary, then a new species or a genetic variety of the old species would

have been created. This then is the proposed mechanism for the origin of species. The general rule for the transformation of species is:

Species 1 + Virus (2-1) -> Species 2

Virus (2-1) carries the genetic material, created by microvita, needed to transform species 1 into species 2. This transformation could perhaps be carried out by a single virus. Otherwise two or more viruses acting in succession on a member of species 1 could produce the required changes. The general rule of transformation of species by viruses remains the same. If more than one virus is necessary to transform a species, then the animals or plants acted upon by the first and later viruses would produce transitional forms between species 1 and 2. It must be emphasized that the virus is just an efficient distribution system for new microvita-created genetic material which actually creates the physical transformation, guided by the microvita in the genetic material.

Of course, the metamorphosis in structure required by the collective controlling faculties of a group of animals or plants may not necessitate a completely new species. A smaller genetic variation might bring about a minor change in the expression of an instinct.

In cases of animal, plant or human evolution, where transitional organisms have not been observed in the fossil record, a complete metamorphosis from one species to another may have come from a single virus. In this case no intermediate variations would have been created. Such single-virus transformations would explain the observed gap in the invertebrate fossil record which contradicts Darwinian theory. Viruses responsible for the species transformation may eventually be found in fossils.

An earlier and currently discredited, but still somewhat appealing, doctrine of evolutionary theory called Lamarckism, "the inheritance of acquired characteristics", comes into a new light in our present theory of the origin of species. Lamarck was a great 18th century French biologist who developed a theory of evolution before the time of Darwin. According to Lamarckism characteristics of a non-genetic origin, such as a slight increase in the length of a giraffes neck as it stretched for the leaves of tall trees, could be passed to its offspring. They would thus being born with a slightly longer neck.

All attempts to prove Lamarckism failed, since a genetic change is required for characteristics to be transmitted to offspring. But with microvita-induced and virus-mediated species transformation, a genetic change takes place in the organisms themselves, which are actually transformed physically into a new species. If these genetic changes affect the reproductive cells of the organisms, their offspring will automatically be members of the new species too, having acquired their characteristics by genetic inheritance from the parents.

According to our microvita hypothesis a group of pre-giraffes, finding themselves in a new environment with taller trees, could have been frustrated with their inability to reach their favorite leaves. A prolonged desire to reach the leaves could have caused their collective controlling faculties, their chakras, to attract appropriate microvita. The microvita would create new RNA viruses which would "infect" the pre-giraffes. DNA would be produced in certain target cells in their bodies. This new DNA would encode changes in the pre-giraffe structure, giving them, for example, a longer neck, longer legs and necessary coordinated internal structural changes that regulate their blood pressure. When these changes are incorporated into the reproductive cells, these new characteristics would be passed genetically to their offspring.

Many cases of animals and plants, as well as human beings, transforming their physical structures to adapt to new environments, could be explained in the same way. Evidence that supported this hypothesis would be finding the viruses responsible for such transformations, or establishing similar transformations of species experimentally with viruses today. A complete proof would use both approaches.

We have seen that a virus could be the means of transforming one species into another. In a similar manner, viruses could be responsible for the creation of the first living cells from inanimate matter.

The Creation of the First Living Cells

According to Sarkar, even inanimate or non-living objects have primordial instinctive longings for physical pabula or objects. These longings are expressed, for example, by an increase or decrease in intermolecular and interatomic spaces.

In non-living structures there are self-controlling faculties as well. These self-controlling faculties goad the objects to express their instinctive longings. One way for inanimate structures to increase their ability to express these longings is to transform themselves into animate structures, that is, living cells.

We have hypothesized that the first living chemical structure was a creation of microvita emanated from the Cosmic Mind, acting on chemical building blocks such as amino acids for making proteins, and nucleotide molecules for making RNA or DNA. Once the first living chemical structure is formed, with the ability to maintain its existence and to reproduce, it can evolve into protoplasmic cells by the action of further microvita attracted by the self-controlling faculties of the living chemical structures. These microvita generate new genetic material, which is packaged in a virus. If we apply our rule for the transformation of one species to another by means of a virus, we get, when the first species is the first living chemical structure:

Living chemical structure + viruses -> living cell.

Since a living cell is very complex, with much DNA, it will require many viruses acting in succession to complete the transformation of the first living chemical structures into fully functioning living cells. In this case, each virus would add a bit of DNA to the DNA of the living chemical structure. If the environment of the structure is suitable, the DNA will find amino acids and other chemicals necessary for the manufacturing the components of a living cell. Since the viruses would be reproducing themselves in the process, many living cells would be created. So the microvita --"little life"--is a cosmic seed for the creation of the first living cells in a proper physical and chemical environment.

Some very new research results have just appeared that support the concept of self-controlling faculties in organisms that generate genetic changes to modify instincts in a desired way. An article in the International Herald Tribune (Sept. 15, 1988, p.7) reports on an experimental study of E. coli bacteria that sometimes appear to modify their genes in non-random ways in the face of environmental change. Bacteria were found to mutate, or undergo genetic change, seemingly in direct response to a changed environment. The genetic changes were passed on to following generations of bacteria. The research was done at the Harvard School of Public Health by John Cairns, Julie Overbaugh and Stephan Miller. According to them, the research seemed to support the largely discredited view that acquired characteristics can be passed on genetically (the Lamarckian view), and suggests "that cells may have mechanisms for choosing which mutations will occur."

If microvita and viruses, emanated from the Cosmic Mind as a result of the action of organisms' self-controlling faculties, are the means of the origin of species, then the existing species today should show evidence of their evolutionary history and the effect of these ancestral microvita and viruses in their present developmental processes. The next chapter examines this idea more closely.

Chapter 10. Evolution and Development

The recent Renaissance Universal discourse by P. R. Sarkar, "The Four Dimensions of Micro-Psychic Longings", offers several new insights into the process of evolution. It is safe to say that when these insights have been more fully explored, and integrated with Sarkar's ideas about microvita, they will create a revolution in our understanding of the process of biological evolution. There are important social implications of these ideas as well.

Historical Background

In the last century, Charles Darwin created a revolution in people's thinking about the origin of species. His theory stated that humans, animals and plants evolved over extremely long periods of time through a process of variation and natural selection. Certain religious doctrines which supported the idea of divine creation of species in their present forms without any evolutionary process were fundamentally challenged.

Darwin's ideas contributed fuel to the conflict that was already well developed between people supporting religious faith in scriptures and people supporting the idea that truth is gained by the use of one's rational faculties and the evidence of the senses. This conflict between faith and reason over the origin of species has come down to the present day.

While most biologists accept Darwin's theory of evolution as fact, a few consider it to be still only a theory which should not be given any more weight than any other theory about the origin of life. For example, scientific creationism, a non-evolutionary theory of creation, is basically one scriptural version of creation expressed in scientific terminology. The intellectual battle continues, especially in the USA, where supporters of scientific creationism have political and financial influence over the educational system in some parts of the country.

Evolution theorists supporting Darwin's views almost unanimously agree that evolution is caused by natural selection among organisms whose differences are the result of mutations created by random errors in their genetic material. Such errors could be the result of processes internal to the organism, such as DNA copying errors, or external processes, such as radioactivity. Although most mutations are acknowledged to have unfavorable effects on the organism, a few, according to this view, may be favorable and be selected in the process of natural selection. This would lead to a gradual evolution of a species, particularly in a changed environment where previously unfavorable mutations could become favorable, and thus be selected.

Anti-evolution theorists have disputed this view, saying that animals and plants that are extremely well-adapted to their environment just could not be the result of random processes. Therefore, according to some of these

theorists, divine power must have created the animals, plants and human beings in their present forms.

Sarkar's recent statements about the evolution of living organisms do not challenge the idea that the evolution of species takes place in a natural way. But they fundamentally challenge the presently accepted hypothesis about the means by which evolution takes place.

According to his Renaissance Universal discourse, "Four Dimensions of Micro-Psychic Longings", all organisms have self-controlling faculties that control the expression of their psycho-physical urges or instincts. If the collective body of a group of humans, animals or plants of one species is dissatisfied with any of its instinctive expressions and makes continuous efforts to change them, the collective self-controlling faculties may act to bring about a metamorphosis in their physical structures. Their instinctive expressions would be correspondingly modified. But such a metamorphosis must have the support of the macrocosmic conation, or cosmological order, to take place.

In Sarkar's *Varna Vicitra* under the subject of "usa'k" (porpoise) he gives an example of such a metamorphosis (summarized in Bodhi Kalpa, Ananda Purnima issue 1987, p.45): "There are certain fish which although aquatic have been trying for lakhs (hundred of thousands) of years to become terrestrial. There have been therefore certain changes in their physical structure. We call these fish, i.e anabas, catfish, etc., jiol fish. If they survive they may become terrestrial in a few lakhs of years."

It is clear from this passage that these fish are being gradually transformed into a new species of animal as a result of their continuous efforts for transformation, and not as a result of random mutations in their genes. This process occurs in successive stages over a period of hundreds of thousands of years, in this case.

The idea that catfish or any other organisms except perhaps human beings for that matter, can evolve into a different species as a result of their own efforts may seem strange to most biologists. They are accustomed to thinking that evolution is caused by random processes where the efforts of most organisms are related only to the struggle for existence.

If Sarkar's ideas about evolution are correct, it is still necessary to show the means by which, as a result of their desires and efforts, organisms are metamorphosed into different species. If random mutations and natural selection in organisms are not the mechanisms for their evolution, then what is?

Sarkar has hinted that microvita play a crucial role in the evolution of life. In one recent discourse he stated the following:

"Microvitum is a very subtle being. It is of three types. The crudest type were instrumental for the emanation of life from the Cosmos. They created a stir within the physical structure. In the subsequent stage, through clash and cohesion, enormous changes in the physical structure occurred leading to the emergence of the dinosaurs, the mammals and finally the human beings."

Later, he posed and answered the question, "How does the theory of microvita affect biochemistry?" He replied, "The internal protoplasmic formula will change. Nuclei can also be affected by microvita. And protoplasm will be affected by bringing a change in the nucleus with the help of microvita. Displacement of the nucleus can be brought about with the help of microvita, which will bring a qualitative change in the internal structure. It will internally affect the hormone and thus externally, the corporal structure."

In the previous chapter, I proposed that microvita, attracted to a group of organisms of one species by the self-controlling faculties of these organisms, could bring necessary genetic information to the organisms in the form of viruses. These viruses would insert new DNA into the DNA of the organisms. This new DNA would cause a metamorphosis in the organisms, so that their instinctive expressions would be modified according to their desires and efforts. As a result new species or sub-species would be evolved.

Elaborating the New Theory of Evolution

Two assumptions can now be added to the above proposal that will make our theory more accessible to scientific investigation.

First, we assume that in an evolving organism, when new DNA is added by a virus to the DNA in the nucleus of a cell, it is added in such a way that it can be reactivated in the same order in which it was added. This will create a functional "DNA stack" of genetic material in every organism over evolutionary time. The evolutionarily older DNA will be at the bottom of the stack and the newer DNA will be at the top of the stack. This functional DNA stack will not necessarily resemble the actual physical order of DNA in the chromosomes. The functional DNA stack encodes the temporal order of arrival of new genes in an organism evolutionary history. (It is known that retroviruses show no apparent preference as to where along a cell's own DNA they add their viral DNA.)

Second, when a new organism grows from a single cell or a fertilized egg, the DNA in the stack is activated in the same temporal order in which it was formed. So the functional DNA stack is activated from the bottom of the stack to the top. DNA that arrived earlier in evolution get reactivated earlier during development, in sequential order. The organism develops under the control of only the activated portion of its DNA. Several important consequences follow from the above two assumptions:

1. The genetic changes that cause the evolution of species are not random changes which damage old genetic material to create mutations in organisms. Rather, the genetic changes are precise and directed towards the psychophysical metamorphosis desired by the organism.

2. In a developing embryo, the activation of DNA in the same sequence that occurred in the organism's evolutionary history is consistent with the general observation that a developing embryo passes through the embryonic stages of its species ancestors before attaining the structure of its present species. This does not mean that the developing embryo resembles the adult forms of its different ancestors, only their embryonic forms (since the developing embryo keeps "evolving" by activating later DNA before early adult forms have a chance to develop). This is not the same as the principle "ontogeny recapitulates phylogeny", which as originally formulated by Ernst Haeckel, meant that the adult form of evolutionary ancestors was preserved in the earlier developmental stage of the embryo and is not factually correct. See *Ontogeny and Phylogeny*, by Jay Gould.

3. It follows from our two assumptions that essentially the entire species ancestry of a human being, animal or plant is still contained in its present genetic material. All of these ancestral species can therefore in principle be recreated by selective permanent inactivation of evolutionarily more recent DNA in a developing embryo or organism. This means that previously extinct species of animals or plants, or even human beings, may be produced from the genetic material of their living descendents. One example of this is the "living fossil" amphibian, the axolotl. Normally it grows to maturity and reproduces as a gill-using fish-like creature while if treated with thyroid hormone it can metamorphose into a land walking, lung-using creature. The mature gill-using animal is clearly like the evolutionary ancestor of the air breathing animal. Somewhere in its evolution its development somehow got "stuck" at the amphibian level. See Goldschmidt (1960). Such examples seem to be in stark violation of the idea that evolution is based on the random mutation of earlier genes, since the genes of the earlier ancestor appear to be intact in the case of the axolotl. Our add-on theory of DNA evolution seems more consistent with the facts.

4. The genetic difference between one species and its immediate ancestors or descendants can in principle be determined by isolating the genetic material in the DNA stack that transforms one species into another. So the genetic difference between the present species of human beings and its immediate genetic ancestor is due to the DNA at the top of the present human species functional DNA stack.

5. Further evolutionary changes in human beings will be attained when microvita add new DNA onto the present DNA stack of human beings. This is also true for animals and plants. In the future human beings may learn to control microvita to accomplish this. Already, new sub-species of animals

and plants are being created by genetic engineering techniques that modify an organism's DNA.

6. Defective activation of an embryo's DNA stack can lead to the birth of evolutionary throwbacks with some characteristics of the organism's ancestors. These occurrences, documented in an area called teratology, are not mutations but expressions of evolutionarily earlier portions of the parents' DNA stack.

According to our theory, microvita-induced genetic changes that metamorphose an organism into a new species occur in a fully formed organism, one which has already fully activated its own functional DNA stack. The new DNA units are added to the top of the organism's DNA stack and causes the required metamorphoses of the organism. When this new DNA is added to the organism's reproductive cells it becomes hereditary. The embryological development of the organism's offspring then proceeds by linear activation of the offspring embryo's DNA stack, including at the end the most recently added DNA that transformed the parents. All of the structural specifications and developmental control mechanisms for an organism's entire evolutionary history are still contained in its DNA. The embryo's development is thus being directed by the same DNA that it gained during its evolutionary history, and in the same order in which the DNA was gained. The embryo develops its cells, tissues and glands under the genetic control of a continuously increasing portion of its DNA. At the earliest stages, only the evolutionarily oldest DNA is activated. At later stages, evolutionarily more recent DNA is activated, modifying the cells and tissues developed under the control of the older DNA. DNA activation continues until the evolutionarily mature organism is finally formed.

The Evolution of Specialized Cells, Glands and Organs

Until now we have been assuming that the DNA brought by certain viruses to an organism's DNA, causes the organism to be metamorphosed into a new species that makes possible a better expression of the organism's psycho-physical longings. But we have not inquired in detail about how such a metamorphosis actually takes place. What does the virus and its genetic information do to create this metamorphosis?

According to Sarkar, it is the organism's instinctive expressions that are being transformed in a desired way during the process of evolution. What controls the physical expression of instincts in an organism? It is the glands and the hormones, or their structural and chemical counterparts in less developed organisms. So the evolution of glands in an organism will play a critical role in the evolution of the whole organism. The secretion of a hormone by a gland affects many target cells elsewhere in the organism, and modulates the expression of the organism's instinctive behavior. For example, Sarkar once said that a change in the lymph glands during human

evolution caused the early human beings to have less body hair and to lose their previously large jumping ability. The evolution of new glands with new hormones will thus produce major changes in the expression of instincts and add new instincts to the species as well.

Where will these new glands and hormones come from? If a cell gains the ability to secrete a hormone, then that cell becomes a gland cell. A group of cells that gains this ability then becomes a gland. But where does the new hormone come from? And how does the cell get its capacity to secrete the hormone?

What is a hormone? It is usually a specialized protein molecule requiring a specialized enzyme (also a kind of protein) for its manufacture. The way an organism gets protein molecules is by manufacturing them as directed by its DNA, where the code for the building of specific proteins from amino acids is stored. According to our theory, the only way an organism's DNA can acquire the code for a completely new protein is from the genetic material brought by a virus, or a microvita. The virus or microvita adds new DNA to the organism's DNA. So when an organism requires a new hormone to modify its instinctive expressions, it will get the capacity to manufacture the hormone and its corresponding enzyme from microvita or viruses. The structural changes in a cell that will allow it to secrete the hormones must also come with a virus, which can bring the RNA for structural proteins as well as hormones and enzymes.

Looked at in one way, a protein such as a hormone, enzyme or structural protein, can be seen as a molecular structure whose function is to help in some way to modify the psycho-physical longings or instincts of an organism. An organism itself is a structure permitting the expression of a particular range of instincts, or more generally, micro-psychic longings, in Sarkar's terminology. And the DNA of an organism contains both the complete physical record of the modified instinctive expressions that went into the evolution of the organisms species, and the microvita "blueprint" for the physical development of that organism from a single cell or fertilized egg.

A virus when it enters an organism does not affect every cell equally. It has very specific target cells. That specificity is determined by the proteins forming the coat of the virus. Certain sites on the virus protein coat interact with certain molecules on the surface of the target cells. The virus attaches itself to the target cell. Then the virus either enters the target cell or empties its DNA or RNA contents into the target cell, where new copies of the virus can then be generated and leave the cell.

Suppose a retrovirus comes in contact with an organism as a result of the efforts of a group of organisms of that species to modify some instinctive expression. The virus carries new RNA and proteins created by microvita

emanated from the Cosmic Mind in response to the activity of the organism's self-controlling faculties. That virus will target only a particular kind or kinds of cells, depending on the proteins in its coat. The RNA from the virus is converted into DNA by the action of reverse transcriptase carried in the virus. This viral DNA is then added to the DNA in the cell's nucleus. After some time the new DNA starts generating copies of RNA, viral proteins and reverse transcriptase, and new copies of the virus are assembled in the cell. But other copies of the new proteins may have some specific action on the cell itself. The cell may start manufacturing and secreting a new hormone, which will then have transforming effects on several other types of cells in the organism. A single virus may act on several different kinds of target cells, having different transforming effects on different cells as a result of the differing chemical environment in the different cells. The result will be some structural and functional metamorphosis of the organism, at least temporarily, so that the organism expresses particular instincts differently than before, or develops a new instinct. The manufacture of many new virus copies in the cell ensures that the maximum number of target cells, as well as available species members, will be affected by the virus. The metamorphosis of the species members will be to their liking since their new instinctive expressions are now more in accordance with their desires.

Even though the organisms are happier as a result of their new metamorphosis, this metamorphosis has not yet become hereditary. This is because the DNA from the virus has not yet entered the reproductive cells or germ line of the organisms and added the new DNA there. Infection of the germ line with the virus could be achieved if the virus "infected" an embryo during the very early stage of embryological development, when the germ line cells have not yet differentiated. (It is at this stage that DNA can be injected artificially by genetic engineering techniques in order to get DNA to become inherited in organisms, mice for example. The technique works, and later generations of mice inherit that new DNA from their parents.) As a result, a new species or subspecies would be formed. At some point during the transformation process, the immune system of the organism would recognize the new virus as part of its "self", and not try to destroy it by creating antibodies.

The Embryological Development of Specialized Cells, Glands and Organs

We have seen how viruses, or microvita, may have the capacity to evolve specialized cells, glands and organs in an organism. The virus or microvita-created RNA brings the capacity to manufacture specialized hormone molecules, enzyme molecules and structural protein molecules to certain target cells responsive to certain proteins in the virus coat. In this way, step by step, a more complex organism is evolved from a simpler one. Those cells which are not target cells for the virus, remain untransformed by the

virus. This is still true at a later stage, when the virus spreads to the organism, reproductive cells or a developing embryo, making its structural and functional transforming effects hereditary.

When an embryo of a species is developing, we have made the assumption that the DNA in its cells is activated in the same order that it arrived from viruses during evolution. And therefore the development of the embryo follows the same pattern as the evolution of the species, at least at the evolutionary embryonic level if not in mature structural expression. But can we be sure that the evolutionary and development patterns will be the same? (Actually they are not always the same, as characteristics acquired by an organism late in evolutionary history, such as markings, are often found developing early in embryological development. Such effects are common in embryological development, and the tendency of embryos to manifest this property was once claimed to be a general rule of embryological development.) In the case of evolution of the species, the physical metamorphosis was created by the action of viruses on target cells of the organism. But as an embryo develops, the DNA provided by old viruses to an ancestor's DNA is activated sequentially from within the embryo's cells. This is not the same thing. How can the newly activated DNA transform the embryo in a similar way as the newly activated DNAs corresponding virus transformed the species in the past?

When a virus added new DNA during the evolutionary history of an organism, the effect was to start the manufacture of copies of the virus in the target cells. Those viruses then spread to other target cells. These cells were also transformed by some of the DNA brought by the viruses, producing specific structural and functional changes and thus altering the organism's instincts in the desired way. The viral DNA in the organism's DNA may retain its ability to make new viruses in the descendants of the organism. This means that an organism's DNA may retain the ability to manufacture copies of many of the viruses in its evolutionary history that contributed DNA to its present DNA stack.

The simplest way to ensure that the development of an embryo follows the pattern of evolution of its species, then, is to assume that a portion of the embryo's DNA, when it has been activated sequentially according to its place in the DNA stack, starts generating virus copies from the activated DNA. The same viruses are now generated that caused the organism's ancestor to be metamorphosed during evolution, and which stored their DNA in the ancestors DNA stack. The present developing embryo has inherited this viral DNA and has created new virus copies. These new virus copies leave the cells and find target cells, which are also the same as during evolution. Those target cells are then metamorphosed during embryological development in the same way they were during evolution, causing the embryo to develop along its evolutionary pattern. The fact that certain

features of an organism that developed late in evolutionary history sometimes manifest earlier than they "should" in a developing embryo can be explained by the possibility that DNA can be activated earlier if nothing prevents it. For example, once embryonic skin cells develop enough on an insect embryo, DNA that causes stripes to develop can act on those skin cells to produce stripes on the embryo, even though stripes did not develop as a protective adaptation until proportionately much later in the organism's evolutionary history.

So according to our theory, viruses, or microvita, help manufacture an embryo in the same way, and in somewhat the same order, as the organism's species was formed during the course of evolution. In evolution, microvita from the Cosmic Mind formed the necessary DNA and viruses as a result of a group of species members' desires and efforts to change their instinctive expressions. In the development of the embryo, the microvita remain in the organism's DNA, which retains the ability to construct viruses that will metamorphose the embryo similarly to how its ancestor was metamorphosed during evolution. Some original viral DNA in an organism's DNA may lose the ability to manufacture certain parts of the virus, such as the protein coat, if the coat is no longer necessary for the viral DNA to perform its developmental role within the cells of an organism.

What determines the rate of activation of the DNA stack in the developing embryo? The target cells for specific viruses need to be developed sufficiently for the viruses to interact correctly with them. This will depend on the degree of development that the embryo has previously achieved. So any inherited virus will have no effect on the embryo until a particular level of maturation of the embryo, or at least the virus-specific target cells, is reached by the action of earlier viruses on the embryo. This condition allows certain features to develop earlier than normal if the target cells are sufficiently developed so that a virus creating a particular feature is able to affect the target cell. This explains how stripes can develop on an early stage embryo even though they appeared relatively late in evolution, in the example mentioned earlier.

In this way the cells, tissues and organs of a developing embryo go smoothly through a sequence of evolutionary transformations while the organs and tissues themselves are still immature at any evolutionary stage. Scales will not develop on a normal human embryo even though the embryo even though the embryo developed through a phase where cells for the production of scales have been produced. The cells are transformed into skin cells, for example, before they have got the chance to produce scales. An organ of an ancestral species, such as gill slits in fish, becomes transformed into an evolutionary more advanced organ, like an ear in the case of mammals. But gill slits are still observable in the embryo of developing mammals, including human beings.

Later arriving DNA in evolution may have the effect of suppressing the action of earlier DNA so that an earlier organ doesn't get a chance to develop, or starts to develop but then goes away. Human embryos have a small tail at one stage, which is gone by the time a baby is born.

Flexibility of an Organism's Developmental Pattern

An organism's DNA stack is activated more or less sequentially during embryological development. But the process can be quite flexible and depend on the surrounding cellular environment. Certain cells may develop into a different kind of cell than they normally would, if attached to a different type of cell tissue than the kind they normally grow next to. So a phylogenetically undeveloped or less developed cell is not programmed for a specific path of development or a specific final cell type. Its path of development depends on how it is targeted for transformation during development, and that targeting depends on the cells around it.

The ability of certain organisms such as salamanders to regenerate whole limbs that have been lost, also shows the high degree of flexibility that exists in the genetic expression of particular cells. Embryonic-like tissue called a regeneration blastoma forms over the end of a limb stump, and a new limb grows out of that tissue. DNA much lower in the DNA stack is activated and higher DNA is temporarily suppressed, allowing the cells to form a more embryonic state, out of which a new limb can grow. The limb grows as the DNA in the cells is again sequentially activated in the normal way.

The flexibility of sequential activation of the DNA stack of an organism is also demonstrated in the growth of identical twins from a single fertilized egg. When the egg first divides, the two daughter cells become detached from each other. Each daughter cell then develops into a complete organism. This is true for multiple daughter cells as well, as long as they are physically separated. The separation of the daughter cells prevents the cells targeting mechanism from being activated, so further activation of the DNA cannot occur. As long as the daughter cells remain as single cells, further phylogenetic development of the cells is delayed. When conditions that permit the targeting of the cells for further development are fulfilled after further cell division with new daughter cells remaining in contact, the sequential activation of the DNA stack in the cells resumes. Since the level of DNA activation in the separated daughter cells is the same as that of the original fertilized egg (due to the delay of further activation caused by separation), each daughter cell now develops into a complete individual. The two twins that develop in this way are genetically identical, since they both came from the same fertilized egg.

In the case of Siamese twins, a partial separation has occurred between two groups of cells in a developing embryo. The cells that are most separated

between the two parts had their DNA activation delayed because the proper environment necessary for timely targeting of cells for further development was delayed. So these cells develop into parts of two identical organisms. The cells in the region where partly separated cell groups are joined together do not get their DNA activation delayed and so grow as a single organism. The result is that two organisms develop with some section of their body shared between them. (Technically it is really a single organism as long as the two twins are still physically connected.) These are Siamese twins.

Sometimes there is grossly abnormal development, described in the literature of teratology, the study of biological monstrosities and malformations. There are cases of children born with tails and even gill slits, and insects born having extra segments like their more primitive ancestors. These cases are explained quite easily by our DNA add-on theory as malfunctions of the expression of evolutionally more recent DNA after a particular level of phylogenetic development of certain parts of an embryo is reached. Those parts of the embryo continue to mature at a particular phylogenetic level, but their further phylogenetic development is blocked. This results in the development to maturity of tissues or organs of an evolutionarily earlier ancestor of the organism. These cases are not so easily explained by the random mutation theory of DNA evolution which would predict that much of earlier structural information would be lost in the mutation process.

Evidence for The Microvita-Virus Evolution Hypothesis

In our microvita hypothesis for evolution and development, viruses play a key role. Microvita are emanated from the Cosmic Mind and attracted to the self-controlling faculties of an organism or structure desiring instinctive change. These microvita organize Prana or vital energy, which builds DNA, RNA, and protein molecules and perhaps even viruses from naturally occurring chemical building blocks. Viruses then distribute new RNA to evolving organisms, reproducing themselves in the process. Viruses only act on certain target cells, determined by chemicals on the protein coat of the virus. These target cells are transformed in a particular way by the action of the DNA brought to the cells by the virus. The viruses later get into the reproductive cells of the organism and become hereditary. This inherited viral DNA retains its ability to generate new viruses in descendants. These inherited viruses act on target cells of the developing embryo to transform them in the same way that their ancestors' embryos were transformed by the original viruses. This causes the developing embryo to follow, or recapitulate, its ancestors' embryonic evolutionary pattern. Cancer develops when this inherited virus-mediated developmental process goes wrong due to chemical hormonal imbalances in an organism. These hormonal imbalances de-suppress the DNA of inherited viruses, causing uncontrolled cellular development and cancer tumor growth.

The only known natural way that completely new (not mutation-induced) DNA can be added to the DNA of a cell is by means of viruses or virus-like particles. Some viruses carry DNA and add it directly to a cell's DNA. Other viruses carry RNA and produce corresponding DNA in a cell by means of reverse transcriptase, and add that DNA to a cell's DNA. Reverse transcriptase is the enzyme that changes RNA into DNA, and is only carried by retroviruses or virus-like particles. This fact alone strongly suggests that viruses or virus-like particles have an important, and perhaps critical role in evolution. The fact that viruses now can only reproduce within a cell, because of the presence of necessary cellular chemicals, does not mean they could not have existed before the first cells, when the chemicals needed for reproduction could have been available elsewhere.

It is now well established that there are inherited viruses in the genetic material of a wide variety of plants and animals, as well as single-celled organisms. It is also accepted that certain genetically inherited viruses were acquired by a species of animal from a very different species during evolutionary history. And it has been shown experimentally that certain viruses can pick up genetic material from a cell of one species and transport that genetic material to another species. So the data already exist that supports the idea that viruses could have played a role of new gene distributors in evolutionary history, and are inherited with the DNA of organisms today.

In many plants there are inherited mobile genetic elements or transposons which resemble viruses in many respects. They move DNA from one part of a chromosome (a genetic structure made of many genes) to another. One class of transposons, called retrotransposons, makes RNA and again makes new DNA using reverse transcriptase. The new DNA is inserted in a different part of the chromosome. Some transposons have the ability to make a virus-like protein coat while others do not. It is suspected that gene shuffling within a cellular nucleus by transposons could lead to evolutionary changes even without the further addition of new DNA.

Where did transposons come from and what is their relationship to retroviruses? One hypothesis is that retroviruses evolve from transposons, which evolve within an organism. A second hypothesis is that transposons originated from retroviruses which got into the germ line of organisms during evolution and became inherited. Some of those transposons then lost their ability to make a protein coat but could still move genetic material from one chromosome to another within a particular cell nucleus. The existence and action of transposons is strong suggestive evidence that viruses or virus-like particles have an important role to play in evolution.

There is further evidence for a role for endogenous viruses in the evolutionary process. It is now known that a high proportion of spontaneous mutations that occur in certain organisms are mediated by endogenous

viruses. In the fruit fly this figure has been estimated to be 90%. When mutations are induced by environmental stress the figure could be substantially higher. So at least in some organisms mutations, when they occur, are generally not caused by random changes in genetic material, but are caused by precise changes in activity of the existing genetic material due to the activation of certain previously suppressed endogenous viruses. So endogenous viruses acquired during evolution may be the source of most mutations that could lead to further evolution of a species. In this view, organisms are preprogrammed by their virus-influenced heredity to mutate in a range of very specific ways when faced by a stressful or changing environment, as would have happened numerous times in evolution. Most of the mutations in fruit flies do not appear to be adaptive. But the fact that these mutations are virus-induced rather than random adds a new dimension to the evolutionary process.

Our hypothesis also predicts a major role of inherited viruses in the development of an embryo. According to the microvita hypothesis, inherited viruses develop the embryo along the same pattern that embryos of evolutionary ancestors were evolved by the original viruses from microvita. Inherited or endogenous virus-like particles have been observed in various developing organs of developing human and animal embryos. In the developing human embryo the presence of these virus-like particles in different developing organs corresponded to the embryonic stage at which those organs develop. Virus-like particles are also found in the placentas of healthy, normally developing human and animal embryos. In the fruit fly, one particular inherited virus-like particle, called *Copia*, is found in the developing fly embryo, but not in the fly egg or the mature fly. The presence of these inherited virus-like particles during embryological development does not however prove that these particles are causing the developmental changes. No causal role for them as yet been proved. Yet their existence in embryonic organs suggests that they do play some role in normal development. Our microvita hypothesis says what this role is.

One cancer researcher has proposed a similar developmental role for endogenous viruses. Nobel Laureate Howard Temin in 1971 proposed the proto-virus hypothesis in which inherited viruses help create and distribute new DNA sequences. These viruses would be the medium for genetic material exchange between somatic or body cells during developmental processes. He proposed that one class of RNA tumor viruses associated with cancer, called C-type RNA tumor viruses, were aberrations of endogenous viruses acting in the normal developmental process. Our microvita hypothesis is very close to the proto-virus hypothesis as far as the role of viruses is concerned. The difference is in the mechanism of evolution of the virus and its RNA. We propose that this is due to microvita, while Temin assumes random mutations and natural selection were the cause.

So for biologists, the question is now not "Do endogenous viruses and transposons play a role in evolution, development and normal functioning of organisms?" but "How much and what kind of role did they and do they play?" This represents a growing shift in thinking about the mechanisms of genetic change during the evolutionary process. When confronted with the presence of viruses in organisms in non-disease-producing roles, biologists are beginning to accept the possibility of radically new ways of looking at the mechanisms of evolution, while still mostly remaining within the Neo-Darwinian framework.

References

- R. E. Benveniste and G. J. Todaro, Evolution of C- type viral genes
- Inheritance of exogenously acquired viral genes, *Nature* Vol. 252, 456, 1974
- R. Goldschmidt, *The Material Basis of Evolution*, Pagent Books, New Jersey, U.S.A., 1960
- Jay A. Levy, The Multifaceted Retrovirus, *Cancer Research*, 46, 5457-5468, November 1986
- F. Michel and B. F. Lang, Mitochondrial class II introns encode proteins related to the reverse transcriptases of retroviruses, *Nature*, Vol. 316, 15 August 1985
- G.H. Mondal and P. H. Hofschneider, Isolation and Characterization of Retrovirus-like Elements from Normal Human Fetuses, *Int. J. Cancer*, 30, 281-287, 1982
- H. M. Temin, The Protovirus hypothesis, *J. Natl. Cancer Institute*, 46, III-IV, 1971

Chapter 11. Cancer

Because of all the attention that has been focused on viruses as disease agents for cancer, AIDS and many other diseases, it may come as a surprise to the reader that the vast majority of viruses and virus-like particles observed in human beings, animals and plants are not associated with disease. Most of them are somehow associated with an organisms normal physiological activities during growth and development. However, the function of these non-harmful viruses and virus-like particles has not yet been determined.

Virus-like particles have been observed in the organs and tissues of normally developing healthy embryos of humans and animals, and in the placenta of developing embryos or fetuses as well. According to our microvita theory of evolution, these viruses are causing the embryo to develop along the pattern of its evolutionary history. These viruses, now inherited in coded form in an organism's genetic material or DNA, were first brought to the DNA of the organism's ancestors in order to transform the evolving organisms species in a particular way that would increase its range of expression of instincts or micro-psychic longings, in P. R. Sarkar's terminology.

Microvita and Cancer

When something goes wrong with the normal functioning of a cell and the cell starts dividing uncontrollably and threatening the life of an individual, we say that cell has become a cancer cell. The interesting thing about cancer cells is that they do not produce any chemical products such as enzymes and hormones that are not also produced at one time or another by normal cells of the same organism during its life. Only the quantities and regulation of these chemical products is different in cancer cells as compared to normal cells.

All of the viruses associated with cancer tumors are retroviruses. They work by converting the RNA they carry into DNA with the help of reverse transcriptase, an enzyme they carry with them. That DNA is inserted into the genes of a target cell, and later on is stimulated to produce many virus copies. Retroviruses may also carry an additional gene called an oncogene, which is associated with the abnormal physiology of cancer cells. These oncogenes are also found in the DNA of normal cells. These genes are then called proto-oncogenes because it is thought they may be involved in the development of cancer or in the evolution of cancer viruses from cellular DNA.

It is known that a retrovirus that does not carry an oncogene can pick up one from a cell and incorporate it into its own RNA structure. When retroviruses without oncogenes are given to an animal, the animal will sometimes develop a cancer tumor which produces copies of the retrovirus. The retroviruses produced by the tumor are like the original retroviruses,

except that they now contain an oncogene. So it is not necessary that an initial virus given to animal contains an oncogene in order to cause cancer.

Do the oncogenes in cancer viruses originate during evolution from the proto-oncogenes in normal DNA? The main evidence for this is given above by the ability of a retrovirus without an oncogene to pick one up from cellular DNA. The other evidence is more indirect. The genetic material or DNA of genes, including proto-oncogenes, of animals and plants above the level of bacteria, is made up of portions of DNA encoding the final protein product, separated by portions of DNA that do not code for the final protein product. The parts that do code for the final protein are called exons, and the others are called introns. The interesting thing is that, after an RNA copy of a genes DNA is made, the introns are spliced out or separated from the exons, and RNA containing only the exons is sent from the cellular nucleus to the processing molecules, called ribosomes, outside the cell's nucleus, where this messenger RNA is used for manufacturing protein molecules from amino acids. The relationship of introns to exons on certain genes is quite specific, and is very similar in related species of animals, showing that the introns must have been there before the ancestral species diverged into two or more different species during evolution. So if oncogenes first evolved in viruses and later were transferred to cellular DNA and become hereditary, it must have happened before the species diverged many millions of years ago.

According to our microvita theory of evolution, viruses carrying genes created by microvita, have been adding genes to DNA from earliest evolutionary history. But our theory does not require that the genes for new hormones and other proteins in evolution had to evolve from microvita in the virus itself. The microvita could have evolved the new genes in certain body cells directly, and these new genes, now labelled proto-oncogenes, could have been picked up and distributed by viruses to other tissues and other species members in order to produce evolutionary changes. So what are called proto-oncogenes today were at one time new DNA created by microvita during the evolutionary process, were distributed by viruses, and are now inherited in the cellular DNA and are necessary for normal embryological development.

There is evidence that some introns may carry information needed in making a retrovirus, such as the code for reverse transcriptase. So an intron may be DNA from a later retrovirus that was inserted by a virus in the middle of DNA brought by an earlier retrovirus. According to another proposed theory, exons may have evolved separately as "building blocks" of DNA, and then were joined by introns to make more complex proteins. The microvita theory also permits this, since it mainly states that genes or gene parts were evolved from the action of microvita, and did not evolve by random interactions among component parts. Viruses play a critical role in

distributing these new genes widely to target organs and tissues and to other members of an evolving species and perhaps to different species as well. And once the new genes are inserted into reproductive cells by viruses, they become hereditary. These genes become active during embryological development, when they create the same changes in the evolving embryo that they created during the evolution of the ancestors into the present species.

The Nature of Cancer

If research on cancer viruses is suggestive of evolutionary and developmental mechanisms, the reverse may also be true. What can be learned about the nature of cancer from normal evolutionary and developmental mechanisms? Is cancer a normal developmental process gone out of control?

It is known that there is a class of proteins which are produced both in cancer cells and in the organs and tissues of developing embryos. These proteins are called carcino-embryonic proteins. These proteins are found in quantitatively similar amounts during embryological development and carcinogenesis or the development of cancer. This stimulated the hypothesis that there is a common, gene-related basic process in both. Carcino-embryonic proteins were also discovered in inflammatory or regenerating states of organ tissues and in the placenta and other extra-fetal structures. Apparently the genes for these carcino-embryonic proteins are de-repressed in certain phases of development and in cancer. Detection of these proteins in the blood became one of the first chemical methods of testing for certain types of cancer. The idea developed that cancer could result from abnormal regulation of normal genes.

There is a re-expression of fetal gene products in regenerative processes, i.e. regrowth of damaged tissues, and this re-expression is of a temporary nature. But in cancer tumor cells, the re-expression of fetal gene products usually becomes permanent. In the relatively few cases that have been investigated, the same gene product enzyme occurs both in normal development and in development of cancer, i.e. prenatal genes are re-expressed in cancer.

Whether a cell becomes cancerous or not can depend on the environment of the cell. An embryonic carcinoma cell--the stem cell of teratoma--is highly malignant when placed within the peritoneal cavity of the abdomen, but is apparently benign when placed within the blastocoelic cavity. One researcher suggested that this embryonal carcinoma cell could be "nothing more" than a normal, early ectodermal cell.

What are these prenatal genes that reappear in a cancer tumor? And why do they reappear? According to our microvita theory of evolution, an embryo develops normally through the action of endogenous, genetically inherited

viruses that act on target cells. These viruses cause embryonic cells to differentiate into various organs and tissues as they did during the evolutionary history of the species when these viruses were first created from microvita and acted to evolve the physical structure of the species ancestors. The function of the endogenous viruses found in developing embryos has not been explained clearly yet by scientists, but it is thought that they may play a role in normal development.

It is only a short step to suggest that "cancer viruses" may be just normal endogenous viruses expressed by an organism's genes at the wrong place in the body and at the wrong time. The normal function of endogenous viruses would be to transport "proto-oncogenes", i.e. normal developmentally related genes, to particular cells and tissues in order to supply developing tissues with enzymes or other proteins necessary for their development and differentiation. After the embryo has developed fully, the manufacture of endogenous viruses from the DNA of cells is suppressed by the action of mature cells. If this suppressive mechanism breaks down for any reason, then endogenous viruses are again created by a cell's DNA. But now these endogenous viruses cause cells to divide and differentiate in an uncontrolled way, and this is what we call cancer. During repair of inflamed or injured tissue, carcino-embryonic proteins are also found. This could explain why certain tissue injuries, for example due to exposure to ultraviolet light, may also lead to cancer. When the hormonal control system guiding development, maturation or organ regeneration or repair breaks down, growth stimulated by hormones occurs in an uncontrolled way, and this uncontrolled growth is cancer.

Cancer, in our view, is therefore caused by the breakdown of the cellular suppressive mechanism that prevents endogenous viruses from being produced after their work of helping to develop an embryo has been completed. The uncontrolled growth of a cancer tumor may create a semblance of some embryological tissue or organ, depending on the particular endogenous virus that is produced. For example, a small tooth was found in the middle of a cancer tumor in another part of the body than the head. Hair may also be found growing in certain cancer tumors where hair normally doesn't grow.

So cancer viruses are genetically inherited endogenous viruses whose normal role is to help an embryo develop along the pattern of its evolutionary history. They transport specific genes that activate chemical processes in specific target cells to cause those cells to develop or differentiate in a particular way at a particular time, as corresponding cells in one of the organism's ancestors first did in its evolutionary history due to the action of a virus. The cells created by these out-of-control endogenous viruses are cancer cells. Yet in most cases we cannot say that these uncontrolled endogenous viruses are the cause of the cancer. The

breakdown of the hormonal control system which directs the production of endogenous viruses is the root cause of the cancer. And this breakdown can occur for a variety of reasons such as radiation, carcinogenic chemicals, and various other kinds of stresses on the cell.

Cancer viruses, once produced, may induce cancer formation in otherwise normal tissues. It would depend on whether the site in the cellular DNA where the cancer virus adds its own manufactured viral DNA is under the suppressive influence of a hormonal system that can also suppress the development of new cancer viruses from the newly added viral DNA.

It follows from the above analysis that mechanisms of cancer development can best be studied by studying the organism's ability to suppress and express the manufacture of endogenous viruses during and after the development of an embryo. The amount of various hormones in the blood should correlate with the various stages of development of different embryonic organs and tissues, since these hormones are directing the expression of endogenous viruses which cause the tissues to develop and differentiate into different organs corresponding to the organism's evolutionary history. The spatio-temporal pattern of selective de-repression of endogenous viruses is what determines the growth and development of an embryo.

It follows that anything that changes the timing of that hormonally-controlled selective derepression process will change the development rate of different tissues and organs of an embryo. If this change in timing is encoded in an organism's DNA and inherited, then a new species could be created which will develop under the modified genetic hormonal control program.

Hormones have a major influence on the normal growth and structural development and maturation of an organism. A defect in the gland producing growth hormone can produce gigantism or dwarfism. Cancer tumors may also be activated or inactivated by the presence or absence of hormones from another part of the body. (Certain cancer tumors also produce hormones in areas of the body that don't normally produce these hormones.) Already, efforts to control cancer tumor growth through hormone treatment are well-developed in the medical profession. Some of the techniques of controlling tumor development are quite crude, such as the surgical removal of normal glands in order to remove their hormonal secretions which are stimulating tumor development in another part of the body.

Since some cancer tumors may be controlled by hormone treatment, it is reasonable to suppose that they could be controlled by physical exercises which affect hormonal secretions. Yoga asanas are one such type of exercise, and have in fact been prescribed by Sarkar as part of a naturopathic approach to the treatment of cancer.

Sarkar has also said that one biochemical effect of microvita is to act on the cell nucleus and alter the production of hormones in a cell, and thus affect the physical structure of an organism. So the introduction of positive microvita into the body through the action of certain homeopathic medicines and other means could also have a good effect on the regulation of hormones in the body and thus be beneficial in the treatment of cancer.

The microvita theory of evolution may lead to a better understanding of the cellular mechanisms that give rise to cancer, and a better understanding of the normal development process as well. Conversely, studying the mechanisms of normal cellular development and differentiation, as well as abnormal development such as cancer, may shed further light on the organism's evolutionary history and provide further evidence for particular features of the microvita theory of evolution.

The microvita theory of evolution provides a unified understanding of three apparently distinct roles that viruses play in life processes. As efficient distributors of new microvita-created genes for new hormones and other proteins and DNA control genes to various cells of an organism and to other organisms of the same species, viruses further the evolutionary process initiated by the efforts of species members to expand the range of their instinctive desires and behavior patterns. As genetically inherited endogenous viruses, they help an embryo to develop and differentiate along the evolutionary pattern of its genetic ancestors to create a fully mature organism with a specific range of micro-psychic longings suitable for its present ecological position and its evolutionary stage of mental development. And when the hormonal control processes regulating embryological development break down, these same endogenous viruses, now out of control, cause uncontrolled cell division and differentiation which we call cancer.

We have seen that it is not only hormones themselves but the proper timing of their actions on embryonic tissues that is crucial in the normal development and maturation of an organism. The production of hormones from the body is controlled, usually by complex chemical and neural feedback processes, from the pituitary gland, the so-called "master gland" in the brain. Even if the other endocrine glands are properly functioning, a defect in the functioning of the pituitary gland will disturb the timing of hormone production in the body and upset the normal developmental and maturational processes of an organism. So the pituitary gland is the key gland for normal embryological development and maturation. Disturbances of the pituitary gland should also lead to different forms of cancer, by activating in an uncontrolled way the production of endogenous viruses normally suppressed after embryological development is complete. Cancer tumors in various parts of the body would be the result, created by the action of uncontrolled endogenous viruses.

According to Sarkar, positive microvita begin their journey in the human body at the lunar plexus, his name for the yogic chakra corresponding to the pituitary gland. So positive microvita, acting first on the pituitary gland, could bring information not only for the creation of new DNA for hormones and other proteins, but also information changing the genetically controlled timing mechanisms for the expression of already existing hormones, which would alter the relative rates of growth of different parts of the body in a permanent way. In either case, a new species would be created, as long as the changes produced were large enough, and these changes were passed by viruses to the DNA of reproductive cells in order to become hereditary.

So it seems that the pituitary gland is the key controlling gland for the evolution of the physical body. In less developed animals and in plants lacking a pituitary gland, some other controlling nuclear structure or plexus would be the primary attractor of positive microvita that would bring new DNA for evolutionary changes in the organism's physical structure.

Since in humans and more developed animals the pituitary gland receives chemical and neural inputs from higher centers in the brain, this implies that psychological factors, mediated through the nervous system, will also play a role in the regulation of normal hormonal control mechanisms of the body. Psychological factors could also play a role in restoring balance to a hormonal system that has been thrown out of balance by disturbing environmental factors. Specific mental imagery has already been demonstrated to have a controlling effect on cancer in certain persons, when carried out in association with other forms of medical treatment. In cases where mental stress could trigger the development of cancer by destabilizing the hormonal balance of the body, techniques such as meditation could be helpful in preventing such a destabilizing hormonal effect from developing, or in restoring hormonal balance in a way that facilitates a cure for previously developed cancer.

Chapter 12. AIDS

In our analysis of microvita and cancer, we suggested that cancer viruses are originally endogenous, genetically inherited viruses that contribute to an embryo's development along its evolutionary pattern. Identical viruses had originally contributed to the evolution of the developing embryo's species ancestors. And those viruses with their DNA or RNA had been created by the action of microvita emanated from the Cosmic Mind and sent to the evolving ancestors of an embryo. The viruses developed the psycho-physical longings of the species' ancestors by metamorphosing their physical structures into a new species or subspecies.

When these inherited viral genes are switched on at the wrong time or place, after their work of developing the embryo is complete, then uncontrolled cell division and tissue growth occurs which is called cancer. In normal development, the expression and suppression of these endogenous virus genes are under the control of the body's hormonal system.

At first glance, AIDS (Acquired Immune Deficiency Syndrome) seems very different from cancer. AIDS affects the body's immune system and leads to the development of usually rare diseases, which in the person with AIDS can prove fatal.

AIDS has been connected with a virus, called HIV (Human Immunodeficiency Virus). The present scientific consensus is that HIV causes AIDS. There is no known cure for AIDS, and no known vaccination will protect a person from getting AIDS. Although more is now known about HIV than any other virus, still neither a medical prevention or a cure is in sight, despite much research.

One of the difficulties in treating AIDS is due to the fact that HIV is a retrovirus. Like retroviruses associated with cancer tumors, it carries two equivalent strands of RNA and the enzyme reverse transcriptase inside the virus' protein coat. In a body cell, the RNA is converted by the enzyme into DNA, which is added to the DNA in the nucleus of the cell. This embedded HIV DNA can then remain in a latent or inactive state for up to ten years, reproducing along with the normal cellular DNA when a cell divides. Then the viral DNA can be stimulated by another viral infection or some other cause to produce new copies of HIV which then cause the symptoms of "full-blown" AIDS to develop. This full-blown AIDS is generally fatal, at present.

In order to study the effects of HIV experimentally, scientists have now succeeded in producing genetically altered mice that inherit HIV. This work was recently done by Dr. John Leonard the National Institutes of Health in Bethesda, USA. Developing mouse embryos are injected with the DNA that encodes HIV. In some mice this DNA is incorporated into the mouse's reproductive cells, thus making the HIV hereditary. Offspring produced from

these mice will have HIV DNA in every cell of their bodies, along with the normal mouse DNA.

These "transgenic" mice are abnormal in many ways. The HIV does not seem to kill cells as it does in humans. Clumps of immune cells stimulated by the viral DNA enter the lungs of the mice, like the effect of AIDS in humans. The mouse's immune system doesn't work properly. Also, their tails develop a skin disease, in which the skin grows faster and thicker than normal. It seems that the HIV genes are responsible for these effects directly and not through the death of cells by the action of the HIV genes, since cells are not dying in the mice from the effect of the HIV genes.

HIV-produced viral DNA contains a section of DNA called the LTR sequence. This has the ability to switch on the activity of other genes in the viral DNA embedded in cellular DNA. Some transgenic mice were produced containing not the whole HIV DNA but only the LTR sequence. Tests on these mice suggest that HIV can be switched on by proteins found in the thymus gland, where the helper cells of the body's immune system develop. (Helper cells are one type of cells infected by HIV in human beings.) But such proteins turning on the LTR switch were also found in other parts of the mouse, such as the eye and the heart, which are not apparently related to AIDS.

In work by Dr. Gilbert Jay at the National Cancer Institute in Bethesda, USA, different transgenic mice were developed which carry the LTR switching sequence and another HIV gene called *tat*. These mice develop a skin cancer similar to Kaposi's Sarcoma, which infects many people with AIDS. This may disprove the hypothesis that Kaposi's Sarcoma is caused by a separate virus when the body's immune system is weakened by AIDS.

Dr. Flossie Wong-Staal, also at the National Cancer Institute in Bethesda, hypothesizes that the *tat* gene encourages production of some cell proteins encoded by the mouse's own DNA. These proteins then cause uncontrollable growth of skin cells. This would produce even more of these proteins, resulting in skin cancer.

Another regulatory gene in HIV, called *nef*, plays a role in keeping the HIV virus in a dormant stage. Better understanding of this gene may lead to the ability to keep the HIV in an infected person suppressed, so that symptoms of AIDS do not develop.

Based on the above evidence and our previous reasoning about viruses and cancer, we can propose a tentative hypothesis about the origin of AIDS. I suggest that, like many so-called cancer viruses, HIV or a virus very much like it, is actually an endogenous, genetically inherited virus in all human beings, as well as other developed mammals. This endogenous HIV plays a normal role in the embryological development of the immune system, particularly in the tissues in the thymus that develop T helper cells. And it

has other roles in the embryological development of skin, the heart and the eye.

When an adult or child is infected with foreign HIV, the body responds, producing antibodies which signify the presence of HIV. The reason why foreign HIV causes so much damage is that it so closely resembles the body's own non-infectious endogenous HIV. The foreign viral DNA is suppressed in the cellular DNA for so long for the same reason, as the same hormones which suppress endogenous HIV suppress foreign viral DNA also. But when the foreign HIV in the nuclei of cells is finally desuppressed by some stress to the body, the body responds as if its own endogenous HIV is desuppressed, and perhaps it is. The HIV virus then multiplies rapidly, leading in many persons to Kaposi's Sarcoma, the skin cancer mentioned previously. The HIV also then interferes with the proper functioning of the immune systems cells, which normally are developed through the action of endogenous HIV during embryonic development. The characteristic clumping together of some of the immune systems helper cells, observed in AIDS, is produced. The activated foreign HIV can affect all those areas of the body where there are target cells responsive to endogenous HIV during normal embryological development. This then results in full-blown AIDS.

So we predict that a virus very similar to HIV will soon be discovered to be an endogenous, inherited virus in all developed mammals and other animals with a developed immunological system and T helper cells. In fact, the HIV originally must have been a virus whose genes were created by microvita to help develop the body's immune system. It played a role also in the evolution of various other tissues of the body, such as skin, heart and eyes, and perhaps the brain as well, since HIV has been found to act on target cells in the brain.

If HIV is recognized as an endogenous, inherited virus serving many necessary roles in immunological and tissue development, the approach to finding a cure for AIDS should change as well. As in cancer, the only real solution is to bring the body's hormonal system back into balance so that HIV will be again suppressed when its normal functional role is not needed. Its normal role is in development and perhaps in regrowth of damaged tissues or organs of the immune system or other body structures such as the heart, skin and eyes where endogenous HIV has a developmental role.

There is systematic variability in the pattern of people who gets AIDS. So both prevention and cure should focus on finding a lifestyle that gives maximum strength to the body's immune system and maintains the proper hormonal balance of the body. In this way, foreign HIV will be defeated by the immune system or suppressed if it has already gotten into the DNA of the cells. The physical and psychological practices of yoga and meditation are likely to form a necessary part of that lifestyle, because of the role they

play in stress reduction, balancing the body's hormonal system and strengthening its immune system.

It is interesting to note that the way scientists modified mice in the laboratory so that they inherited the AIDS virus in their genes, is basically the same way that we propose that mice, or their evolutionary ancestors, acquired endogenous HIV the first time by means of microvita. That is, DNA coding HIV genes "infected" a mouse's ancestor (the same species ancestor as human beings) and passed the "infection" to the embryos of developing offspring. Finally the HIV is incorporated into the reproductive cells and the virus adds its genes to those of that ancestor species. The HIV in the genes of the ancestor species then becomes active during the normal development of embryos of each successive generation, specializing in the development of the immune system and certain other body tissues.

The fact that scientists are now routinely adding DNA to developing embryos (even sometimes by means of a carrier virus) to add new hereditary genes to an organism is strong, though indirect, support for the idea of a virus-mediated mechanism for adding new genes to organisms in their evolutionary history. It is already known that there has been inter-species transfer of endogenous viruses during evolution, but the effect of these transferred viruses on evolutionary changes of the species has not been proved. Our theory explains the origin of endogenous viruses by saying that their genes were the creations of microvita responding to species members active efforts to modify their instinctive expressions. This resulted in an appropriate physical metamorphosis of their bodies to bring the desired instinctive changes.

Chapter 13. Medicine, Harmony and Health

In order to develop the theory of microvita so that it applies to the field of medicine, we must first have a clear concept of what life is. According to P. R. Sarkar's book *Idea and Ideology*, life exists when there is a proper adjustment and parallelism between a physical body and a mental body or mind. Due to this parallelism there is an attraction between the mind and the body, which results in an association between them. This association is life, while disassociation or separation of the mind and body as a result of loss of proper adjustment or parallelism is death.

Ten vital energies or vayus, collectively known as Pranah, coordinate this association between the mind and the body, through the various plexuses, or chakras, of the human psycho-physical structure that control the mind and the five fundamental physical factors in the body, the solid, liquid, luminous, aerial and etheric factors. The vital energies are purely physical in composition, consisting of different expressions of the aerial factor. They are also known as vital airs. Pranah is a blind force. It cannot act independently, but require direction from the mind in order to carry out its functions properly. The developing theory of microvita suggests that microvita are the direct organizers of Pranah in the body. Microvita, under the influence of mind in cases where mind is expressed, would organize and maintain Pranah, which would maintain the association with mind and body in the condition called life.

Disease (dis-ease) is the state of improper or unbalanced adjustment between a physical body and a mind. There is a corresponding subjective unhappiness, pain or loss of physical or mental equilibrium in the disease state. The proper role of health workers is to prevent and remove disease and to restore a proper adjustment and balance between the body and the mind. This adjustment must be in the direction that gives people the greatest ability to develop and express their physical, mental and spiritual potentialities as human beings. Otherwise imbalance, frustration or unhappiness will remain at some level of the mind and we cannot say that the disease has been cured.

The relationship between the mind and the body is mediated through the vital energies or Pranah of the living being. Since microvita are in every structure at certain controlling nuclei, disease symptoms are indications of a defect in the organization of Pranah. This implies a defect in one or more of the microvita nuclei that control Pranah. So the most direct approach to curing disease would be to correct the defects in the microvita nuclei by changing in some way the microvita there. To do this is the essence of proper medical practice.

Not only do microvita nuclei exist in the individual organism, but in society as well, since society is an organic collection of individuals. If the nuclei of a

society are unhealthy, maintaining the health of individuals in that society will be difficult, as they will be affected by the defective microvita nuclei of the society itself. So medicine has a social as well as an individual dimension, since all the microvita nuclei of individuals and society should function in a proper, balanced way. Sarkar has introduced the concept of Prama as the balanced state of equilibrium and equipoise in the physical, mental and spiritual levels of the individual and society. Prama is disturbed by negative microvita in individuals and society, and is restored by the application of positive microvita.

Even when both the body and the mind are free from disease, there can develop or remain, also due to the action of a subtler type of microvita, a desire or dissatisfaction that cannot be treated successfully except by the following of practices that lead a person towards a state of spiritual realization or self-realization. So medical practice in its broadest sense should include the application of spiritual practices for self-realization as one of its remedies for human physical and mental ailments.

Harmony Between Body and Mind

According to yoga philosophy, every object that exists is vibrational and can be described in terms of waves of various lengths and frequencies. This is true for both the physical body and the mental body or mind. The cruder the vibration of an object is, the shorter is its wavelength, while subtler objects have longer wavelengths. The five fundamental physical factors--solid, liquid, luminous, aerial and etheric factor--have increasingly long wavelengths from solid factor to etheric factor. Mental waves have still longer wavelengths, increasing from conscious mind to subconscious mind to superconscious mind (supramental, subliminal and subtle causal mind). Beyond the superconscious mind the wavelength would be described as being infinite or immeasurable.

Seen in this light, the proper adjustment and parallelism between mind and body, or psycho-physical parallelism, does not require that the wavelengths of the body and mind be equal. If wavelengths do not have to be equal to be in proper adjustment, then what is required? Another term for proper adjustment is harmony. There must be a harmonious relationship between the waves of mind and body. But here harmony is not just a metaphor. It implies a precise mathematical relationship between the wavelengths of the mind and the body. So we should look for the indicators of harmony and health of body and mind in the mathematical relationships between frequencies described in the science of musical harmony. And microvita, through their control of Prana, are the key to creating, maintaining and restoring a proper adjustment of wavelengths of body and mind.

When two or more musical notes have certain regular relationships of their frequencies or wavelengths, we say the notes are harmonious or in

harmony. Otherwise the relationship is one of disharmony or dissonance. Musical dissonance is often accompanied by an uncomfortable or strained mental feeling (dis-ease), which is resolved (re-solved or cured) if the musical notes come again into a harmonious relationship. So the relationship between harmony and health is a close one. Let us go a little deeper into the comparison.

Good health implies a harmonious relationship or proper adjustment between the wavelengths of the physical body and the mind. Now suppose some physical disease occurs, corresponding to a shortening (crudifying) of certain physical wavelengths of the body by a small amount. This would be caused by a defect in some microvita nucleus that causes the Prana to go out of balance. Now the body and mind will be out of harmony and there will be a state of disease. This disharmony can be expressed as a relationship between the wavelengths of the diseased body and the corresponding wavelengths of the mind. These wavelength differences would correspond to symptoms of the disease the person is suffering from.

As a result of this shift in the relationship of wavelengths of the physical body and the mind, the attractive force between the physical body and the mind decreases. It becomes more difficult for the Prana to maintain the relationship between the mind and the body. The greater the shift in wavelengths, the stronger the symptoms of the disease, and the greater the decrease in the attractive force between the body and the mind, caused by the Prana. If the physical wavelengths decrease beyond some critical limit, Prana cannot maintain the adjustment between the mind and the body. Death, the disassociation of the mind and body, occurs, and the mind and body separate.

What is the effect of an imbalance in the harmony of body and mind? When there is a small difference between two frequencies or wavelengths of two vibrating objects, a process of addition and subtraction of the waves from the two frequency sources takes place, producing what are called "beats" or pulsations of sound. The frequency of the beats is equal to the difference between the frequencies of the two frequency sources. For example, if the frequencies of two musical tones is 440 and 441 vibrations per second, then the beat frequency that will be also heard will be 1 beats per second. The closer the two original frequencies are to each other, the smaller the beat frequency and the longer the period of time between beats will be.

A similar but subtler relationship would apply to two frequencies or tones which were initially in a harmonious relationship (say, one frequency was two times the other) and then one of the frequencies changed slightly. Instead of beats being created, there is a different periodic change in the time or phase relationship of the waves produced by the two frequency sources or tones. A corresponding unpleasant or out-of-tune feeling is created in the listener. This dissonant phase relationship between the two

frequencies is projected into the environment of the tone sources, so that any acoustically sensitive listener can know that the two musical notes are out of tune. If the frequencies of two harmonious frequency sources are both lowered a proportional amount, we can say that the two notes still have a harmonious relationship with each other, but a person with a sensitive ear for music will notice that both the musical notes are "flat" with relationship to some other standard of pitch. Similarly, if the waves of both the body and the mind are shifted proportionately to shorter wavelengths, there may remain parallelism between the mind and the body, but the person will not be able to function at the level possible when both body and mind are in harmony at a subtler level.

So a lack of harmony of body and mind is expressed as symptoms of disease, and in frequency terms as a dissonance of frequencies or wavelengths. That dissonance is "broadcast" into the body and environment. Microvita are then attracted to the defective microvita nucleus, resulting in the cure of the disease. In many cases the organism cures itself by restoring the proper balance of microvita to its microvita nuclei. Medicines capable of stimulating the body's natural healing processes will have microvita in them which create vibrations in the Prana similar to the dissonant vibration frequencies of the Prana of the diseased person. The microvita in these medicines produce the same disease symptoms in a healthy person, where dissonant vibrations in the person are absent, as the disease symptoms they cure in a diseased person where the dissonant vibrations are present. This is how one recognizes the correct medical remedy in homeopathy.

Microvita can be both the cause and the cure of diseases of the physical body and the mind. Microvita have a particular vibration and in general will be attracted to minds and bodies with a similar vibration. Normally a loss of harmony between body and mind will attract negative microvita such as disease viruses which will intensify the lack of harmony until the body's vital resources are able to combat the psycho-physical imbalance which was the original cause of the disease. Yet we have seen that psycho-physical dissonance can have the effect of attracting microvita that can cure the disease of a person. This seems like a contradiction, since disease-causing agents (viruses) and health producing homeopathic remedies both are "tuned" to the psycho-physical dissonance of a diseased person.

Can it be that a virus is actually a kind of homeopathic remedy that is attracted to a person who has already developed the psycho-physical dissonance or symptoms that the virus is supposed to have caused? A person without the psycho-physical dissonance corresponding to the virus will be immune to that particular virus. It is well known that there are many viruses and other disease-associated organisms in the environment but only some people fall sick. Certain virus infections actually result in the strengthening of an organism so that it is more resistant to other diseases.

So the presumed adversary relationship between health and viruses is not so clear as might be supposed.

And when we consider that microvita may create viruses that mediate evolutionary transformation, attracted to living beings with psycho-physical dissonance in their instinctive expressions, the actual role of viruses in disease and evolution becomes a little clearer and more integrated. Viruses, even when they seemingly cause disease, may actually be the agents for evolutionary transformation of organisms, leading to both physical and mental evolution. They do not cause the transformation, but are the mediators of that transformation which was actually initiated by the living being itself through dissatisfaction with its instinctive expressions.

Many questions remain unanswered in this brief discussion of the relation of microvita to medicine, harmony and health. The main theme is this: Microvita are the organizers of an organism's Pranah or vital energy, which maintains the life and health and internal harmony of the organism. Disturbance of health means disturbance of some microvita nuclei regulating Pranah, resulting in loss of internal harmony. It follows that health maintenance and health restoration of an individual or of society requires the proper application of microvita to the microvita nuclei of their individual and collective bodies and minds to restore that harmony. This would be the role of medical practice in the Microvita Age.

Chapter 14. The Creation of Life in Scientific Laboratories

The ultimate test of our practical understanding of the answer to the question "What is life?" will be to create a living organism in a laboratory from non-living component parts. Even the materialistic view of the evolution of life says that this should be possible. All that would be necessary is to create the right physical and chemical environment, and life could evolve from matter right under the eyes of scientists. Of course, the time required for life to evolve in the laboratory would depend on the means by which life was created originally. And scientists might not be willing to wait the time that was necessary for life to evolve the first time. It may have taken about billion years for the first blue-green algae cells to evolve after the formation of the Earth about 4.5 billion years ago. The first fossil evidence of living cells has been dated to about 3.6 billion years ago. But any day, new discoveries of even older fossil remains could push back the date of the existence of the first living cells even earlier. In fact, scientists have no idea how long was necessary for the first living cells to evolve from inanimate matter. If life originated on Earth then it probably required less than one billion years. But if originated in outer space, as some scientists believe, then it could have taken much longer.

According to our microvita theory, the creation of the first living biological structure could have taken perhaps a few seconds, once the necessary chemical ingredients and physical environment was available. Microvita emanated from the Cosmic Mind at that point could have mobilized the prana or subtle energy in atoms or in free space and brought the right combination of amino acid molecules together to make the first proteins, and the right combination of nucleotide molecules together to make the first DNA or RNA, and then combined them together in a suitable package that was able to reproduce itself in the existing physical and chemical environment in which it was created. Our microvita hypothesis predicts that a highly diluted and shaken solution that originally contained antibody molecules but no longer contains any because of the high dilution, may create new identical antibody molecules in a few seconds in a solution containing the necessary chemical building blocks. If this hypothesis is found to be correct then the creation of the first living structure from the proper microvita and physical ingredients should not take much longer.

For the moment, let us assume that the hypothesis is found to be correct. It is only a specific deduction from P.R. Sarkar's statement that positive microvita can vitalize carbon atoms and cause them to develop ultimately into human structures. If Sarkar's statement is correct, then the only question is how to translate his statement into the practical creation of life in a laboratory. In January, 1988, Sarkar predicted in the author's presence that life would be created in scientific laboratories in the near future. Along with that prediction he also said that he would speak on the transformation

from inanimate to animate existence at the coming Renaissance Universe seminar, which was to take place in May 1988. It was in the May Renaissance Universal discourse that Sarkar made the statement about vitalizing carbon atoms with positive microvita. The discourse is entitled "Mobility and Movement of Microvita". So this vitalizing of carbon atoms by positive microvita seems to be the key to the creation of life in scientific laboratories.

A recent highly publicized controversial scientific report about the "water memory" experiment, claimed that a highly diluted and shaken solution of certain antibodies can have the same biological effect on certain white blood cells as these antibodies themselves, even though no antibodies remain in the highly diluted solution. Since this result can be explained, at least in part, by the action of microvita, the result has a high bearing on the effort to create life in a scientific laboratory. So researchers on the creation of life need to follow up that experiment with related experiments on the physical effects of other highly diluted substances, like DNA, RNA, various proteins, enzymes, and even whole viruses.

It should be determined whether highly diluted solutions of these substances, which no longer contain a single molecule of the substances, can create identical molecules of the substances when added to solutions containing the chemical building blocks of the substances. If new identical molecules can be created in this way, presumably by the action of microvita from the original molecules, it suggests that these molecules might have been created by microvita in the distant past from chemical building blocks. These would be the same type of microvita that now reside in the chemicals and are responsible for the above creation of molecules from chemical components by the addition of a highly diluted chemical-free solution. Scientists, by studying the creation of biologically active molecules by this means, may find a way to generate living organisms in a stage-wise process by adding various highly diluted chemical-free solutions (obtained by highly diluting proteins or RNA) successively to a solution of chemical building blocks such as amino acids and nucleotides, which themselves can have been created by natural processes. Microvita in the chemical-free solutions would mimic the action of primordial microvita in creating the first biological proteins and RNA and building up the first living biochemical structure, which later evolved into a protoplasmic cell.

Chapter 15. Who Should Play God?

In our discussions about the role of microvita in the creation, evolution and development of life and the maintenance of health it is important to keep in mind the moral and ethical dimension of research into the origin and nature of life. The same objections may be raised about research on the creation of life as have been raised about the modification of existing life forms by genetic and other means. Scientists and genetic engineers have been accused of "playing God" by developing and using new biological discoveries and techniques to genetically modify organisms and create new forms of life.

Although the accusation of "playing God" is sometimes based more on emotion than on reason, it emphasizes that there are moral, ethical and spiritual dimensions to the efforts to create or modify life forms, in addition to scientific, economic and safety dimensions. And while the accusation reminds us that scientists are not gods, it also implicitly acknowledges that there is human beings a desire or instinct, more or less expressed, to "play God", that is to develop god-like powers and knowledge, to exchange limitedness for limitlessness. Religious dogmas usually attempt to suppress this instinct, resulting in unnecessary feelings of inferiority and an "I am a sinner" complex. But in fact this human urge to "play God" or express divine qualities need not be suppressed or ridiculed. Rather it can be channelized into efforts towards real spiritual progress which will benefit both the individual and society.

Scientists are already creating new forms of life in laboratories by a variety of techniques. In one such technique, the very early embryos of two different animals, such as a goat and a sheep, are joined together. When the embryos develop, they may produce not two animals but a single animal combining physical properties of the two different species. Another technique is called genetic engineering. Genetic material or DNA from one organism is inserted into the DNA of a different organism. If the DNA is added to single-celled organisms, such as bacteria, or the reproductive cells of a multicellular organism, such as a mouse, then the new DNA is genetically inherited by descendants of the organism that received the new DNA. A genetically engineered organism will have one or more new characteristics that it did not have before, such as the ability to manufacture some additional hormone or enzyme, as a result of the new DNA in its genes.

P.R. Sarkar has predicted that in the near future life itself will be created in scientific laboratories. This will be a major advance over the present capabilities of scientists, who now are only modifying previously existing organisms by genetic transfer and by combining embryos of different animals. It is clear that microvita will have a major role to play in this scientific creation of life. We have already seen that the recently published report about biological effects of highly diluted antibodies cannot be

explained by current scientific theories and will probably require an explanation in terms of microvita. Based on this research, we have predicted that highly diluted solutions of a biological substance can create the same molecule from chemical building blocks, even though no molecules of the original substance remain in the highly diluted solution. Such a result could be explained in terms of the action of microvita. It would also have a big impact on efforts to create life in a scientific laboratory.

When scientists and genetic engineers are described as "playing God" the implication is that either genetic engineering should not be done at all, or at least that scientists and genetic engineers should be more aware of the ethical dimensions of their work, and alter it accordingly if necessary. The main fear seems to be that genetic manipulations on animals, plants and human beings could lead to irreversible damage to living beings in the form of new diseases that could be caused by genetically engineered life forms, and that the power to alter life will be abused by persons or groups with selfish interests. There is also the fear that genetically engineered animals and plants will suffer from the effects of the changes, or that such modified animals and plants will be exploited by human beings without regard for the welfare of the animals or plants themselves. So the main practical and moral objection to this research is that the potential for harm to humanity, animals and plants, either knowingly or unknowingly, caused by modifying present life forms through genetic engineering and related technology is much greater than the benefits that might be gained from such techniques.

There is also the implied objection, stemming from some religious beliefs, that the artificial creation of new life forms goes against the wishes of the Creator. For to accuse practitioners of genetic engineering of "playing God" implies that no human being should ever "play God", i.e. imitate God's described role as the creator of living organisms, whether that process of creation took place through evolution or any other means. The idea is that human beings should not act like gods, since their inherent human weaknesses will prevent them from fulfilling the described functions of God properly, and that the spiritual pride and arrogance causing them to dare to perform God's described functions will certainly lead them to destruction and bring harm to others as well. So the religious view opposing genetic engineering stems from the belief that "playing God" will certainly result in spiritual, moral and physical harm to those who "play God" as well as others.

Another religious objection is that, even if human beings could fulfill certain divine functions perfectly, God still might not like it. Perhaps God would be angry and jealous that someone else is trying to take over His role, and actually trying to become God.

Let us consider, one at a time, these objections to genetic engineering and experimenting with the creation of new life forms. The first criticism is that genetic engineering could lead to irreparable harm to human beings or other

living beings. While this objection is correct, it is not a fatal objection. For many scientific discoveries in history, such as fire, gunpowder and atomic energy both can and have led to harm to human beings and other living beings. But careful applications of these technologies have had many beneficial effects as well. Scientific knowledge, it is said, is a two-edged sword. It can lead to either welfare or harm, depending on how it is used.

To try to suppress the development of scientific knowledge, when the process of gaining knowledge does not itself harm society or violate valid moral and ethical standards, is futile. For one essential part of human nature is the desire to know the truth about life, the universe and oneself. To suppress the search for knowledge is to suppress human nature itself. The essence of science is to search for knowledge and to apply this knowledge for individual and collective welfare. How the results of scientific research on the creation and modification of life are to be used is a question the whole society must answer in a rational way. This should be done by considering all the facts, the pros and cons, the knowns and the unknowns involved in particular applications of scientific knowledge. Then a decision can be made based on the effect of the application of the knowledge on the welfare of the whole society, as well as all animals and plants.

In such decisions, considerations about individual and collective welfare should be paramount. Where there are known dangers in such research, as in all research, these should be taken fully into account. Where there are unknown dangers, it is better that careful research should uncover them before any harm to the society results. This means proceeding ahead with due caution, but it does not mean to not move ahead. It does mean that selfish individual and group interests, such as the desire for money, fame or power, should not guide such research and applications of scientific knowledge, since in the pursuit of these things people often forget about the general welfare. So a system must be created which excludes these selfish interests from being the driving force behind such research and applications of scientific knowledge about life.

So the first objection to research on the creation of new life forms is answered by creating proper institutions and leadership to guide such research for the welfare of the whole society. In this way, the harm that could come from ignorance, and the abuse and exploitation of life forms for selfish gain at society's and other living beings' expense would be minimized, while the benefits in terms of individual and social welfare would be maximized. The creation of such benevolent institutions and leadership may be a difficult problem, but it is not an insurmountable one. To stop all such research until such ideal social institutions are created is impractical, as the benefits of such research in areas such as medicine and agriculture currently seem to outweigh the risks. So society must proceed with caution, weighing the benefits and risks of such continued research at every step and

passing and enforcing proper legislation regulating such research whenever necessary.

The first religious objection to "playing God", i.e. creating new forms of life, can also be answered in a rational way. It is to recognize that human beings do have certain weaknesses, such as pride, the desire to accumulate wealth, power and prestige even if their actions in pursuit of these goals go against the collective welfare of society and other living beings. So here the solution is to not let these weaknesses be motivating factors behind research into the creation of new life forms. The research should continue, when it does not violate moral and ethical values, but it must be carried out by persons whose motivations are pure and who have sufficient mental strength and moral integrity to resist temptations to work for selfish individual or group interests.

The main motivation for research on creating new life forms, or any other scientific research for that matter, should be the desire for knowledge and the application of that knowledge for the welfare of the whole universe. One can also be spiritually motivated to conduct such research, by feeling that ones actions are guided only by the desire to please the Creator, and not by selfish motives such as the desire for individual rewards for one's actions. Such a spiritual motivation would require a high degree of self-insight, as the potential for self-deception in human beings--hiding selfish motives behind a facade of noble motives--is very high. In fact this type of spiritual motivation for work is the highest motivation, and the one that, if genuine, is the least likely to bring harm to oneself and others.

How can scientists channel normal human desires for power, name and fame into desires for knowledge, service to the universe, and devotion to the Supreme? The best way is to do spiritual practices which develop these lofty qualities. These tendencies are inherent in the nature of every human being, and spiritual practices bring them out. The goal of spiritual practices is not narrow self-interest but oneness with the ultimate source of all life. So the scientists researching the origin and variety of life in the future should be spiritualists, in the broadest and best sense of the term. Only genuine spiritualists can be relied upon by the society to work for the welfare of the society and the whole universe, and not for any narrow and selfish interests. Sarkar calls such genuine spiritualists Sadvipras. So scientists researching the creation of life should channel limited human qualities into qualities associated with the fullest expression of humanity. When such efforts are genuine and the results promote the welfare of the whole society, who can object?

As to the objection that God does not want human beings to "play God", one can ask, "What kind of father does not want his children to realize their full human potential?" The development of full human potential should not be confined by narrow dogmas that try to limit the heights that the human

mind, moral sense and personality can reach. According to Sarkar, as human beings evolve, they move from more physical to psychic levels, and then from psychic to more spiritual levels of existence. Finally they realize that the responsibility for the care and unfolding of the potentialities of the whole universe is their joint responsibility with the Supreme Creator or Cosmic Consciousness. Sarkar has described this evolutionary development of human beings in his philosophy called Neo-Humanism. Individually, human beings should make efforts to merge their minds into the mind of the Supreme Creator, while collectively they should work for development and utilization of all of the hidden potentialities of the universe, life and mind, for the benefit of all. The evolution of the universe itself will be furthered by this collective effort of human beings towards their spiritual goal.

So it is important to separate valid criticisms and cautions about research into the creation of life and new life forms from beliefs about the nature and purpose of life and human beings that are based on narrow dogmas. Every day doctors and scientists as well as other people are "playing God" when they make life-or-death decisions in their treatment of dying patients, in their conduct of research on animals and living embryos, and in their decisions on whether or not to swat a fly, use pesticides or eat meat. Human beings cannot avoid moral and ethical decisions on issues involving the creation and destruction of living beings in any form. So the question is not "Should human beings play God?" but "How can human beings become divine?" In their individual and collective efforts to reach the fullest expression of humanity, which according to Sarkar is no different from divinity, they will find the answers to all of their other questions about the nature of and creation of life.

Chapter 16. The Future of Human Beings

P.R. Sarkar has given only a few hints so far about how human beings will be affected by microvita in the future. He says the theory of microvita has immense potentialities for introducing numerous changes in human beings. Major changes can be made in the protoplasmic cells of the human body, for example. With the application of positive microvita, ordinary persons will become extraordinary. If microvita are supplied in sufficient quantity, their mental qualities and capabilities can be enlarged. Microvita can change the ectoplasm of the mind. This will bring further changes in the mind and as a result the human mind will be able to control the physical body in a better way.

He says that as a result of the application of microvita, there will be remarkable changes in human personalities. Changes in the nerve cells caused by microvita will bring about changes in the ectoplasmic cells of the mind. This will bring about a change in the effulgence emitted from the body. Other changes will take place in the human body during the age of microvita. Human beings will become more psychic than physical, and in the next phase they will become more spiritual than psychic.

It is difficult to imagine the profound changes that will be brought about by the application of the theory of microvita to human beings in the future. At least Sarkar is implying that these changes will be beneficial for human beings. It means that the persons who are applying the theory of microvita to produce these changes will be qualified to know what changes will really be beneficial for human beings. Those persons knowing how to apply the theory of microvita will no doubt bring various changes in themselves first, and then inspire others to produce these changes in themselves, as they also realize the value of these changes. The human evolutionary process will advance with tremendous speed during the age of microvita.

Positive microvita will be used to continuously expand and deepen the micropsychic longings of human beings, so that they will be able to experience more fully the psychic and spiritual potentialities inherent in themselves but which now are hardly expressed at all. The physical body and brain will necessarily become more subtle as well, so that they will be able to express more subtle feelings and the mind will be able to think more subtle thoughts. For in order to maintain life or psycho-physical parallelism between the body and the mind, the body will have to evolve to keep pace with the evolution of the mind.

How will the physical body of human beings change in the future? Sarkar said some years ago that in the future their heads would become bigger, their eyes smaller and their limbs thinner. But he said that these future humans would find their physical appearance quite normal, just as we find our own appearance normal. We can assume that all of these changes will

be brought about by the action of microvita on the cells of the body, adding new genes that manufacture new hormones and other chemicals that bring about these physical changes. He also said that in the future human babies would be created in scientific laboratories, and that they would be more spiritually oriented than the human beings of today. With the creation of human beings in scientific laboratories, nature would gradually take away the normal reproductive capacity of human beings, since it would no longer be necessary for the continuation of the human species.

The process of human evolution has not stopped. The present human beings stand at one point in an evolutionary process that goes billions of years into the past and may extend billions of years more into the future. According to Sarkar, a final "heat death" of the universe will never occur. If one planet or star becomes unable to support life, human beings will migrate to other planets. Humanity will never perish. Rather, there is an unimaginably bright future for humanity. The universe will never cease to exist. Sarkar said in a discourse in February 1985, entitled "The Universal Man and The Transcendental Entity:

"Perhaps you remember that I said that there won't be any thermal death of the universe...the universe will remain forever. In certain portions there will be introvert, in certain portions there will be extrovert... but the universe will remain. You need not be afraid of thermal death. The total number of calories will be unchanged, so far as the world of physicality is concerned. And the calories in the psychic and spiritual phases will go on increasing forever; that is, your future is assured. You need not be afraid of collective death or of any other kind of death."

The coming microvita age will facilitate the development of human potentialities and the potentialities of the universe in ways that cannot even be conceived of now. Each upward evolutionary stage of humanity will be filled with the realization of more human and divine possibilities and potentialities than the last. At every new threshold of humanity's evolutionary journey a new world has awaited us. Microvita appear to be the key to the doorway to the infinite. Humanity must now take up that key and move ever onwards towards life's ultimate goal.

First published 1988, Mainz, Germany

Typographically corrected 2010

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