

**SIGNS OF A
REVOLUTION
IN SCIENCE**

BY

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TRANSACTIONS

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It is a great privilege and honour for me to be asked to speak to you today, in memory of Theodore Leslie Crombie, or TLC as he was known to his friends. Of course, I did not know him personally, but Sophia TenBroeck has lent me her copy of his biography by Ethel Beswick, and I And on perusal that his ideas and ideals contain much that I find of great attraction. For instance, his analysis of what ails the India he so dearly loved and his prescription for its cure are an echo of Mahatma Gandhi's:

"Love is described as blind, but the real love is far-seeing. The only solution for India, as for the rest of the world, is to energize herself from within, and in this respect India has a peculiar advantage. For centuries she has been the custodian of the Ancient Wisdom which points out the Path leading men to the only freedom worth having, the Inner Freedom. Why do her people no longer pursue it? Why do they go on seeking after false gods becoming followers of materialism, and adopting the vices rather than the virtues of the western world?"

A factor that most of us are not aware of, even though it has such an important bearing on our lives, is the subtle relationship between the tenets of modern science and the materialistic attitudes that TLC has bemoaned above. It is not so much that science or scientists are deliberately promoting materialism, but that this has become the natural, even if, unintended, consequence of their world-view which, by suppressing or at least ignoring references to anything of the higher or subtler realms, has made mankind focus all attention on the material. Therefore, it seemed appropriate to me that I should take up on this day a discussion of some new ideas in science which carry with it the promise of reversing this trend and thereby helping us to get over the tendencies that TLC has bemoaned. I am referring to some dramatic developments within the framework of science itself which carry with them possibilities of a major revolution in the very framework of science, and thereby affecting our lives in a very big way. These developments, in different fields such as biology, psychology, thermodynamics, neurophysiology, agriculture, the medical sciences and also the social sciences, have gathered considerable momentum over the last 15 years, and are the subject of a recent book by Briggs and Peat, titled "Looking Glass Universe" (taken from Lewis Carroll!) and sub-titled "The Emerging Science of Wholeness: The new revolution in physics, mathematics, chemistry, biology and neurophysiology". Briggs and Peat convey the import of these new developments by using the powerful analogy of an earthquake:

"Science and its sister, technology, are full of surprises - so many surprises it's difficult to be surprised anymore. Black holes, genetic engineering, dust-sized computer chips -- what next? We're ready for anything. The theories and artifacts of science have long since become firmly established on our landscape, spreading and changing like a city's skyline. We've all become inhabitants in this city. Around us new structures rise, redevelopment projects take place as discoveries come and go. We take it in, rather jaded by this fast-paced and dazzling environment.

"But lately, faintly, there has been a rumbling of the ground, a change in light: mysterious signs. Strange reports reach us from people who have been working beneath the ground, in the deepest structures of the city, that they may have uncovered something, stirred something, which could drastically change the city and all who inhabit it. We have called the theoreticians who bring us these reports scientists of the looking-glass. They have a deep surprise in store for us, they say ~ deep because it is a surprise at the very foundations of science.

"As yet, however, our city's planners don't seem worried. They assure us our basic structures and conveyances are safe. 'Hard' evidence for looking-glass science is scanty, and its proponents are hopelessly outnumbered...."

Hopelessly outnumbered yes, but eminent scientists nevertheless. Some of those who are contributing to this revolution have impeccable credentials - like Karl Pribram the neurophysiologist, David Bohm the physicist, Rupert Sheldrake the biologist, Elizabeth Kubler-Ross and Michael Sabom who are well-known doctors, Arthur Young who invented the Bell helicopter, and Carl Rogers the psychologist. Some of them, such as Illya Prigogine the chemist and Brian Josephson the physicist, have even been awarded the Nobel Prize in their fields. The fact that the "city's planners" are ignoring or underplaying the importance of their work need not bother us, especially when we bear in mind that the same treatment has been meted out to the recognized giants of 20th century science - Einstein, Schrödinger, Niels Bohr, Heisenberg, Max Planck, James Jeans, Arthur Eddington, etc.

In fact, the taproot of the revolution that Briggs and Peat are referring to may be traced to the work of these recognized giants responsible for the two theories, known as quantum and relativity theories, that have made 20th century physics so different from the physics that existed earlier. Till the advent of these two theories, science was moving steadily in the direction of a purely mechanistic explanation of the physical universe, a direction symbolized by Laplace who, when Napoleon remarked that he had written bulky volumes explaining the behavior of the universe but never once made a reference to the Creator, replied "Sir, I had no need for that assumption." It was Laplace who put the goal of science in the following words:

" An intellect which at a given instant knew all the forces acting in nature, and the position of all things of which the world consists -- supposing the said intellect were vast enough to subject these data to analysis -- would embrace in the same formula the motions of the greatest bodies in the universe and those of the slightest atoms; nothing would be uncertain for it, and the future, like the past, would be present to its eyes."

This, then, had become the goal of science — perfect knowledge of the past and future based on an explanation of all phenomena in terms of "building blocks" that constitute the universe, with all movements being explained in terms of the forces acting between them. The problem arose after the discovery of electromagnetism - a set of forces having a much wider and deeper impact on the behavior of the "building blocks" than the gravitational forces that formed the basis of the Newtonian model that Laplace had made use of. Initially, it was believed that the equations which Maxwell arrived at would account for electromagnetism in the same way that Newton's equations accounted for gravitation. In fact, so successful were the initial attempts to explain all material phenomena with the help of these two sets of equations that at the turn of the century a mechanistic model of the universe, with an all-pervasive "ether" (assumed to be a subtle but physical substance, unlike the same word that is sometimes used as a translation of the 'akashic tattva'), was being seen as the scientific model of the universe.

There were only two experimental results - known as the Michelson-Morley experiment and the Black Body radiation experiment - that refused to be explained away by this mechanistic model, and it is a great irony that attempts to "fit" these results ultimately led to the abandonment of the "building block" model itself. This is where the contribution of the giants of 20th century physics comes in. They gave to science Relativity theory and Quantum mechanics, which not only explained the Michelson-Morley and Black Body experimental results respectively, but completely overturned the world-view of science as it obtained till then. The extent of this revolution is seldom appreciated, especially in the world of science.

Clear, unequivocal statements in this regard by those very scientists whose equations and theories are taught in our textbooks are totally ignored. Not one, but each of these giants has very categorically stated that the "building block" model of the universe no longer holds good, and yet we cling on to it as though science itself will cease to exist if we were to abandon it. In order to get out of this groove, let us take a careful look at the explicit statements made by some of these giants, and try to internalize what they are trying to convey. Let us start with a concise declaration by Max Planck, whose "Planck's constant" forms the centerpiece of equations in both relativity and quantum theories:

"As a man who has devoted his whole life to the most clear-headed science, to the study of matter, I can tell you as the result of my research about the atoms, this much:

"There is no matter as such!"

"All matter originates and exists only by a virtue of a force which brings the particles of an atom to vibration and holds this most minute solar system of the atom together... We must assume behind this force the existence of a conscious and intelligent Mind. This Mind is the matrix of all matter."

In the statement quoted above, not only is Planck abandoning the "building block" model of the universe, he is declaring in very categorical terms that the existence of matter, the subject that forms the focus of all studies in physics, is itself an illusion! Is this not a revolutionary discovery which should have been the subject of intense study and introspection in the world of science? But, no, the world of science has chosen to ignore it completely! The only possible explanation can be that it challenges the materialistic world-view that has become so entrenched in science, and taking cognizance of Planck's statement would amount to abandoning it in favour of the "mystic" world-view, with all its spiritual ramifications. Perhaps that is why Erwin Schrödinger, of Schroedinger's equation fame, preceded his statement in this regard with an appeal to his audience not to categorize what he was about to say as 'lunatic' or 'blasphemous':

"The only possible inference from [my efforts to integrate biology with my quantum physics] is, I think, that I - I in the widest meaning of the word, that is to say, every conscious mind that has ever said or felt "I" - am the person, if any, who controls the "motion of the atoms" according to the Laws of Nature.

"Within a cultural milieu (Kultukreis) where certain conceptions (which once had or still have a wider meaning, amongst other peoples) have been limited and specialized, it is daring to give to this conclusion the simple wording that it requires. In Christian terminology to say 'Hence I am God Almighty' sounds both blasphemous and lunatic. But please disregard these connotations for the moment and consider whether the above inference is not the closest a biologist can get to proving God and immortality at one stroke.

"In itself, the insight is not new. The earliest records, to my knowledge, date back some 2500 years or more. From the early great Upanishads the recognition ATMAN = BRAHMAN (the personal self equals the omnipresent, all-comprehending eternal self) was in Indian thought considered, far from being blasphemous, to represent the quintessence of deepest insight into the happenings of the world. The striving of all the scholars of Vedanta was, after having learnt to pronounce with their lips, really to assimilate in their minds this grandest of all thoughts.

"Again, the mystics of many centuries, independently, yet in perfect harmony with each other (somewhat like the panicles in an ideal gas) have described, each of them, the unique experience of his or her life in terms that can be condensed in the phrase: DEUS FACTUS

SUM (I have become God)....

"Allow me a few further comments. Consciousness is never experienced in the plural, only in the singular.... Consciousness is a singular of which the plural is unknown there is only one thing and that, what seems to be a plurality, is merely a series of different aspects of this one thing, produced by a deception (the Indian MAYA); the same illusion is produced in a gallery of mirrors, and in the same way Gaurisankar and Mt. Everest turned out to be the same peak, seen from different valleys."

Schroedinger has not only termed the material world of phenomena an illusion the way Planck did, he has made reference to mystic experiences and the Indian spiritual traditions in this context. The other giants of 20th century physics have done much the same, as for example Niels Bohr, Robert Oppenheimer and Arthur Eddington:

"For a parallel to the lesson of atomic theory . . . [we must turn] to those kinds of epistemological problems with which already thinkers like the Buddha and Lao Tzu have been confronted, when trying to harmonize our position as spectators and actors in the great drama of existence." -- Niels Bohr

"The general notions about human understanding... which are illustrated by discoveries in atomic physics are not in the nature of things wholly unfamiliar, wholly unheard of, or new. Even in our own culture they have a history, and in Buddhist and Hindu thought a more considerable and central place. What we shall find is an exemplification, an encouragement, and a refinement of old wisdom." -- Oppenheimer

"The physicist-philosopher of the twentieth century must look beyond physics to the borderland of the material and spiritual worlds. For religion has become possible for a man of science mainly because the philosophical trend of scientific thought has been startlingly redirected by the discoveries of men like Einstein, Heisenberg and Bohr in the field of relativity and quantum physics." -- Sir Arthur Eddington

This "startling redirection" of the trend of scientific thought took place in the first two decades of this century, but perhaps equally startling is the fact that it had practically no impact on scientific activity for over half a century. This was especially the case with the application sciences, which went merrily along the "building block" path. In fact, the goal in these disciplines became, and still is, to explain even the most intricate phenomena, including subtle ones such as pain, emotions, personality characteristics, even mind, consciousness and life itself in terms of these "building blocks." Francis Crick, of Double Helix fame, and regarded as the father of modern biology, put it in these words:

"The aim of the modern movement in biology is in fact to explain all biology in terms of physics and chemistry."

Therefore, the older world-view of physics, which has been overthrown nearly a century ago, continues to be drilled into and internalized by students as well as teachers, who tend to think of it as the scientific way of viewing the universe. Thus, almost every student in Biochemistry is initiated into the subject with the use of Lehninger's famous and widely-used textbook on the subject, whose opening sentence declares: "Life is made up of lifeless molecules." This trend is sometimes even carried into the social sciences, where many are trying to practice the famous injunction of Wilfredo Pareto: "If political economy and sociology would progress it is imperative that they should follow the example set by the physical sciences." Robert Oppenheimer was so shocked by this trend in the field of psychology, that, when invited to deliver a lecture at the American Psychological Association

in 1956, he warned his audience:

"The worst of all possible misunderstandings would occur if psychology should be influenced to model itself after physics which is not there any more, which has been quite outdated."

The behavioral and Freudian schools in psychology did not pay heed to Oppenheimer's warning, but some others did - and there are now new trends and schools of thought which indicate that a major revolution may be in the offing. Similar ideas and trends are also appearing in the other application sciences. Simultaneously, the implication of relativity and quantum theories has become the subject of many new books, some of them by physicists of great eminence. Over the last 15 years or so, a large number of interesting publications, each of them carrying new ideas with the seeds of revolutionary potential, have appeared. The following list gives us an idea of the breadth and depth of this revolutionary trend:

1. **"Order Out of Chaos: Man's New Dialogue With Nature"** and **"Time, Life and Entropy"** are two books authored by Ilya Prigogine, the first one jointly with Isabelle Stengers. Both authors have a background in Chemistry. Prigogine was awarded the Nobel Prize in 1977 for his work on the thermodynamics of non-equilibrium systems. These two books represent an extension of this work, and in them he contends that scientists' attempts to understand the universe in mechanistic terms is doomed to failure because most phenomena of nature are 'open' and not 'closed' systems.

2. **"Science, Animals and Evolution"** by Catherine Roberts, a microbiologist, points out that life's evolution on this planet cannot be explained on the basis of the principle of survival alone, and that life is continually evolving, often even surpassing itself through the process of self-actualization and self-realization. Building upon this data, she points to the "unrealized potentials" of biology and medicine which science has hidden from itself because it has turned a blind eye to the spiritual side of man.

3. **"The Holographic Paradigm and Other Paradoxes: Exploring the Leading Edge of Science"** is edited by Ken Wilber, and aims at explaining the highly technical work of the famous neurophysiologist Karl Pribram in common man's language. The well-known scientists (including Karl Pribram) who have contributed to this volume point out that the latest research findings of the workings of our brain seem to correspond with the age-old assertion of the mystics that each of us "microcosms" contains, right within our forehead itself, the entire "macrocosm," the whole universe, and are endowed with hidden faculties which, when awakened, will reveal to us this grand truth.

4. **"A New Science of Life: The Hypothesis of Formative Causation"** is a book that has created quite a splash in the world of biology, resulting in a much-publicized debate between the editors of '*Nature*' and '*New Scientist*'. The former has taken the author, Rupert Sheldrake, to task for having abandoned the existing world-view in science and called his book "fit for burning" while the latter has praised his courage at bringing in notions of the transcendent when his research findings so warranted, despite the fact that he held an eminent position in the scientific establishment

5. **"Godel, Escher, Bach: An Eternal Golden Braid"** is written by the computer scientist Douglas Hofstadter, and aims at showing the common link in the creative upsurge responsible for great feats in mathematics, graphic arts and music. His later book "The Mind's I^M" traces the origins of this creative upsurge to our subtler faculties, the highest of them being the spiritual.

6. **"The Emperor's New Mind: Concerning Computers, Minds and the Laws of**

Physics” draws an analogy between the vast mass of scientists who are absolutely convinced that the whole universe including mind and consciousness can be explained on the basis of a mechanical model and the masses who, in the famous story, refused to see the emperor as naked for fear of being termed fools. Written by Roger Penrose, Professor of Mathematics & Physics at Oxford, the book argues against artificial intelligence and says that to comprehend the workings of the brain/mind, we need a new insight in physics, and that this insight maybe the same one that will be required for arriving at a unified theory of everything -- again, an echo of the mystics’ ‘macrocosm in microcosm’.

7. **”Space, Time and Medicine” and ”Beyond Illness”** are two books by Larry Dossey, a specialist in internal medicine. Drawing on his long experience in which he attended to many cases of migraine, blood pressure, cancer, heart diseases and other chronic disorders and found "alternative" therapies such as biofeedback to be more useful than the medication he had been taught, he develops a new theory of human health drawing on modern physics (in particular the theories of Einstein and Prigogine) as well as ancient wisdom.

8. **”The Miracle of Existence”** is by Henry Margenau, Professor Emeritus of Physics at Yale University. Starting from the concept of the 'world line' introduced in physics by Minkowski and Einstein to explain space and time, this eminent physicist builds up the case that the external world is really a reflection of the mind (rather than the other way around as normally assumed by the scientist) and, further, that all minds are connected together at a deeper, subtler level in the form of a "universal mind" access to which is possible if we follow the advice enunciated in the *Upanishads*.

9. **”Recollections of Death”** is by Dr. Michael Sabom, an eminent cardiologist. He starts his research work with the idea of disproving the earlier work of fellow-doctors Raymond Moody and Elizabeth Kubler-Ross, but is astonished to discover that his findings corroborate their findings about states of super-consciousness that persons in the 'clinical death* state experience, and the similarity of these experiences with those of the mystics of the East.

10. **”Wholeness and the Implicate Order” and ”Unfolding Meaning”** are by David Bohm, one of the world’s leading theoretical physicists. He draws on his deep knowledge of relativity and quantum theories to picture all of existence, including matter and consciousness, as an unbroken whole, and develops a cosmology remarkably akin to that of the mystics.

11. **”The Tao of Physics” and ”The Turning Point”** are by 'Fritjof Capra, a well-known physicist. The first book was a pioneer in drawing the parallels between the findings of modern physics and the world-view of the mystics, especially of India Ad China, and the second deals with the social transformation that the advent of this new world-view could bring about

12. **”The Human Mystery”** is by Sir John C. Eccles, who won the 1963 Nobel Prize for Physiology and Medicine. In it he argues against the theory that the human brain is a "superchimpanzee brain" or even a "hominid brain," and refers to the deep mysteries it contains, and points out the special role that self-consciousness plays. A very good starting point for understanding the later work of the neurophysiologist Karl Pribram.

13. **”The Web of Life” and ”The Secret of the Creative Vacuum”** are by John Davidson, formerly of Cambridge University. The books contain a wonderful understanding of the human being and the universe he inhabits by weaving together modern scientific knowledge with the deepest of mystical insights. *The Web of Life* brings together *pranas*,

chakras and *tattwas* with holograms, endocrine functions, the adrenal medulla etc., while *The Secret of the Creative Vacuum* looks at the electromagnetic and gravitational fields from a very revolutionary point of view, and deals with the immense possibilities of generating inexpensive, pollution-free, user-controlled, decentralized sources of electric energy in abundance if the new world-view is assimilated and made a part of our living pattern.

14. "**Dancing Shiva in the Ecological Age**," is by the well-known ecologist **Henryk Skolimowski**, and brings out the spiritual ramifications of the new world-view in science required to preserve the world's environment.

15. "**Alternative Agriculture**" is the research findings of the USA's prestigious National Academy of Sciences. It concludes that "natural ways" of agriculture are superior to the currently practiced "modern" ways based upon the "building block" approach in science.

This is not the place to go into details regarding any of these books, but I would strongly recommend them to anyone who is interested in the subject. For those who do not have the time or inclination to read these books but would nevertheless like to get an idea of where all this may lead to, let me summarize the central message of all these books in just one sentence: the visible has to be explained in terms of the invisible, not the other way round. In the earlier world-view, the goal was to explain the invisible in terms of the visible: electromagnetic phenomena in terms of electrons, light in terms of photons, mind and its characteristics in terms of RNA-DNA molecules, etc. In the new world-view, it is the invisible that is seen as primary, with the visible being delegated to the category of an "epiphenomenon." Thus, matter may seem real, but is actually accountable by the invisible EM fields, which in turn are caused by something even subtler. Eventually, the chain leads to what Planck was pointing to — the subtlest, the Mind (and who knows, something even more subtle than that) as the matrix of all matter.

The problem with regarding the invisible as primary and the visible as epiphenomena lies in our lack of access to the invisible. Our laboratories are full of equipment and procedures which reveal the minutest of physical phenomena to our senses, but the invisible, by definition, lies outside the spectrum of frequencies accessible to sense perception. This difficulty lies at the heart of the discomfort that many of us, especially those with an investigative or scientific bent of mind, would feel with the new world-view. Carl Rogers, the famous psychologist, has confronted this question and provided a bold, and perhaps the only, answer. He has pointed out that every human being has the latent potential to have access to the invisible. Unlike the sense perceptions which come to us automatically with birth, these latent faculties need to be developed through practice, and this practice has to be built on sound moral/spiritual foundations - not an easy task in the atmosphere prevailing these days. But, he points out, there can be no real study of the human mind unless the scientist who wishes to study it is willing to show the courage and perseverance required to do this. In fact, in his address to fellow psychologists at the American Psychological Association, he dared the younger generation of psychologists to do this, calling it the "most exciting challenge" ahead:

"Perhaps in the coming generation of younger psychologists, hopefully unencumbered by university prohibitions and restrictions, there may be a few who will dare to investigate the possibility that there is a lawful reality which is not open to our five senses; a reality in which present, past, and future are intermingled, in which space is not a barrier and time has disappeared; a reality which can be perceived and known only when we are passively receptive, rather than actively bent on knowing. It is one of the most exciting challenges posed to psychology."

This is a reference to higher states of consciousness that mystic training, with sound morality (niyama) as its foundation, can lead us to. It is what William James, another well-known psychologist, had referred to earlier.

"Our normal waking consciousness, rational consciousness as we call it, is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different."

In the context of the new ideas in science that we have discussed, it is interesting and important to note a very special point: that the world-view emanating from 20th century science can be experienced (as different from intellectualizing through mathematical equations) when we enter into these higher realms of consciousness. For instance, how ever much we study the theory of relativity in a classroom, space and time are still experienced as separate, independent entities by us. But how close the revelations of this theory comes to the experiences of the mystics is evident if we compare the following two sets of statements, the first two by the well-known physicists Hermann Minkowski and de Broglie, and the next two by - Lama Govinda and the Zen master Dogen:

"The views of space and time which I wish to lay before you have sprang from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality." - Minkowski

"In space-time, everything which for each of us constitutes the past, the present, and the future is given en bloc... Each observer, as his time passes, discovers, so to speak, new slices of space-time which appear to him as successive aspects of the material world, though in reality the ensemble of events constituting space-time exist prior to his knowledge of them." - Louis de Broglie

"If we speak of space-experience in meditation, we are dealing with an entirely different dimension... In this space-experience the temporal sequence is converted into a simultaneous co-existence, the side by side existence of things... and this again does not remain static but becomes a living continuum in which space and time are integrated." -- Lama Govinda

"It is believed by most that time passes; in actual fact, it stays where it is. This idea of passing may be called time, but it is an incorrect idea, for since one sees it only as passing, one cannot understand that it stays just where it is." - Dogen

This is the crucial part of this newly emerging world-view in science, that to truly grasp it one needs to experience it. Perhaps this explains the reluctance of the world of science to take note of the categorical statements of Planck, Schroedinger, etc., that we examined earlier - the training imparted in our universities is just too intellectual and "rational" to allow us to stomach such "mystic mumbo-jumbo," to use a favorite phrase often employed to dismiss such ideas. In this context it is also interesting and important to note that the giants of 20th century physics had, generally speaking, personalities that indicated a high level of moral development: some of them have in fact been compared to our *rishis*. This is particularly true of Albert Einstein, who not only displayed Mahatma Gandhi's photograph prominently in his room, but also displayed many of the mahatma's characteristics, including that of *aparigraha*. -- non attachment He attributed his scientific insights to a "vision" in much the same manner as Ramanujam had done, calling it a "cosmic religious experience" which he termed "the strongest and noblest mainspring of scientific research." From this emanated his insight of "the passage of time" (and hence of this world, for what is this world if not a drama enacted in space and over time?) as an illusion, which he conveyed in the

following powerful words:

"For a convinced physicist, the distinction between past, present and future is an illusion, though a stubborn one/'

Among the many statements of these giants of 20th century science that our academic community has chosen to ignore is a most powerful definition of the human being, using the same notions of space and time that formed the bulwark of the Theory of Relativity, left behind by Albert Einstein:

"A human being is part of the whole, called by us "universe;" a part limited in space and time. He experiences himself, his thoughts and feelings as something separated from the rest; a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. Nobody is able to achieve this completely, but the striving for such achievement is, in itself, a part of the liberation and a foundation for inner security."

If the revolution in science that I see signs of does take place, the ultimate impact will be on our notion of the human being and human potential. As Einstein has conveyed so beautifully, each of us has the latent potential to overcome the barriers of space and time in which we find ourselves imprisoned, but this demands a high degree of moral and spiritual development through which we can break away from our narrow attachments and selfish desires and instead seek to embrace the entire universe in our fold. This, Einstein has pointed out, is the only road to inner security - so lamentably lacking amongst all of us today. This is therefore the path to the "inner freedom" that TLC had referred to, "the only freedom worth having." Maybe these new developments in science will open our eyes to what TLC was pointing towards.

— *T.S. Ananthu*