CONSCIOUSNESS: THE ULTIMATE ENIGMA

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The Albert Schmitt Lecture

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Good evening, Earth people. I am most honored to be here with you this evening. The distinguished procession of gentlemen who have preceded me at this lectern have all made magnificent contributions to mankind's knowledge. They have each year, one by one, appeared before you to present their concepts and to inspire you to new and exciting vistas of thought. It is my desire also to inspire you, but more importantly to challenge you to consider some concepts that are on the frontier of science. Although for years my efforts have been devoted to exploration of outer space, my thoughts for tonight will be directed toward an equally important area - inner space.

The Albert Schmitt Lectures, several of which I have read, stand as major testaments to the power of science to inform us about the Universe and about ourselves. They stand as testaments, also, to the potential which science has for helping mankind live more harmoniously with itself and with the environment. This is science at its best. This is science not only as a systematization of knowledge which enables us to make testable hypotheses and predictions, but also as a repository of wisdom about life.

The etymological meaning of the word science is "to know". The methodological connotation of the word is "knowing through objective empirical techniques". However, if we limit our usage

in this way, we must assert that science is not our only way of "knowing". There are other approaches and channels by which people have gained knowledge of the universe - approaches and channels which we have generally overlooked, ignored or denied because they did not fit within the paradigm which science has implicitly constructed over the centuries. For example, "intuition", "hunch", "gut feeling", "ESP", are words sometimes used to describe these channels. I, among others, have been exploring some of these alternative routes to knowledge in recent years. We have been attempting to apply the methods and principles of science to them so that mankind, as a species, may better understand ourselves and learn to use more effectively all the faculties of mind and body which we possess. For the moment, let us refer to these channels collectively as "nonrational" approaches to understanding nature. Let me assure you that I am using the term "nonrational" in a sense which is quite different from "irrational".

Because of my interest in nonrational approaches to knowledge, I was distressed by a recent statement made by the National Academy of Sciences which concerned textbooks for California's public school system. The Academy, in arguing that religious concepts of life's origin - such as the Genesis theory of creation - should be kept out of the new school books, was quoted in a news release as stating: "Religion and science are...separate and mutually exclusive realms of human thought whose presentation in the same context leads to misunderstanding of both scientific theory and religious beliefs." I understand that one of the authors of the resolution said it expressed the position of the broadest spectrum of people in science.

Although I am not defending any individual theological cosmology as being complete or correct, it appears the position taken by the Academy is not only sanctimonious, it is untenable if, for no other reason, than use of the words "mutually exclusive realms of thought". The principle of mutually exclusive categories, arising from Aristotelean logic, is valid only in certain limited situations and is certainly not valid at the level to which the Academy's resolution is addressed. Quantum theory, general semantics, systems philosophy and other developments in modern thought have shown that mutual exclusivity is not a fundamental aspect of the universe but rather is a category of logic arising from linguistic inadequacies. (I think linguistic inadequacies may be responsible for more philosophic disagreements than we realize.) However, not only is the resolution shortsighted - it does not represent the broadest possible spectrum of people in science. As those who might object to the resolution, I have in mind people such as Isaac Newton, Albert Einstein, Erwin Schroedinger, Wernher Heisenberg, C. F. von Weizsacker, J. S. Eccles, Arthur Eddington, Albert Schweitzer and other eminent men and women of science who have made public statements to the effect that the farthest reaches of their scientific thought and experiment brought them to the profound realization that ultimately there is an enigma, a mystery, behind the physical world, that seems in many ways to have the attributes which people traditionally ascribed to God.

Speaking more personally for the moment, I would like to add this humble footnote to that powerful chapter in the history

of science. My experience during the Apollo 14 lunar expedition gave me direct, experiential knowledge which fully supports the views of those scientists I just mentioned. My view of our planet, suspended like a tiny blue and white jewel against the immense black velvet sky, was a glimpse of divinity. It became absolutely clear to me that the vastness of the universe and its harmonious functioning throughout is not solely the result of a cosmic accident based on chance and random processes.

That view of Earth from space was a breathtaking sight that has profoundly affected my thinking. It has remained with me long after splashdown - the view was that powerful, that awe-inspiring. It led me to re-examine my entire philosophic framework. As a result of that examination, I have come to see that at the most primal level, scientific thought (based on objectively observed data) and religious thought (based on subjectively observed data) must coincide. They are <u>not</u> "separate and mutually exclusive realms of thought whose presentation in the same context leads to misunderstanding of both scientific theory and religious beliefs". As I now look at the matter, there is no real substance at all to this long-standing controversy. Objective observations and subjective observations are complementary modes of interacting with the universe. Unfortunately, some scientists and some theologians have focussed their attention so narrowly that they have created an illusion for themselves - the illusion of science vs. religion, objectivity vs. subjectivity, rationality vs. intuition, physical vs. spiritual.

Let us now examine what I have called the illusion of objective vs. subjective thought and attempt to see that what appear to be opposites can be viewed from a higher level as a composite, a union of opposites having a polar relationship rather than being mutually exclusive. To do that we will examine the process of objective thought and its relationship to self-awareness. At the end I hope to have convincingly suggested that a journey into inner space will lead to discovery of ideas that can complement the concepts derived from objective (or outer) observations. The term "inner space", as we are using it, refers to those vast regions of unexplored territory that exist within the mind of man. If any skilled observer with a knowledge of the physical universe, will turn his observations inward toward his own inner space and explore diligently, he will find that the existing paradigms in both science and religion are convergent. That convergence is most clearly discernible in the examination of that ultimate enigma, consciousness. If this thesis is correct, then we can conclude that the future of science and religion alike rests on the study of the facets of consciousness.

But what is consciousness? We do not really know; at the moment we can only experience it. Some of the scientists I mentioned have declared it to be the irreducible foundation of all experience and knowledge. Sir Russell Brain, a neurophysiologist, said that consciousness is fundamental and cannot be defined in terms of anything else. If this is so, perhaps we will eventually find that Consciousness is the necessary and sufficient condition for existence of the Universe. I am personally biased to think this is so.

The most we can say at the moment, however, is that consciousness is probably a necessary condition for existence of life. Since we are unable to test this directly, perhaps we should reverse the argument and ask the question: Is the existence of life sufficient to presuppose consciousness, awareness, sentience of some degree? There is evidence to suggest this. In reasonably elemental applications, such as a single-cell organism, consciousness may result in nothing more than programmed reaction to the environment. However, a sentience or knowingness of some degree also appears to be present. As we move below the single-cell level toward the low end of organic organization, it has been suggested that the quality of sentience still exists in some sense, even to and below the organizational level of the DNA/RNA molecular matrices. Perhaps as some ancients have maintained, there is a degree of consciousness in all matter.

But let us now direct our attention upward in organizational complexity. As we consider increasingly complex molecular organization, at some point we will find a change from the level of simple consciousness to a new level: Self-awareness. The only form of life, which we are certain exhibits this characteristic is homo sapiens. (and perhaps some immediate evolutionary predecessors)

So far as we now know, plants and animals are not self-aware. That is, they do not maintain an image of self in their capacity for sentience. The mental quality we label "ego" or "I" appears absent from their awareness. In a word, they are unselfconscious. We do not yet have the ability to examine closely the contents of any thought process except our own individual, personal process.

It may be, however, that some of the higher orders do indeed have a rudimentary sense of self. There is some evidence that they do. (A chimpanzee named Suzy, pictured in LIFE Magazine a year or so ago, seems to show evidence of self-awareness.) If so, this would establish the possibility of a continuum in the development of self-awareness rather than an abrupt gap between man and the rest of life.

The conclusion which may, perhaps, be drawn from this - and it has already been stated by some psychologists - is that for plants and animals there is a fundamental unity to all things. From a psychological view of the matter, this basic connectedness among the parts of the natural order exists because there is no division made between self and non-self. If no sense of self exists in plants and animals for a distinction to be made between "I" and "other", the logical conclusion is that their whole environment is experienced in some sense as a part of a plant or an animal's awareness. And since theoretically there are no limits to what constitutes environment, we can say - again, with sound logic - that in the sentience of a plant or an animal, they <u>are</u> in continuum with the whole universe. But why should mankind be inferior to the plant and animal in this respect. Why are we not a part of and have a sentience that includes the totality of nature just as the "lower" forms of life. Well - I think we do have universal "knowingness", but we have blocked it and submerged it beneath our sophisticated rational thought processes. (A study of linguistics shows how this can come about in the evolutionary process.)

This line of reasoning brings us dramatically close to the position taken by some religious sages and mystics, both Eastern and Western, with their formulations of the Atman-Brahman union and the microcosm-macrocosm correspondence.

To make this tentative conclusion of undifferentiated unity of consciousness in the natural order more poignant, let us experiment with an example of nonrational knowledge. In this mode of functioning, logic and discursive reasoning have no part, only being, sensing and knowing. To illustrate this, let us suppose we could enter the awareness of a flower and feel the changes imposed by the environment through growth, pollination, blossoming, etc. Try it as an exercise without using words. Allow yourself to project your awareness into a flower and attempt to feel and respond to the things you think a flower might feel. With practice of this sort (and some mind development training) some startling things occur.

This flight of imagination into the sentience of a flower cannot be adequately described because the structure of English - and, indeed, most other languages - has a subjective/self-objective/other structure which tends to impede holistic thinking. In the realm of language, only poetry comes close to expressing these innermost feelings of being and knowing. This inadequacy of language to express our innermost selves causes considerable dilemma in scientific investigation. (Can you imagine scientists writing poetry or painting a picture to display the results of an experiment?) Science, in the present at least, has a different methodology. It is called objectivism. Science, by agreement, involves a process of observation of external objects. To be objective is to

be neutral, colorless, detached, emotionally uninvolved. From the objective scientist's point of view, the world is a collection of discrete parts. A rose is a rose is a rose. One thing may enter into relations with another, as when tree roots cling to a rock or a fish swims in water. There may be a cause-and-effect relationship between them as they interact. But the principle of separate identity remains in effect. A tree is not a rock, a fish is not a pond, and none of them are linked to the scientist observing them.

We may think of objectivism in terms of looking through a pane of glass or, more accurately, through the lens of our eyes. What we know is what we see before us. Everything is exterior to us, not a part of us. It is separate from ourselves in space and time. This assumption has been fundamental to science. Under its banner, scientists proceed to weigh and measure, describe the color, form and texture, list the component parts and constituent elements and so forth of objects. The scientist stands apart from his research, remaining objective and detached about it. To look inward and be subjective in observation is not an accepted technique.

We must not be critical, however. Using the method called objective observation, science has made enormous advances in knowledge. Our ability to control and manipulate the natural world is unparalleled in history. The feats of science and its hand-maiden, technology, are wondrous to behold. The twin towers of the World Trade Building in New York City rise more than one-fifth of a mile above the earth. The nuclear-powered engines of the mighty U.S. aircraft carrier Enterprise can propel it around

the globe five times without stopping, and its aircraft can fly at more than twice the speed of sound. Polio vaccine and smallpox immunization have virtually eliminated those plagues from this country after they had caused suffering and death throughout the world for centuries. Huge bridges span rivers, canyons and ocean narrows. Factories produce food, clothing, medicine and other necessities of life in an abundance never known to us. All this and much more is a direct result of the objective technique of science - of researchers who probed and explored and observed, noting their results and passing them on to other scientists and technicians who took them a step or two farther, always increasing our ability to comprehend the significance and apply the knowledge to problems of society. But always with the outward, objective point of view.

There can be no doubt that this method of investigating the world has been successful and beneficial for the most part. But the past few generations have seen science put to uses which easily rival the most inhumane acts ever committed. The same power that drives the Enterprise has destroyed two cities, and there is a distinct possibility that it may be unleashed in a global burst of aggression which could annihilate the entire race. Our medical understanding of microorganisms and chemical reactions is used to formulate biological and chemical warfare agents. Those factories manufacturing goods for our society and those plants producing materials for industry are also discharging waste into our rivers and atmosphere to such a degree that we have created an ecological crisis of planetary proportions. Whether by design or by ignorance, science is proving itself to be as much a bane as it has been a blessing because of man's perverse penchant for misapplying it.

Why has our increasing knowledge about life not led us to wisdom about living? Must everything which value-free, objective science gives us be eventually used for destruction? Is there no way for objective science to ally itself with the subjective side of man which has given us moral codes and value systems for the protection and enhancement of human life? Can there be a fusion of reason and intuition, of scientific and religious experience, so that our grand achievements do not become the cause of our extinction?

In my opinion, it is possible to heal this cleft in the human psyche. Moreover, it appears to me that a healing process is already at work on our schizoid civilization. (Call it our split-brain society, if you like.) Whatever the term for this failure to integrate our rational and moral natures, I see a possibility that it may be cured by efforts now going on in both hemispheres of experience - the objective lobe of outward looking which is typified by science and the subjective lobe of inward looking which is typified by religion. Health is wholeness. An impulse toward health is emerging. A trend toward wholeness is developing. On a dozen frontiers of science - frontiers which I will describe later - the conclusion is being reached that further progress can only be made by considering the nature of consciousness, which is the ground of both subjectivity and objectivity.

Thus it is an irony of history that man, who undoubtedly evolved from a primitive subjective being in tune with the universe, became self aware, invented language to express self, put a barrier between self and other, and through the objectivism of science now should extend self so far through objectivism that he rounds

the circle and comes face to face with the problems of subjective awareness and the nature of self. (Perhaps the bibical account of the Garden of Eden is a primitive description of this process.) The further irony of the situation is this: Both faces belong to science when we interpret science simply as knowing.

Subjective awareness has always been there in our consciousness. It is almost a cosmic joke to realize that we would not admit that we are privately conscious until it has been publicly proven by objective means. Quantum physics provides a clear example of how this happened. In a recent article in JOURNAL FOR THE STUDY OF CONSCIOUSNESS, the physicist Evan Harris Walker points out that the Copenhagen interpretation of quantum mechanics, led by Neils Bohr, necessarily leads to a picture of physical reality in which consciousness plays a role. The role is that of the observer. In experiments dealing with sub-atomic reactions, the role of the observer has been found to influence the experimental results <u>just by trying to observe them</u>. Experimental results seem to confirm this and offer the further possibility of explaining the phenomenon of psychokinesis.

Psychology is also showing that scientists must now consider what lies on the inner side of the lenses of our eyes. The discovery of experimenter bias is one example. What ever the experimenter wants is likely to move his results toward that expectation. The demand characteristics of an experimental situation is another, i.e., the sort of questions we ask tend to determine the answers we get. The sort of hypotheses we formulate can predispose us to look for certain results and through selective inattention,

disregard subtle but contrary effects. Or the experimenter non-verbally communicates his expectations to his subjects and fellow scientists, affecting their behavior and consequently the experiment. Even working alone in a completely mechanized situation is not totally sufficient to avoid error. The experimenter may nonconsciously interpret his data or perhaps even influence the apparatus favorably or unfavorably. The scientist's degree of self-awareness affects and possibly even controls the outcome of an experimental situation, not only in psychology but in every discipline.

Thus science has reached the limits of objectivism. It is beginning to awaken to the fact that our thought processes must be considered an integral part of the data arising from so-called objective, detached examination of the universe. And as the boundary between inner and outer disappears, subjective and objective modalities must appear in our investigations. No longer should reason oppose feeling, or the intellect oppose intuition. As subjective observation is allowed, an expansion of awareness takes place and the capacity "to know" is increased.

Science has gone outward only to find that self-awareness is the substratum and background within which science functions. Consciousness is beginning to reveal itself everywhere as the unifying factor behind objective knowledge and subjective experience. With the discovery of ever smaller sub-atomic particles, nuclear forces and so forth, the material universe is showing itself to us in forms so subtle that the structure of man and the universe alike seem to dissolve into patterned fields of energy - fields

within fields within fields, to use the apt phrase of World Institute Council president, Julius Stulman. And what can we postulate to provide the guiding field for all those fields? It appears to be consciousness - consciousness as a universal primal field governing matter and energy in all their manifestations.

But what more do we know about consciousness as a field of science. The formal term for the science of consciousness is noetics. Noetics comes from the Greek root nous, meaning mind. In the Greek world view, mind was the highest development of rationality. Their concept of Reason with a capital R, best displayed in Plato's philosophy, was synonymous with our concept of God and was higher than the pantheon of gods. In other words, to the Greeks the universe was rational and ordered and harmonious because it had been designed that way by the Logos, the structuring principle of creation. Man, as the rational animal and the epitome of creation, was a reflection of Divine Reason. The Greek philosopher Zeno asked his colleagues, "Why not admit that the world is a living and rational being since it produces animate and rational entities."

Notice that in this conception of man's origin, science and theology are one. God is not only the prime cause but also the fountainhead of intellect and reason. Man, or at least the wise man, is merely a vehicle for expressing God-given knowledge. Many centuries later, Johannes Kepler echoed this view. When he discovered the laws of planetary motion, he is said to have exclaimed, "O Lord, I think Thy thoughts after Thee!"

It is this fusion of reason and intuition, of subjective experience and objective knowledge, which I see returning to us and restoring health in the body of mankind. Like King Lear, we see feelingly. Now let us make a brief survey of some of the frontier areas I said are converging to bring us toward a science of consciousness.

I have already mentioned quantum theory. The work of Dr. Walker, whose article I mentioned, is significant because his theory of consciousness bridges quantum mechanics with neurophysiology and psychic research. The editor of Journal for the Study of Consciousness, Dr. Charles Muses, is also making major contributions to noetics, along with Mr. Arthur Young, president of the Foundation for the Study of Consciousness and co-author with Dr. Muses of the recent book, Reality and Consciousness.

Psychical research is a burgeoning field where exciting strides are being taken by numerous scientists around the world, especially here in the United States, in Europe and in Russia.

Bridging physics and psychic research is a new development called paraphysics, which I briefly mentioned earlier. Paraphysics extends the laws and methods of physics to explain so-called paranormal phenomena through the use of sophisticated technology and methodology, all of which are thoroughly compatible with the existing body of science. Two of the more exciting thinkers in this area are Dr. Hal Puthoff and Mr. Russell Targ, both laser specialists at SRI. Two more are Professor Wilbur Franklin at Kent State University and Professor William Tiller of Stanford.

Two other people who have received some recent publicity in this area are Mr. Cleve Backster of New York City and Dr. Marcel Vogel of San Jose, California. Mr. Backster is the discoverer of a phenomenon called "primary perception". This is an undefined capacity in plants and other simple organisms to sense or register human thoughts and emotions. Dr. Vogel has taken this discovery and is using it for some very interesting explorations in the nature of thought and mind.

Biofeedback is another area I consider a frontier of consciousness research. Scientists such as Dr. Joe Kamiya of Langley Porter Neuropsychiatric Institute in San Francisco, Dr. Elmer Green and Dr. Barbara Brown of the Menninger Clinic in Topeka, Kansas, are investigating brainwaves relationship to creativity, control of pain, meditation, learning and other aspects of the mind-body problem.

Meditation research is still another promising development. Science and religion have their clearest union in this field. The meditative practices of yogis, Zen Buddhists, transcendental meditators and others are being examined instrumentally in laboratories to see what physiological effects accompany the subjective experiences meditators report. One important development already emerging is that meditation is quite successful for curbing drug abuse. Meditation research is being encouraged by many spiritual leaders and teachers. Among them are Maharishi Mahesh Yogi, who teaches transcendental meditation and who has a degree in physics. Another Indian scientist-philosopher in this area is Gopi Krishna, who is presenting the thesis that

kundalini, a subtle biological energy in man, is the key to evolution and enlightenment.

Meditation is a tool for altering consciousness. So are drugs and hypnosis. All three of these may be seen as part of the research on altered states of consciousness. Studies of sleep and dreaming, trance, ecstasy, peak experiences and cosmic consciousness are also part of this frontier. The workers here are too many for naming. Many of them meet each year at Council Groves, Kansas for a conference on altered states of consciousness. I will simply refer you to three recent books which survey this subject and some of the others I have named. They are Altered States of Consciousness, edited by Charles Tart; The Highest State of Consciousness, edited by John White; and The Nature of Human Consciousness, edited by Robert Ornstein.

Linguistics and artificial intelligence have come together in an interesting fashion at Massachusetts Institute of Technology. It was Prof. Noam Chomsky, a linguist at MIT, who in the 1960's began linking linguistic data with a theory of mind. However, his theory of language, transformational grammar, was inadequate for the computer of Dr. Marvin Minski in MIT's Artificial Intelligence Laboratory to translate languages. But Prof. Sydney Lamb of the linguistics department at Yale University has developed a theory of language called stratificational grammar, and recently it has proven quite sufficient to allow Dr. Minski's computer to translate languages. I am told this is a real breakthrough in artificial intelligence studies. It also speaks well of Prof. Lamb's theory of language, which I understand he now

refers to as cognitive linguistics because he is extending it to include neurophysiological and natural intelligence as he develops a theory of thought processes and mental systems in domains other than language.

I must also mention transpersonal psychology. This is a broad term which overlaps many of the areas I have just discussed. Transpersonal psychology's emphasis is on the development of man's fullest potential in all areas of his sensory, psychic and spiritual being. I will simply mention that the Journal of Transpersonal Psychology, started by Dr. Abraham Maslow and others and edited by Mr. Anthony Sutich, is guiding the field and articulating it to the public.

Another frontier area is exobiology, the study of extraterrestrial life. The data coming from exobiologists such as Dr. Carl Sagan and Dr. Frank Drake, who are both in astrophysics at Cornell, indicates that the building blocks of life exist throughout the universe and that life will indeed develop not only where conditions are good for it but even where they are only less than extremely hostile. There are efforts now under way here and in Russia to detect communications from extraterrestrial civilizations. As I said earlier, where life is, consciousness appears to be. Therefore, this question is foremost in the minds of some exobiologists: If life has existed elsewhere in the universe for periods significantly longer than our own, how much beyond us would the consciousness of such intelligences be?

The last area I will mention is one that has been called the final frontier: Death. In the past few years, scientists, especially medical researchers, have turned their attention to the process of dying and death in an effort to understand it and thereby help human beings. From this has developed thanatology, the study of dying and death. Several interesting studies are suggesting the possibility that death is not the end of life, but only an altered state of consciousness in which life continues through a nonmaterial form or, if you will, through a change in energy field patterning of much subtler density. (Of course, traditional religious concepts have always suggested this.) Dr. Karlis Osis of the American Society for Psychical Research in New York City and Mr. William G. Roll of the Psychical Research Foundation in Durham, North Carolina and Dr. Florence Hertzler of the Foundation of Thanatology in New York City are among those actively investigating the question of survival out of the body.

These are the primary areas of science which I see converging on the central question: What is consciousness? A theologian would probably rephrase the question this way: Who am I? Just over the horizon is the development of a field which I suggested earlier tonight - a field that will consider both questions simultaneously. I called it theobiology to indicate that science and religion will work hand-in-hand to study the operation of spirit through matter or, to put it another way, consciousness. I am sure all of you know the thought of the great theobiologist Teilhard de Chardin, especially his magnus opus, The Phenomenon of Man. The biologist Edmund Sinnott also pioneered here in works

such as The Biology of the Spirit and Cell and Psyche. Since then four other books have made further explorations in theobiology. First is Prof. Oliver Reiser's Cosmic Humanism, published in 1966. Five years later the unknown author of the The Single Reality, using the pen name Preston Harold, had his masterwork released. And this year two other important books have appeared - Gopi Krishna's The Secret of Yoga and philosopher Dane Rudhyar's The Planetarization of Consciousness.

A science of consciousness should have both a theory and a body of investigative techniques. Theory is being provided by people such as Dr. Puthoff, Mr. Targ, Dr. Walker, Dr. Muses, Dr. Arthur Deikman (who chaired the 1972 conference on altered states of consciousness), and by others. The relationships among various states of consciousness are being classified by Dr. Jean Houston and Mr. Robert Masters of the Foundation for Mind Research in New York City; by Dr. Roland Fischer of the Veterans Hospital in Washington, D. C.; By Mr. Daniel Goleman of the department of social relations at Harvard University; by Dr. John Lilly in his recent book The Center of the Cyclone; and others. Techniques for public verification of private awareness are likewise being developed by researchers around the globe, many of whom I have already mentioned in other areas. I recommend to you a recent article by Dr. Charles Tart in the June 16, 1972 issue of Science. Dr. Tart, whose book I mentioned and who teaches psychology at the University of California's Davis campus, writes about the development of state-specific sciences for examining various states of consciousness.

The problems and difficulties accompanying the development of noetics will be many. Not the least will be the development of an adequate, precise vocabulary. The phrase "higher consciousness" is more or less synonymous with the terms "superconscious", "supra-conscious" (suggested in 1964 by the English physician Kenneth Walker) and the most recent term, "ultraconscious", coined by Dr. Stanley Dean, a psychiatrist in Miami, Florida who chaired a task force for the American Psychiatric Association this year on psychic phenomena and psychiatry. There is need for standardization and greater precision in describing states of consciousness. In this regard, it is interesting to note that Sanskrit has dozens of words for describing different states of consciousness, and that Indian Buddhists have classified 121 mind states.

I have made this aerial survey of scientists and their work for several reasons. First, I want to provide a perspective or framework within which any further research will be oriented to benefit mankind. Second, I hope to plant seed-ideas for stimulating such research. Last, I consider this work significant and want to give it wider public recognition because, as I have indicated, it has potential for healing the rift between science and religion, subjectivity and objectivity, rationality and intuition, materiality and spirituality.

In their subjective/intuitive/experiential approach to understanding the nature of reality, the ancient sages and religious teachers learned a great deal about the universe, and expressed it in prescientific terms. Now objective/rational/experimental science is rediscovering it. Primary perception in plants, for example,

was recognized in early Indian literature. Cleve Backster is therefore really the rediscoverer of it, and he is aware this is so. The metaphysical implication of the Backster effect is a striking confirmation of the position many religious and philosophic traditions hold - namely, there is an invisible but objectively real connectedness to all life. It is no coincidence that ecologists are saying the same thing.

As our self-awareness expands, we find that what we had supposed was our independent existence is subtly but inextricably linked with others and with the environment. We are interdependent, not independent. This thing we call "self" takes on new dimensions - universal dimensions. We cannot yet be certain that plants and animals have this sense of undifferentiated unity with the cosmos (although we can deduce that they do), but we certainly can say that man does - or at least, some men and women do. I am referring, of course, to the mystics, saints and other spiritual masters who have made this claim the center of their teaching. They have proclaimed the possibility of all people achieving this highest state of consciousness. Jesus said the Kingdom of Heaven is within us. Buddha said that by awakening ourselves, by attaining enlightenment, we enter nirvana, a state of mind akin to, if not identical with, Jesus' concept of heaven. I find it most exciting that science is now attempting to demonstrate some aspects of what religions have proclaimed since early times.

The future of man's evolution is hopefully toward higher levels of consciousness and wholeness, a process which we may expect to accelerate in the next few decades if the body of mankind

comes to know its planetary self. As scientists relearn the truths expressed in veiled fashion by religions centuries ago, science can approach omni-science, omniscience. Omniscience is a characteristic traditionally ascribed to God.

There is nothing to fear about this. It will accomplish what we have failed to do so far - ensure that science is used for service to humanity, not destruction. I am convinced through both experiment and experience that as we study the nature of consciousness, a universal value system will become unveiled. Our awareness can expand to become cosmically aware, cosmically conscious. The structure of the universe and the moral nature of man are understood to be only differing aspects of that enigmatic phenomenon called consciousness.

Intelligence, will and love are three primary expressions of consciousness in operation. All psychological traits, all dimensions of mind can perhaps be classified as emanating from one or more of these three characteristics. It is no wonder, then, that through the ages people have described the mystery of creation as being due to Infinite Intelligence, Supreme Will or Universal Love. These are traditional ways of saying that God is consciousness. Perhaps by focussing our own consciousness on the nature of consciousness, on the question "Who am I?", we can become aware of divinity within us.

Realistically, however, consciousness will likely never be wholly defined or completely comprehended by man. But like the impulse which guides returning salmon to their place of birth and like the phototropic action of a plant that grows toward light,

man will forever be drawn to seek greater understanding of himself and the universe through the study of that ultimate enigma, consciousness. For me, at least, this leads to a philosophy of science which I sincerely hold and which I have been offering to you this evening. I will sum it up in one sentence for your consideration: Seek to know yourself, know the universe and serve humanity.

Thank you for your patient attention.

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