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East-West Perspectives on Science
and Spirit: Time and Consciousness

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TOWARDS SUPERCONSCIOUSNESS

by

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Towards 'Superconsciousnesss'

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Ladies and Gentlemen,

I am a neurosurgeon. I am grateful to Prof. Ravindra for the opportunity he has given me. He invited me to talk on 'consciousness'. I thought it was a very easy task for me as I am dealing with alterations and changes in the levels of consciousness so frequently in my neurosurgical practice. But, I have realized that the word 'consciousness' has indeed a very wide meaning.

I have been taught about the pathways of pain. About the pain receptors and the spinothalamic tract of nerve fibers and the thalamus. Also, I have been taught that the final destination of the pain pathways is in the cerebral cortex. I was surprised to hear about a saint in India. His name was Swami Ramanand. At the age of 58 he suffered from a cancer somewhere in the neck. He was advised surgery for this problem. He refused any kind of drug or anesthesia. The doctors told him about the length of the operation and about the nature of the surgical incisions and that anesthesia was necessary. But the swami did not budge. He was ultimately operated upon and the surgery completed without anesthesia. It is told that throughout the operation the Swami had a smiling face. When asked, he replied that during the operation he was remembering his God. All my medical

school learning about the pain fibers and their destinations appeared to have a big lacuna. Was this Holy man having some unique receptors for tolerating pain? Or was he having some kind of 'super power' to tolerate pain? Or was his meditation and God helping him? Or was he 'super conscious' during the meditation.

I am also amazed by Buddha. I appreciate his preaching's. We are all aware of his sitting posture and prolonged meditation. I understand that he was sitting in a lonely place under a tree. I have learnt from the previous ICUS meeting that the position he adopted during sitting was very well suited for proper relaxation. I learned that his eye posture produced slow-waves on the electroencephalogram allowing a state suitable for high level thinking and calculation. I find it difficult to comprehend how he was undisturbed for so long. Were there no mosquitoes in that jungle? Where did the rats disappear? Did he not feel muscle pain and hunger? I assume he was 'super conscious' during his meditation.

I have seen during 'Moharrum' a day of mourning for the Moslems, many religious muslims walking bare footed on burning coal. During this procedure they dance and sing and remain unaffected by the fire.

The word 'consciousness' is understood in different ways by religious and spiritual leaders, scientists and philosophers. I hope we come to a conclusion as to what it really means during

this conference, wherein a galaxy of Thinkers have assembled.

My patients seem to have different concepts about the word consciousness. Now, I realize that I, myself am not truly clear about its exact meaning. Plato writes: 'Everyone of us is like a man who sees things in a dream and thinks that he knows them perfectly, and then he wakes up to find that he knows nothing'. The paradox of phrases, evident here, arises out of a profound epistemological dilemma: Can we truly and meaningfully describe the experiences of one level of consciousness, in the words, symbols, frames of references of another?

Scientists believe that Life and consciousness is a result of the evolution of 'the primordial substance'. It appears that the Universe started some fifteen billion years ago in a big explosion of the primordial substance under extremely high temperature. The fragments settled and cooled down to form galaxies, stars and planets. Earth is one of these stars. Five hundred million years later living molecules resembling viruses appeared and biological evolution began. Consciousness appears to be a universal phenomenon. Every object, big or small, living or non-living is subject to some sort of control. The response to this control or law can be conceived as 'consciousness'. Only the manifestation of 'consciousness' is more evident in the higher beings. Consciousness is the state of awareness of the self and environment. Plants, animals and other living beings are all 'conscious'. Are we, the humans,

'more conscious'?

Manu, the Primal Man, was the first great law giver; The Laws of Manu touch upon all aspects of human existence, secular and spiritual alike. And they search for the first causes of all things: 'This (Universe) existed in the shape of darkness, unperceived, unattainable by reasoning, unknowable, wholly immersed, as it were, in a deep sleep. Then the divine self... appeared with irresistible creative power, dispelling the darkness.....'

With the initiation of mankind, biological evolution has transcended itself. Human being is the only species engaged in two evolutions at the same time- biological and the cultural. The two evolutions are distinct in principle. Biological inheritance is transmitted by genes, cultural inheritance by instruction and learning. 'Language' is the most diagnostic single trait of man. All normal men have a well defined language; no other living organisms do.

The contrasting characters of the cultural and biological domains are evident. A majority of social scientists believe that these domains are wholly disconnected. It has even been asserted that in acquiring culture, mankind has escaped biology. This is certainly an illusion. Culture and biology are connected by feedback relationships. Cultural changes have genetic consequences.

I considered myself a 'science' man. But as I delve into the depth of things I realize I am not a happy individual. I found most of the people I come across in some kind of stress and pain. Stress has become one of the most important factors which causes disease. Can some spiritual power help us to become 'happy '? Science has been more often equated with the West and religious and spiritual existence with the East. Can Science and Spirituality coexist? Also can science help an individual becoming pain and stress free, make him happy, improve his memory, change his mood and emotions, and take him towards 'superconsciousness'?

A century ago, people looked at science, first and foremost, for enlightenment. It was a source, not so of physical comforts and conveniences, but of fresh ideas and insights. It challenged men's views about the world they lived in, its history and destiny, and about the significance of human beings in that world. It helped them, as Thomas Henry Huxley puts it, to understand, not just Nature but Man's place in Nature. But in the mid-twentieth century, what people seek as a product of scientific research is less likely to be enlightenment than physical comfort. The intrinsic complexity of scientific knowledge increasingly makes enlightenment inaccessible to non-specialists. This results in a mounting alienation between science and society.

It appears that man is the result of natural selection

functioning within his self-made and transmitted culture. Thus, man is 'necessarily' a technological animal whose technological disposition is just as innate (and in the same sense) as his disposition to suffer death. Man cannot choose to be anti-technological because to become such an animal he would still have to use technology to to remake himself. It is logically conceivable, and perhaps with psychosurgery even technologically possible, that human gene pool could be manipulated to eradicate the uniqueness of human beings so as to let the species try to start again from where it was five million years ago.

Increasingly man's ability of manipulate the environment threatens the social stability achieved by sentiment and religion, and it is probably no accident that the rise of the great oriental religions accompanied the decline of science. The second great wave of science began with Copernicus and almost ended when Galeleo was sacrificed for social stability; yet, for a multiplicity of reasons science has survived, flourished, and become the most powerful surrogate for religion as the primary source for current conceptions of social order. Like religion, science is charismatic in that it purports to provide enlightenment about reality and man's place within the universe. From science we expect 'information in terms of which human life can be patterned (and which organizes) extrapersonal mechanisms for the perception, understanding, judgment, and manipulation of the world. '

Although knowledge is still power, and science is still the dominant source of knowledge, the post-World war II years, and especially the last decade, have witnessed a deepening distrust of and even antipathy to science.

Since the days of the Greeks, men have known that normal conscious behavior depends on intact brain function. I remember a famous quote from the Hippocratic writings: 'And men should know that from nothing else but from the brain came joys, delights, laughter and jests, and sorrows, griefs, despondency and lamentations. And by this, in a especial manner, we acquire wisdom and knowledge, and see and hear and know what are foul, and what are fair, what are sweet and what unsavory.....Without doubt, the brain is the most important of the body organs- the master control, the guiding force behind all our actions. It is the seat of all human thought and consciousness and it is, perhaps, the last frontier of man's exploration of himself. Perhaps the most revealing thing about the study of man's brain is that he has inherited the structure and organization of three basic types which, for simplification, MacLean (1973) refers to as reptilian, old mammalian and new mammalian. It cannot be overemphasized that the three basic brains show great differences in structure and chemistry. Yet all three must intermesh and function together as one unit. In evolution one might imagine that the brain has developed like a building to which wings and superstructures have been added. Man's oldest brain is basically reptilian,

forming the matrix of the upper brain stem, midbrain and basal ganglia.

In contrast to the mammals, there is only rudimentary cortex in the reptilian brain. The old mammalian brain is distinctive because of the marked development of a primitive cortex which corresponds to the 'limbic system'. Finally, there appears late in evolution a more complicated type of cortex called neocortex which is the cerebral hallmark of higher mammals and which culminates in man as the brain of reading, writing and arithmetic. Conscious behavior depends on the presence in the cerebral hemispheres of relatively intact functional areas that interact extensively with each other as well as with the deeper activating systems of the upper brain stem, hypothalamus, and thalamus. The only certain knowledge we have about brain function is based on brain stimulation and brain lesions. We know that stimulation of the visual area produces flashes of light, of the auditory area, sounds and of motor area, localized movement. Lesions in these areas produce cortical blindness, deafness and paralysis. As for the function of other areas, like the limbic system, their stimulation produces emotional responses which are an integration of skeletal, autonomic and glandular responses. The prominence of visceral responses in aroused emotional states led to the widespread use of such measures as blood pressure, heart rate, sweat-gland response and respiration as indices of emotional behavior.

The increasingly complex nature of our knowledge in every scientific discipline including medicine in general and neurophysiology in particular means that progress brings new problems to light. The results of research conducted on the limbic system, the role of which in determining emotional response and controlling the autonomic nervous system was recognized relatively recently, have appeared in a large number of publications. Previously unknown neural circuits have been localized, and this has greatly contributed to our understanding of certain functional relationships. Such discoveries not only explain pathological conditions but are also of practical importance in understanding certain functions of the brain.

The term 'limbic system' refers to a deeply situated region of the brain which consists of well defined individual parts that are closely connected by a complex network of fibers forming a functional unit. Limbic means 'forming a border around'. Thus, this convolution, which is formed by the cingulate gyrus and the hippocampal gyrus, comprises a system surrounding the brain stem and separates it from the neocortex. It deserves emphasis that this lobe is found as a common denominator of the mammalian brain. Its relative stability throughout mammalian phylogenetic history contrasts with the mushrooming neocortex which culminates in man.

Having observed the fiber connections between the hippocampus,

mamillary body, anterior thalamus and cingulate gyrus, Papez postulated the existence of a functional circuit largely concerned with emotion and its expression. Convincing evidence of the credibility of this hypothesis was swiftly offered by Kluver and Bucy, who in 1939 published their observations of behavioral changes in monkeys after bilateral temporal lobectomy.

It should be emphasized that the limbic cortex has similar features in all mammals and is structurally more simple than the neocortex. From this it can be inferred that it continues to function at an animalistic level in man as in other animals. In marked contrast to the neocortex, it has strong connections with the hypothalamus which plays a basic role in integrating emotion expression. The central position of the hypothalamus in emotional expression depends on its function as the chief outlet for neural messages chiefly from primitive parts of the brain to effector organs, such as smooth muscles and glands.

The brain is formed of a bundle of structures representing different potentialities and different activities which are inter-connected by neural pathways which serve to complete reverberating circuits. A unified action of the brain, therefore, is attained by the interactions of these various structures which can explain why an emotional arousal caused by an unpleasant experience does not cease the moment the stimulus is over; we continue to glower and smolder for a long time afterwards as the positive feedbacks continue to reverberate.

Such a continuous process may underlie some examples of pathological anxiety.

The brilliant suggestion that reverberating circuits might explain emotional experience came from Papez. He said, "Is emotion a magic product or is it a physiological process which depends on an anatomical mechanism...This fertile suggestion achieves its merit by combining in an anatomic and functional formulation the chief center for the co-ordination of emotional behavior, namely the hypothalamus with the cingulate gyrus which is a portion of the neocortex, thus bringing a component of discrete awareness to the more vague but nevertheless powerful impulses which are regulated by the older cortical areas.

Antonio Egas Moniz reflected on the first psychosurgical operation- the destruction of the white substance of the frontal lobes for relief of anxiety- conducted in association with the surgeon Almeida Lima on 12th November, 1935. In 1949, in recognition of the importance of this work, Moniz was awarded the Nobel Prize for Physiology and medicine, the citation stating: "Frontal leukotomy, despite certain limitations of the operative method, must be considered one of the most important discoveries ever made in psychiatric therapy, because through its use a great number of suffering people and total invalids have recovered and have been socially rehabilitated". The controversy has continued over four

decades, being temporarily quieted in the mid 1950's when the advent of psychotherapeutic drugs resulted in a reduction in the number of psychosurgical operations. Initially such operations caused great moral concern throughout the world because of 'a tampering with the human soul'. In the last two decades the debate has reached new heights of emotionalism and these operations have been abandoned in most countries. However, the research on the subject still goes on.

The level of aggressiveness shown by an individual is determined by interaction of his genetic endowment and his life experiences. If areas are destroyed that normally initiate aggressive behavior this will be lessened; if on the other hand inhibitory areas are destroyed, aggression will occur more readily. Damage leading to excessive aggression may be associated with a wide range of lesions affecting the appropriate areas of the brain; tumors, scarring from head injuries including those that occur at birth, encephalitis, meningitis and so on. A well-known example of a patient who ultimately was found to have a temporal lobe tumor was Charles Whitman who shot forty-one people on the campus of Austin, Texas, killing seventeen of them (Mark and Ervin, 1970). Psychomotor seizures originating from lesions of the anterior temporal lobe or the orbitofrontal cortex may be accompanied by antisocial behavior or even acts of violence. Cerebral mechanisms underlying some emotional disturbances and psychic dysfunctions may be related to cholinergic hyperactivity of neurons in certain areas of limbic system. An obvious practical

conclusion would be the development of drugs with useful degrees of stability and specificity that will block excitatory cholinergic transmitters. In the meantime some patients can benefit from surgical interruptions of those hyperexcitable pathways that have precipitated the psychic dysfunction.

Certain chemicals can be injected directly into the brain by means of a "chemitrode" and the resulting neuronal electric changes recorded. Recent studies have shown that the application of acetylcholinesterase inhibitors or cholinomimetics to such limbic structures as the septum, amygdala and lateral hypothalamus, cause increased aggressiveness and hyperactivity in animals. This suggests that the changed behavior is a result of the disturbed function of neural mechanisms which are normally subject to cholinergic mediation. Irritative lesions in or near the limbic cortex may give rise to epileptiform discharges accompanied by such emotional feelings as terror, fear, strangeness, unreality, sadness, wanting to be alone or feelings of a paranoid nature. Experiments were performed in rats where the septal area was stimulated with the help of an electrode, the switch of which was fixed to the legs. The rat enjoyed the stimulation and repeatedly switched on the electrode. Based on the rewarding effect of septal area, therapeutic stimulation of this region has been applied in humans to surgical management of chronic pain. A decrease in gastric ulceration and plasma cortisol were observed in the septal stimulation group. No direct influence

on the catecholamine system was noted. Experiments have also been carried out that would improve the memory of the rats. The relevance of these discoveries to actual therapy should be obvious, since more detailed knowledge of the functions of the various structures of the limbic brain facilitates a more precise localization of the target areas of the psychotropic drugs and psychosurgical procedures. In the days of psychosurgery a frequently performed operation was posterior hypothalamotomy. An interesting observation was that in a number of patients their IQ's improved. It appears that there is some center in the neighborhood that is responsible for the person's IQ. If a person can be relieved of pain and anxiety, and his IQ and memory is improved by artificial means there are chances that we have a better and happier product. I am concerned not only with psychosurgery but also with the full range of biomedical and behavioral techniques by which an individual can be manipulated.

The word consciousness is derived from 'cum' meaning -'with' and 'sure' meaning 'to know'. In other words, it is not simply a 'knowledge of', but also a certain 'knowledge with' a particular state. The state of consciousness and consciousness of something emerge as two essential aspects of consciousness suitable for consideration. Consciousness is a process, which manifests itself with a subjective awareness of one's own identity, one's own past and actual perceptual and emotional situation. The products of consciousness itself- fantasy and dreams primarily- may be the products of tensions and events of

the past. The difficulties in understanding consciousness is attributable to our lack of knowledge of aspects of human existence which are essentially correlated with consciousness such as perception, memory, learning, attention and thought. Consciousness is interpreted as one of the attributes of the 'mind'. Consciousness is normally filled with content peculiar to each individual, providing a sense of the 'unique' self.

The science and modern technology has made life much more comfortable. It appears that science knows the truth of existence. However various questions about 'consciousness' remain unanswered. What we call consciousness is like ocean of thoughts, perceptions, images and symbols. Ordinarily it is only the surface of this ocean that is available to us, to our awareness; the rest lies hidden as 'subconscious'. Though we do not know what are the organs of perceptions of the subconscious it is now generally understood that the subconscious is far more intelligent and 'conscious' than our ordinary consciousness. As The Upanishads say : He, the highest Person, Who is awake in us while we are asleep, shaping one lovely site after another, that alone is called the Immortal.

Ancient Hindu medicine treatise 'Charaka Samhita' observes that Man is formed by a sum of six proelements, the sixth one being 'consciousness'. In the Buddhist view, consciousness is accepted as a real entity knowable by direct experience. One needs to develop one's proper mental faculties to be able to

realize the existence of one's own consciousness. In Buddhism, consciousness or mind is the fundamental factor of existence. Consciousness is not static. It comes and goes quickly in succession like flashes of light.

Religious and spiritual thinking is that religion canalizes psychic energy and creates consciousness. Scientists understand religion as obsessional neurosis of mankind, coercive in a magical way. Can we combine the religious and spiritual feelings? Can we bring East and West together?

Spiritual means to achieve a state of 'superconsciousnes' is 'meditation'. My professor of neurosurgery keeps on saying to me that the operating theatre is your temple and operating under the microscope is closest to meditation. This kind of meditation is sometimes referred to as concentrative meditation. In this method, mental energy, usually scattered and distracted, is mobilized and channeled into a single beam directed towards one objective exclusively. Such concentrated attention is possible only when no irrelevancies distract. There is a very popular story in 'Mahabharta'. There was a tournament held by the teacher to test the marksmanship in archery for his prince students. A wooden fish was set up high on a pole and the eye of the fish was the target. One by one the princes tried their skills, but in vain. The teacher asked them just before the arrow was shot as to what they were seeing. They replied that they saw a fish on a pole at great height, the head of the fish, the sky etc. But Arjuna, said

that he could just see the eye of the fish, and he was the only one successful in hitting the mark. A well disciplined mind has been aptly compared to a light beam that can be directed at will to any object in the dark of the night. The state of the mind to achieve its goal should be content free, alert and expectant.

Meditation, under various names has been practiced throughout history. Meditation has been practiced the world over, especially the East and there have been various claims about its efficacy. Indian thinkers and 'Yogis' seem to have proved that by practical techniques, it is possible to rise above the constricting feeling of 'I' and 'Mine'. Meditation is a means of understanding consciousness. Meditation, autogenic training, Zen and Yoga have been used synonymously. The origin of these practices is based on spiritual pursuits. Increasing popularity of such practices in the West is mainly due to expectations that they are good for relaxation, reduction of stress, anxiety, neurosis and other problems inherent on our fast moving , competitive, stressful society. The underlying concept of these practices is that man has innate regulatory mechanisms which, if given the chance, restore the brain and body processes to optimal conditions. They seem to have 'normalizing influence' on many body and mental disorders. Charaka Samhita (Suthra 138-139) mentions 'From the contact of self, the senses, the mind and sense objects arise pleasure and pain, these too cease to be, as a result of inaction of mind which is

firmly fixed in the self. Then, while embodied, it acquires the psychic powers; and this state, the Rishis who are conversant with Yoga, refer to as Yoga. But the real aim of such yogic practices is to achieve a state when the 'consciousness-awareness-self awareness' is transcended and one reaches a level of universal awareness, which is beyond time and space. An accomplished 'Yogi' can reach this state of universal awareness at will and thus though he lives in the ordinary world he is not a part of it. Normally the brain finds little rest, and practice of such self-regulatory methods may help in restoring the optimal brain function. Ramamurthi, an Indian Neurosurgeon, feels that this is the sum and substance of Indian contribution to the development of human power, to reach a state of 'super-consciousness- a state that is above mind and thought'. There have been claims for the efficacy of meditation in educational settings and in health problems such as drug and alcohol abuse, hypertension and stress management. However, no conclusive evidence that meditation is therapeutic is still available. It has been postulated in 'Charaka Samhita', "Because the self is the conscious element, therefore it is called the agent or the doer, while mind though actually performing, is not called the doer, because it is devoid of consciousness". It appears that the brain possesses the mechanism of higher achievement than has been conceded by modern thinkers and scientists, but we are not using it adequately.

'Chetna' and 'prana' are the words used in Sanskrit to describe

consciousness. In Hindu psychology, the sense, the mind, reason and ego are all part of the material body, all driven by the life force "prana". Over and above the 'prana' is the soul or the 'athma'. The entire Universe is pervaded by a force called the 'paramathama'. Liberation or 'moksha' is when the soul gets close to the 'paramathma'. It has a close semblance with 'nirvana' in Buddhism.

Buddhism lays great emphasis on the present moment. It regards the instantaneous now as the only reality where the truth may be discovered. The past is gone and the future is but an imaginative projection of the present. Buddhism, without advancing any hypothesis beforehand, urges the truth seeker to analyze the immediate experience of living, moment to moment, rigorously. The seeker, however, needs to equip himself or herself with adequate tools. These tools are some of his wholesome mental properties, particularly mindfulness, which can be developed to its utmost capability. Science preoccupies itself mainly with the material aspects of existence. This materialism is certainly contributing to moral decay and a host of problems in present day society. It is refreshing to note that the scientific community has been shifting from its former negative attitude towards meditation. Many scientific bodies have recommended further research on this matter. In this meeting of the ICUS we must stress the need of these investigations so that a 'science' man can become 'spiritual' and thus have a heightened consciousness and increased

happiness and completeness. Eastern and Western ideologies and way of thinking should join hands and become one.

Prof. Manu Kothari, from India, suggested that the left sided hemisphere appears to be more like a 'Science brain' or 'Western brain and the right had 'Spiritual or Eastern' nature. It is an anatomical and physiological fact that left cerebral hemisphere has centers for 'calculations, learning, speech, reasoning and action, all qualities of Western thinking. While the right hemisphere has centers for music, emotions and constructive thinking, qualities of Eastern thinking. It has now become a familiar story in neuroscience that when you divide the brain surgically by midline section of the corpus callosum or the cerebral commissures the 'mind' also is correspondingly divided. It appears to me that for an individual to be 'complete' he has to have both right and left side brain intact or both a 'Eastern' and 'Western' way of thinking. The need of the hour is to have a strong 'corpus callosum'.