Dr. Sarvepalli Radhakrishnan Memorial Lecture

PARADIGMS OF DISINTEGRATION AND HARMONY

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Science & Technology and Ocean Development
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INDIAN INSTITUTE OF ADVANCED STUDY
Rashtrapati Nivas, Shimla

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PROLOGUE

The Radhakrishnan Memorial Lecture is the most important event in the academic calendar of the Indian Institute of Advanced Study, Shimla. The Seventh Radhakrishnan Memorial Lecture was delivered this year on the 26th June 2003 by Professor Murli Manohar Joshi, eminent scientist, educationist and thinker, currently the Hon'ble Union Minister for Human Resource Development, Science and Technology and Ocean Development. The lecture was greeted by a thunderous applause of welcome by the audience on which it left a deep impression.

I am happy to place before the public the text of the lecture along with a brief Introductory Note by Professor S.C. Bhattacharya, National Fellow at the Institute.

BHUVAN CHANDEL
Director
Indian Institute of Advanced Study
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INTRODUCTION

Startling developments in science and technology over the last two centuries and the consequent transformations have wrought in the material aspects of life have had a dazzling effect on the contemporary perceptions about the nature of the universe and man's role in it and about human destiny. While these scientific and technological 'wonders' were taking place another series of developments were transforming the character of political dispensations. Monarchy was being supplanted by democratic nationalistic governments. Despite the timeworn caution about the *Kakataliya* fallacy, the simultaneity of these two sets of developments got bound in a cause-effect relationship in our contemporary perception. It seems that we have become unable to view and evaluate these two sets of developments independently and keeping them separate.

And the impact of what was viewed as a major change had cast a spell on the thinking process. A supremely confident enthusiasm greeted these developments and it was felt that the world had at last discovered the golden key to all its existential problems. The world had just to shed off its outmoded attitudes and begin applying science and scientific temper to all walks of life and look forward to the dawn of the millennium. Unfortunately the course of the actual events did not measure up to the expectations. Despite stunning scientific and technological innovations, a truly just, happy and harmonious world remains as distant as ever. Instead of creating an equitable world, the technological changes appear to have widened and deepened the cleavages. The economic disparities between nations and between various segments and groups within the

national boundaries are increasing at a disturbing pace and extent. Naturally therefore opportunities of life are growing in a menacingly uneven manner. It is no wonder therefore that the contemporary world is fast turning into a hotbed of ethnic conflicts, terrorism and senseless violence. It is not only that the edges of the conflict of interests between nations have got sharpened, but all sensitive and discerning persons can feel that men in general have become much more edgy, disoriented and disturbed than they were before. A dehumanizing process seems to be overtaking man. These are alarming signals. And then resources and the degradation of environment and biosphere are staring us in the face. It seems something crucial has gone terribly wrong somewhere.

Even at the very heyday of the progressive march of science murmuring voices of dissent about the course chosen by the world for its future development were heard. Among the most compelling of such voices were those of Marx and his follower Lenin. But unfortunately they mistook symptoms for the disease and prescribed treatment for them. The disease thus not only lingered but got aggravated. More perceptive were some of the great sons of our own country. Tagore in a number of his writings had warned of the folly and danger of succumbing blindly to the 'charms' of scientism and uncritical industrialization. His plays *Raktakarabi* and *Muktadhara* are eloquent depictions of the terrible price the dehumanized scientism exacts. Mahatma Gandhi's views are well known. And from within the domain of science itself came the voice of J.C. Bose. Unfortunately they did not receive the deserved attention. Even the implications of Bose's findings were not worked out and properly appreciated.

Professor Murli Manohar Joshi deserves our gratitude for choosing to understand and examine minutely the nature and the implications of the paradigm of development that has been dominating the world for more than last two hundred years in the Seventh Radhakrishnan Memorial

Lecture he delivered at the Indian Institute of Advanced Study, Shimla. In a comprehensive and penetrating treatment of the history and the trajectory of the growth of modern science and economic development, Professor Joshi has highlighted the above facts and put his finger on the central fallacy of the philosophy of unlimited growth in a limited world. His diagnosis, however, goes a step deeper. In an in-depth and perceptive analysis he shows that the trajectory of modern scientific and technological 'progress' was a natural, perhaps inevitable, outcome of the philosophy it enshrined. It was based on a paradigm of exploitation and a master-servant world-view. From Galileo, Descartes, Newton, the founding fathers, modern science had inherited a mechanistic world-view where nature was looked upon a something to be exploited for the benefit of men. This discourse soon acquired a hegemonic character and was borrowed by Locke and the Positivists and was applied to the understanding of society. Such a philosophy by its very nature is unable to inspire or sustain a scheme of balanced and harmonious growth. In an impassioned plea Professor Joshi has appealed to our reason to call a halt to this mad rush along this uncritical philosophy of growth. Instead we could better look towards our own traditional holistic philosophy.

To his friends and close acquaintances Professor Joshi was always known as much for his acute and sensitive mind as for his command over physics and his commitments to the country and the society. It augurs well for the intellectual life of the country that Professor Joshi seems to be acceding to the desire of his friends to share his thoughts on crucial issues of contemporary concerns with larger public. This lecture would go a long way to establish Professor Joshi among premier thinkers of philosophy of science.

SIBESH BHATTACHARYA
National Fellow
Indian Institute of Advanced Study
Shimla

Respected Professor G.C. Pande, Distinguished scholars and Members of the academia!

I consider it a matter of great privilege to be here and deliver the Sarvepalli Radhakrishnan Memorial Lecture. I am extremely thankful to Professor Pande and the Institute to have invited me for this occasion and given me a chance to visit this historic building dedicated by the then President of India Dr. Radhakrishnan for the pursuit of higher learning and research. I take this opportunity to offer my homage to that great scholar statesman and also to share my thoughts on the urgency for discussing the world problematique and the need to have a new holistic paradigm in place of the mechanistic reductionistic world-view.

1. Sarvepalli Radhakrishnan was the most variously gifted Indian of his generation and the sheer range and diversity of his achievements make it difficult to hold the totality of him in the mind. His intellectual activity itself was many-sided: a seminal thinker; an evocative teacher; a virtuoso orator; a writer with stylish vigour; an indefatigable translator and commentator and a prophetic soul. Added to this were the worthy interventions in public affairs: the staunch patriot, the constructive educational administrator, the ambassador who won confidence in what was thought to be an un-congenial atmosphere, and finally the dignified presence for 15 years in Delhi as Vice President and President of India. There is an element of paradox in the various aspects of such a crammed life – a successful philosopher, a man of the world with a devotion to the life of the spirit, an austere believer who had not shut the door on emotions, a progressive mind within the Indian ethos, an embodiment of Hinduism, a politically committed person within contemplative temper. He can be best described in his own

comments on Samkara – "The life of Samkara makes a strong impression of contraries". Such diverse gifts did he possess that different images present themselves, if we recall his personality. Yet his thought, his faith, his travails, his patience and gentle temperament, were all aspects of a coherent life, the realization of a particular vision.

2. His reading of Hinduism provided the base for his philosophy of idealism. His efforts to interpret Hinduism and restore its vitality were far from chauvinist and promoted social concern and action. His conviction that Hinduism at its best stood for a religion of the spirit which encompassed all routes to the same goal prepared the ground for spiritual bridges and world unity. Like Gandhi, he too was (in the highest degree and) at the same time a Hindu and a World Citizen; and these attitudes were not only compatible but merged into one. His genius lay in the totality of his work considered as the totality of the manifestation of the person. His early works establish a powerful intelligence; *Indian Philosophy and Eastern Religions and Western Thought* conveys a sense of massive scholarship held together by interpretative skill; the editing of the classics shows his ability to attract lay audiences to serious subjects. *An Idealistic View of life*, original, distinctive and challenging gives him a secure place in the intellectual history of the 20th century. Radhakrishnan is more than just an undeposed figure in the realm of pure thought. His comprehensive mind had also turned to aspects of life and viewed current issues in wide perspectives.

3. Radhakrishnan brought together two powerful living forces – pride in the past and faith in the future. His work not only shows the influence of thought of other times and places, but is of interest to men and

women everywhere. Today, when people's mind are awash in doubt and confusion with science no longer offering comfortable certainties, Radhakrishnan's work goes far to meet the spiritual needs of the ordinary person. He came nearer than any other philosopher of his time to resolving the tension between intellectual conscious and the longing for a religious faith. With creeds and traditions losing their hold, his teachings are again coming to their own and helping to assist and enrich life. His work reflects not only the spirit of the age but to lead it forward, to state the values, set the goals, point the direction and lead to new paths. A product of his times, he also saw ahead and brought nearer his vision of the international landscape to come. He maintained that the ultimate truth was one, that every religion shows some traces of it and it is the matter of indifference to which religion we adhere.

4. His power of reconciliation, of understanding and interpreting the conflicting positions was so well recognized that when he was appointed ambassador to the then Soviet Union, his appointment was hailed by Sarvashri Guruji Gowalkar, Hiren Mukherjee and Sarat Bose with equal enthusiasm. His approach to world issues was such that he won acclaim from Stalin, Mao Tse Tung and Kennedy in equal measure. Such an achievement of an individual is all the more unique when the climate of Cold War was at its peak. His life and style are more relevant today than in the times when he lived. I salute this statesman scholar and believe that the life of Sarvepalli Radhakrishnan would continue to be a beacon torch for the world leaders and thinkers that in the face of conflict potentials, it is possible to keep the feet firmly rooted to the ground and arrive at solutions which meet the general consensus.

I

During the past two centuries rapid advancement of science and technology has played a very crucial role in transforming human society. Since the beginning of the twentieth century researches in the domain of atomic and sub-atomic world, nuclear power, space, lasers, superconductivity, biotechnology and genetic engineering, medicine, cybernetics, information and communication technology etc. have been successfully used for producing mind boggling affluence and unprecedented levels of consumption.

But, despite all this success story, in the last decade of the twentieth century and in the beginning of the twenty-first century human society finds itself engulfed in a multidimensional crisis. It is a crisis which encompasses all aspects of human life – social, political, techno-economic, cultural and spiritual. All nations whether rich or poor are troubled nations and are undergoing serious stresses and strains. Mankind is witnessing an unprecedented fragmentation of society and atomization of family; tremendous rise in crime, violence, widespread terrorism and religious bigotry; rising trend of civilizational conflicts; rapid erosion of social discipline and moral values; fast degradation of natural environment and consequent climatic changes; increasing economic disparities between nations and between groups within a society and numerous other psychological disturbances. The tragedy is further heightened by the fact that with all the scientific discoveries and technological advancement and sophisticated tools of analysis at hand the modern expert is unable to resolve the divergent components of the complex of world problems. This is the predicament which has engulfed mankind today.

II

The growth of an industrial society in the West in the early decades of the twentieth century and the rapid transformation of some of the countries from the debris of the Second World War into powerful and affluent societies generated a sense of optimism and enthusiasm for adopting technology to resolve many of the problems confronting modern societies. In the light of the series of spectacular technological achievements many people thought that a panacea to the ills beplaguing human society was ready at hand. In the late sixties and early seventies of the last century some bold announcements were made that, if modern technology was more fully employed, it was not difficult to chase out hunger from the earth within a decade or two; comprehensive physical and economic success for humanity could be accomplished in one-fourth of a century; with anticipated gains in technology and pollution control, product substitution, and alteration in price structure almost limitless growth could be attained.

How far these statements are supported by the available information? Whether the present model of unlimited growth in a limited environment adopted by the western nations is the right answer to the complex of the world problematique? These and certain related questions have to be debated and resolved by thoughtful men and women in the light of the existing evidence. Facts do need a closer scrutiny.

Human relationship in the superindustrial societies is undergoing tremendous stress. People define their social interactions on functional terms rather than on the emotional plane. In technological societies human beings have lost their individual personality, they have been transformed into a 'modular man' – an atomized personality existing in

a highly amorphous society. Due to superindustrialism families has been broken and human relationship have become transient. The number of single parent families in the West is on the rise. From this fragmented psyche flows the sense of alienation and frustration as reflected in the rise of terrorism, alcoholism, schizophrenia, drug abuse and sex crimes. Human heart is in a desperate search of 'total involvement' which is denied by the compulsions of the technological society. Men are neither in peace with themselves nor with their social and natural environment.

With the end of the Cold War and failure of the communist system marked by the disintegration of Soviet Union the West today enjoys an unchallenged political and military supremacy. It is now a unipolar world where the international political and economic institutions are being controlled by a small group of nations to the exclusion of the vast majority of humanity. Through the international economic institutions the West now promotes or even imposes its own economic policies, political and cultural value systems on other nations in order to protect its own interests and consumption patterns. Many of the developing countries have protested that the way the WTO works their political and economic sovereignty and their right to autonomous development are being undermined.

The level of inequality worldwide is grotesque, says the Human Development Report 2002. Long-term trends in interpersonal inequality, using Purchasing Power Parity (PPP) exchange rates, show that the world has become much more unequal.

The socio-economic conditions prevailing towards the close of the Twentieth century as reflected in various Human Development Reports can be summarized as under:

- Twenty per cent of the world's population living in the richest countries consume 16 times more as compared to the 20 per cent living in the poorest countries.
- The gulf between the poor and rich has further widened, of the 23 trillion global GDP in 1993, $ 18 trillion is in the industrial (20 per cent of world population) and only $ 5 trillion in the developing countries, even though they may have nearly 80 per cent of world's population.
- The poorest 20 per cent of the world's people have their share of global income declined from 2.3 per cent to 1.4 per cent in the past 30 years. Meanwhile the share of the richest 20 per cent rose from 70 per cent to 85 per cent that doubled the ratio of the shares of the richest and the poorest from 30:1 to 61:1.
- The assets of the world's 358 billionaire, exceed the combined annual incomes of countries with 45 per cent of the world's population.
- The gap in the per capita income between the industrial and developing worlds tripled from $ 5,700 in 1960 to $ 15,400 in 1993 and the trends are that this gap is further rising.
- The current trade and economic policies (the free flow of trade and money) around the world have brought economic growth for the fortunate in the largest and the strongest economies but have also created a widening gap in the health and wealth between and within the countries. The UNDP Human Development Report 1998 makes clear that pervasive market and government failures have made it

impossible for many in Asia, Africa and Latin America to reach the desired consumption frontier.

These polarizing forces have intensified in the past decade, creating a 100 million poor within rich 'core' in addition to 1.3 billion people in the periphery who exist on $ 1 a day or less.

To understand the consequences of excessive consumption by the rich and affluent it is instructive and sobering to look at some global trends. First the consumption disparities. Globally, 20 per cent of the world's richest people accounts for 86 per cent of total private consumption expenditure, the poorest 20 per cent only 1.3 per cent. The richest fifth consume 45 per cent of all meat and fish, the poorest fifth 5 per cent; the richest fifth consume 58 per cent of total energy the poorest fifth less than 4 per cent; the richest fifth have 74 per cent of all telephone lines the poorest fifth 1.5 per cent; the richest fifth consume 84 per cent of all paper, the poorest fifth 1.1 per cent; the richest fifth own 87 per cent of the world's vehicle fleet, the poorest fifth less than 1 per cent. Worse, the gap between the rich and the poor is growing. In 1970 the ratio was 30:1, today it is 74:1.

What are the implications of this consumption imbalance? Firstly, disproportionate consumption on the part of the rich contributes to reduced consumption on the part of the poor by causing a strain on overall resource availability and reduced affordability. Secondly, as the 1998 Human Development Report of the UNDP has dramatically brought out, the pollution and waste generated by excessive consumption far exceed the earth's sink capacities to absorb and convert them. The fifth of the world's population in the highest income countries account for

53 per cent of carbon dioxide emissions, the poorest fifth for 3 per cent. The human consequences of the global warming from carbon dioxide can be devastating for poor countries, playing havoc with harvests, rise in sea-levels, permanent flooding of large areas, increased frequency of storms and droughts, extinction of some species, spread of infectious diseases and possibly sudden and savage flips in the world's climates. Thirdly, excessive consumption of the affluent on the one hand and the poverty-environment-population problem triad on the other are causing an unbearable strain on natural resources. The number of water scarce people is expected to soar from 550 million to 3 billion by the year 2025. Global water availability has dropped from 17,000 cubic metres per capita to 7000 today. A sixth of the world's land area is now degraded as a result of overgrazing and poor farming practices. Forest area per 1000 inhabitants has fallen from 11.4 square kilometres to 7.3. Fish stocks are declining with about a quarter currently depleted or in danger of depletion and another 44 per cent being fished at their biological limit. Wild species are becoming extinct 50:100 times faster than they would naturally. The cost of this environmental damage is the heaviest and the most severe on the poor.

The remarkable scientific advances that have contributed to food production globally have been achieved at some cost. Over the past 50 years there has been a loss of 25 per cent top-soil and 20 per cent less agricultural land. We have spent the capital rather than using the interest. In 1961 the amount of cultivated land supporting food production was 0.44 ha per person; today it is about 0.26 ha; based on population projections, by 2050 it will be in the vicinity of 0.15 ha per person. Irrigation has become increasingly important with about 16 per cent of

arable land being irrigated and producing one-third of the world crops, but it has produced problems of salivation and soil degradation.

In assessing the environmental impact of material intensity of production processes in highly industrialized economies, an often ignored factor is the moving or processing of large quantities of primary natural resources that do not end up being used in the final product. For example, fabricating automobiles and other metal intensive products requires mining and processing a yearly per capita equivalent of 14 metric tones of ore and minerals. Similarly, in the U.S. growing the food required to feed a single US resident causes about 15 metric tones of soil erosion annually. These hidden material flows from mining, earth moving, erosion and other sources – which together account for as much as 75 per cent of the total materials, that industrial economies use – are easy to ignore because they do not enter the economy as commodities bought or sold and are thus not accounted for in a nation's gross domestic product. These hidden material flows represent a truly massive scale of environmental alteration given the scale of material flows. Significantly, the resulting impact from these hidden flows is often felt far from the economies that benefit from them, since industrial economies import a very substantial part of their raw-materials from developing economies. These hidden flows are a major contributor to environmental inequity.

The main features of the emerging scenario are thus highly disturbing. The techno-economic system adopted with a view to producing a democratic egalitarian world order has resulted in an exploitative and a highly fragmented world. The wealth of the world is disproportionately possessed and in fact never before in human history too few enjoyed

so much affluence at the expense of too many. The unipolar world in other words signifies a highly oppressive and thoroughly exploitative world order. The Third World which was exploited for centuries under the colonial and imperial orders is now again sought to be dominated in the name of new world order. With all the promises of producing an egalitarian society and a fairer distribution of wealth the globalized world today is more unequal than ever before. The social consequences of this highly iniquitous consumption need to be investigated.

All nations of the world are troubled nations in a sense. They are unable to understand and diagnose their problems. No country whether rich or poor is free from problems. According to reports appearing in International Herald Tribune the US unemployment rate was at an eight-year high when it rose to 6.1 per cent in May, 2003. The US economy had lost more than 2.5 million jobs in the last two years. In Canada the unemployment rate was pushed to 7.8 per cent the highest (7.5) since February, 2002 according to Stastics Canada. This signifies a broad-based weakness in these economies. Reports regarding European economy indicate that Europe is on the brink of tumbling back into recession, after Germany, Italy and Netherlands reported that their economies unexpectedly contracted in the first quarter of the year 2003. According to the noted economist Joseph Stiglitz "Europe has failed in that essential mission (creating stable growth). Its framework is not well designed to address the problems of to-day". And as we all know apart from the shrinking of various developed economies, problems like civilizational conflicts, emergence of religious fundamentalism, rise of terrorism, poverty amidst plenty, loss of faith in spiritual values and

institutions are present in varying degrees in all nations and need an urgent solution.

Stiglitz in his seminal work "Globalization and its Discontents" goes on to say, 'The barbaric attacks of September 11, 2001, have brought home with great force that we all share a single planet. We are a global community, and like all communities have to follow some rules so that we can live together. These rules must be – and must be seen to be – fair and just, must pay due attention to the poor as well as the powerful, must reflect a basic sense of decency and social justice. Intoday's world, those rules have to be arrived at through democratic processes; the rules under which the governing bodies and authorities work must ensure that they will heed and respond to the desires and needs of all those affected by policies and decisions made in distant places'.

Stiglitz, who had functioned as Chief Economist at the World Bank and was Chairman of President Clinton's Council of Economic Advisors, had the opportunity to observe the functioning of US Treasury from close quarters, has given a detailed account of what globalization has done to the developing countries. In his seminal work *Globalization and its Discontents* he writes, Globalization today is not working. It is not working for many of the world's poor. It is not working for much of the environment. It is not working for the stability of the global economy. Voicing his concern for the poor of the developing countries who are severely hit by globalization he continues to write, 'I have written this book because while I was at the World Bank, I saw first hand the devastating effect that globalization can have on developing countries, and especially the poor within those countries. I believe that globalization – the removal of barriers to free trade and the closer integration

of national economies – can be a force for good and that it has the potential to enrich everyone in the world, particularly the poor. But I also believe that if this is to be the case, the way globalization has been managed, including the international trade agreements that have played such a large role in removing those barriers and the policies that have been imposed on developing countries in the process of globalization, need to be radically rethought.' According to Stiglitz, 'It is the trade unionists, students, environmentalists and ordinary citizens marching in the streets of Prague, Seattle, Washington and Genoa who have put the need for reform on the agenda of the developed world'. An alternative paradigm is, thus, the need of the hour. While I tend to agree with Stiglitz that it is necessary to have a fresh look at the way the globalization is being managed and also the contents of the international trade agreements, I as a student of science also believe that it is imperative to have a deeper analysis of the developmental model promoted by the West and rooted in the mechanistic world-view accepted by the scientific community for the past three centuries or so.

III

The scientific thought dominating the western mind for the past three centuries evolved as a result of the works of Galileo Galilee, Francis Bacon, Rene Descartes and Issac Newton. The foundations of scientific rationalism were laid when Galileo for the first time combined experiments with mathematics. Bacon propounded a clear theory of inductive procedure and Descartes declared, "all science is certain and evident knowledge". Descartes also constructed an entirely new system in which events were mathematically described. His statement 'Cogito

ergo Sum' (I exist because I think) resulted in a fragmented human personality with 'mind' separated from the 'body' and functioning as a controlling authority of the body. Descartes with his analytical skill portrayed Universe and all the objects which constituted it as automata. His method consisted of breaking up thoughts and problems into fragments and then arranging them in their logical sequence. Cartesian approach thus produces a fragmentary world-view. Like Bacon, Descartes himself believed that the aim of science was the domination of nature affirming that scientific knowledge could be used to render ourselves the masters and possessors of nature.

Descartes also extended the mechanical view of matter to living organisms. Plants and animals were simply considered as machines. As far as the human body was concerned it was indistinguishable from animal machine. He said, "I do not recognize any difference between the machines made by the craftsman and the various bodies which the nature alone compose. I consider human body as a machine". Descartes, however, believed that human beings were inhabited by a rational soul. The mechanistic world-view received further support from the works of Issac Newton who along with the works of Descartes synthesized the works of Copernicus, Kepler, Bacon and Galileo. Newton developed his mathematical theories and machines on the basis of the Cartesian view of the universe and created a strong foundation of classical physics.

Newton showed the western world that the universe was rationally comprehensible. He was responsible for a speedy development of experimental sciences particularly in physics, which ultimately resulted in some of the most wonderful scientific and technological discoveries.

The industrial revolution could only be propelled because of his discovery of laws of motions which demonstrated that Celestial bodies also obey the laws valid on our planet. Human mind could, thus, comprehend what till then was believed to be purely the domain of the divine. If Descartes developed the discipline of mathematical analysis and proved that Nature could be pictured as a Great Machine, it was Issac Newton who discovered the laws on which the machine operated. Newtonian physics required the existence of an extra-terrestrial agency like God to set the machine in motion in accordance with some divine laws. In Cartesian scheme the nature could be described objectively by a set of mathematical equations and the existence of an observer or extraterrestrial agency was unnecessary. The synthesis of these two ideas retained universe as a machine but bade a goodbye to God. Cartesian dualism between matter and spirit thus created a deep spiritual void that has become characteristic of the mainstream of scientific rationalism. The philosophical basis of this secularization of nature was the Cartesian division between matter and spirit.

Some of the philosophical consequences of the Cartesian-Newtonian approach or in other words of scientific rationalism can be summed up as under:

a) that the Universe or Nature is a Giant Machine and is governed by certain universal laws which can be discovered through experiments and rational understanding;

b) that there is an external world which exists independent of us, that "I" as an observer exists "in here" and "out there" exists the external world to be "observed". This external world is impersonal and the

observer can strive for "Absolute Objectivity", i.e. measuring the external world without disturbing it;

c) that phenomena and problems can be understood by reducing them to fragments and then rearranging them to their logical order. In other words "whole" is merely a sum of its "parts";

d) that with persistent refinement of the experimental techniques and mathematical methods the scientist would one day observe the ultimate reality of the Universe, the nature would be forced to reveal all its secrets. Scientists would then become complete masters and possessors of nature with full liberty to exploit it. Scientific rationalism thus provides a philosophical justification for an exploitative system.

The mechanistic view and the reductionist approach had influenced the western mind so much that the model was extended not only to chemistry and biological sciences but also to social sciences. In the late seventeenth century the well-known philosopher John Locke had published his work which was deeply impressed by the Newtonian model. This had tremendous influence on the eighteenth century thinkers.

Locke developed an atomistic view of the society by reducing the patterns of social behaviour to individual behaviour. Drawing parallel with the Newtonian approach – as atoms in a gas settle in a balanced state – Locke propounded that human beings would settle in a society in a 'state of nature'. He believed that there were laws of nature governing the human behaviour just as there were laws governing the physical universe. According to Locke these natural laws included the freedom and equality of all individuals, as well as the right to property. In Locke's

view the human society was governed by certain natural laws just as the physical world obeyed some laws of nature, the government instead of imposing its own laws should try to discover the natural laws of human behaviour which existed before the institution of government was created and function in accordance with them. The role of State was thus restricted to a narrow area.

Locke's ideas provided a new value system and had a deep impress on the evolution of the Western political and economic thought during the eighteenth century. Application of Locke's philosophy resulted in the development of a socio-economic system based on individualism, property rights, free market economy. Based on these ideas a capitalist system and industrial society emerged on the western horizon. Significantly enough, these very ideas continue to be the tenets of the modern Western political and economic thought where a superindustrial society has come into existence.

The philosophical basis for a capitalist society was thus provided by scientific rationalism or scientific materialism. These societies needed ever-expanding markets, cheap raw materials and labour and continued upgradation of their technology to survive in the cut-throat competition of a free market economy. Vast colonial empires were created which provided necessary capital and resources to fuel the industrial engine of the West. During the nineteenth century one finds the growth of capitalist society and also the emergence of socialist ideas as a reaction to it. After the Russian Revolution the conflicts between nations also assumed ideological dimensions.

Karl Marx recognized the highly exploitative nature of the capitalist society and his monumental work – Das Kapital – is a thorough critique

of the Capitalist system. He offered an alternative system which promised to abolish the exploitation of the working class by the capitalists. As a nineteenth century thinker Marx was also influenced by the success of the mechanistic world-view. Fascinated by its logic Marx also formulated his theories using the language and concepts of the Cartesian-Newtonian approach. Scientific rationalism thus continues to be an important ingredient of Marxist philosophy and as a result Marxism also accepts the conquest and exploitation of nature as the aim of science and technology. Consequently, a dominant role of technology in achieving faster rate of growth is also acceptable to the Marxists.

Even before the collapse of the Soviet system as far as the obsession with growth was concerned the attitudes of both the capitalist and the socialist worlds were remarkably similar. Both subscribed to the principle of unlimited growth on a limited planet, both produced hard technology, both practiced high degree of centralization and bureaucratic control and both believed that life was merely an ongoing struggle for existence. Thus many of the differences between these two blocks – otherwise believing in different value systems – were being obliterated and both were converging. The only difference between them was about the ownership and control of technology and production system – whether it rested with some private agency or with the State. Marxism, thus, also supported an exploitative order. It did not or could not prevent the exploitation, but simply transferred the centre of exploitative forces from one point to the other. We are thus led to the inescapable conclusion that the models based on the mechanistic world-view are not in a position to provide an enduring solution to the world problematique.

The techno-economic system adopted by the West is based on the concept of unlimited growth on a limited planet. The question naturally arises can material growth continue forever or there is a limit to it? Is it possible to provide the consumption levels of the western societies to the entire world population particularly when billions today are hungry and poor? In the earlier stage of the industrial society the population was small and the techno-economic activities of human society were relatively less as compared to the seemingly inexhaustible natural resources, the model appeared to work quite satisfactorily. But now, as the western experts themselves admit, with a steep rise in world population, staggering rate of increase in the consumption level in the West, speedy depletion of the natural resources, rapid degradation of the environment and fast erosion of moral, cultural and spiritual values it is quite obvious that the present model cannot last for long. Members of the Club of Rome have warned that with the existing pressures on natural resources and environment even the most optimistic use of technology would not be able to sustain the modern growth model for long. According to them tensions are bound to be generated when industry after industry faces serious economic problem of the prohibitive cost of the raw material and the search for resources and capital seeks new relationship between producer and consumer nations and throws up new and complex political questions. Attempts to provide solutions by dividing life and problems into parts and to seek the solutions by technology alone have led to the current impasse.

The predicament which mankind faces today is, how can we change this course of development and restore the dignity of an individual, his

inner calm and peace, equilibrium and harmony in human society? Can the fragmented individual be once again transformed into a 'total man'? Can the level of present scientific and technological information be fruitfully utilized to understand the dynamics of the development of mankind as a whole? Can we propose a model which provides a more enduring relationship between individual and his social and natural environments? A critical examination of the world-view hitherto adopted by the techno-economic societies thus becomes imperative. The need to have an alternative world-view capable of resolving the various modern conflicts was never so urgent as it is today. Intellectuals must define their goals and life values clearly and take a bold initiative to transform the society they live in. Can India make a meaningful contribution in resolving these conflicts? Dr. Radhakrishnan's works can certainly help us to answer this question.

IV

The development and growth policies hitherto advanced and pursued are a legacy of the mechanistic model of Universe. Their main assumptions have been derived from a world-view based on 'Cartesian Divide' or 'Cartesian Partition' between matter and spirit, between body and mind. Any alternative to the present socio-economic thought deeply rooted in a particular comprehension of the world, the cosmos or the physical reality will have to be derived from an alternative world-view. The new paradigm must emerge from a new and fuller understanding of the nature of Universe and life and the interrelationship between man, his environment and the physical world.

Towards the end of the nineteenth century scientists had begun realizing the limitations of the mechanistic world-view. In physics itself Maxwell's theory of electromagnetism was not compatible with the Newtonian mode and in biology the Darwinian theory of evolution could not be explained on Cartesian concepts. The scientists however, continued to believe in the general correctness of the Newtonian concepts till during the first quarter of the 20th century relativity theory and quantum mechanics raised fundamental issues.

Jagdish Chandra Bose towards the end of the nineteenth century started investigating the responses of non-living things like metals and the animals. He discovered the fatigue of metals and then moved on from physics to physiology. Scientists saw with wonder the similar curves of muscles and metals, when they were responding to the effect of fatigue, stimulation, depression and poisonous drugs. Bose said, "I have shown you this evening autographic records of the history of stress and strain in the living and the non-living. How similar are the writing ! So similar indeed that you cannot tell one apart from the other. Among such phenomena, how can we draw a line of demarcation, and say, here the physical ends, and there physiological begins? Such absolute barriers do not exist".

Examples can be multiplied to prove Bose's thesis, the Viennese biologist Raoul France, Clean Backster of America, the Japanese scientist Dr. Hashimoto and many other confirmed what J.C. Bose had demonstrated. The mechanistic world-view cannot explain this interconnectedness of organic and inorganic.

Science today is confronted with certain questions which it earlier considered to be outside its domain. But as a result of some of its own

discoveries intellectuals are asking, 'Is matter related to consciousness in any manner? If so, then what is the nature of this relationship? It all began sometimes around 1924-25 when Louise de Broglie put forth the hypothesis of matter waves. Erwin Schrodinger – the father of wave mechanical model proposed his new equation which replaced Newton's equation of motion for a free particle in case of electron. Then came W. Heisenberg with his Principle of Uncertainty and stated that if you are certain about the position of a moving particle like electron you are uncertain about its momentum and vice versa. According to this principle a sub-atomic particle has no distinctive objective reality. As Michael Talbot characterizes it as 'omnijective', an inseparable combination of the subject of the scientist and the object observed.

The natural corollary of Heisenberg's principle of uncertainty was (a) that you cannot know what exactly a fundamental particle is? (b) that in sub-atomic world the strict law of cause and effect breaks down and (c) that the strict division between an observer and the observed withers away. The efforts to discover the ultimate reality through experiments are, therefore, meaningless. Heisenberg declared that the common division of the world into subject and object, inner world and outer world, body and soul is no longer adequate and leads us into difficulties.

Modern physics is now dealing with this new paradigm of quantum mechanics. The central question is 'what is it that quantum mechanics describes'. The answer generally accepted is known as Copenhegen interpretation which simply states that the quantum mechanics is about correlations in our experiences. It is about what will be observed under specified conditions. Einstein, however, opposed this till his last. His famous statement, 'that he did not believe in a dice playing God,

expressed his disagreement with the probabilistic interpretation of quantum mechanics'.

The most startling consequence of the Copenhegen interpretation was that the physicists under pressure of their own findings were forced to accept that a complete comprehension of reality lies beyond the capabilities of rational thought. It is significant that Einstein never agreed with this. However, the quantum mechanical paradigm unhesitatingly stated that the new physics was not based on "absolute reality" but upon us. The world "out there" was inseparable from the observer "in here".

Einstein who believed in causality could not accept Heisenberg's uncertainty principle. In order to disprove it Einstein, Podolsky and Rosen published a paper "Can Quantum Mechanical Description of Physical Reality be Considered Complete"? The authors postulated that if principle of uncertainty was correct that causality does not hold good in the domain of the sub-atomic world then it will lead to a strange paradox that two same kinds of sub-atomic particles must somehow be simultaneously connected, even if they remain separated at enormous distances. How is it that these two particles communicate with each other instantaneously even at distances which electromagnetic waves take few seconds to travel. Do they possess some sort of consciousness? Until 1936 no such phenomenon was known to exist hence Einstein concluded that Heisenberg was wrong. But the strange phenomenon did exist was proved by successful experiments in 1972 by David Bohm in London, Clauser and Freedman in USA and a team of Alain Aspect in Paris in 1982. The impossibility of superluminary connections as propounded by the theory of Relativity is no longer valid. Hence 'an

interconnectedness in events taking place at space like distances is valid'.

J.S. Bell, a physicist at the European Organization for Nuclear Research (CERN) gave a mathematical formulation of the EPR effect. The astounding implication of Bell's theorem is that 'at a deep and fundamental level, the separate parts of the Universe are connected in an intimate and immediate way'.

The most startling consequence of all these discoveries is that the Cartesian concept of reality as parts joined by local connections does not fit in the Quantum Mechanical Paradigm. David Bohm suggested that quantum physics demands a new order. 'Instead of starting with parts and showing how they work together, we start with the whole'. This is also in consonance with Bell's theorem. The separate parts of the universe are not separate parts. Says Bohm, "Parts are seen to be in immediate connection, in which their dynamical relationship depends, in an irreducible way, on the state of the whole system (and indeed, on that of broader systems in which they are contained, extending ultimately and in principle to the entire universe). Thus, one is led to a new notion of unbroken wholeness which denies the classical ideas of analyzability of the world into separately and independently existent parts. . .".

Explaining his hypothesis of apparently random sub-atomic phenomena, David Bohm says, "Particles may appear in different places yet be connected in the implicate order. Particles may be discontiguous in space but they are contiguous in the implicate order". Matter according to Bohm is a form of the implicate order as the vortex is the form of the water it is not reducible to smaller particles. Like "matter" and everything

else, particles are forms of the implicate order. The question which arises now, is "what is the 'implicate order' the implicate order of?"

As Gary Zukov says, "The 'implicate order' is the implicate order of 'that – which – is'. However, 'that which is' is the implicate order. This world-view is entirely different from what we are using in classical physics". In the words of David Bohm "Description is totally incompatible with what we want to say". Says Gary Zukov "Because of the deep rooted Greek notions in the western mind, it is unable to comprehend this new paradigm". The Greeks believed that only Being is, therefore, Non-Being is not. Actually in the new paradigm Non Being also is. Both Being and Non-Being are 'that which is'. Everything even "emptiness" is that which is. "In Bohm's physics, there is nothing which is not "that which is". Bohm's theories have striking parallelism in Eastern thought, in the Upanishadic statements.

The Chandogya Upanisad gives a dialogue between Svetaketu and his father. When Svetaketu returned home after learning Vedas for twelve years, his father asked him "Svetaketu have you asked for the knowledge by which we hear the unhearable, by which we perceive the unperceivable, by which we know the unknowable". What is that knowledge asked Svetaketu. His father Uddalaka said , "That knowledge is knowing that by which we know all". And further explaining the father pronounced, "In the beginning there was Existence, One only without a second. Some say that in the beginning there was non-existence only, and that out of that the Universe was born. But the question is how could existence be born of non-existence? In my opinion in the beginning there was Existence alone – One only. He the one thought to himself: Let me be many, let me growforth. Thus out of

Himself he projected the Universe, and having projected out of Himself, the Universe, He entered into every being. All that is has its self in Him alone. Of all things He is the subtle essence. He is the truth. He is the self. And that, Svetaketu, THAT ART THOU – "तत्त्वमसि"

In the Brahadaranyak Upanisad the sage informs King Janaka about the true nature of Brahman, "Brahman can be apprehended only as knowledge itself – knowledge which is one with reality, inseparable from it. For he is beyond all proof, beyond all instruments of thought. The eternal Brahman is pure, unborn, subtler than the subtlest, greater than the greatest. By the purified mind alone Brahman is perceived. He who knows Brahman to be the life of life, the eye of the eye, the ear of the ear, the mind of the mind – he indeed comprehends fully the cause of causes. In Brahman there is no diversity. He who sees diversity goes from death to death".

The quintessence of the Upanisadic thought is given by the following:

एकमेवाद्वितीयं ब्रह्मं – Brahman alone exists without a second.

अयमात्मा ब्रह्मं – Atma itself is Brahman.

सर्वमिदं खलुब्रह्मं, अहंब्रह्मास्मि, तत्त्वमसि – All this is Brahman, I am Brahman, So art thou, and

यत्पिंडे तत्ब्रह्माण्डे – That which is in microcosm is also in the macrocosm

अणोरणीयान, महतो महीयान – Brahman is all pervading, it is subtler than the subtlest and larger than the largest.

The implicate order of David Bohm has striking parallelism in the ancient Hindu philosophy where the Cosmic consciousness connects every 'being' with the rest of the Universe.

Max Planck also believed that matter was derived from consciousness "Consciousness" said Planck, "I regard as fundamental. I regard matter to be derived from consciousness. We cannot get behind consciousness. Everything we talk about, everything we regard as existing postulates consciousness". Schrodinger writing in his book *Mind and Matter* tried to provide an outlook of non-dualism. Wolfgang Pauli wrote, "From an inner center the psyche seems to move outward in the sense of an extroversion, into the physical field".

Said Swami Vivekananda, "The internal universe, the real is infinitely greater than the external, which is only a shadowy projection of the true one. This world is neither true nor untrue, it is the shadow of the truth". He goes on elaborating the Advaita or non-dualism in his own way when he says, "Matter is only externalized thought".

"On the subject the object has been superimposed; the subject is the only reality, the other a mere appearance.

We have seen that it is the subjective world that rules the objective. Change the subject, and the object is bound to change, purify yourself and the world is bound to be purified".

In a Buddhist text, for example, we find the words:

> It was taught by the Buddha, oh Monks, that ... the past, the future, physical space, ... and individuals are nothing but names, forms of thought, words of common usage, merely superficial realities.

In the words of Lama Govinda:

> To the enlightened man ... whose consciousness embraces the universe, to him the universe becomes his 'body', while his physical

body becomes a manifestation of the Universal Mind, his inner vision an expression of the highest reality, and his speech an expression of eternal truth and mantric power.

How strikingly similar is the language of modern scientists and the Eastern Philosophers. Just as Bell's theorem has proved that the Universe is a stupendous hologram where each part is interconnected with the rest of the Universe so also is the view of the Upanisad – यत्पिंडे तत्ब्रह्माण्डे

Says Karl Pribram, a brain researcher and a neurosurgeon that brain's deep structure is essentially holographic. Each brain cell is a miniature brain itself. So is the Vedantic statement that each soul is the manifestation of Brahman. Karl Pribram continues "What if the real world is not made of objects at all? What if it is a hologram". These statements have raised deeper questions like who was looking through this hologram and who was looking at this hologram? Who was running the brain computer? "Was it a Ghost in the machine" inquired Arthur Koestler. Who interprets the hologram was the million dollar question before the scientists. The answer depended upon a deeper understanding of the interrelationship between matter and consciousness, of a fuller comprehension of 'Reality'.

Roger Penrose, writing in his celebrated book '*Shadows of the Mind*', has argued that consciousness, in its particular manifestation in the human quality of understanding is doing something that mere computation cannot. Says Penrose, 'In this book, I shall attempt to address the question of consciousness from a scientific standpoint. But I shall strongly contend – by *use* of scientific argument – that an essential ingredient is missing from our present-day scientific picture. This missing ingredient would be needed in order that the central issues of human mentality could ever be accommodated within a coherent scientific

world-view. I shall maintain that this ingredient is itself something that is *not* beyond science – although, no doubt, it is an appropriately expanded scientific world-view that we shall need'.

Penrose, further elaborating his theme that consciousness may be potentially inherent in the behaviour of all material things, writes, 'In Part I, I argued (in the particular case of mathematical understanding) that the phenomenon of *consciousness* can arise only in the presence of some non-computational physical processes taking place in the brain. One must presume, however, that such (putative) non-computational processes would *also* have to be inherent in the action of inanimate matter, since living human brains are ultimately composed of the same material, satisfying the same physical laws, as are the inanimate objects of the universe. We must therefore ask two things. First, why is it that the phenomenon of consciousness appears to occur, as far as we know, *only* in (or in relation to) brains – although we should not rule out the possibility that consciousness might be present also in other appropriate physical systems? Second, we must ask how could it be that such a seemingly important (putative) ingredient as non-computational behaviour, presumed to be inherent – potentially, at least – in the actions of all material things, so far has entirely escaped the notice of physicists?

'No doubt the answer to the first question has something to do with the subtle and complex organization of the brain, but that, alone, would not provide a sufficient explanation. In accordance with the ideas I am putting forward here, the brain's organization would have to be geared to take advantage of non-computable action in physical laws, whereas ordinary materials would not be so organized. This picture differs markedly from a more commonly expressed view about the nature of

consciousness (basically that of *A*) according to which conscious awareness would be some kind of 'emergent phenomenon', arising merely as a feature of sufficient complexity or sophistication of action, and would not require any specific, new, underlying physical processes, fundamentally different from those that we are already familiar with in the behaviour of inanimate matter.

With regard to the second question, we must indeed expect that vestiges of such non-computability should also be present, at some indiscernible level, in inanimate matter. Yet the physics of ordinary matter seems, at first sight at least, to allow no room for such non-computable behaviour. Later on, I shall try to explain, in some detail, how such non-computable behaviour could indeed have escaped attention, and how such behaviour is compatible with present-day observations.

May we expect that there is something corresponding to be learnt with regard to the phenomenon of consciousness? If so, it would not be *mass* that would need to be large for the phenomenon to become apparent – at least not *only* mass – but some kind of delicate physical organization. According to the arguments put forward in Part I, such organization would have to have found a way of making use of some hidden non-computational ingredient already present in the behaviour of ordinary matter – an ingredient that, like the light-cone tilting of general relativity, would have totally escaped attention had that attention been confined to the study of the behaviour of tiny particles'. The similarity, between what J.C. Bose had remarked and what Penrose is now proposing, is easy to recognize.

And said Vivekananda a century ago "This mind is a part of the Universal mind. Each mind is connected with every other mind. And each mind, wherever it is located, is in actual communication with the whole world. In his famous Madras lecture he had said, "One atom in this Universe cannot move without dragging the whole world with it". Swamiji had also said, "One man contains the whole Universe. One particle of matter has all the energy of Universe at its back".

Some of the philosophical consequences of the holistic world-view can be summarized as under:

(1) All objects and events in the physical world are interdependent and inseparable 'parts' of the "Cosmic whole". The 'whole' and its 'parts' are constantly and mutually interacting.

(2) Consciousness is the essential aspect of the Universe.

(3) Each 'part' in some sense contains the 'whole' and the physical world is so structured that whole is enfolded in each of its parts. In other words that which is in macrocosm is also in the microcosm.

(4) The 'whole' is primary and the properties of the 'parts' can only be derived in terms of the dynamics of the 'whole'.

(5) The 'whole' is not comprehended merely as the sum of its 'parts', it is something more. The relationship between the 'whole' and the 'parts' is organic.

(6) The Cartesian view that all science is certain, evident knowledge is untenable. The concept that external world can be observed without disturbing it is also invalid. It is a participatory universe.

(7) The Cartesian Divide of the world into inner and outer worlds, matter and mind, body and soul, subject and object is unacceptable.

(8) The holistic approach prohibits the domination or torture of nature, since man and his environment are inseparable. Humankind must learn to live in peace and harmony with nature.

It has been well recognized that no valid socio-economic paradigm can be built unless man's relationship with the ecosystem and Universe is properly understood. Since the very dawn of human civilization, the Indian mind has reflected on the true nature of Universe and man and their interrelationship. The depth and profundity of their enquiry in this regard is revealed in various schools of philosophy developed in India. The ancient Indian genius had discovered the fundamental unity of all Cosmic phenomena and the earliest clear and unequivocal enunciation of the holistic world-view is found in Upanisads. Researches in modern physics are also establishing the holistic nature of universe. Newtonian or reductionist approach is now being increasingly replaced by an integral approach.

Karl Pribram admitted that this holographic concept of a Holistic Reality was first given to the world by Eastern Philosophy. In one of his speeches he said, "Eastern philosophy has come into western thought as in the past. . . . whether it will stick this time or we will have to go around once more will depend on you. The spirit of the infinite could become part of our culture and not a little far out".

The prevailing belief in many of the scientists that the whole of life and mind can be understood in terms of the fragmentary atomistic

approach to reality has ultimately resulted in a fractured human personality living in an amorphous society. Explaining this, David Bohm in his seminal work 'Wholeness And Implicate Order' writes, "of course, the prevailing tendency in science to think and perceive in terms of a fragmentary self-world-view is part of a larger movement that has been developing over the ages and that pervades almost the whole of our society today: but, in turn, such a way of thinking and looking in scientific research tends very strongly to re-enforce the general fragmentary approach because it gives men a picture of the whole world as constituted of nothing but an aggregate of separately existent 'atomic building blocks', and provides experimental evidence from which is drawn the conclusion that this view is necessary and inevitable. In this way, people are led to feel that fragmentation is nothing but an expression of 'the way everything really is' and that anything else is impossible. So there is very little disposition to look for evidence to the contrary. Indeed, as has already been pointed out, even when such evidence does arise, as in modern physics, the general tendency is to minimize its significance or even to ignore it altogether. One might in fact go so far as to say that in the present state of society, and in the present general mode of teaching science, which is a manifestation of this state of society, a kind of prejudice in favour of a fragmentary self-world-view is fostered and transmitted (to some extent explicitly and consciously but mainly in an implicit and unconscious manner).

"As has been indicated, however, men who are guided by such a fragmentary self-world-view cannot, in the long run, do other than to try in their actions to break themselves and the world into pieces, corresponding to their general mode of thinking. Since, in the first

instance, fragmentation is an attempt to extend the analysis of the world into separate parts beyond the domain in which to do this is appropriate, it is in effect an attempt to divide what is really indivisible. In the next step such an attempt will lead us also to try to unite what is not really unitable. This can be seen especially clearly in terms of groupings of people in society (political, economic, religious, etc.). The very act of forming such a group tends to create a sense of division and separation of the members from the rest of the world but, because the members are really connected with the whole, this cannot work. Each member has in fact a somewhat different connection, and sooner or later this shows itself as a difference between him and other members of the group. Whenever men divide themselves from the whole of the society and attempt to unite by identification within a group, it is clear that the group must eventually develop internal strife, which leads to a breakdown of its unity. Likewise when men try to separate some aspect of nature in their practical, technical work, a similar state of contradiction and disunity will develop. The same sort of thing will happen to the individual when he tries to separate himself from the society. True unity in the individual and between man and nature, as well as between man and man, can arise only in a form of action that does not attempt to fragment the whole of reality.

In the very early phases of the development of civilization, man's views were essentially of wholeness rather than of fragmentation. In the East especially in India such views still survive, in the sense that philosophy and religion emphasize wholeness and imply the futility of analysis of the world into parts. Why, then, do we not drop our fragmentary Western approach and adopt these Eastern notions which

include not only a self-world-view that denies division and fragmentation but also techniques of meditation that lead the whole process of mental operation non-verbally to the sort of quiet state of orderly and smooth flow needed to end fragmentation both in the actual process of thought and in its content?"

V

The holistic world-view offers a new paradigm for building a socio-economic system free from exploitation and also resolving the dilemma which mankind is presently facing. The paradigm has universal applicability and addresses mankind as a whole. It demands attitudinal changes with regard to the relationship between human society and the ecosystem, consumption levels and growth rates with consequent changes in the value system of the Cartesian world. In Indian context, rooted in ancient wisdom of the land, the model based on integral approach would find favour with our psyche.

As a natural corollary of the integral approach there is an 'unbroken wholeness' between man and the ecosystem. Different constituents of the ecosystem are interdependent and their relationship is symbiotic, each sustaining the other. No human problem can be solved without taking into account its interaction with social and natural environment. Since each part contains the whole the exploitation of the part/whole by the whole/part or of one part by the other is ruled out. Exploitation of any part in the ultimate analysis is the exploitation of the whole. Degradation of environment in its turn degrades human life. The integral approach demands that for the survival of humankind the dynamic balance between man and nature must not be disturbed beyond repair.

In a sense man is the child of mother nature, he can have a breast feed but cannot be allowed to make the mother bleed to death. Violence against nature is totally repugnant to the holistic view because violence against nature is violence against mankind as well. Integral approach, therefore, means the establishment of a non-violent, non-exploitative socio-economic order.

The cardinal principle which governs all human activities techno-economic or otherwise under this paradigm is that ecosystem should not be irreparably damaged. It, therefore, follows that one cannot have 'infinite growth in a finite system'. This approach not only sets a limit on the mad race for growth but also demands a new definition of growth and development. The level and patterns of consumption which are available only to a miniscule minority to the exclusion of a vast majority are not permissible in this paradigm.

The integral approach is neither antigrowth nor anti-technology. It emphasizes the need to have a balanced growth which does not mean only material development at the cost of moral and spiritual development. Human personality has four attributes – a body, an intellect, a mind and a soul. An equilibrium between social, cultural, spiritual and material needs of mankind on the one hand and the finite dimensions of our planet on the other is a must if mankind is to be really saved from the holocaust looming large. It may be fully recognized that all aspects of human life material, intellectual and spiritual are inseparable and interact with each other and interference with any one is bound to influence the others. Any strategy for development must take into account the fact that problems cannot be solved in parts, they have to be approached and comprehended in their totality. Growth and developmental concepts

thus need to be redefined. Technology must not serve the rich and affluent alone, it should not become a tool for exploitation or dehumanization. All technologies have side-effects. They not only influence the material life but also the social and cultural lives. Effect of technology on value systems has also to be clearly understood before integrating a technology in the production system. The holistic paradigm demands a technology with a human face, as an instrument to serve both man and nature. There is no blind rejection of growth or technology but there is no acceptance of blind technology and growth.

The most striking effect of the mechanistic world-view has been the widespread fragmentation in the societies and individuals. Human society has been divided into separate nations and different ethnic, religious and political groupings. This fragmentation has resulted in continuing conflicts at various levels and different parts of the globe. Many civilizational fault lines have emerged because of the deep rooted thought that these separate groups exist independent of each other and human society is just an aggregate of these parts. To believe that these components are really separate has resulted in the multidimensional crisis which is encompassing us today. All nations are interdependent and must maintain a balance between themselves and also an internal equilibrium between their constituents in order to serve the well being of mankind. In the holistic approach each part enjoys the autonomy – while functioning as a whole – and also submits to the demands for the larger whole – while functioning as a part. Subject to the general principle that the dynamic balance between the social system and the ecosystem has to be preserved, each nation is autonomous in formulating its own strategy of material development and in evolving a code of moral and

spiritual conduct. Nationalism in this manner releases tremendous constructive energy to serve the society and also the humanity at large. Contrary to the nation-states of Europe, built on Cartesian principles, which engaged themselves in bloody conflicts for territorial and economic reasons, nations in a holistic paradigm will function on the principle of co-operation and co-existence.

Unlike the mechanistic view, individuals in holistic approach are not nuts and bolts of a social machine, but are representatives of human society, in mutual and perpetual interaction with each other and nature. Individuals are born in a society which itself is composed of individuals. The interrelationship between an individual and society is thus organic, both sustain each other. Social orders built on this principle prohibit exploitation of individual by society or vice versa. Viability of any system depends upon the principle that while each constituent enjoys autonomy in its own domain it remains in dynamic equilibrium with the entire system. Participation by each constituent in sustaining the system is thus an inbuilt attribute of the holistic paradigm. Socio-economic orders based on this concept are inherently democratic, decentralized, sustainable and non-exploitative. Holistic approach, therefore, implies a social system based on a set of norms and values. Human activity devoid of any values leads to a virtual collapse of the social system. Moral or ethical codes of conduct are imperatives of a holistic approach. Viability of a system also depends upon its ability to constantly harmonize the conflicts as and when they arise. Continuous efforts to discover harmonizing principles must go on and a refinement of moral and ethical code should be sought after.

The human endeavours to comprehend the ultimate reality may lead to a variety of spiritual experiences. The holistic approach recognizes this divergence as the manifestation of one and the same cosmic spirit. The Vedic Rishi had long back realized this aspect of life. The Rig Veda declares एकं सद् विप्राः ब्रहुधा वदन्ति (Reality is One but is described in many ways.) This realization makes human mind tolerant and receptive of fresh ideas. Such a mind becomes democratic in approach and treats all spiritual experiences with equal respect. History bears testimony that this concept has been deeply engrained in Indian psyche and the Hindu society has been a most ennobling experiment in spiritual co-existence. This paradigm not only tolerates diversity but accepts it. In fact in deeper analysis the holistic approach respects diversity.

Commenting on the present multidimensional crisis the authors of 'The Limits To Growth' have said, "Short of a world effort, today's already explosive gaps and inequalities would grow larger. The outcome can only be disaster, whether due to the selfishness of individual countries that continue to act purely on their own interests, or to a power struggle between the developing and the developed nations. The world system is simply not ample enough nor generous enough to accommodate much longer such egocentric and conflicting behaviour by its inhabitants. The closer we come to the material limits to the planet, the more difficult this problem will be to tackle. The authors expressing the hope that a controlled transition from the present state is possible have also stated, "Man possesses, for a small moment in his history, the most powerful combination of knowledge, tools, and resources the world has ever known. He has all that is physically necessary to create a totally new form of human society – one that would be built to last for generations.

The two missing ingredients are a realistic long term goal that can guide mankind to the equilibrium society and the human will to achieve that goal. Without such a goal and a commitment to it, short term concerns will generate the exponential growth that drives the world system towards the limits of the earth and ultimate collapse. With that goal and that commitment, mankind would be ready now to begin a controlled orderly transition from growth to global equilibrium".

It is not necessary to agree with the concept of equilibrium society discussed by these authors because their report was limited only to the material aspects, it did not and perhaps could not include other aspects of human personality in the analysis, but nobody would differ from their concerns about the failure of the Cartesian paradigm and the need for a change in the present situation. The moot question is can such a change be brought about without a fundamental change in the values and aspirations at individual, societal, national and global levels? How can the present society be motivated to opt for such a transformation? The authors have themselves answered the question in the statement, "Only real comprehension of the human condition at this turning point in history can provide sufficient motivation for people to accept the individual sacrifices and the changes in political and economic power structures required to reach an equilibrium state". The socio-economic system based on mechanistic model has resulted in a highly insensitive and individualistic society, it is too much to expect such a sense of compassion and concern for the suffering humanity from it. A holistic approach alone can provide a value system promoting compassion, cooperation and co-existence.

The opening hymn of the Isha-Upanisad says:

ॐ ईशावास्यमिदं सर्वं यत्किञ्च जगत्यां जगत् ।
तेन त्यक्तेन भुञ्जीथा मा गृधः कस्यस्विद्धनम् ॥

The first part of this verse offers a holistic world-view, it says that, whatever exists and wherever it exists is permeated by the same Supreme Being or Cosmic Consciousness. The second part gives a direction as to how one should conduct in a holistic system. It emphasizes to consume with restraint, to consume and to replenish and to take by giving. It further emphasizes not to covet because this rich and splendid world around us is His manifestation; it does not belong to any single individual. Every thing belongs to everybody and if one has to live in harmony with others the relationship has to be symbiotic. The Isha-Upanisad says that the best way to sustain the society is to 'give' before you 'take'. This hymn thus provides a sound foundation to build a human society which will last for aeons.

The remarkable aspect of the integral approach is that there is no dichotomy between an individual and the society. They are mutually complementary. The ancient Indian genius characterizes an individual with four attributes or centres of energy viz., a mind, an intellect, a body and a soul. The society must create conditions for a balanced growth of the individual, that is an equilibrium is maintained in all the four aspects of the human personality and the individual must strive to sustain and strengthen the society. There should be perfect harmony between the societal aspirations and the individual activity. Since the conscious entities are capable of exercising their choice among various available options a conflict can emerge between various aspects of individual or national

life. Who then harmonizes? The answer to this very important question makes it imperative to have an inviolable code of conduct. It is here that philosophers like Radhakrishnan show us the light. According to these enlightened thinkers it is the "innate law" and "Dharma" which decide the propriety of individual and social behaviour in a particular situation. In fact Dharma comes from the root 'dhri' which means to uphold. Hence those set of rules which sustain the existence and promote the progress of the entity which they serve are known as "Dharma". According to the holistic view there has to be harmony between the "whole" and its "parts". Therefore in its broadest sense Dharma is that which sustains all aspects of life, society and ultimately the whole world. It is Dharma and Dharma alone which provides a motivation for people to accept individual sacrifices and the changes required in the prevailing socio-economic order.

Aurobindo described man as a transitional being; he has to evolve to a higher level of consciousness. It is the property of life to seek higher levels of consciousness. There is an urge towards perfection. Of all life forms human beings alone are capable of distinguishing between what 'is' and what 'should be'. The evolutionary nature of human beings also permits human mind to discriminate between what is pleasurable and what is desirable. It is Dharma which strikes a happy balance between the two. The holistic view, therefore, motivates people to continue their evolutionary journey towards a better understanding of the Ultimate Reality.

Integral humanism – a concept which was enunciated by Pandit Deen Dayal Upadhyaya takes into account the single 'unbroken wholeness' underlying man, the ecosystem and the Supreme Being.

This approach is in full consonance with Indian ethos and conforms to the basic Indian understanding of reality. Integral Humanism can provide the basis of building up a socio-economic order capable of resolving the conflicts which India is facing today. Pandit Ji had shown how the linkages between the individual and the society can be established through various institutions and functions fulfilling the material needs, inspiring for higher goals through various creative and productive activity regulated by Dharma. I would urge the enlightened gathering today to deliberate on these issues and suggest the paradigm for a socio-economic structure which reduces if not completely resolves the present global conflicts.

India is at the moment at a crucial juncture of her history. It cannot remain unaffected by the multidimensional global crisis which mankind faces today. It is a moment in its history when self-evaluation has become necessary. There are moments when the direction which a society should take for its development gets lost. India has to rediscover its world-view and redefine its path for its future. As Dharmpal has rightly said, "Once we seriously get down to the task, it may not turn out to be too difficult to find a new direction for the Indian civilization. . . . For every civilization there comes a time when the people of that civilization have to remind themselves of their fundamental civilisational consciousness and their understanding of the Universe and Time. From that recollection of the past, they then define the path for their future. . . . We need to undertake such an exploration into ourselves once again".

India's understanding of the Universe and Time has been well defined by its seers and philosophers. Only on this recognition of its past it can

chart out its path for reconstruction and future progress. When India rediscovers its holistic world-view it will recognize its original self. It will be the awakening of India which will not only resolve its civilizational crisis but will also show new light to mankind. Dr. Radhakrishnan's works are a great help in rediscovering ourselves. My tributes to him. I am thankful for the attention you have given me.

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