

**Dr. B. D. Nag Chaudhuri,**

*Vice-Chancellor,  
Jawaharlal Nehru University, New Delhi  
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We live in stirring times. The pace of change has accelerated so greatly that what happens during the next 25 years is likely to be far different from what has happened during the last 50 years. Those of you who are graduating today will be concerned more with what is going to happen in the next 25 years than with the past 50 years and yet those of us who have taught you have been more concerned with the last 50 years than with the next 25. If the past is of any consequence in predicting the future, the next 25 years will see more changes in our attitudes, in our ways of living than what we have seen in the last quarter of a century. Very often our traditions and our heritage will not be helpful as guides in many of the problems you will be faced with. Tradition is basically a self-contained internal reference system which enlarges itself with time, while the foundations of tradition tend to weaken with time. Traditions can die but they cannot undergo revolutions or revolutionary changes. This is a serious hiatus and a legitimate source of misgivings about the future, because the problems that you will face in life, the confrontations with tradition that may appear, will not always bear much relation with what you have been taught or what you have learnt at the university. If some of you have been fortunate as students as I was, then you may have been able to imbibe an outlook or a perspective in the university that may make it easier to accept these confrontations and paradoxes of progress without becoming schizophrenic. Life is lived at many levels. The family, society, school and university, work-place, community of friends or communion with nature are not mutually exclusive categories in a man's life. They are all a part of the same fabric of life. To live a life that is rewarding and full, one has to partake of all of these aspects or as many of them as possible. However, it is difficult for most of us to live such a life, because each one of us is a blind man of Hindustan who perceives only one facet of life at a time. We tend to forget that change and evolution are inherent in nature's living processes, biological as well as social. We are a part of this evolutionary process if we change, we live, if we remain where we are, we die. To understand the processes of change in our culture in our society and in our lives, we need some knowledge of ourselves. This knowledge is, in part, external of science, of culture, of history and of traditions; but in part it is internal to each of us as individuals born out of our awareness, our empathy with

nature and our fellow-men. We have to recognise that man—the most superior of animals—is still vulnerable, weak and often sensitive when he is alone, while collectively he may become clever, strong and rapacious.

Education is a man-made and comparatively recent cultural device of 3000 years or so in his million years or more of existence—a paradoxical system that has strengthened both the forces of continuity and of change in human culture. Change, unfortunately, is not necessarily evolution—evolution implies a certain directivity of change. Evolution—sometimes just change—is both a biological and a social process. Change occurs most speedily under stress. I have seen human beings at their best and worst under stress—stress of famine, stress of war. Under these stresses some men cease to be selfish and put the interest of their group higher than their individual survival. That is, often, how the group survives even when the individual does not. At the same time men can be transformed into a mob that is cruel, insensitive and stupid.

It is such perceptions that led the ancient sophist Protagoras to say that “man is the measure of all things, of things that they are that they are and things that they are not that they are not.” While the measure of man is man, it encompasses the community of man. A great contemporary of Protagoras, Plato, thought that the measure of man is extensible by his own efforts, by his education, by his service to the community. Man’s measure should be as high and not as low as possible. Man’s most serious problem is his laziness. Plato argued further that this meant that education’s greatest function was to get rid of man’s innate laziness—his formula was that “All that could promote laziness should be banned from the curriculum.” A pronouncement that is as singularly apt today as when Plato made his indictment against the education of his day. But, if we have to eschew laziness, what do we have instead to keep students occupied ?

The early Indian philosophers were generally strong in logic and weak in their emphasis on the empirical nature of knowledge because of their generally held reservations about the reality of perceived objects. There were, however, a few like Nagarjuna who argued the reality of external objects and the need for empirical investigations. Amongst the Vedantic systems Sankhya admits an external reality but does not admit that Prakriti is perceived as such—the self-Purusha modifies it drastically. The great Indian philosophers like Shankara were thus very logical in their arguments but the material basis tended to remain weak. Jain and Budhist thought followed different but parallel lines. In all of these systems of thought, there was the implied or stated goal of self-realisation which was somehow equated with intimate contact

with God. The stress on intuition and reason led to systems of coherent thought but at the same time to the neglect of emphasis on careful empirical observation except in the case of astronomy and medicine during the later Gupta period.

We can use some pointers from both our traditions and those of the Greeks. Both the ancient civilizations were deeply concerned with man's perception of nature. They accepted both continuity and change in nature. They advocated living closely with nature and working with it and not against it. In their separate ways both traditions were imbued with the thought that man was a part of nature and that he cannot find fulfilment unless he can live in harmony with nature.

The ancients lived in a larger world-fewer people-with nature as a source of nourishment for their minds and bodies. We, now a people living in crowded conditions, find that the enforced proximity of man with man has driven nature further from us than at any time in the past. Whatever we do seems to interfere with nature adversely. Our sensitivities have been dimmed by the technological excitement of the day and have contributed to our laziness, mental and physical, as never before.

Nature has ceased to be as much of an enigma as it was to our forefathers. The insistent need for establishing harmony with nature in our style of life has been lost in the process. It is only through the agony of our cities, our depleting resources and the ravaging of our forests, hills and rivers that we are beginning to dimly see the need for living in cooperation and not in conflict with nature. We have also discovered the need for an inner harmony if we have to live in a country of 600 million people. In the next 25 years our population will increase to a 1000 million and we will be living in a country which will be even more crowded and cramped than it is today. The need for internal harmony will become even stronger and more insistent, if we are not to be pushed into a situation like the lemmings who, unable to bear overcrowding, commit mass harakiri. The dual search of human beings for greater harmony amongst them-selves and with nature will be increasingly a part of our individual and social life in the years to come.

We cannot live in harmony, or in symbiosis with nature unless we view our environment consisting of other living and nonliving systems, our consumption of a more well-knit pattern. These interdependent problems are in part problems of science but not entirely. Our social ethos and geography are important determinants. The environmental aspects that our nation will have to take into account will comprise all these factors. The consequent socioeconomic burden and discipline will bring about

increasing costs and responsibilities both social and economic which will not only involve cities and villages, industry and agriculture, forestry and dam building, it will also affect others who live contiguous to these activities or even those further away whose lives may be affected by these activities. This in a simplistic manner becomes the environment-growth dichotomy. In our country the needs of the many cannot be disregarded. On the other hand, neither can we despoil our waters and our land without our children having to pay a heavy price for it. We cannot demarcate problems of socioeconomic development as separate from the problems of environment. This dichotomy which is associated with my earlier statement that we human beings thrive best if we can live in harmony with nature. Rather the resolution of the dichotomy is achieved when we find out how to carry out development and at the same time live in harmony with nature.

You will ask me : what has the university to do with all this ? The University, to my mind, is the institution, par excellence, that can attempt to resolve the dilemma by applying itself to the problem. It can, through its various disciplinary skills of the natural and social sciences, unravel the skein of interconnections that relate us and our activities to nature. Universities have lived in isolation too long. Scientists and philosophers in our universities have talked about the importance of living in harmony with nature but they have done little about it either in what they teach or in what they investigate. The chemist, the physicist, the economist, the sociologist and other scientists and technologists as well as ordinary persons are all interested in using water. We complain of the unhygienic and dirty waters of our ponds, tanks and rivers. Our natural scientists and social scientists in our universities can not only tell us how bad our water is but also how we can prevent it from getting that way, so that all of us can enjoy as well as use water and at the same time preserve it. If we do not learn how to protect, preserve and if necessary even reuse our water, there will not be enough water for all of us to use as we like in the years ahead when our population may well be double of what it is now. Surely technological and scientific progress does not imply that the burden of bad water becoming worse or forests becoming barren hillsides are the legacies we leave to our students and to our children. Environmental protection is both a science and a social discipline. The university more than any other place can study its many facets and bring about the consciousness of the social discipline that must accompany efforts to protect our environment.

Energy is both the basic ingredient for development and a major polluter of the environment if not used with knowledge and circumspection. Moreover, coal and oil, two of the primary sources of energy are nonrenewable. Once used they are gone. It

takes a million years to produce the coal that we now burn in a year. The population of our country will increase by about 60 or 70 per cent during the next 25 years to around 1 billion. Our resources of coal or oil would not have increased at all, although some more coal or oil fields may be discovered in the next 25 years. On the other hand, if we use too much of it now, there would be that much less left for our children or grandchildren. The energy we spend may be used more intelligently and with careful planning. If we do so, we will emphasize efficient use of energy, develop methods of using renewable sources of energy and see to it that in the process of using energy, we do not interfere with nature to its detriment or to ours. Again this is a matter of both natural and social science as well as technology. Few universities have yet tried to study, investigate or teach students about either environment or the related energy problems.

As we approach the twentyfirst century, these problems will amplify; we shall use more energy, we will live in more crowded conditions. The problems of maintaining our harmony with nature — the external harmony — will grow more acute. Political leaders and administrators will seek solutions. They can only seek them in universities and institutes only if we have worked hard to develop our skills and can apply skills to the problems of our environment. That is, if we produce students who are able to understand and work on these areas.

There are many other problems equally important and equally fascinating which connect us with nature with a bond which we can sever only at the risk of our own survival. Let me cite just one example : the new hybrid dwarf plants such as wheat and rice which have given us adequate food are not hardy. They are sometimes unable to withstand diseases or pests unlike the sturdier and naturally evolved plants of the same genus. We shall, undoubtedly, be able to develop in the future high-yielding pulses, vegetables and fruits. However, the problems of diseases, pests and the like will only increase and not diminish. On the other hand, there are wild plants, wild rice species, wild fruit trees and wild vegetables, which have evolved in nature which our forefathers domesticated and we now use. Although they are more sturdy and resistant to pests and diseases, their yields are usually low. One of the techniques that plant breeders use is to combine the sturdy and resistant characteristics of the wild plants and the high yield of dwarf plants to generate new varieties which are both resistant and high-yielding. However, even this possibility is becoming smaller because many of the wild plants are disappearing as we encroach on forests to clear new land for cultivation, destroy old ecosystem, to make new arable areas. There used to be many wild species of rice in Eastern India. Some

of them have disappeared in the last 30 years. Once they disappear, the qualities that those plants have had, which could have helped us, also disappear. We cannot recreate a species that has been lost. These problems may seem somewhat academic to many of you today. I can assure you that twenty years from now, they may well be considered vital for our survival. The price that we may have to pay as we reduce our forests and our harmonious relation with nature can be not just lost beauty but also lost resources.

It takes years to develop knowledge and skills in any area of human endeavour. Environmental and energy problems are no exception. They are as valid areas of science as zoology or ecology and certainly of greater consequence to our society. Our universities, I feel quite strongly, should come forward to take up such studies and create opportunities for students to study and be trained in these subjects.

Before I end, I would like to take up briefly the other question that I introduced in the beginning. I called it the matter of internal harmony, I did not mean by internal harmony, religious experience. I meant something quite capable of rational approach. The study of how men live and adapt themselves to each other and to their environment. The first part of my observation is related to the findings of various experimental studies on animals and human beings and the effect on them by stress. Stress can be fear, anxiety, overcrowding, insecurity and can elicit psychological, neurophysiological or psychosocial responses. Related to the effects of stress are effects of overstimulation by visual, aural or other sensory effects. Deprivation of such sensory stimulation also gives rise to abnormal differences in individual or group behaviour. Over-crowding in monkeys, for example, tends to produce aggressive behaviour while security tends to produce docility. In human beings stress has been related to increase in blood pressure and cardiac symptoms. Overcrowding in human society, it has also been noted, leads to increased aggressive behaviour and crime. Importance of leisure activity and human contacts has also been noted as beneficial in cooperative human behaviour. Human beings do tend to put group interest above individual interest, particularly in times of external threats. In wartime, cohesive behaviour of soldiers and civilians is a well-known fact.

The preservation of the individual is a strong principle, but the preservation of the species or the group can, under certain circumstances, be even stronger. This is true of many animal species as well. A third principle which seems to be followed by all species is that of further development. It is in the achievement of harmonious

working of the three principles that one develops towards harmony of relationships, internal and external.

There is one interesting aspect of human behaviour which, however, has no known counterpart in animals. His sensitivity to beauty. The sense of beauty seems to be an innate human character. Civilization amongst other things is a development of the sense of beauty. Beauty is an important facet of our perception of nature and life, but it is not necessary, to life. However, in a deeper sense beauty that we perceive in nature is because of the perfection of nature's balance which has perfected over millions of years of evolution.

This perception of beauty and the ability to control and reduce stress are the new dimensions of human search for inner harmony. It requires the study and understanding of individuals and the enormously complex interactions within his social group and with nature. Such studies include study of the human mind and its perceptions and their relations to human behaviour. A range of disciplines, physiology, neurophy-siology, psychology, sociology, ethnology, philosophy and their inter-relations are of growing importance to us to enable us to live in crowded conditions, to be able to generate the social and psychic conditions which will lead to psychosocial development of the individual and the group.

Universities in India have in the past generally taken little interest in these growing and vast new areas of knowledge. In the past, universities have remained isolated. Their history and their structure have contributed to it. We have come to think of universities as places which need some protection from the problems of the society that surround them. In one sense this isolation of universities is valuable. can give some ability to shelter immature investiga-tion until the skills have grown. On the other hand, in large measure, the isolation of the universities becomes untenable not only because they depend on the government and the tax-payer for their resources but even more so because the universities are a repository of our future and they cannot be entirely unconcerned about the problems of society or the future that concerns nearly 3/4ths of our nation.

Let me come back to Shankara and Plato before I end. These two great teachers above all were concerned with life and with people. They protested against the education of their own times and demonstrated by their own practice that education not only needed change but could be changed by their own fearless examples. Plato pleaded for the perception of external harmonies that relate man to nature. Shankara preached the need for achieving an inner harmony by each individual

through his self-discipline and dedication. Both raised or lowered philosophy, as you may choose, to a practical plane. But both were restricted by their own times, the lack of appreciation of empirical knowledge which could weave science and philosophy into a single fabric. We have come a long way and perhaps reached a crossroad in the history of our nation. Both change and harmony are insistent needs of our society. The place of the university is central in any scheme to gather knowledge, define what needs to be done and demonstrate what can be done. To my mind, universities are not only repositories of knowledge, they are creators of sensibility. The students who go out of the university carry knowledge and sensibility as guidelines to their future activity. May I wish the students, particularly those who are getting their degrees today, that they work to find a sense of fulfilment in the pursuit of a harmonious existence.

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