K. V. SUBBARAM

TOWARD A FUTURE

Ideas On

Education, Science And Society

SCORPIO BOOKS

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ROHTAK
INDIA

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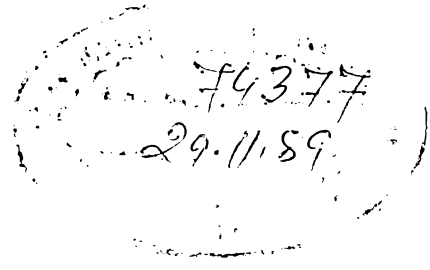

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K. V. Subbaram

PREFACE

It is said that India has had many pasts and that each of the pasts has contributed to the thought processes in the country and to Indian civilisation. It is impressed upon that the present is nothing but a combination of the several pasts and does not exist on its own. Many of the pasts are still visible in the country while the future toward modernisation beckons "to catch up with the rest of the world". That inevitably, leads to a competition — even to a conflict — between the translucent and the transparent, the symbolic and the material, and between the abstract and the concrete. The time has come for us to leave the several pasts behind, using them only as our experiential layers to move into the future that is expository. It is imperative that we have to imbibe a rational and humane outlook with the help of the relevant elements from our many pasts and with emphasis on higher perceptions of life *now* and *here*.

In a largely illiterate society like ours, education plays a great role in spreading not only knowledge but also providing skills to the people, apart from opening a window to the world. On various occasions I had the opportunity as a teacher to speak and write on issues concerning the several aspects of education including those of higher education. Furthermore, in the present scientific and technological world, the ideas of science have been successfully exploited toward material benefits. Again, I, trained as a scientist, had expressed opinions on science in particular regard to our society both in conceptual and concrete terms.

The book thus is a collection of a number of articles, written in the last about a decade or so, concerning education, science and the Indian society.

Although no formal divisions have been made, the first seven articles are on some general and specific issues pertaining to education and the educators, followed by articles on the various aspects of science *vis-a-vis* some of the predominantly obscure elements and the obviation of a scientific culture in the country inspite of its many proponents and back-slappers.

To enable the reader to understand and appreciate the context in which some of the articles had been written, seven appendixes have been added at the end of the book as also to give a sense of completeness to the particular context. The contents in Appendix-G form the basis for the essay "The Critic, Performer, And The System" that has been included with regard to the role of individuals in society.

In the present atmosphere of cynicism, pessimism and despair prevailing in the country it is reckoned that the ideas contained in this book will perhaps stimulate deeper thinking, provoke discussions for more ideas for founding a "living philosophy" and generate some hope toward a future for our society.

ROHTAK **K. V. Subbaram**

Spring of 1989

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EDUCATION IN INDIA : PAST, PRESENT AND FUTURE

"The world could get along without literature. It could get along even better without man".
—Jean-Paul Sartre

Much has been said and unsaid about education in India, and much more has been undone than has been done about innovating and adapting it to the present day needs and improving its quality to that effect. Ever since India became independent, a national concern of sorts had developed to streamline all the aspects regarding the various stages of education, the modernization of it, and to diversify the specialized fields with emphasis on both vocational and interdisciplinary approaches. This concern culminated in the formation of discussion groups, study committees, and education commissions (eg. Kothari Commission) to delve into and advise on the details of dressing up the educational model with a relevant national dress. In spite of the sincere efforts of all the concerned individuals and bodies, it is a matter of regret—indeed distressing and shameful—that nothing tangible has emerged in terms of translating words into worthwhile practice. Most reports and recommendations have been either implemented in a half-hearted manner or have been gathering dust on remote shelves, or perhaps they have become dated and hence irrelevant in view of the fast changing national perspectives and priorities. The implementers are afraid of even touching the Pandora's box lest the reforms turn out to be too sweeping although they might feel

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convinced that the said reforms are acceptable—intellectually speaking, but emotionally not yet. A lot of indolence and indifference towards the execution of ideas, and too much interest in self-aggrandisement have also contributed to the static picture. There is now thus a *status-quo* while everyone keeps watching and hoping that someone else may try to roll even newer ideas and recommendations onto the track so that they pick up momentum at some stage, the rate of change of which, with time, turns it into somewhat fruitful socio-economic-cultural forces. Hope and hap seem to reign supreme over efforts and efficacy.

Need For Education

What is education ? Why education at all in the first place ? Does the training in or the lack of it affect the individual's creative capabilities in any way ? One may not necessarily find the answers either in the multiple layers of the formal type of education or in the recently invoked non-formal type. But, nevertheless, one has to start constructing one's building on certain firm foundations : education of all types advances a civilization, and each society has to develop its own style(s) of imparting the same depending on its backgound after analysing the forces, from a national historical perspective, that have brought society to the (present) point of debate.

Education, if one is allowed to define the seemingly obvious, is the transfer of knowledge acquired by an individual or a group of individuals to another person or a group of persons, and in a larger sense from one generation to the succeeding generation (s). Thus, it is a set of unlocked ideas or ideally a set of positive values passed on to posterity in the hope that they will prosper both materially and intellectually. This is an iterative process strengthening the infinite-knowledge-chain at each joint. A wealth of knowledge acquired and built up might sometimes have the limitation of being only useful to the people belonging to a particular period of time. Yet, some of it related to affirmative values of life is eternal and holds good for all

time although it appears that, in practice, such eternal values have, of late, lost their intended meaning and sense, paving way to short-lived and vague ideologies and cliches.

The transfer of knowledge, one might argue, has stultifying implications such as making people conformistic in their thinking and action if no new ideas were forthcoming according to the changing times. In fact, this apprehension is a well justified one, and most people nod their heads in obeisance to what they are taught. However, a very few defiant individuals who question the prevailing traditions, values, ideas and ideologies, and who, in the process, contribute their own new strains of thinking enrich the fabric of life in general and make living a little more worthwhile than what it has been. But the waves of retrograde thinking and obscurantism keep making their presence felt very often in the minds of the people, owing mainly to the congenital fear of the unknown caused by ignorance and superstitions that are spread, particularly by the older generations, to confine human beings to the beaten track of organic existence with some inorganic spiritual punches. It is, in this context, that education becomes an extremely relevant and potent tonic to make the people aware of what they had not known till then and make their lives more meaningful, both socially and psychologically, with a certain amount of rational and independent thinking with self-confidence, restraint and discretion.

Primitive Men And 'Semiology'

Although the primitive man had no formal education organized as we know it today, he used his sensory perceptions, limbs, and body to fulfil his instinct for survival. His offspring had only to imitate him in all the processes he undertook, again using their own senses—particularly, the sense of seeing and imprinting the various methods in their mind—and where necessary they improved the existing startegies as their mobitity increased and as they found new environments to cope with, adding something new

to their own perception of the life style. This process of improvisation of methods over successive generations led to the advancement of civilization from one stage to another enabling human beings to exploit their surroundings and nature as well as the available material around them effectively for their survival. The advancement of civilization has always been a slow process and there rarely occurred any leap-frogging or telescoping as one impatiently wishes these days to happen. The primitive man was a self-educated person, and he had to train himself as he had no teachers to tell him how and what he should or should not do. In the absence of any particular script, he engraved symbols on mountain walls, inside the caves, on tree trunks etc. Mainly as a from of art towards self-expression, and the various symbols served as a medium—known as 'semiology'—to pass on what he had to say to posterity though it appears that is was not his intention at all to educate any one in particular. The excavations of various sites and the finding of seals, objects with several shapes, figures, figurines, and the discovery of rock paintings and wall engravings are actually the only means of educating the present day man about the beliefs, customs, rituals, and of the general life style of the early man, and possibly to derive some knowledge and perhaps inherent wisdom from the imprints left by him. The findings of the Indus valley civilization is a case in point, insofar as this sub-continent is concerned. This apart, there are many tribes and sects of people living in the remote areas of the country (as elsewhere in the world) with almost no impact of the present-day civilization on them. This may be interpreted as the knowledge-gap, irrespective of the way one looks at it—either from the point of view of the modern day man or from that of the tribal man living far away from the towns and cities.

Early Settlers And 'Scriptology'

With the beginning of the waves of immigration into the country from Central Asia and other regions, the situation had come to

change from what it had been till then. The early settlers were mainly pastoral groups with reasonably well developed methods of agriculture and well-made weaponry for conquering the local people and for self-defence in an environment alien to them. One significant characteristic of the early settlers was their highly developed skill in effectively communicating to one another through written script apart from the oral tradition that had been in vogue with them. The profundity of individual development, social mores, and philosophical studies because of the usage of the oral tradition and the written medium are the strongest assets of these early groups. The holy scriptures—the esoteric *Vedas,* the *Upanishads* and other texts—were, however, not available to everyone, and they were in the custody of certatn groups and sects of people, mostly of high caste. The transmission of the knowledge embodied in the above mentioned scriptures, which consisted of highly imaginative, intuitive and invigourating material, was to a selective group of young boys from the upper castes of the society. This was supposed to hopefully channelize the thought processes and regulate the life pattern of the individual. In this system, the *guru* selected the *sishya* for educating him, and the *sishya,* in turn, had to lead a rigorous routine ordained by the *guru.* The mode of transmission of knowledge from the *guru*—that is, the education of the *sishya*—was mainly through word of mouth, and the *sishya* was to repeat the same until he thoroughly memorized the whole thing verbatim and until he could reproduce it to his *guru's* full satisfaction. Thus a system—may be termed as 'scriptology'—had been developed where the maximum emphasis was laid on memorizing the verbally communicated material as also the written matter of the scriptures and parroting it out faultlessly. No questions were to be asked about the veracity of what had been taught but certainly some amount of discussion was allowed only to clear one's doubts about the interpretation of the material, and no doubts whatsoever were to be expressed about the authenticity of the contents of the scriptures themselves. Thus the 'scriptological' mode of transmisson of knowledge—in other words, religio-spiritual education—held sway during the early

periods of invasions by alien groups and later had taken deep roots in the soil of India.

The tribals who were very much present all through the periods of successive invasions by the new creeds of people from outside were to be pushed into the hinterland—jungles and remote areas—, and they moved away from the forceful alien influx with their own mode of transmission of knowledge intact. The country thus had come to experience two distinctly different types of education patterns : (i) the transmission of knowledge through signals, gesticulations, and symbols ('semiology') which could not necessarily always be expressed through the written medium (some of it remains to be deciphered till today) AND (ii) the process of learning adopted by the later groups of people—the vedic warriors—through reading and listening to the sacred matter written in scripts with emphasis on memorization-reproduction ('scriptology'). These two variant streams of consciousness among the population existed independently with no noticeable effect of one on the other in terms of organized education except in the cases of worship of idols (symbols for gods) and ritualistic and faith-oriented practices. However, the method of education followed by the majority of the settlers—the memorization-reproduction process—had firmly established itself overshadowing the existing folk forms.

Renaissance In The West And 'Scientology'

In medieval times, although religious thought had its grip over the general public in the West and influenced their life style and thinking pattern, simultaneously out of sheer curiosity and inquisitiveness extreme individualistic personalities began probing the physical world around more vigorously than the philosophers/ thinkers of the early ages and in an organized manner, from a 'scientific' point of view and tried to propose systematic, rational and logical explanations : 'scientology' as it may be termed—to the multiple and varied phenomena that occur in nature. (In

Indian philosophical literature too, theories have existed regarding the formation of the universe and the living beings, which have been propounded on the basis of the intuitive capabilities of the individual thinkers.) This situation had brought out and later aggravated the conflicts between the till then upholders of religious explanations which were basically didactic and faith-oriented. The methodical procedures, aided by logic, adopted by the scientific thinkers and experimenters convincingly proved to one and all what they had postulated by actually demonstrating simple experiments and displaying the ensuing results. As a result, the consciousness of the general public in the West slowly and partly altered from the religious base of thinking which they had been accustomed to, to a totally new and more appealing type of thinking—namely, the 'scientific' method or 'scientology'. And because of its definitive nature, science and scientific thinking were taking root in Europe although religious faith had not been totally abandoned to the advantage of the former.

British Contributions

It was during these medieval times, that the British (and the other western colonialists such as the French and the Portugese), with the sole aim and ambition of extending their hold over the materially exploitable parts of the world in disorganized societies, entered India in the guise of merchants interested only in trade. The locals, in awe of the white-skinned intruders paid obeisance (a part of our tradition) and yielded to the pressure tactics of the British rulers. Mainly to keep their hegemony over the locals, who they considered were pagan in their approach towards life and who they gauged were mentally very flexible depending on opportunity and convenience, the British trained the Indians (largely the upper crust and the elites) to become clerks and petty officers to serve their needs and authority. In this connection, they initiated a pattern of education which was in operation back in their own country, and they compartmentalized it into

various stages—the primary, the middle, and the secondary, and in some cases college level also. The primary and secondary stages of education were sufficient to make use of the locals and these stages broadly introduced the students to literature (English, with some sprinkling of local tongues), geography and the history of the world, arithmetic and general science. This kind of education, to a good extent, was merely a necessity for the natives to serve the masters, and lead and sustain their lives in a largely subservient manner. The British further trained the successful candidates again in the specialized disciplines of accountancy, banking, commerce, and general administration. Apart from the various functional aspects of the colonial style of education introduced into India, the scientific education and thinking progressing in the West did not get unimplemented here, and the institutions of higher learning in some of the metropolitan cities of India were established by the British.

The concept of a university existed in India too (eg. Nalanda and Taxila), much earlier to the British initiations, but not organized in the manner it had been developed in the West whose main concern was with the humanities and research in life sciences and the physical world around, and its exploitation to the full advantage of man and his material comforts. The universities in England (eg. Oxford and Cambridge) were started in small, quiet towns away from large towns, and they were supposed to have a number of scholars conducting research—thinking, writing, and experimenting—in the various disciplines and also to inculcate universal values among students which the British cherished so fondly—namely, freedom of thought, freedom of expression, and freedom of action within the limits of the society in which one lives and to enrich it in turn. It will be relevant to reflect here that the higher learning which was imparted in India (much before the advent of the British) among the intellectuals and thinkers was *self-oriented* to achieve (hopefully) salvation and unison with the Almighty whereas the kind of higher learning the British inherited and tried to transpose

on India was *society-oriented* through individual efforts and adhering faithfully to the universal values they believed in (but not necessarily practised when they subtly entered the various continents in the guise of traders, and in the guise of missionaries to 'civilize' the people in the countries they had crept into).

Indian Predicament

India was thus exposed to and had come to experience yet another type of education involving the 'scientific' method, which is systematic and methodical in approach. And a new stream of consciousness had been added to the already existing ones—namely, the 'semiological' and the 'scriptological'. The 'scriptological' one had primarily to do with religious and spiritual matters as far as the Indians were concerned, and one could imagine, intuit and conclude without ever going through the details and the logical steps that are involved in the new 'scientific' way of thinking. These three streams also exist today, one not necessarily either below or above the other, but the latest 'scientological' way—methodical and organizational in form—seems to have been impressed upon in the country because of the obvious technological growth leading to more material comforts and an easier life style. If there is no one particular tradition to follow, most individuals keep their minds constantly open to receive anything new (a dubiously healthy practice indeed!) that suits them at any given time and may end up finally in : (a) accepting the best from the alien (modern) ideas after convincing themselves about their need and totally rejecting the existing (antiquated) ones, (b) total confusion in the personalities of the individuals, being not able to decide as to which one to follow and which one to reject and thus ending up as distorted personalities, and (c) faithfully clinging to the awareness they have had, completely rejecting the new ideas although they might seem to be logically very convincing to the mind. These alternatives can be extended to society as a whole, consisting of clusters of randomly oriented persons. In the present day India, we seem to have been badly caught in the second alternative (with a whole lot of people rigidly opting for the third

alternative as well at the same time) where a traditionally imaginative, intuitive, and authoritarian *guru* and an obedient, mostly non-questioning, memorizing-parroting *sishya* have been in existence for a very long time in transmitting-receiving the knowledge contained in the ancient, so said sacred texts deemed to be absolute in their matter-content AND the study of nature and societies where a systematic, methodical, and rational way of thinking including some imagination is required instead of extrapolations, conjectures, often contradicting arguments, and conclusions which we have been and are used to. It is in this confusion that we have adopted a system of educating and evaluating students in subjects such as all branches of science including medicine, engineering and management studies where we employ the traditional memorising-reproduction method in which understanding, analysis, criticism and feedback from any new ideas that might emerge and enrich the mainstream of thinking in the sciences and scientific studies are, to a large extent, ignored. As a consequence of this mismatch between the *modern subjects to be taught* and *the ancient method of learning* we have adopted, the effect of education in India has been cataclysmal instead of being catalytic for the betterment of individual behaviour, for individual awakening and the much needed and much talked about socio-economic and socio-cultural transformations from the antiquated mould to a contemporary one. Nearly all our failures in scientific endeavours can be traced to this mismatch and the individual successes in scientific discoveries are capricious in nature.

Lack Of Creativity

There has been much hue and cry about the lack of creativity among Indians despite the large number of people attending schools and colleges and getting formal education. One need not go very far to find the cause for this deplorable situation. The present methods employed in the name of transmission of knowledge conform young minds to the particular mode of memorising-reproduction process. It might sound appalling, yet

it is an undeniable fact that many a first class "brilliant" person cannot even draft his own leave letter without noticeable mistakes, be it in English or any other language including his mother tongue. And he is not to be blamed for this state of affairs. A mind which has been trained over a period as a computor to store material and retrieve it just for examination and evaluation purposes will not be and cannot be creative. Under the circumstances, in certain cases, there is visible mental retardation made apparent by the dulling of the mind because of the narrow and conformistic training it had received from the current education methods, let alone creativity. In fact, if one researches the records of outstanding creative individuals, most have been failures in schools and/or dropouts, and if they had been able to create and innovate they could do so in spite of the education pattern and not because of it. However this should not be misconstrued as a recommendation for not going to school at all, especially in a country of about 400 million (more than half of the total population) illiterates completely ignorant of the three R's. One must also concede to the important fact that the intelligenc of a person is not a mere memory oriented property. It has been wrongly understood and propagated as such in a naive and simplistic manner in the absence of a knowledge of the correct and expanded meaning of the word. The intelligence depends on an individual's extent of awareness and level of consciousness; his exposure to the various phenomena, objects, people and situations; his critical observation power; his intellectual level of perception; his comprehension and assimilation of facts; his analytical capabilities, and, of course, his strength of memory. In reality, it is a complex combination of all these qualities along with a host of other mental faculties and responses in an individual that leads to a 'creative' (original) as opposed to a 'productive' (mechanized) personality, and memory storage and retrieval are only a part of one's intelligence that are helpful to a certain degree. All human beings are not the same, and it will be unfair—indeed cruel—to blindly bunch them and grade them according to their exclusive ability to memorise, as is being done at present in evaluating one's

performance in studies. No wonder, many hurry up to achieve the time bound goal of completing the *correct* answers of their question papers in examinations by resorting to reprehensible and objectionable methods of 'copying' because their memory powers are not as strong as they are demanded by the education pattern. It is also not right to conclude that the memory failures are not intelligent people as the other mental faculities might be well developed in them, and the present treacherous system is entirely responsible for discouraging them to make full use of and exploit those other faculties and be creative in their own right.

Some Outlandish Suggestions

Unless we adopt an education system which encourages inquisitiveness, enthusiasm, a questioning attitude, amenability to certain amount of reasoning and receptivity, AND a system in which the personality development of the individual right from the kindergarten stage (regretably now managed by unscrupulous school merchants) is encouraged including some social concern, AND a system in which the individual is evaluated and graded according to his comprehension of the concerned subject in a non-memorization-reproduction process, AND a system in which the individual's potential for contibutions to society is effectively gauged with (or without) formal education, we have no salvation from the existing chaos. Up till then, we will be sternly pontificating in classrooms about some impressive gibberish and branding students like animals with highly dubious percentages of marks (obtained through by now sanctified 'unfair' means) corrected to the second place of decimal and honouring them with a 'classification' where the trauma or elation of being branded in a particular division carries them to the end of their lives (and perhaps even beyond, in line with our religious philosophy). Our compulsive obsession with (im)precise percentages of marks awarded has to be exorcised, and a more general gradation system has to be forced into operation, and we must humbly accept that we are not perfect human beings acting like gods. The process of evaluation and gradation is not absolute in any system as the evaluator is also a

human being (hence, very likely subjective) and therefore need not be always just or right. But certainly in a given class of students, each student can be graded relative to the rest of his classmates and then can be left to fend for himself with the help of the knowledge which he has been exposed to for a period of time. This requires some radical thinking and appropriate action on the part of the people concerned passionately with the state of education in this country. More importantly, less proclāmations and more execution of ideas would result in something worthwhile where human potential is not weighed according to the paper degrees (no better than toilet paper) one receives in the mad scramble for white collar jobs and the divine divisions one is bestowed with. The process of channelising young boys according to their aptitude (which is inborn and so genetic in nature) and interest (which is acquired from external stimuli and so environmental in nature) has to be undertaken, of necessity, preferably at the end of the secondary stage of schooling, and they must be strongly advised to choose their path of contribution to society on which their efficiency will be nearly equal to the maximum they can squeeze out of themselves and along which path the output is expected to be substantial. This requires perceptive judges of human personalities, their aptitudes and interests. A society which cannot effectively make use of the manpower (more precisely their mental and physical powers) it has, will indeed become poorer in all respects than what it has been. Further, the governments have the right and responsibility to see that all the money they spend towards education of all kinds brings in appropriate returns, at least in the long run and certainly not in the business sense. Every individual may not be *per se* a cerebrally oriented person, and those who are not must be given their dignity, share and status in society so as not to make them feel psychologically inferior to those indulging exclusively in intellectual and theoretical exercises. This will be a desirable break from the past social and cultūral tradition, and education should only hasten such tolerant attitudes instead of indignity and damnation. This new ethos requires full and unconditional

encouragement from all those waxing eloquent about modernizing the Indian society. There have always been anti-views for anything new that had been suggested and put forth in the past too, and now also, the concerned educationists have to anticipate and thwart through discussions any obstreperous tendencies and opposition to the transformation or changing of the present education system in India.

Relevance Of The Past

What is the purpose of digging into the past, as we have indeed done, to pass some sort of value judgements on the predicaments we find ourselves in, insofar as the present education system is concerned ? As Carl Jung has said : In older societies, if one wants to understand the psychology of an individual it is not sufficient to study the particular individual and conclude obout him. It is actually necessary to gather as much information as possible about his grandfather, or preferably his great-grandfather and other ancestors, to analyse and know thoroughly about the behaviour pattern of the individual under scrutiny. Jung's statement is more than valid in the case of India with the tradition of continuing civilization and unbroken links with the past—even the distant past traceable to a few thousands of years. Any system, including the education system in India, has thus visible connections with the psychology and awareness of the past people and the systems they had themselves developed or acquired from other sources. It therefore becomes essential to dig into the past, which has suspended us in the present state of animation, with the hope to build a concrete future through not a so rigid and inflexible education pattern as of now preventing modernization and progress.

Future, And Role Of Educationists

Is there any future at all, and is there any respectable and practical way out of the present state of suspension ? The scientifically and industrially advanced West is tinkering with the ideas to create

super-babies, and super-machines which are expected to work more efficiently (under remote control) than the present-day men themselves—perhaps robots with their own brains. The future species are supposed to be more aggressive mentally and more strong physically than the existing species of humans (if they cannot control the urge to fiddle with natural processes in the name of experimentation and eugenics). We in India are still (mercifully) far away from that kind of a horizon but soon we will be caught in yet another stream of consciousness where situations may be much more different and bewildering than what we have been trying to get adjusted to so far and for so long. Out of the present 'semiological' (must this ancient visual medium be betrayed altogether when especially it is well known that a child responds favourably and reacts creatively to symbols ?), 'scriptological' (primarily memorization-reproduction process nurtured in the oral-written tradition which has been with the mainstream of the population with deep roots), 'scientological' (step-wise, methodical and rational mode of thinking regarding the physical world and material phenomena, of late extended even to the social sciences), and the future 'supralogical' (a new word coined to denote the mode of communication between robots with their own brains) we will finally have to take sides with one or the other system predominantly instead of embracing all of them at the same time disproportionately and thoughtlessly, and ending up in further confusion and obscurity. Some appropriate linear combination or synthesis of all the available patterns will have to be used during the various stages of education for the full growth of human personality, and this seems to be inevitable even if impracticable owing to a lack of vision and will. This would, of course, depend on what kind of society we would like to build for posterity. It serves no purpose, and there is no use incessantly accusing the British and their legacy or even the evils of western and other foreign influences. An 'open society' has to compulsorily live with onslaughts from outside ideas, ideologies, systems and values, and it can be free from their sinister influences only if it is basically cohesive and strong by pooling the human

potential in its totality by "educating" them in a nationally relevant manner depending on its history and its psyche. The alternative is to allow the drift to continue in the hope that some order might emerge from out of the chaos (*a la* Mao Zse Dong) prevalent in all fields, particularly in the field of education, which is the driving force for a civilization to survive and progress in a comprehensive sense, whether it is formal, non-formal or say the informal type if one is allowed and encouraged to develop this latter variety. The secularization of the education system is a painfully prolonged process, and the fusion and development have to be tendered in an environment which must involve the hitherto neglected lowest sections of the society. For example, the imposition of the scientific milieu on the tribals would not result in their awakening overnight, and it may turn out to be futile and damaging unless their consciousness is considered and slowly altered with respect to their own traditions. If this is not done, the already existing knowledge-gap and consciousness-gap will widen further resulting in outright hostility on the part of the tribals and other lower segments of society. Many more opinions freely expressed by all and sundry would only further obviate the spread of knowledge through the various methods of education and would affect the development of Man as an integrated being, without completely surrendering the emotional, rational (and perhaps even the spiritual) aspects of his personality. The Pandora's box has to be opened if the wealth of knowledge is to be shared and enjoyed by all sections of society even if the bees sting the lock opener(s) to death. Such a sacrifice is to be welcomed and hastened. It will be a crime of great virtue by the Indian public, the punishment being grateful applause.

There is a lot for the scholars and the 'learned' educationists of this country to address themselves to, to reflect, to ponder over, to hypothesize, to think in concrete terms, to connive with others about the need for a change from the present stagnant pattern to a future dynamic one, and to finally implement those ideas and execute them with vigour, sincerity, and firm conviction.

The (most important) execution part of this whole revamping exercise will not be effected if the responsible, decision making positions are donated to persons who enjoy political patronage and who continue to be life long proteges of imperceptive and illiterate politicians. The political interference has already played havoc with the education system along with the inherent incongruities already present in it, and this pollution of the system has only exacerbated the crises further. Until we resolve this menace, we cannot be leaders and advisers in education, with clarity and relevance, to those who need help from us. This is possible *if* and *only if* the politicians themselves withdraw voluntarily from the educational scene as this withdrawal cannot be forced on those who wield power and exercise authority. The educational administration has got to be outside the bureaucratic labyrinth to enable one to follow 'regulations' rather than rigid 'rules' and 'laws' which would only conform and confine the knowledge pool.

In Retrospect

The Indian man has looked after, has been and is looking after his SELF for too long a time under the guise of religion and spiritualism and on abstractions based on theoretical and hypothetical models, and the time has arrived for transforming those abstractions into pragmatism embedded in a new educational pattern for the larger interests of the society in which he lives. The temples of 'learning' have yet to be built, and only when they are built on egalitarian foundations can the Indian man call himself truly 'enlightened' and society can be called 'civilized' without losing altogether its past in the hurry to advance the present, by merely aping, into a rather uncertain and foggy future. With a little bit more of reason and objective thinking on the individual's part than before for the welfare of society, the Indian man can control events if only he is less complacent and more committed to contribute his mite for the furtherance of knowledge. Else, everything would remain either a glib talk or raucous writing loaded with endless rhetoric (*sic*), and no amount of borrowed wisdom

would salvage this society from the perilous path it might choose in haste and with indifference. Should those circumstances arise in adversity, the 'existentialist' statement of Sartre quoted at the outset might have to be rephrased into ān 'eternal' one to suit the perennial mood of the people of this country : "India could certainly get along without education. But it could not, at all, get along without God".

EDUCATION - THE TRACK OF THE SOCIAL LOCOMOTIVE

Education is one of the topics treated in the section 'Social Basis of the Third Universal Theory' in 'The Green Book' by Muammar Al Qathafi. (Appendix—A)

Education, as opined in the Green Book and in its truest sense, certainly does not mean tailored curricula transmitted through prescribed text books during academic sessions. Yet this is precisely the process that is being followed in almost all societies where people have learnt to read and write. The assertion in the Green Book that organised education enforces conformism and is against human freedom is open to debate on various levels.

If people at large, as individuals, have to be informed of the several phenomena that occur arround them in society and in nature and inside themselves, it is convenient that the details be classified and systematised to be further taught in classrooms. In the absence of such an approach it is to be deemed that everyone is perceptive enough to comprehend the surroundings within which one lives all by himself, and also about the mechanisms that cause things to happen the way they do. However, it is well known

Based on a paper presented in the symposium on the 'Green Book' by Muammar Al Qathafi, held at Vigyan Bhawan, New Delhi in September 1984.

that this is not true, and each one requires a teacher or some other authoritative source to learn from whatever one likes to learn. At the societal level, there is no other way that is convenient to put forth the knowledge that is accumulated from time to time except to organise the pattern of education in a *most liberal* way, much one may abhor it as a cause for suppression of human freedom.

This brings in the question of human freedom and the limits to it insofar as the topic of education is concerned. In practice, all varieties of education polarise the thought processes and influence the behaviour of human beings. No educational course worth its name preaches limitless freedom although one may aspire, in the utopian sense, for 'absolute' human freedom. If everyone were to be free in the desired 'absolute' sense, free from all sorts of bondages by not getting organised education as of now, anarchy shall prevail. None of us had the freedom to choose our parents before we were born, and if we had that freedom we all would have been different from what we are and even some of us would have had the freedom of not being born at all. Now that we are here, it is our duty as individuals and as social creatures to work out how best we can utilise the limited freedom we have in the pragmatic sense through a liberal, organised education process both for individual development and social obligations.

As said in the Green Book, the fact that the enforcement of education on human populations obviates their being creative and brilliant is true to some extent. It does not however necessarily follow that all people who have had no formal education are creative/brilliant. If that were to be so, all illiterate and uninformed societies in the world would have been *per se* both creative and brilliant. Perhaps then there would have been no need for any theories. Creativity is spurtic in nature, and resides in the non-conscious planes of human minds. The outward surge of it depends on a plethora of faculties that control the human minds and is a manifestation of both the personal and environmental

factors. Also, creativity is certainly not made to order. In some cases it may make its appearance more pronounced as one reacts to conformism bred by organised education that is being theorised to be abandoned by Qathafi. The total abolition of the prevailing system of education may sound revolutionary and outlandish yet it will result in increasing the number of randomly oriented individuals posing to be creative and brilliant which actually they are not. Only a few individuals are creative, and the knowledge that accumulates as a result of their creativity has to be transmitted to others who are not creative, through the various information media such as teachers, books or other means. There are three strata in any society at the cerebral level—firstly, the creative individuals; secondly, the classifiers and propagators of knowledge created by gifted people; and thirdly, the learners who form the majority in populations—each stratum feeding the other in a symbiotic relationship. Even to "emancipate man's mind from curricula of fanaticism" one requires some form of organised education without which there is every likelihood of one turning a fanatic.

The pattern of education as envisaged in the 'Third Universal Theory' foresees that society should provide all types of education, giving people the chance to choose freely any subjects they wish to learn. Perhaps, societies with smaller populations (for example, Libya) may easily get away with the implemention of such an idea but older, largely populated societies (for example, India) do not simply have or cannot have the necessary resources to even accept, let alone follow, the above as the magnitude of the problem in such societies relates to mere physical existence alone. Thus the so-called 'Universal Theory' on education of the masses of their free choice remains a highly 'Insular Theory'. Further, even if one assumes that all societies can follow the 'free choice' dictum in matters of education, the premium is fully on the individual to choose any subjects he wishes to learn. Which means that each individual knows what he ought to or ought not to learn. This is a highly presumptuous conclusion thrusting the onus of choice

onto the shoulders of the individual with little room left for advice from others and discussions with others for some guidance to steer one's life without confusion. In the larger sense, this sort of situation leads to minimal interpersonal relationships in societies, destabilising societies ultimately, which is against the larger social perspective of the 'Third Universal Theory'.

The Green Book says: "Societies which ban and monopolise knowledge are reactionary by nature, biased towards ignorance". An open society neither bans nor becomes the whole time contractor of knowledge. It constantly thrives to receive new knowledge from outside sources for invigouration, sometimes even to the detriment of its own culture, social mores and traditions. One learns from the above statement in the Green Book that *all* societies must keep their doors open to external influences, hoping that what is needed to the further development of the particular society is extracted from those very external influences and absorbed and what is not needed is ignored. Regretably, it is this discretionary valour that is totally lacking in most societies of the world. Education should help build such an egalitarian society at the global level, breaking down the existing social structures and obnoxious social barriers. Today most societies are closely guarded by their own inherited traditions—mainly religious in nature—thus impeding the desired development of individual human personalities and the societies of which they are a part. The monopolistic aspect towards knowledge is yet another manifestation of the selfish survival instinct in humans to gather and own it all for their own ends, oblivious of the welfare of others.

It is very confusing to learn from the Green Book that the "Societies which prohibit the teaching of religion as it actually is are reactionary societies, biased towards ignorance and hostile to freedom" and also that the "Societies which monopolise religious education are reactionary societies, biased towards ignorance and hostile to freedom". Every human being at the time of his birth

is not just born into a family but also into the tradition of the particular family. When traditions are organised, they become the tenents of a religion that are to be mandatorily followed by the people of that faith. More often than not, traditions do not usually have a rational basis as such but are nevertheless to be adhered to to escape social wrath and ostracism. Organised religions indeed monpolise and stultify people's thought processes and demand people to comform to a particular way of living, much to the discomfiture of radicals ard the like. Certain older religions, disorganised as they are, also freeze peoples' behaviour, deeds, and their mental processes through mainly superstitious and irrational pronouncements thus making them ignorant. Religion, in any event, is a binding force in almost all societies—only at the emotional level. It is not clear as to what Qathafi exactly means by "religion as it actually is". If altruism is the real ingredient of any religion, and if a religious education's duty is to inculcate certain amount of disciplinary conduct in individuals then it must not be abandoned but must be welcomed. Futher, a religion in the modern day world, in its broadest scientific sense, must emphasise on certain amount of reason and receptivity at the individual level, and concern and compassion at the human societal level. A good religious education, must not only hasten these attitudes if social balance is to be achieved without losing the identity of the individual. Such a "religious" people—as appropriately and succintly theorised in the Green Book to be the real custodians of power and authority—must awaken and in turn demand of their implementors developmental programmes for the upliftment of the society at large.

Any universalised precept of education bereft of ethical and social mores is futile. The education process must lead to the enlightening of mind and soul in peoples for the general good of society rather than towards individual inflated attitudes and postures.

Accumulated, non-monopolised knowledge transmitted to

individuals in a manner they are able to receive and appreciate it, truly makes them free from ignorance, superstition, prejudice, dogma and fear—but not free from the society in which they live.

Individual freedom through a liberal education process has to operate within the periphery of a society AND the inner core of a society must consist of its knowledgeable individuals. The education process in any society must equibrate these two aspects, and only then it becomes truly 'Universal'.

MERIT PROMOTION : THE OTHER VIEW

Prof. Amrik Singh in his article "Merit Promotion Scheme : A Close Look" (Appendix-B) laments that the scheme introduced in universities a couple of years ago has been misinterpreted and misused to a large extent. He cites a few examples where anyone and everyone has been promoted without due respect to the "merit" factor.

Teachers in this country starting from the primary school level to the university level are the most condemned lot in terms of social status and monetary benefits. "Sensible" people have realised this fact soon enough and have been, of late, drifting to other lucrative jobs where social status and recognition are more instantaneous and overt alongwith other benefits like the services rendered by peons, availability of vehicles for trips, priority in various social services, health and the house loan schemes, leave travel concessions and the halo of office with authority and power.

In most professions one aspires to and gets promotion after a certain number of years based on "merit" and "performance". The teaching profession, however, has been an exception. Teachers are condemned, humiliated and kicked around if they request for promotion during their career. It does not speak much of a profession where a teacher retires without the benefit of even a single professional promotion.

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Who is responsible for this pathetic condition of teachers ? Obviously, the few seniors who have made it to the top and think that they only are deserving, outstanding and significant persons of knowledge and learning. This myth should be demolished. If the teachers in general are not performing their duties as expected of them, how come so many people are running through the rut of the present education system, passing their examinations, sitting in competitive tests and getting through, securing jobs and serving their respective organisations ? This is not giving a clean chit to the teaching community (some of the "dons" do not deserve to be where they are) but certainly teaching in some manner is going on all the time.

As a person who has been closely associated with education in various capacities, Prof. Amrik Singh may have realised by now that "merit" is a much maligned word in our country—more so in education.

Indeed there should have been no "Merit Promotion Scheme" at all considering the relevant Indian situation. Once one gives a name to a scheme, however erroneous it might be, one hopes that at least something close to what is implied in the name will be followed.

As the evaluation of one's merit by another individual or a group of people (euphemistically called "experts") requires a high amount of objectivity for pronouncing a verdict, and since that "objectivity" factor is totally missing from our mental structure, the "Merit Promotion Scheme" proposed by the U.G.C. should have been abandoned completely in favour of a realistic scheme.

In the name of "merit" the teaching community relentlessly pursues the seemingly unreachable goal of promotion adopting all sorts of tactics—devious and often mischievous—to reach the top. By introducing the word "merit" in the expression "Merit Promotion Scheme" for university teachers, the U.G.C. has encouraged teachers to start a scramble for power.

"Merit" is valid and gains credibility only in such societies as are less subjective than our own where everything unacademic and unintellectual manifests itself as "merit" and is justified as such.

Prof. Amrik Singh ridicules those who have been promoted recently in a few universities in accordance with the alleged "mass promotion scheme", essentially unmeritorious, hence not outstanding, and hence undeserving of promotion. This is a regretably obstructionist attitude. It may be true that all promotees are not "outstanding". I would like to ask Prof. Amrik Singh one question : before the birth of the "Merit Promotion Scheme" (delivered by the U.G.C.) have all the teachers who had become Professors become so because of their "outstanding" ability ?

What are the criteria that are to be adopted to scrutinise the credentials of the "outstanding" thin stratum of Professors ? They are : significant contributions in one's own field (this has to be endorsed by Nobel laureates in the field as Indians are deemed to be prejudiced and unscrupulous) along with desirable contributions to knowledge in the larger sense of the word; the individual's professional activities through the membership of professional organisations and his mental involvement in the furtherance of his field of study by participating in policy decisions; inter-disciplinary activities in tune with the expected personality development and motivation to be in turn injected into younger colleagues and students; expository abilities in terms of talks, public discussions, and writings reflecting one's proven perception about life and society; unconcealed social awareness and environmental concern; writing books and reviewing contantly one's field of study and interest with intellectual vigour and rigour; actual involvement in the preparation of syllabi and the implementation of course work; certain personality characteristics which not only speak of one's philosophy of life, (including idealism) but also enable others to follow that philosophy by one's own action and behaviour to the

best of one's ability; the display of integrity in all matters and issues; and national and international citations and honours.

A tall order, Prof. Amrik Singh would say. So let us not put someone in a position in the name of merit and outstandingness which he supposedly deserves and attribute qualities we would like to see in him thereafter, but let us put a person who has all the requisite qualities in a deserving position and let the qualities speak for themselves. In Indian universities there are people with the desired qualities—some thoroughly underemployed as lecturers—close to their basic pay; some rotting in the same lecturer's position for decades; and yet some others planning to drop out of the system altogether. It is suspected that the "Merit Promotion Seheme" (that never was) was devised for these ignored species.

One point is worth noting. If the criteria laid down above are strictly adhered to, they will lead to a perfect reversal of symmetry of the prevailing situation of academic stratarchy in the universities.

Considering the relevance of "merit" and "outstandingness" in terms of the Indian situation, the scheme should have been realistically termed as "Automatic Personal Promotion Scheme" (A.P.P.S.) under the framework of which a teacher can ask for assessment and promotion after putting in a certain number of years of service and after fulfilling a few obligations to the institution he is attached to. This mercifully, does not preclude those with "merit" and "outstandingness" as they can ask for promotion even before the stipulated years of service and after an appropriate display of the requisite qualities

In fact, every teacher deserves promotion automatically to the next cadre after a certain number of years in an institution. The reason for a demand of this charitable act is this: every teacher does contribute, however little to the activities of the department he is a part of through the assigned teaching work and, therefore, becomes eligible for promotion. Not promoting a person

to a higher cadre will amount to some kind of punitive action which implies criminality on the part of the teacher concerned.

Looking at the proposal superficially, one may find that all and sundry will get promoted even if they do not deserve promotion. But common sense tells us that even if all are prompted only those who are mentally active are recognised and respected by their colleagues and fellow-workers (professional jealousies are part of the game), and those who have gone into a slumberous spell are ignored in spite of their elevated designation.

As Prof. V.K.R.V. Rao aptly put it: "Teachers are accountable to their students, colleagues, and themselves and not to any external coercive agency trying to weigh merit on a balance". Thus by encouraging A.P.P.S. all will be benefited without bitterness and rancour and some will be benefited more in terms of the diversion of their mental energies to other creative activities.

The question is: who will not benefit from the A.P.P.S. ? The senior Professors (possibly they have been or are heads of departments also) will miss the hangers-on and alms-seekers extending their hands for promotion—deserved or undeserved. The teachers will not have to approach any authority for favours. That is precisely the lamentation of gerontocrat educationists and senior "Professors". All self importance is lost if the A.P.P.S. is implemented.

The pyramidal structure with a few Professors at the top (the virtues of which Prof. Amrik Singh extols) is actually an impediment to any growth that should otherwise take place in the Indian universities.

The inverted pyramidal structure with a large number of Professors at the top, which Prof. Amrik Singh seems to abhor, will statistically speaking contain at least some who are outstanding, some who are good and some who are somnambulists. This

is in consonance with the fact that any system or organisation will have such a categorisation—be it governmental, industrial or academic.

The one dangerous drawback of the pyramidal structure is this: if a teacher with a dubious distinction becomes a Professor, it is most likely that he would believe that he is indeed an "outstanding" personality. Such an illusory posture is damaging both to the person at the top "Professor" and to the system as a whole. So it is advisable to have a large number of promotee Professors at the top—an inverted pyramidal structure of some of whom, at least, the system could feel proud.

UNIVERSITY AUTONOMY IN THE CONTEXT OF NEW EDUCATION POLICY

At the outset I thank the organisers of this seminar for choosing the topic we are discussing. The issue involved is not only of contemporary interest but also has long term effects on our education system and on our society as a whole which undoubtedly is in a state of flux. I feel honoured to have been particularly invited to come and present my views on university autonomy with reference to the document "Challenge of Education".

Before I go into the details of university autonomy vis-a-vis the New Education Policy (NEP) that is bandied about, I should like to share the titles I have given to the four chapters according to the nature of the contents in the "Challenge of Education" document. Chapter I (Education, Society, and Development) is "umbilical"; Chapter II (An Overview of Educational Development) is "infantile"; Chapter III (A Critical Appraisal) is "confessional"; and Chapter IV (An Approach to Educational Reorientation) is "redemptive" in nature.

The "confessional" Chapter (III) begins thus : "The national policy of education of 1968 envisaged a radical transformation of

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Based on a paper presented in the seminar on 'University Autonomy' organised by the Punjab University Teachers Association, Chandigarh in January 1986.

the education system to relate it more closely to the lives of the people, provide expanded educational opportunities, initiate a sustained intensive effort to raise the quality of education at all stages, emphasise the development of science and technology and cultivate moral and social values. The goal of the education policy was nothing less than the creation of an ethos that would produce young men and women of character and ability committed to national service and development. That we have fallen short of these goals is evident enough. In the meantime, new learning needs have arisen from the inexorable march of economic and social growth and progress in science and technology". In this context, I venture to pose the following questions: What was after all wrong with the 1968 report laboriously and meticulously prepared by the concerned commission ? What were the circumstances in which the 1968 report had been shelved ? Are the needs and goals any different today than in 1968 ? Should we not have the 1968 report as the reference point so as to enable to identify our failures in relation to our aspirations, and consequently prepare new strategies for essentially what we call "the task of national reconstruction" ? But no, it appears what we have in 1985 is the "new" education policy in which case the 1968 document is (or may be) called the "old" education policy. Now that we have the "Challenge of Education" document let us confine ourselves to the contents of that and discuss points about "university autonomy" as we have gathered here and are expected to do so.

The word "autonomy" means self-governance. And governing a university in an effective manner is not as easy as say governing a factory producing soap cakes. From out of a university we expect well trained, mature and socially useful human beings as end products who by their presence in society and through individual efforts advance a civilisation materially, intellectually, and spiritually. The process involved is not cost-effective *per se* whereas in the case of soap cakes the process could be cost-effective. There is a need to carefully understand the proposition of

cost-effectiveness in the business sense when we talk of education and the immediate returns society might (not) accrue from it.

What exactly is a university—the highest academic portal in the hierarchy of education ? A university is a place where both creation of new knowledge (research—free critical inquiry) and transmission of the existing knowledge (teaching) take place enriching each other in a symbiotic relationship. Presently there appears to be a little too much emphasis on research usually at the expense of teaching efforts. So there seems to be a need to redefine the goals a university is supposed to attain. While research work must be encouraged it should not be treated as the be all and end all to secure recognition and promotion by a teacher. The overall contribution of the teacher to the development and progress of the institution should be considered than merely his research contributions which, in any case, could be hastily contrived to secure promotion in the hierarchy. University autonomy must be bold enough as a tool to guage a teacher's innate potential and overall contribution so that both the institution and the individual teacher are benefited.

The emphasis on teaching and interaction with students in various desirable and healthy ways brings in a plethora of factors for consideration. The foremost of these is : what to teach the students. At the (college and) university level, our society is not yet prepared to offer off-beat combinations like say psychology, political science and ballet dancing or some such adventurous combinations as the NEP document suggests. We are a developing society and the economic pressures seem to be overweighing all other needs. In a university one does expect the student to undertake specialised courses mainly for his intellectual development, and the economic aspect, if met, should be considered then to be only incidental. It is imperative that postgraduate and higher courses are only offered to those who have the necessary intellectual curiosity and inclination to learn. Most economic needs, one guesses and hopes, could be met with at the bachelor's

level degree itself with a bit of extra training relevent to the job the person wishes to take up, again depending upon his aptitude (inborn) and interest (developed).

One other important point to be considered is : How far the university autonomy has been exploited at the present to offer challenging courses with relevant and rigorous syllabuses so that universities become places, as Nehru said, for adventure with and generation of new ideas for the overall benefit of our society ? The anwer is : very little. The NEP document confesses about this shortcoming. I urge the formulators of the NEP in its final form to work and suggest for uniform syllabuses in all our universities and in all subjects offered in order that a certain amount of homogeneity is achieved. This is not an assault on the autonomy of the universities in any way. In fact, the autonomous nature must manifast itself in the quality of teaching that is involved in the various courses, the syllabuses followed in the various universities being the same. This will necessarily reflect on the judgment of the university authorities in selecting their faculty. Consequently a university will show up as a good or as a bad institution depending on the quality of the output—that is, the young human resources with sharpened minds to face the outside world and to contribute for its rejuvenation. Curriculum planning thus, in my opinion, should not be a complex and bewildering multiple exercise, each university guarding its autonomy zealously, ending in chaos and later introducing common entrance tests such as the ones the UGC and the CSIR have invented for some of the research fellowships. This is a sad reflection of the state of affairs in the universities—each as of now "autonomous" in its own way.

It is said that we do not have teaching-learning institutions but examining institutions. "The Challenge of Education" document notes that the credibility of a university depends on how regularly and how much on time it conducts its examinations, declares its results and grants degrees. This is true to a great

extent as the emphasis has been on a one way process—teaching—and on examinations and on granting of degrees for hopefully landing a job. If we have a clear cut idea as to what courses are to be taught and if the syllabuses are accordingly chalked out to prepare the student for a cerebral battle, then it is necessary that the teacher-taught relationship is not only to be respected in a seminar type exercise (contrary to the present classroom approach) but also to be trusted. I feel that there is no better person to evaluate a student's potential, level of attainment and his gradation than his own teacher. It is at this point, the self-governance aspect in universities has to be judiciously invoked in such a way that a perfect decentralisation of the examination system is achieved. The present evaluation system is too centralised and too cumbersome and too clerk-oriented that one has to be superhuman to untangle the different stages of the cobwebs that are woven round the whole examination-result-degree granting process.

It has often been charged, and the NEP document reasserts, that the colonial hangover is responsible for our present meladies in the education system. While it is true that we are by and large influenced by the legacy we have inherited from the Raj, I beg to submit that no one is coming in our way now to cleanse our own system. There is no point in continuously blaming the British or the West in general for our mental blockade, especially after the administrative tentacles of the British have been released physically nearly forty years ago. In actuality, I feel we are our own hurdle raisers and the oppressive, feudal sections of our society are largely responsible for the *status quo*. Instead of finding scapegoats and throwing red-herrings, we have to sincerely identify our own social, economic, political, intellectual, cultural, and other shortcomings in the light of the society we yearn to build. The university education pattern has to demand new ideas to build a new vibrant society and has to work for the integration of the mental faculties of our youth rather than a lopsided or fragmented development for immediate short term gains alone.

I find that the NEP document makes references at places to this aspect but then it fails to formulate a clear cut strategy to reach our goals through a conscious and integrated approach.

Usually, if one gives (voluntarily or by force) a sum of money to an institution he would like to oversee the progress of the expenditure/returns his finances have generated. It is no surprise then that governments in general are concerned about the way the finances to educational institutions are expended. Thus, in spite of the academic autonomy the universities seemingly have, there is very little administrative autonomy in the sense that governmental/political interference does appear both in overt and covert fashions. It must be made clear to the governments concerned that they have not undertaken a businesss venture in the conventional sense by investing in the universities, and immediate returns are not expected as in a factory producing soap cakes. At the same time, with the tax payers' money pumped into universities for quality output, the autonomy or the self-governance aspect should not stop with the office of vice-chancellor who is invariably a political appointee. If the vice-chancellor demands no interference from his political god-fathers he also should be prepared not to interfere and to give autonomy to the various academic/administrative bodies on the campus and even to affiliated colleges to decide about their affairs all by themselves rather than thrusting some of his own "original" ideas on them or remaining totally "dumb". It is very unfortunate that in the prevailing system, most academic bodies in the universities are either mildly active or totally ineffective if not defunct. Part of the blame must be shared by us, the teachers, who wait for orders from "above" instead of putting forth our own ideas in a convincing manner to that "above" that the ideas are good and useful for the institution and for the society at large if implemented. If we sacrifice our avarice for currying personal favours the society around us would be that bit the beneficiary.

At the crossroads as we are presently, we have to necessarily choose the right path by guiding the politicians/administrators than

being guided by them. This would demand a certain amount of obstinacy with positive convictions, and there is nothing abhorrent about it. Consolidated minds with clarity of thought and vision will surely win over the foggy minds if only we, the teachers, persist in our endeavours with sincerity. National reconstruction is not one day's job, and it is a continuous avocation geared to the needs and inclinations to the ever changing society to be built upon ethical and moral values.

Lastly, I feel that there can be no autonomy of any kind of an institution much less universities unless there is decentralisation at every other level in the democratic system we have chosen to take us forward as a nation. Universities cannot be isolated; the manifestation of that decentralisation would show up in the universities as well in the form of autonomy of the various bodies within the university system. For that we have to bid good bye to our feudal attitudes through proper education, spreading awareness and wisdom. I hope that the New Education Policy would strive to achieve that end, and indeed deliver us from the present impasse we are in. ●

EDUCATION IN HUMAN VALUES

UNIVERSITY ENVIRONMENT : VALUE ORIENTATION

"Human history becomes more and more a race between education and catastrophe". —H. G. Wells

By definition, a university stands for upholding and propagating universal values—human dignity, freedom, liberty, compassion, fraternity, charity, tolerance and such other cherishable pieties. Accordingly, the university structure is so constructed that people who apparently possess the desired universal values, that is teachers, form the pivot around which a university revolves. The teachers are expected to uphold and propagate the universal values, ideally speaking, even against severe odds. Whether they do so in practice is worth examining and debating.

While the teachers of a university are expected to uphold the universal values, they are also supposed to propagate and inculcate those values to the student body they come in contact with. Students at the university level are on the last step of an organised education system, ready to venture into the outside world from the sheltered environmet they have been in till then. Apart from constantly guiding and advising the student body in a desirable

Based on a paper in the U. G. C. sponsored Workshop on 'University Environment : Value Orientation' conducted at Maharshi Dayanand University, Rohtak in May-June, 1986.

manner i.e., explicitly teaching them to differentiate between the right and wrong practices—essentially moral in nature which leads to behavioural orientation, the principal task of the teachers in the present day world is to actually impart knowledge and skills in a particular specialised discipline. This is done with a view to equipping the students to seek a job in the market place, obviously for economic reasons. So, the duty of the teacher in a university environment is in fact four fold : one, to uphold universal values; two, to propagate the same universal values; three, to inculcate the universal values; and four, to impart knowledge to the students to arm them with a degree to hopefully land a job. Yet another obligation of the university teacher is creation of knowledge through scholastic pursuits and generation of new ideas.

The external environment viz. outside the university environment is much different and even diametrically opposite to the idealistic environment the students are exposed to in the universities. There are several causative factors for the existence of such an outside environment, the details of which will not be gone into. But the following question is posed : How does an individual student, suddenly now in a totally different environment, with a different value system react to such a transition ? There are two possibilities : 1. He sticks on to the idealistic value system with no compromises made whatsoever at any stage and tries to contribute to enrich the system; and 2. He ignores the idealistic values and falls in line with the rest to accrue benefits from the system. The one perilous consequence of the possibility given above at 1. is : cracking up of the individual if he does not have the mental and moral strength to withstand the onslaught of the system perhaps leading to collapse of the individual in the extreme sense. And certainly no one wishes that to happen. Nevertheless, those who do not compromise, who are tenacious, stubborn and committed to certain positive values and principles and who also possess the required strength to face up to challenges and possibly even mould the external environment they come in contact with are the real products of the university environment. They are the

torch-bearers of the future for a better world. Even if a few such individuals are produced by a university environment the universities could proudly justify their existence. As a matter of fact, while leadership qualities with certain basic universal values can be inculcated in a university environment there are some who are born leaders and they exist inspite of the university environment and outside of it; this small tribe of people are the ones who contribute to the system rather than grab from it.

The consequences of possibility 2. are : With all the familial, social and personal bonds and commitments that abound and beckon and force the individuals, it is very likely that one gives up the struggle at the outset itself and conforms himself to the track of the system. It is very easy to fall in line rather than challenge the obviously wrong because of the severe adverse forces an individual has to face up to otherwise. Of those who tread the beaten track the question may be asked whether they do so consciously and willingly or reluctantly and unwillingly ? Most do so consciouly and willingly because it demands least efforts. The others who do so reluctantly are strung by pangs of guilt, problems of conscience and may end up as disturbed personalities. Does one then blame the university system that in the first place is responsible to have created an idealistic person who later could not adjust himself to the external value system ? The anwer to that is in the negative because in principle and rationally speaking all seem to cherish the universal values a university system is supposed to uphold. It is actually the external environment that is unsensitised to certain positive values, higher perceptions of life etc. Thus inspite of the problems the university environment may create for certain individuals in the outside environment owing to the idealistic training they had received, we have to go on inculcating and propagating the universal value system if we sincerely believe that such universal values transcend individuals, generations of individuals and even centuries on time scale. There is certainly something absolute and permanent about the universal values and their transmission.

Having said so much, the following question may be asked : What about survival in a hostile world that portends an uncertain future ? If one is concerned only about organic exlstence in the world all the lofty things about which we have talked so far become redundant. But at this juncture, the teachers and the idealists are expected to play a worthwhile role. With increasing knowledge accumulation (information explosion), a certain amount of wisdom has to be associated with it where not only the physical existence becomes meaningful but the whole existence—cerebral, spiritual, aesthetic etc.—becomes a little more meaningful and joyous. It is for such a world the university environment has to go on orienting individuals rather than towards purely commercial considerations and acquisitive hedonism.

It is often emphasised that the ultruistic nature of the university based system i.e. teaching along with the medicine and law professions has to be maintained looking from a historical perspective about professional and organisational structures. It is the service to the community as a whole one has to be trained for rather than for individual benefits. Teaching in general and university teaching in particular has to orient the minds of the students and it should even polarise their thinking patterns for surrendering the individual greed in favour of the collective need of the community. As one concerned citizen put it : The university is the last portal where it is told to the young minds in a structured environment about what is good and what is bad (both for the individual and for society) and later no one would venture to even advise unless, of course, one turns to and depends on gurus or godmen. So, despite the odds, it is the university environment that has to go on imparting a positive value system where the gap between thinking, speaking and action is reduced to the minimum extent possible creating individuals with integrity. This becomes particularly important because the other two altruistic disciplines (medicine and law) have been considerably degraded and dragged into by organisational structures where they have, to a large extent, lost their originally intended good samaritan characteristic.

We all have heard of primitive societies, tribal societies, pastoral societies, industrial societies and presently we are told of "information societies"—projecting the progression of one form of living to the next form as "civilisation". The envisaged "information society" is not something new to human beings. But it is new only to the extent that the whole material knowledge is being gathered, accumulated, categorised, stored, processed, retrieved when needed and used for the benefit of mankind through the latest technological contrivances. Insofar as non-material knowledge is concerned the projected future "information society" is not something really new as it has existed from time immemorial in the form of gossip or the esoteric "information exchange" in societies regarding human beings mainly for dominance, pursuit of power and the associated strategies, exploitation and wars. One sincerely hopes that the new "information systems" are used by the State exclusively for material knowledge and the utilisation of it for better living conditions and not for non-material purposes. Else, the fear is that we might end up with totalitarianism and the entering of the State into the minds of its citizens. This is where the teachers have to use their wisdom to persuade the State to act with discretion. We are well aware of the hazards of the "industrial revolution" and the recent modern scientific endeavours that could play havoc with mankind if misused by the wrong heads of Heads of State. Nuclear weapons and disasters, genetic tinkering, chemical warfare, biological guineapiggery are a few examples of the present state of civilisation.

The final question is now marked : What are the values and what is the value orientation that we would like to give to posterity ? Apart from the universal values we have talked of, we must train the coming generations which will be rooted in "information societies" not to suppress information, not to distort information, not to truncate information, not to manipulate information, not to release misinformation, not to spread disinformation but to transmit "information" as it *is* and also

share it as it *is*. This in itself leads to truth value and that is the orientation one ought to consider as a teacher in a university environment even though one may find that there are impediments and the external environment may even be mocking. With that conviction and action a teacher would have managed himself well and would have contributed his bit to the betterment of mankind even if little. And that *bit* could lead to a largely value based society.

The following concrete suggestions are made toward an action plan :

1. The present impersonal teacher-student relationship has to be replaced by a close, symbiotic relationship in the form of counselling service. This can be achieved by attaching small groups of students to individual teachers with a large teacher-student ratio so that the group can be guided and advised in regard to the students' personal, family, societal, economic, academic and other problems they encounter while in the university environment. In conversations and discussions, a teacher need not explicitly and excessively moralise but certainly can give a positive slant so that the basis for the advice is the universal value system. At the present, in most universities the suggested counselling services do not exist. It is much desirable that such groups are formed to guide the young minds through a personal and human touch to enable them to manage themselves better and also create a better external environment.

2. The third wing in a university environment—the administration—is mainly organisational in structure and it should be made aware of the need for its unobstructionist support to the teachers and their goal of imparting universal values to the students. Usually there is a tussle between the administrative wing and the teachers in universities and one tries to dominate the other section, normally the administration tightening its grip over the teachers. This is and has been an

internal organisational impediment by itself and obviates the performance of the teachers to pursue their expected professional role. The administration which is hierarchical in structure needs managerial lessons from time to time from the teachers in a university environment so that the officers too appreciate their own role vis-a-vis the anticipated professional role of the teachers to impart universal values in an autonomous environment that is also liberal and humane. Self-governance only then gains credibility.

3. The State has to be made thoroughly conscious of the role of universities that it is much more than just doling out degrees. This can be achieved through participative discussions of the various relevant departments of the State and government with the university wings regarding education in general and inculcating universal values in particular. With the kind of attitudes that pervade in the present setup nothing can be achieved toward education in human values unless all concerned come together, cooperate, appreciate the assigned roles and act in a concerted manner for the establishment of a value based society. ●

ROLE AND RESPONSIBILITIES OF TEACHERS

In today's complex world it is nearly impossible to make a role definition and attribute definite responsiblities to teachers. The responsibilities are numerous and the role is multifaceted. It would indeed be disconcerting to fragment and analyse the role(s) and responsibilities of teachers as it would lead to a bits and pieces view and not a composite view. If fissiparous tendencies are to be identified and checked, the teacher is one who ought to take up a larger than life role for inculcating a composite living pattern in others which is both liberal and humane. So much for the pedantics. Now we shall turn to pedagogy.

It is imperative that the primary responsibility of a teacher is to teach. This presupposes that knowledge has been created and it exists to be transmitted to young minds. Since the theme of the present seminar is "Higher Education in 2001" we shall restrict our thoughts and ideas to college and university education. Class room teaching, a one way process it is, has been in vogue and the teacher is assigned a particular subject to be taught in the prevailing organised education system. The one

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thing a teacher must bear in mind is that, whatever he is assigned to teach on a particular day and in a particular period, the students would be getting exposed for the first time to that topic. The teacher certainly would have planned as to how to get across the matter to the young and eager minds and the planning must aim at the average intelligent students. The reason for this is: the above average intelligent students would grasp the matter anyway, and the below average students would at least get exposed to the matter even if they don't understand it the first time. As each word has it own meaning and connotation depending on the context, words have to be carefully chosen by the teachers so that the students are able to comprehend the subject matter easily and quickly. Here the importance of the mother tongue as the medium of instruction vis-a-vis English can be debated. Perhaps in a technologically saturated and scientifically beckoning world, English becomes a necessary evil to live with —at least in India and in other developing countries. Sufficient care is to be taken to transmit the existing knowledge hrough the 'scriptological' mode with the help of symbols ('semiology') if the student is to grasp and retain what has been pumped into his mind.

We often hear the lamentation that the present class room teaching is a one way process and that it should be replaced by alternatives. One alternative one may think of and venture to suggest is to have "seminar" type classes wherein the students come sketchily prepared to the seminar with the subject matter and the teacher listens to that with his own suggestions thrown in so that the student is guided rather than taught. This demands a very enlightened attitude on the part of the teachers and the students: the teacher also becomes a learner in a way—so to speak. It might also sound too revolutionary an idea in the prevailing conformistic environment. Nevertheless, the one definite role the teacher will be playing would be to inculcate questioning attitude and inquisitiveness in students. This is all the more important in the present day scientific world. It is my considered opinion that no

amount of (impersonal) audiovisual presentations can replace teachers and their (personal) attention to students.

Now let us pose the question whether the responsibility of a teacher ends with the "teaching" he does in the class room. If the answer is in the affirmative then we are being evasive of our other responsibilities. A teacher not only teaches the subject matter in the class-room but he also trains young minds to try and understand the world so as to enable them to live as responsible human beings and useful citizens. This is particularly so in the case of students leaving universities after getting their degrees. Essentially, it becomes the responsibility of a teacher to mould an attitudinal and behaviour pattern. How much a teacher is successful in achieving this proselytization in his students cannot however be gauged immediately. Even the teacher may not be aware of his efforts and their impact but the student in later day life may feel grateful to his teachers if he manages to steer himself and even wriggle out of difficult situations in life. So, not only transmitting the subject matter in the class-room but shaping the personality of students to face the world outside the class-room as well are the immediate twin responsibilities of teachers.

At the present, there is very little teacher-student interaction apart from the conventional class-room contact. Normally, institutions of higher education do have some sort of cocurricular activities chalked out, to be carried out during an academic year, involving students and the teachers overseeing and guiding them. There is a tendency among teachers to ignore/side-track this particular responsibility of taking part in cocurricular activities alongwith their students. This tendency is often based on two erroneous assumptions : i) class room teaching is be all and end all and would suffice to fetch a degree to the students, and ii) it is *infra dig* to interact with students at a what is known as non-intellectual level. These wrong notions have to be done away with and teachers have to think of interacting with students in "every possible way" rather than in certain archaic and compart-

mentalised patterns. As a corollary to this, all institutions of higher learning must have, of necessity, teachers attached to a group of say five students. This is a feasible proposition and, if practised, would help the students to know, plan, and execute what is useful for them in life. For this particular facet to germinate and take firm roots, counselling service for students by teachers must be made mandatory and one of the primary responsibilities. This is a concrete suggestion made here to be considered.

The role of the teacher in an institution of higher learning is, as said at the outset, multifaceted. The primary responsibility is teaching the students and interacting with them in every possible way. In multifaculty institutions, the teacher has an opportunity to interact with colleagues from other disciplines than his own so as to make himself aware/conscious of something in which he has not been formally trained. Continuous interaction with colleagues from other disciplines would make the concerned teacher an enlightened human being. This is a great thing because such a teacher would able to guide and advise his own students in a better way than he would otherwise have i e. by keeping himself insulated and hence reticent. There is great need for teachers in one discipline to look a little beyond their own subjects and enlarge their role as teachers. Such an attitude of teachers in institutions of higher learning would help produce students as better end products. This might sound mechanistic and commercial but, if looked at in the proper spirit, it is an organic view and an emotional appeal for an enlargement of their role.

A real teacher is one who sensitises the minds of not only his bonafide students but also the public at large through discussions and also through popular lectures in the subject of his training or interest. Very few institutions of higher learning have taken this aspect seriouly, and it is about time that public utility lectures in terms of extension lectures should be organised

to enable teachers reach out to a larger population and to extend their role. This could be a direct contact made through any of the available media. This is another concrete suggestion for mandatory extension lectures by teachers.

Teachers are said to be agents of social change. This is often misconstrued, in a narrow sense, that the change is to be effected only in the economic sphere. There is a need to transcend this narrow view and teachers must consider themselves as agents of economic, social, and even political changes in society, and as agents for establishing educational, scientific and cultural foundations towards a morally healthy and spiritually vibrant society. A great premium is laid on us teachers of the developing countries such as ours and we should not disappoint or betray our countrymen by being apathetic and lackadaisical. Thus a comprehensive role has to be defined for teachers to enable them to understand and even enact such a role so that humanity enters the next century with confidence.

One last question need be asked: What is the role of the teacher beyond academician/agent of social change ? The answer is : to be a creator of new ideas as well; particularly the university teahers have to actively enter the domain of research and pursue with vigour This role is not a new one that is being defined now but a role that has been expected of them since long and yet an elusive one. Research or creativity is in general not made to order. An excessive emphasis so far on research by various national agencies and organisations has created not only bad researchers in the guise of creators of new knowledge but also bad teachers who have become so by diverting their attention away from teaching which is their primary responsibility. Nevertheless, a generally inquiring mind with acute observational capabilities would at least ask questions relevant to the social milieu even if the answers are not found immediately by the same mind. Such questions would perhaps be the basis for a new social order/structure that we envisage at the turn of the next century.

In sum, the role and responsibilities of teachers demand them to be god-like characters and inspiring if not gods themselves and for others to emulate them in terms of attitudes, behaviour and establishing healthy traditions for onward transmission to posterity. A civilisation would have been then advanced by teachers so that education would have served the purpose it is meant to have for a new ethos.

THE USE OF MOTHER-TONGUE/ REGIONAL LANGUAGE IN HIGHER EDUCATION

It is by now well accepted that education has the two-fold purpose : i) to make people aware of what they do not know and to increase that awareness, and ii) to impart skills for a proper utilisation of the things learnt. Both these aspects invovle the transmission of accumulated knowledge for the benefit of the individual as well as that of mankind. It would be a cliche to say that education is important for the intellectual development of man in as much as for his economic furtherance.

A convenient way to educate people is to systematise knowledge into various subjects. It is further categorised into different stages of school, college and university depending on the age and level of the taught. The purpose of the seminar, as I understand, is to assess as to how effectively the learner is not only exposed to the subject concerned but also becomes well conversant with the underlying concepts of the ideas for a future use through the use of mother-tongue/regional language.

Even before a child learns to talk the language in which he

Based on a paper presented in the seminar on 'The use of Mother-Tongue/ Regional Languages in Higher Education', in 'Hindi Sahitya Sammelan', organised by Vigyan Parishad, Allahabad in May, 1988.

is trained, he perceives the empirical world mainly through the visual mode and through symbols. The early semiological way of communicating with one another is now in the relics of history and in the modern day world it is part of art and literature—mainly poetry.

Conceding the fact that a child imbibes the mother-tongue literally through the mother's milk, it is recognised by various societies that the child must be taught at the elementary level only through the mother-tongue. Accordingly, recommendations have been made in our country also that it is best to teach, whatever is to be taught, in the mother-tongue at the primary level of schooling. That this remmendation has been ignored is evident from the plethora of English medium schools that have indiscriminately proliferated in nearly all the streets of the towns and cities, and even in the villages of our country. Also, it had been recommended by the educationists that the regional language (if may be different from the mother tongue) should be the medium of instruction at the school level. Once again, no heed has been paid to this recommendation, and we have "English medium" schools doing brisk business in the name of education rather than educating the pupils in an effective manner. With the advent of science and technology and with the impact of western thought and mode of living on our living pattern here, in general, it is now an established fact that everyone is getting "anglicised" without knowing "English" as such. We shall discuss here some of the consequences of displacing the recommended media of instruction by the English language. First let us look at the advantages of teaching through the mother-tongue.

What are the advantages of teaching the subjects in the mother-tongue ? The advantages, needless to emphasise, are purely psychological in nature and would obviate the difficulties encountered in accurately conceptualising simple ideas as well as abstractions. Language is not only a part of the particular cultural milieu but also a vehicle of communication. A mind that

is sensitized right from the childhood with a particular language, usually the mother-tongue, is likely to absorb and internalise the concepts more effectively than an alien language does. If a student is, say, taught the subjects in his mother-tongue/regional language, his concepts are likely to be solid and concrete than when taught in an alien language. An internalised concept understood through the mother-tongue is better utilised in the future than a concept which has been implanted and forced to be "understood" by the student.

However, in the present technological era most of the scientific/technological discoveries are made in the western world. Several countries have imported such discoveries to translate them for the benefit of their respective societies, Japan being an outstanding example. But the scientific subjects such as physics, chemistry, biology, even economics etc. are taught in the non-English speaking countries in their own languages barring India and perhaps a few other smaller countries. This situation has created a two level problem wherein not only the science subjects are not taught in the manner they ought to be taught but also they are taught through the English language as the medium of instruction. Thus the problem of internalisation has been doubly compounded.

One can argue that there is nothing wrong in teaching the various subjects at the higher educational level in the English language. True enough, indeed there should be no objection. But the reality of the situation is that the English language that is taught and learnt in the schools and colleges is thoroughly flawed and poorly presented. Consequently, wrong language and misplaced connotations, added to the ignorance of the naunces of the language, have contributed to internalisation of the wrong concepts.

This has further led to the position that the same wrong concepts are passed on from one generation to the next. Thus there is a civilisational degeneration and cultural decay as also

the sanction of glamour and grace, just because a few English words are bandied about. It is a tragedy that has to be averted before it gets worse. And the solution lies in teaching the subjects at higher education level through the mother-tongue/regional language.

The protagonists of the English language as the medium of instruction may argue thus : "We have the English language with us. And it is only natural that we make use of it for teaching the various subjects in higher education. English is a major world language and so far as we are concerned it is a window to the world". All these arguments are valid and must be respected. No doubt, one is not pleading for the abolition of the English language altogether. One is only submitting that the English language as the medium of instruction at the higher educational level be abandoned till such a time we become really proficient in that language to enable us to use it effectively and with a certain degree of command. Internalisation of concepts is more important (and must be given priority) than language chauvinism of one kind or the other. Some recent blunders detected in the text books written in English would help qualify such a position as the one that is being adopted here. (For example, see the article by Sham Lal, The Times Of India, April 26, 1988).

At the same time, we must take advatage of the tenuous roots of the English language in India to strengthen those roots by having better English language teachers, if need be, getting them trained in England or in some other English speaking country.

It is said that Macaulay justified the kind of Education system he had introduced in India on two grounds : i) to produce sufficient numbers of clerks to maintain the imperial hold on the subcontinent in terms of administration and strengthen the hands of the rulers, and ii) to educate the natives in the English language to sharpen their intellect and also train them in manners and etiquettee that are typically British. By continuing to have Macaulay's education system even today we have, after indepen-

dence, achieved one thing. And that is : the word "rulers" has now a different connotation and is replaced by a different set of "rulers" of the Indian elite variety. Further, we have not been able to wriggle out of the cultural imposition that has been implanted by the British, and indeed we have stiffled our native intellect by surrendering to the alien language and culture. What is urgently required is not surrender to the English language and culture but a mastery of the English language to the extent that we are able to communicate out own thoughts, ideas, feelings, and in fact our Indian culture effectively to the rest of the world. This is only possible if we learn the subjects that enrich our knowledge through our mother-tongue/regional language with the following two conditions satisfied : 1. The particular regional language also must be taugh thoroughly and flawlessly. This is certainly easier than trying to teach the English language in an expected and desirable manner. 2. The English language must be taught without any kind of prejudice, emotional or otherwise, so that we feel part of the world peoples and not feel alienated in any manner.

A stupendous task is ahead of us : To have the technical words translated into the regional languages without the words themselves losing the original flavour. As far as possible let the technical words be adopted as such; that itself leads to the enrichment of the regional languages. Let the structure of the sentences that are formed in the regional languages including the grammar part be retained as such to convey the exact meaning of an idea/concept. Let us work on "rational lines" without whipping up "emotional" feelings. Let us try "hard", not "hardly". Let our intellect bloom and let us make Macaulay turn in his grave with awe and reverence for the Indian languages and culture.

SCIENCE AND RELIGION

Science is the systematic study of the essential processes of nature. Nature mainfests itself in so many ways as to have different branches of science, each branch unravelling the mysteries of nature in its own unique way. The one thing very common to all these branches is the 'systematic study'. It is then imperative that all the material phenomena have to be understood either in the realm of the four walls of the laboratory as is done in the experimental sciences or to be intuitively built up with the help of mathematical theories. In either case it is always a human being that is involved in investigating the particular process. Thus the study of science demands systematic minds of its pursuers. By that we mean, the research worker has to patiently go through the different steps logically and reject those which obviously lead to physically unrecognizable results. Any meaningful result arrived at gets further sanction from the experimenter through the laboratory investigations. However, if the results obtained in the labaratory are gotten with utmost precision then the mathematical framework along with physical constraints has to be so modelled as to explain the laboratory results. As such, this is an interdependent exercise and one hopefully arrives at the truth as one observes it and records. Further the why' s and how' s of the final result have to be discussed again with the help of the already available information on the topic of study. Thus any obtained result cannot violate the already existing laws that have withstood

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time and test. So there exists a cause-effect relationship for every scientific phenomenon recorded and the law of causality is satisfied.

Impartial And Objective Path

The search for truth, needless to emphasize, cannot be undertaken with predetermined values, ideas and feelings. It is a total unemotional process and belief of any kind. Thus a scientist cannot but be rational in his approach in his pursuit of truth. Also, the scientist cannot jump to conclusions unless and until he has gathered enough evidence to validate what he has concluded. In this way, a constant check on what he has obtained is maintained by him as well as other colleagues in his field so that one can get nearer the truth. Moreover, the scientist is expected to be impartial and objective in his path of the study of science and has to have good deal of personal discipline or should have at least the capability of cultivating mental discipline in order to undertake the systematic study. Only a disciplined mind can be step-wise, rational and free of any kind of prejudice to converge onto the final result. The question now arises whether every scientist has the desired discipline or, being human, is carried away with the emotional aspects of scientific facts. The answer to this query lies in the fact about the social background of the scientist in which he is born and/or brought up. It is more likely that the person who has chosen science as his profession in an ancient and religious country like ours is more prone to emotional conclusions rather than to rational ones.

Religious Role

Let us now examine the points about religion and the role—if at all—it has to play in the development of science and scientific outlook. Religion, as it is presently defined, is faith and belief in the existence of God without further questioning the validity of that existence. Early man had no religion—

organized or otherwise and he was a pagan. There were no particularly identifiable gods or goddesses in whom he could keep his faith and live on. But the invocation of spirits etc. was very common and in fact was often practised. Various spirits were invoked on different social occasions to ward off the evils at unpleasant times and yet some other spirits were propitiated as a mark of gratitude on socially pleasant occasions. As time moved, in his perpetual ignorance to understand the materialistic processes and various physical phenomena involved in nature, man invented a superior being and called it 'God'. Soon, the earlier spirits were replaced by gods of different varieties again to be invoked on different occasions. Since it is much more difficult to imagine an abstract God, idols were made to bring humans much closer to the gods, at least through the senses of seeing and touching. The preparation of various idols was also meant to help concentrate the mind on the particular shape, thus indirectly aiding to disciplining of the mind although in practice nothing of that sort ever seems to have occurred in the past to humanity at large. Many sects had God's messengers on the earth to tell what He had told them to be preached to the common folks. Thus, in a general way, a belief about the existence of God was firmly established among the masses so that they could lean on Him particularly in times of distress and get some mental solace. The fact that the common man could "lean" on somebody superior had brought in the belief in the existence of God which was hardly to be challenged by anyone. At the same time, this also showed a sign of weakness, which essentially is psychological, on the part of the human being to use his own senses and the mind together effectively and clearly to solve the problems encountered, be they personal or social. Even today such belief in the superior being exists in most societies and where it did not exist already has been implanted to hopefully make the sects or groups of people also god-dependent. This kind of dependency, understandably, extrapolates about the state of the human mind. It reiterates that the mind has remained primarily

weak over the ages, cannot perform all the functions expected of it except the essential daily routine jobs and anything and everything else has to be left into the hands of God. This fatalistic attitude has led to the inevitable indolence and obscurantist views in societies. Several rituals ably aided by superstitions have been invented and performed which in due course have even replaced the belief in God himself and permeated into the entire system which degenerated slowly into something beyond any recognition. What we are left with today are only the apparently meaningless rituals and inscrutable superstitions probably glossily painted by even more vague mumblings. Thus, to overcome the imaginary fears and phobias of the mind eating away the individual, man instead of growing into space more erect than before has actually yielded to the reptilian instinct remaining in him. The mind, instead of getting more curious probing into and questioning about life, world and nature, has followed the process of dying even before the actual physical death. One might call this as the failure of human evolution from a mere static organic existence to a dynamic psycho-social level. All this can be traced back to the irrational beliefs ; and any belief that cannot be substantiated by evidence is only blind.

Science As A Profession

A person who has taken up science as his profession in a largely religion oriented country like ours, swarmed with obscurantist views, is likely to be influenced by the social surroundings in which he lives and at the place of work as well. One can then say that such a 'scientist' is not really doing justice either to science or to himself and only that he is earning his bread through his monthly income. Further, it will be hard to believe that the scientist has developed compartments in his brain ; one for the investigations science which require a disciplined mind, logical thoughts, analytical capabilities, scrutiny without prejudice and other acquired habits and the other part dealing

exclusively with the human beings in society. In a true personality development, the individual is one with the same personality reflecting in all walks of his life. But it appears that in our country we have several persons taken to scientific profession with scientific views mixed up with uncompromising personal religious beliefs.

"Science Is Religion"

One way to get rid of this paradox is for the scientist to elevate himself into a self confident individual through his own sensory perceptions, control of emotions and the full utilization of his mind at least to the extent possible. Less and less beliefs and more and more of reasoning would enlighten the mind of the scientists and also the other persons in society. It is up to the scientists to stir curiosity in the non-science persons and to awaken the need for questioning in order to seek the answers by himself which will give mental satisfaction and also help in individual development. This is possible *if* and *only if* the presently given definition of religion is changed and propagated as "disciplining of the mind and leading an orderly way of life through physical, vocal, mental and action restraints" and also practised as intensely as the present day religion is done. In this state, the belief in the existence of God or anyone else becomes entirely meaningless and irrelevant. Then, in fact, science and religion become one in the true sense and will never be in conflict as they have been up till now. Instead of science vs. religion (which now involves only dogma), in the new frame-work it will be "science is religion" which would involve logic, reasoning and rational attitude to life itself. Anything beyond these processes will be purely intuitive and is again subjected to scrutiny with the help of scientific methods. Thus, in due course, a "religious" awakening should lead to a better scientific outlook to life in general. Further, it will be more challenging to the person and more fulfilling to the mind to indulge in philosophical theories about life, existence etc., rather than the close minded approach adopted so far.

It indeed becomes the relentless duty of the scientist to oppose all the obscurantist views and the various divisive forces that tear our society apart and to inculcate a sense of discipline in the fellow human beings. Having been trained as a scientist to think and act in an orderly manner, he is already ahead of the rest of the society and thus is in an advantageous position to lead or give lead to the transformation of society from a disorganized, indisciplined one like ours to a well behaved and mature society. An individual necessarily gets lost in such an endeavour but certainly a group of persons, rationalists and all can do a lot in achieving the desired change in our ancient land to steer it out of the present stagnant state.

WHY INDIAN SCIENCE SHOULD BE CRITICISED

Dr. G. S. Venkataraman asks "Is our science really poor ?" and in six points answers that it isn't (Appendix-C). I see it differently. It is definitely poor.

If there was nothing wrong with Indian science and Indian scientists, word such as "scandal", "fraud" and "sychophancy" would never have been used about them Politics, films and cricket provide ample opportunities for writers who want to use such words, without their having to bringing in science. The "inadvertent disservice to everyone" done by supposedly ignorant writers on matters concerning science, contrary to what Venkataraman laments, is indeed the result of critical observation and an analysis of the prevailing maladies of todays's scientific milieu. It is an accepted "scientific" tenet that by constant self-criticism alone can one (or even a system) attain more and more objectivity and benefit from it. On the other hand, as I see it, Venkataraman's piece is very subjective and probably the result of his working in a prestigious national institute of science in Delhi. The authenticity of his perception and honesty of exposition would have gained greater credibility had he written the same thing working in a smaller place. The problems he would have had to reckon with there would have been both complex and manifold. I would like to refute Venkataraman's six points, point by point.

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Bureaucracy And Science

It is a well-known fact that more often than not, Indian scientists are caught in a bureaucratic web; that things move at a much slower pace in India than elsewhere in the world and according to the "lowest quotations", regardless of quality. Surely Venkataraman must have himself been exasperated with this kind of a situation. While it is true that scientists abroad do not operate in an administrative vacuum at the same time they do not have the bureaucracy breathing down their necks. Indeed, things can be got done "over the telephone" because of the little or no constraints on spending funds once they are granted (and irrespective of whether the funds are large or small). In India, scientific infrastructional facilities simply do not exist in a large number of institutions, including the universities, where so-called fundamental rearch is expected to be carried out. True, as Venkataraman points out, facilities have to be created; they are not gifted on a silver platter. But who is going to create those much needed facilities? The answer is : The senior scientists who have been in the game. Moreover, if the scientific community also has to bend itself to the general principle of governance which rigidly operates on the principle of hierarchy, then one has to wait till eternity to get any work done; and justifying the slow pace of development by pointing to the limitations of the culture system indeed evades the real issue of how to spread scientific culture in the country as quickly as possible.

High Investment And Poor Returns

It is true that all research is expensive (at least these days) and that there is no shortcut to getting scientific results. It spite of the fact that only a small investment goes into actual research out of the large funds that are available, the scientific community is itself to blame for not publicising the results and for its poor PR efforts. There is essentially no rapport between science and society. If the nuclear reactor of Kalpakkam (high investment) trips because of bad management or whatever, there would be a

power breakdown (poor returns), and it is only natural that it hits the headlines. There is a great need to be introspective and put one's own house in order, rather than blame the "viscious" media for publicising things when they go wrong.

Fraudulent Practices And Sycophancy

Thefts, dacoities, blindings, burnings and murders do take place in the country, but the percentage of persons that commit these heinous crimes is negligibly small in terms of the population as a whole. And yet all of us are concerned and anxious about such situations, lamenting all the while that something is basically wrong with a system which silently supports such irrational acts. Similarly, within the scientific community itsely, it is the "publish or perish" attitude which leads to fraudulent practices, and the people within a system that encourages such attitudes again find themselves cursing it. Of course, there is the international scientific community which acts as a kind of watchdog and which imposes proper checks and balances on the kind of results that are published. Errors of judgement and interpretation in even simple scientific matters when exposed by the international scientific community become not only an indictment of the group which published the results but also an embarrassment to the nation as a whole. Aberrations are acceptable in an otherwise smooth and near perfect system, not when the system is hell-bent on encouraging aberrations in an insidious manner in the name of competition sans ethics.

As for sycophancy, Venkataraman has not dealt with the issue at all.

Calibre Of Indian Scientists

Venkataraman tells us that in calibre and intellect, Indian scientists are as good as those anywhere else—Counting the best brains in India on one's finger-tips and feeling elated by the fact that one should feel proud that such brains have been produced at all in this country is too naive a feat. The question is : why

are there not many more such scientists in this large country of of ours ? If the answer, as suggested by Venkataraman, lies in the Darwinian hypothesis that the research facilities (environment) mentioned above need not be created by anyone in particular, and that one should just leave the scientists to the fate of their genes, it is a cruel proposition. It again leads top scientists to evade the resposibility of creating and nurturing a scientific atmosphere in India. It is relevant to quote C. V. Raman in this regard : "...The principal function of the older generation is to discover talent and genius in the younger generation and to provide ample opportunities for its free expressions." We have done the opposite. We have duly constituted selection committees consisting of "experts" trying to discard talent and discourage the younger generation to the point of despair and perhaps drive them to suicide.

Facilities And Frustration

The younger scientists' complaints about the lack of facilities and an atmosphere conducive to research are very valid. It is again the responsibility of the senior scientists to create an environment through more institutions with adequate facilities where the training that younger scientists receive abroad can be meaningfully utilised. If young talent has to be sincerely used for the benefit of a developing country such as our own, the national priorities have to be clearly laid down so that the concerned scientist trainees are aware of them well ahead and get trained accordingly, rather than lose themselves in an ocean of trials and tribulations based on chance factors. This demands clear-cut national objectives, planning based on scientific lines, and not wavering according to one's individual needs and biases. The scientists in the Planning Commission have a great role to play in influencing and encouraging an overall scientific ethos.

Indian Science Quantitatively Rich, But Qualitatively Poor

True, research is addictive only if there is a proper environment to encourage it. Otherwise it creates alienation and frustration.

In all the fields where we have made so-called progress, in most cases it is not due to science as such but to the already well-known scientific results obtained, through technological endeavours. While we must feel happy about producing more foodgrains (from 50 million tonnes to over 145 million tonnes) we must still question why we are not able to reach a figure of, say, 500 million tonnes. Untill the time all the oft-quoted high sounding achievements reach the lowest of lowly of Indians to uplift them from misery, we must not rest content with statistics and pat our own backs. As regards the political will : a minister's statement that "colour TV will cost less" needs to be replaced by "foodgrains, cloth and housing will cost less". If this really happens, the political will, then will be seen to have transformed into a genuine concern for the poorest of Indians.

A healthy competition among scientists does, indeed, lead to good science but it is difficult to see and comprehend how this "healthy" competition can be created without responsible senior scientists sincerely contributing to it without feeling insecure, and without leaving aside their prejudices and whims. In the generally immoral and unethical atmosphere prevailing in the country in all walks of life, the much cherished scientific goals cannot be easily reached unless the Venkataramans of the nation take an uncompromising stance in favour of the younger scientists, driving away the real wolves that abound.

SMALL TOWN SCIENTIST'S BIG TIME GROUSE

AN OPEN LETTER TO DR. GEORGE SUDARSHAN

In our July issue of Society (Appendix –D) we had carried an interview with Dr. George Sudarshan. an Indian scientist, who has returned to India after living in the US for 28 years. A strong contender for the Noble Prize for years, he had talked at length about the sad condition of our scientific community, and his plans on revitalising the atmosphere. In a rejoinder to Dr. Sudarshan's statements, Dr. K.V. Subbaram, a teacher-scientist of the Dept. of Physics at the Maharishi Dayanand University, Rohtak, Haryana, takes up cudgels on behalf of the Indian scientists and discusses the controversial points raised by Dr. Sudarshan.

So you have returned to your dear motherland because the wily West had not honoured you the way you hoped they would, even after spending nearly three decades in the US of A. As a result, you have only brought along with you your resentment and bitterness and not the American accent. Your English is not affected after all these years of exile, not even by the 'Indian Airlines' accent when you were in India three decades ago, save the influence of your mother-tongue.

You really love India so much that you have spent nearly three decades of your productive/creative life in the US of A, drawing a huge salary, enjoying all the 'comfies' of the West. But

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the wild West has not been soft on you. Now let's see what happens when the efforts of your reformatory zeal, for which purpose you have entered the dear subcontinent, to cleanse the Indian science fail ? Of course, there is always the West—the land beyond those afar shores of the Atlantic—with the whole family still staying there itself. One foot here and the other foot there. You have the choice, you are lucky, to go back to where you come from. In fact, since you have the choice to go back to where you came from, you came in the first place to have a swipe at Indian science. But you have sacrificed you position in the US of A for the benefit of your motherland. You are a patriot par excellence, apart from a scientist with egotism.

Regretably, your name is not as familiar in this country as it ought to be and as some famous Indian scientists names are who have been honoured by the wild West awarding the Nobel Prize. You are not an inspiration either, for the younger scientists here in the country. How can one be, staying in the US of A for the last three decades ? To inspire others of the tribe, one has to have his tentacles spread in the soil of the land, toil under the conditions prevalent in the country, sweat it out (pardon me for the Americanism), protest severely against injustic, repression, and oppression, a d lead the group of scientists constantly protecting the youngsters—thus creating a conducive atmosphere in the country for some good scientific work to come out. Inspiration from any one cannot come from about 10,000 miles away, unless the personality has the capacity and power to control the minds of the people in the concerned discipline with the sheer strength, beauty and importance of the work done, as also the minds of the scientific biggies who matter here in our motherland. One has to be nothing less than a revolutionary even if his is a case of missed buses. If one is serious in catching the bus, one has to chase it all the time with the hope and tact of catching it. Buses do not stop for us however much we wish they ought to. You seem to have become a victim of your discovery—your own tachyons—the bus seems to have acquired the speed of those

elusive tachyons ! And Feinberg was in the driver's seat, and he still is. Yours is a case of Frankenstein's monster gobbling up its creator.

Theft and even plagiarism of scientific ideas is no new phenomenon and needs no investigation. In an overall atmosphere of "publish or perish" some scientists prefer to publish rather than perish. And if that is so, why not publish the best (stolen) idea ? No scientist stands up for any other scientist even in a case of theft of idea, and the scientific community is a group of rats racing to some common, destination without knowing what that is. And so, personal interest reigns supreme and the inevitable cut-throat competition. But who has created this kind situation ? Not certainly the punters or the jockeys who ride the rats, but scientists themselves. Then why lament when you are in it—the race. Every scientist is bitter that he has not got his share. Every other scientist thinks he is a lion among the lambs. Ultimately it is the lambs who have to recognise the lion in them Alternatively, the lion could devour the lambs so that they are conveniently silenced and wiped out altogether. And that is a carnivorous proposition. But in a a hawkish world of which scientists are a part, is there any other sane alternative ? Something to reflect upon.

You know one thing, even today in the country most do not have even the slightest idea as to what should be done after college or university. There is hope all right—also for highly qualified scientists—that something would turn up from somewhere thrown at by somebody. The scientists keep applying and hoping that some benefactor, some godfather would emerge for extricating them from the drudgery of going round the post office. The pittance, if any, would be not because of the scientist's qualifications and training but because of pity and mercy on the part of the scientists of the Establishment. If nothing turns out, the desperate scientist can turn inwards and resort to self-destruction. Now I'd like to tell you a secret: a senior scientist holding a very sensitive and

important position in the country has commented openly in an interview that the percentage of scientists committing suicide is not more than the national average ! Some revelation that ! And also some consolation for the would-be-scientist-suiciders that they are very much the nation—even in death.

Conceit cannot be concealed, especially if one professes that he is good and doesn't have to seek anything as such. But the Nobel Prize is different—altogether different. It is not just the "killer instinct" but the "death wish" that brings the coveted prize : take a look at some of the Nobel winners in literature. Pursuing science is a painful activity rather than otherwise in India—our motherland. Is there a Messiah who can deliver the "foot soldiers" in science from the excruciating pain and suffering they experience ? There appears to be one in you. For a scientist who has been used to getting things even without asking for them, the Nobel Prize seems to be elusive. And being brash and outspoken is the safest and easiest vent for one's pent up emotions if one has close friends in senior positions in the country who just smile away at the utterances of a pal. If Rochester were not forthcoming, and Austin, Texas did not beckon thereafter, then one would have felt the pinch in Kottayam—a subtle punch on the nose by the fiefs of Indian science. Without having any scientific friends try out your lambasting, you will know what I mean.

Heads of groups in Science Establishment today (not only in your days) are also donkeys—not hard working donkeys in the tradition of Bernard Peters but hind-leg-kicking donkeys in the Indian tradition. Too bad, donkeys are not bright at all in any case. Prejudices are not just Polish property but also part of Indian genetic wealth. There are many non-Madrassi scientists and also Madrassi scientists in India at present who do not like Madrassis in our dear motherland of today. So poor Bernard Peters, the donkey, if he is still alive, would brood over his refugee status and bigotry elsewhere in a retired mood. If he is dead by now, then as a refugee in heaven, he would be in the safe hands of God. At least God doesn't have any prejudices, let us hope ! Pray !

The politico-scientific dialogue portends that the scientist likes to be more of the former than the latter. Pursuit of power is the main aim in India whether it is through political means or through scientific means. Science is yet another cover in India for pursuit of power—if you know that is the accepted definition of politics. "So much money and so many people, but we don't count." One of the quotable quotes. The assassinated prime minister was concerned and so is the would-be Nobel Laureate. Here is yours truly who is hanging on to the lowest rung of the scientific ladder and also worried about what the personalities on the higher rungs are concerned about. I wish to tell you another secret before I breathe my last : it is the attitudes of the top scientists (I am right now in the cardiac intensive care unit of the local medical college). Arrogance, vanity, uppish postures, through proper channels demanding servility, expecting sycophancy, shutting one's mouth through service and conduct rules, non-allowance of dissent, aversion and contempt to any one even remotely better than what they are—these are some of the characteristics of the top Indian scientists that have pushed this country to the bottom on the international level. Kudos (honestly) for your Nobel Prize winning statement : "If all post-Independence physics were eliminated, nobody would miss a thing." By George, you can get away with that statement. Dissent in its purest form. What would then nappen to the third largest scientific and technical manpower in the world ? Sorry, colleges are overcrowded with ad hoc appointments and withont a *sifarish* no entry for even a Nobel Laureate as most colleges are in mofussil/feudal areas of the country, and the managements do not understand science, sense or even nonsense. Don't be contemptuous about college teachers, Chandy ! We need good college teachers in this county for the improvement of science teaching in colleges to feed good graduates for onward research, your forte. I know some scientists who have opened grocery stores, you know. And not one scientist protested in this country for the injustice done to the scientist-turned-grocer. Now here is the answer : the scientists fight each other rather than

commending each other, leave alone nomination for a Nobel Prize or even standing up against any kind of injustice. If some one (scientist) does, he is branded as a nuisance. Avarice is the instinct that keeps the scientists going, not being in awe of other scientists. Science and scientific studies have not affected our atavistic tendencies. What does one do then ? May be genetic manipulation and tinkering is the answer. Shall we say : Khurana, you are welcome here !

When I read Jacob Bronowski's *The Ascent of Man,* I actually thought that he was trying to talk about "The Descent of Women" (no offence meant to feminists) and even wrote a (yet unpublished) poem about it. Only the BBC tv gets my commendation for an excellent presentation of the contents of Bronowski's thesis, much as I do disagree with his occidental hang up and oriental ignorance. That apart, unfortunately, Sudarshan, there is no accountability for either creating new knowledge or destroying the existing knowledge with new ideas. Ideas germinate, grow, and die as and when new revolutionary ideas (including the idea of tachyons) are put forward. Only there is accountability for applying the existing knowledge in a judicious manner for the betterment of the human condition (my book on this topic has received rave reviews including from *The Hindu.* Shame on me for publicising myself). Let's see now. How come you yourself have been publishing only in some foreign journals ? So that your ideas get circulated faster than others' ideas, and but for the stealing incident, the much-sought after Nobel Prize might have after all landed in your lap, you being the lion among the lambs.

Incidentally, I live in a small town, and I don't count in the Indian science scene—scientists in Delhi, Bombay, Calcutta, Madras, Bangalore etc. only count. According to India scientific pundits, ideas come only from people living in metropolitan cities, and knowledge knows from where to emanate ! "People from abroad" is what matters, because there is always an anticipated

scientific reciprocatory gesture for a good will trip abroad. You scratch my back, I will scratch yours (till it starts bleeding).

Back to the Nobel prize--if the prize doesn't always go to the most deserving all the time then why bother about such a prejudiced prize ? Literally, a million dollar question. Follow the footsteps of Jean Paul Sartre, instead. Even if you are awarded the prize, ask the Nobel committee to keep it. Or follow that revolutionary Ho Chi Minh who too declined accepting the prize—now that you have missed the bus many times. The creator of "quarks"—James Joyce of *Finnegan's Wake* fame never got the Nobel Prize, did you know that ? The scientists stole it from him. After spending nearly three decades, it is mean to condemn the West for its hospitality. Indian tradition demands that we should be grateful to our benefactors.

Talking of protests : no scientist in India protests about anything. Why ? The top scientists are happy with the power they have in their hands. The bottom ones are aspiring for what they don't have at the present and what the top ones have which the bottom ones would like to acquire by being servile. Who is doing science for science's sake ? If some imbeciles are doing, they are too engrossed in their own world. So science for the Indian scientist is a political exercise and also an apolitical exercise at the same time. It's a two-in-one. Sudarshan, you are being naive, knowing the nature of the Indian scientist. Or have you forgotten, after staying for three decades in the West, about Indians and their "scientific" bent of mind ? One doesn't have to be an elder (like Bhishma) to protest against injustice or humiliation (like the act of disrobing Draupadi in Kuru's courts); it is just that one reacts because it is in his nature even if one were young and perhaps gets shot in the process.

I rephrase your concern about the scientific Academies in the country. Why there are only three Academies of Science in the country without any academician ? Going by the caveat of

"third larget scientific and technical manpower in the world", I feel that there should have been actually thirty Science Academies in this country. In any case, the Academies are all incestuous in nature and insular in attitudes, and the scientific intellectual intercourse creates either anaemic ideas or haemophelic babies. Science is dead, long live science !

It is relieving to learn that the Messiah has arrived, deeply concerned about the problem in the country, especially the problems regarding science and scientific research. This lion among the lambs has no hesitation talking about Indian science and the associated problems and its retrograde progress. But the problems have been there all along ever since you left this country. Why could you not have stayed back in the country and fought against the problems rather than returning towards the near end of your fruitful scientific career with a broom in hand to sweep clean the Indian scientific scene. Bravo !

Vanity too must have its limits : the Indian Academy of Sciences is indeed honoured by having you, George, as a Fellow. It is not fair of you to be indignant about the grand old man : Nobel Laureate Professor S. Chandrasekhar, your peer. Don't complain, when you get the Nobel Prize the dates of the functions of the Academy will be changed to suit yours. That is just being respectful to the chief guest. But you will not then be exhibited (because you have already done so yourself), and will not be sent off (because you have expressed the desire to stay back and cleanse Indian Science).

And one more nagging question : if you could do your research under the tree where you were sitting and giving the interview why did you go to the US of A in the first place ? Perhaps you would have discovered the 'tachyon' anyway, and also might have been awarded the Nobel Prize you are after. All this rancour you display diffused, towards the Right and the Left and also the Centre, would have hopefully into something satisfying and more creative. Good boys don't leave homes !

Yes, you are right. Chandrasekhar could have done what he did even in Chickmagalur. George, you could have done what you did even in Kottayam except that in Kottayam people could have not tolerated revolutionary things. Why go to the US of A ? It is not just books but the environment that attracts one to any place. The plethora of discussions, conferences, the no-worry atmosphere (no standing in kerosene queues, sugar queues, rice queues, wheat queues and what more queues ?), vacationing etc. and the good life that is perhaps desirable to do some good scientific work. One wonders what is so bad about Austin, Texas now ?

In experimental sciences, people do need equipment all right. If one finds a problem one can do here in India, he finds that it had been done decades ago elsewhere in the world. So, what is the point in duplicating, triplicating or even multiplicating ? Some people like you are predisposed towards achieving excellence. But they are forced to compromise here in India, towards doing less than mediocre things. And after that they are doing great things. They imagine that "it" is science. They live in a completely asinine world. If science is competitive in the modern day world, in experimental sciences, also one has to "waste" money to get "hasty results". Unpalatable proposition for a poor country, but true ! By the way, I was a scavenger (Research Associate or some such designation) here in our own country for good three years after returning from abroad and before I was made a janitor. Have I honoured my country more than ever !

Merely having an institution is not "an opportunity to do good work". There is no one-to-one relationship. Having an atmosphere in the Institute without bickerings, jealousies, backbitings, nitpickings, and having a good library, decent salaries, and other positive infrastructural facilities creates the opportunity to do something good. But still there is no guarantee the something good will indeed come out. Let's not be carried away by rhetoric.

Sorry George ! I have no space here to write a thesis on the the differences between science and technology. I have written a book in which I had done a 'critical inquiry' into the scientific temper. Perhaps, that book might clear the confusion in this country about 'science' and 'technology'. (I shall send you a complimentary copy when it is out.)

I appreciate, George ! You have interests outside science. But stick to science. That's an advice from my personal experience. Otherwise you will be ruthlessly abandoned by the scientists of the East and of the West. You know, I have been sending my biodata for an offer to enable me to pursue my current interests in science, technology, society, education, consciousness, and culture without having to face the ubiquitous selection committee (duly constituted) trying to weigh merit on balance as in the past I have been humiliated enough number of times by the "learned" members. But no, I have been informed that to decide, a selection committee is a must. And it would go into my potential to decide whether a junior research fellowship may be offered. That is the way India is. Everything properly done and legally valid. Not excluding Nobel Prize winners ! ●

INDO-SOVIET DELHI DECLARATION ON NUCLEAR DISARMAMENT

With the advent of modern physics in the early part of this century and with the active cooperation of atomic scientists during the period of second World War and immediately prior to that, the realisation of energy from nuclear sources has become a reality. But the utilisation of nuclear energy depends on the wisdom of man—particularly leaders of nations. If Hitler, in his zeal to conquer the world, had not forced the scientists who stayed back in Germany to get on with the job of producing a weapon based on nuclear energy, perhaps the idea of producing an equivalent weapon by the scientists in America would have remained dormant. The race that started during the second World War on a competitive basis to produce nuclear weapons has culminated in the success of the scientists in America. It is the instinct to survive and the primeval emotion, namely fear, that they may not survive if the adversary gets one better that motivates human beings to make offensive weapons for defense purposes. Further, certain areas of the globe, for reasons whatever, also become experimental playgrounds for testing of lethal nuclear weapons. The Japanese attack on the Pearl Harbour instigated the American government to conduct such

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a heinous experiment as dropping the atom bomb on the Japanese cities—Hiroshima and Nagasaki. The results of that experiment are too obvious and horrendous to be catalogued here. It would be a cliche to repeat that the effects of nuclear radiation on human beings and on other living species including flora and fauna would be nothing less than catastrophic.

The fact that the second World War ended with the dropping of the bomb on the Japanese cities had led to the misconception in the minds of heads of States that the mere possession of lethal nuclear weapons would be a deterrent for the enemy countries even to initiate a war. Added to this misconception, the mutual suspicion and distrust of the capitalist and communist countries of one another had not only divided the world into two perennially hostile blocks but also led to arms escalation. The availability of nuclear weapons has only exacerbated the crisis further and made the situation worse with the two super powers, competing with each other in an insane manner, building up and stockpiling nuclear arms and arsenal including delivery systems. With the help of the extra sophisticated delivery systems such as ballistic missiles it is only a matter of a few minutes for super powers to destroy each other and in the process the whole of humanity. It is again an oft-repeated statement that the number of nuclear weapons available today in the world would destroy the living species of the globe many times over. Thus the super powers have armed themselves head deep—that is, the burial has already taken place even without the war ever taking place using the nuclear arsenal.

In the scenario of mutual suspicion, distrust and the accompanying hostilities, both Russia and America reckoned that it would be safer to come to certain agreements regarding the use or non-use of nuclear weapons. Thus started the negotiations at Geneva and at various other world cities, involving representatives of the superpowers. The talks, negotiations, exchanges and the limited agreements that were arrived at have only had a

marginal effect and the basic mutual distrust of the two super powers of each other seems to still reign supreme, leading to further stockpiling and testing of nuclear weapons—underground, under water and in open air, in deserts and on isolated islands.

The escalation of nuclear arms race between the two super powers has only set a misguided example to the other smaller powers in the world that, if the two super powers can contain each other from attacking each other, they too should perhaps follow the path shown by the bigger powers. This misconception has led to the situation where any two powers in the world, hostile to each other, must possess nuclear arms as a deterrent. Logically speaking, there is no counter-argument to such an intended exercise by the smaller powers. But the economic conditions in the many developing countries where such ideas are not only bandied about but are even vociferously propagated, are far too dismal to fritter away the limited financial resources on nuclear arms. The one-upmanship theory would further demand that the arms one country possesses at any given time be more than the enemy country has. This naturally leads to escalation of nuclear arms race among the developing countries which they can ill-afford. If the developing countries cannot afford the nuclear arms race in the economic sense and for other reasons, the two super powers and other bigger powers too cannot afford it in the humanistic sense even if they can otherwise afford. So it becomes imperative and important that the concerned powers must work towards no armaments and disarmament—more specifically nuclear disarmament. This demand must include not only not producing any more nuclear weapons and stockpiling them but also burying the existing nuclear weapons and the delivery systems as well. The politics of disarmament is thus a complex and long drawn out affair and even small amount of concessions each side gives to the other and agrees upon should be welcomed wholeheartedly by all concerned.

In the context of nuclear disarmament and disengagement, the declaration made at Delhi by Rajiv Gandhi and Mikhail

Gorbachov becomes very relevant and one more sane appeal in a nuclearly insane world. It would also be pertinent to assess how and how far does the Rajiv-Gorbachov declaration matter in the international frame.

India has been one country in the world, with its religious background and philosophic insights, that has been preaching peace to the world at large. It is the land of the Buddha and Gandhi propagating the message of peace and non-violence. It is also an overpopulated and economically backward country and can simply not afford divestation of its precious resources for anything other than economic benefits of her people. Given the present economic conditions and the religious background, India is the ideal country to espouse the cause of peace in general, and of course, nuclear disarmament in particular. India has also emerged as a force to reckon with in the third world countries, as Chairman of NAM and as organiser of SAARC countries. It is only opportune for Gorbachov to not only join hands with India for a declaration of nuclear disarmament at the global level but also to show to the world that he means it in real terms. For Rajiv and India, it would mean reassertion of Indo-Soviet friendship and also reaffirmation of the views of India on matters international with a country which is so large, powerful and which has geographical contiguity with her. In common parlance, neither Rajiv alone nor Gorbachov alone is riding on the other's shoulders but both are riding on each other's shoulders.

The one point that demands attention for a discussion is: whether it matters, particularly to the US if the leaders of India and the Soviet Union have signed a declaration on nuclear disarmament. On first thought, it appears it does not matter at all to the US whether such a declaration has been made. The US would only bother about the direct moves of its adversary rather than proclamations made by the enemy in association with another country (India) which is not rated high in its (US's) evaluation. The politics of balance of power and the quantum of

aid given to the developing countries, depends on how far the receiving country is pliant vis-a-vis the donor country. The US, in the case of India, can also play up (and it does play up) Pakistan by direct arms aid at the same time reducing any aid given to India. So, on reflection, it seems that the US is worried about the joint Indo-Soviet declaration, albeit not in an overt manner. All the same, it is pernicious of the richer nuclear powers to insist upon signing of the nuclear Non-Proliferation Treaty (NPT) by the poorer powers. While 'horizontal' proliferation should be a matter of great concren, it is actually the 'vertical' proliferation of nuclear arms by the nuclear rich powers themselves that requires greater concern and immediate truncation.

The nuclear arms race is an open ended programme if the ends are not defined at the earliest. In humanistic terms, nuclear arms are lethal and in the hands of a mad man would destroy all living species on this earth leading to irretrievable damage. If at all any one survives a nuclear war or attack, he would be "living" like a decaying vegetable. In economic terms, most nations can hardly afford a nuclear arms race. In political terms, the escalation of nuclear arms race in the name of balance of power is an ill-conceived one based on mutual suspicion and distrust. As a matter of fact, anything connected with radio-active elements and their use for nuclear energy—be it for peace-ful purposes or for aggressive postures—is potentially dangerous. Chernobyl disaster is the pilot of the course of events that might occur in the future if there is no cessation of all nuclear activity excepting for academic purposes. An attack on nuclear insta-llations even with conventional weapons would be sufficient to trigger off catastrophes. Possibly, Chernobyl has taught us that it is meaningless to talk of nuclear disarmament if we do not look at the whole nuclear issue in one perspective. Nonetheless, talks, negotiations, declarations, resolutions, exchanges and the such are much important in a world that is ruled by single tracked individuals and paranoid personalities. The initiative the con-

cerned powers should aim at ought to be not 'Strategic *Defence* Initiative' but 'Strategic *Diplomatic* Initiative'.

In the world of today, which is virtually sitting on the nuclear bomb, what is the role of the scientists? Should they quietly acquiesce and collaborate in the destructives projects or say quits ? This question brings in the social responsibility of scientists. A single concerned scientist may not be able to do and achieve much but a body of scientists, particularly the learned professional Associations have to discuss, debate and guide the politicians in matters nuclear about the hazards irrespective of balance of power and related considerations. To the extent possible, individual scientists should dissociate themselves from such projects as would destroy the human race. They should not become pawns in the nuclear power games of insane leaders. Perhaps, if a few individual scientists choose to live morally in an otherwise dangerous world even if they have to physically starve, the world would be then that much richer morally even if not safer physically. ●

THE SCIENTIFIC TEMPER AND SOCIAL REALITY

"The unexamined life is unlivable for a real human being".

– Socrates

Introduction

Eversince India became independent and the Nehruvian model of development has been accepted, the words 'Science' and 'Technology' and the phrase 'Scientific Temper' have been in vogue and frequently used to drive home the point and impress upon the people that science and technology are the panacea that can alleviate the suffering of the poor in this country and improve the general standard of living towards material comforts and will create an enlightened society free from irrationalism, obscurantism and dogma.

As a matter of fact, the introduction to the Scientific Policy Resolution (See Ref. 1) says :

Based on a paper presented in the national seminar on 'Nation Building, Development Process and Communication : A Search for India's Renaissance' held in Vigyan Bhawan, New Delhi during 3-7, December 1988. Also presented under the auspices of the Democratic Forum at Rohtak; the Haryana Vigyan Manch at Rohtak; and the Kurukshetra Scientific Forum at Kurukshetra University during January-February 1989. A Hindi translation of the contents of this article has appeared in Haryana Science Bulletin. The paper has also been submitted to the national seminar on 'Science and Society' organised by the Defence Scientists Association, Delhi.

"The key to national prosperity, apart from the spirit of the people, lies, in the modern age, in the effective combination of three factors : technology, raw materials, and capital, of which the first is perhaps the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources, and reduce the demand on capital. But technology can only grow out of the study of science and its applications."

Thus, one of the most important aims of the Scientific Policy is :

"to foster, promote, and sustain, by all appropriate means, the cultivation of science, and scientific research in all its aspects—pure, applied, and educational."

The Scientific Policy has also the following realisation :

"It is only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every member of the community, and it is out of a recognition of this possibility that the idea of a welfare state has grown."

It has been enshrined in the Indian Constitution that the scientific temper should be fostered in all walks of life and national endeavours to usher in a new era which we like to call 'Second Renaissance'.

Pious statements and fond hopes indeed !

It is proposed here to examine how far the scientific temper concept in particular, within the Indian framework, is valid insofar as the social reality is concerned. Some questions are also raised: whether or not the ambitions of our forefathers have been realised and, if so, to what extent; what are the failure points and impediments; and what ought to be done by us now to resolve the various dilemmas and contradictions we find ourselves in; and finally what should be the modalities keeping in view our own limitations ?

Science And The Scientific Temper

The word 'Science'—as it is generally understood and used—refers to the activity of pursuing a systematic study of nature for revelation of its secrets through experimental observations and theoretical models built using mathematical logic and arguments. Science, essentially, is : "The product of the interaction of the rational part of man's mind with nature." (This definition may also be made valid for social sciences by replacing the word 'nature' with the word 'society'.)

Any scientific activity necessarily involves systematic collection of data, reliance on observable facts, classification and categorisation of those facts, and analysis of the data with the help of models using logic and rationality. The ensuing results, which are nothing but *most probable* conclusions based on the available data at any given time, are open to secrutiny by any scientist who wishes to peruse them and are also open to verification, confirmation, falsification or rejection as the case may be. There is no eternity attached to any of the results, and there is nothing like the 'final' result. For example, in regard to the physical sciences, the Cartesian-Newtonian-Einstenian approach forms the currently followed line of action, and the 'final' discoveries based on acceptance or refutation of the existing results are still to be made in the post-Einsteinian era.

Accordingly, science essentially strives for change. Expanding knowledge implies a constant need to reorganize information in the light of new one. A distrust of one's knowledge appears to be basic for the scientist, and he therefore welcomes innovation as much as he starts to look beyond it. (See Ref. 2)

In the scientific activity one undertakes, one is (has to be) *receptive* to phenomena or events and uses *reason* as a tool to rationalise those phenomena. This naturally demands a particular type of attitude or temper which is termed as the 'scientific temper' where receptivity and reason form the basis. The scientific

temper is a particular type of consciousness (awareness and orientation of the mind) one is expected to deliberately cultivate to proceed with the scientific activity in a methodical and systematic way. In other words, nature forces the scientist to develop receptivity to events and amenability to reasoning (while dealing with her) in pursuit of seeking truth by trial and error, through either experimental investigations in a laboratory or theoretical models built to concretise those observations by understanding the deeper interconnections between the various forces responsible for the observed phenomena.

Society And Social Reality

It will be worthwhile to briefly mention about society itself before proceeding to the social reality part. Firstly, we have the 'individual' (self). The immediate environment of the individual is usually his 'family'—comprising of other individuals related through kinship (by birth or marriage). Several families with similar customs and traditions form 'groups' with common bonds. Any 'society' that has evolved over a period of time consits of a number of groups. There is also some inter-group interaction when certain mutual interests may have to be guarded. (No attempt will however be made here to go into the dynamics of evolution of societies.)

What then, in general, are the main basic interests of any society ? These can be broadly categorised into three different parts : (i) instinct for survival (natural), (ii) certain necessities for survival (economic), and (iii) certain traditional bonds—mainly faith-oriented and religious in nature (psychological-emotional content) among others. The social reality of a society encompasses the above mentioned three parts in a certain proportion, the variables being the economic aspect and the religious aspect.

In the context of the society in which we live, the Indian social reality too has the above three ingredients. All humans and

living creatures have the instinct for survival and perpetuation of the species, and there is nothing special about Indians in particular (except for the population explosion). Further, the economic necessities have to be met through some sort of technology either by using traditional methods or modern methods depending on the available human resources and machinery and society's inclination towards exploiting those for material benefits. Apparently, as stated at the outset, our Scientific Policy Resolution and Technology Policy Statement (See Ref. 1) display some manifest political will to make use of science and technology as tools of economic transformation of the Indian society.* Perhaps, an appropriate definition of the word 'Technology' could be : "The final product of the interaction of science with society's material needs."

The third aspect, connected with emotional equilibrium or stability at the societal level within each group, is normally maintained through either organised or unorganised religion or some common faith as part of tradition.

Religious Aspect

With regard to the discussion on the scientific temper, first we shall concentrate on the religious aspect part related to our society. As such, we have no organised majority religion in India. The pervading multidenominational religio-philosophic atmosphere is a complex and queer admixture of faith in God, traditional rituals, superstitious beliefs, salvation of one kind or the other, unity with the 'supreme reality' (*Brahman*) and such spiritual matters. There are any number of groups who believe and in the same breath follow one or more of the above mentioned

*By and large, there has been scant realisation that science can be applied to development as, for example, there was in Japan at the time of the Meiji Restoration around 1870, when the Emperor took five oaths as part af Japan's new Constitution. One of these oaths was that : "Knowledge will be sought and acquired from any source with all means at our disposal, for the greatness of Imperial Japan". How many of our rulers in the Third World have made a similar pledge as part of our Constitution ? (See Ref. 3)

systems, sometimes at the same time. In addition, depending on the mood of the group or even the individual the belief in one system changes to the other in no time. Thus we have slippery minds with amorphous consciousnesses.

In the reflective sense, *speculation* about the 'supreme reality' of which each living and non-living thing is supposed to be a part and yet different from one another is much needed and welcome in the philosophical-epistomological frame work and should be appreciated. But a firm *belief* in the existence of that 'supreme reality' aided with propagation, and a yearning to reach that 'one and only one' ultimate reality through the process of *looking into* one's self at the spiritual level has, in actuality created individuals who *look after* their selves at the physical level. This degeneration from the (lofty) spiritual level/divinity to the (earthly) physical level has exacerbated the process of creating extremely selfish individuals.

Further, even within the philosophical framework, to become one with the 'supreme reality' each individual is let free to choose the path that he deems fit for himself depending on his background, temperament, and overall personality. Since there are at least as many ways as the number of individuals of reaching that 'one and only one' reality, we have each mind going its own way in a totally free manner. This has, understandably, resulted in creating erratic individuals with randomly oriented minds with interests centred around their selves oblivious of their surroundings—physical, human or otherwise—sanctified by the religio-philosophical rigmarole. Thus we have hordes of non-receptive and unreasonable (often obdurate) individuals whose temper is in direct conflict with the scientific temper maxim and who are used to circular reasoning (?) in their own created worlds. The strong belief in the cyclic process of birth-life-death-rebirth-life-death.....(this unending cycle is valid for those who cannot make it to the 'supreme reality' in a single attempt after the existing life) is an unique example of the circular modality. Ends seem to be more important than the means.

A Brief Digression

It may be relevant to understand the non-Indian social reality vis-a-vis the Indian social reality in relation to the religious aspect that has been dealt with. It is implied that we will be talking about the western society,* where majority religion is Christianity which is a highly organised religion. In plain terms, one has the 'Ten Commandments' for personal attitudes and social behaviour of individuals in the West. Through regular church-going right from childhood on a particular day of the week and listening to sermons from the pulpit, one's consciousness is the western society is polarised and an individual and collective psyche is created which is 'linear' with do's and don't's and orderly in its thought processes. This 'linear' approach is in consonance with the scientific temper precept, and so they have an organised religion (Christianity) which unwittingly helps largely a scientific way of living and even thinking. We can see the reflection of this training the western mind has received in their lifestyle and general orderliness that pervades at large. A recalcitrant western individual who has rejected the orderly approach and become a maverick/heretic/iconoclast is only an aberration in an otherwise orderly society and some of them have been highly creative in their endeavours. However, selfishness and acquisitive character are very much present in the westerner as well in the rat race towards status in society, material well-being and 'success'. (In any case, we will not be discussing the early conflict that arose between religion and science in the West.)

Economic Aspect

In regard to the economic necessities aspect of the main interests of a society, the scientific way of thinking has again a great role to play. The technological endeavours undertaken, the ensuing

*Science, to a greater or lesser extent, has developed in most cultures but in its most modern technological from it mainly is a product of Europe and North America, and is closely linked to other features of western culture. (See Ref. 2)

results of which are to be enjoyed by society, would involve minimum wastage of the precious human resources and efforts if carried out in a planned manner. Further, the systematic approach would increase the efficiency of production and would result in a fair and just distribution of the produce for the general good. Without entering into the details of dialectics, it is to be emphasized that the scientific approach to meeting the economic necessities manifests itself in the systematics that are to be rigorously followed. And development does not mean economic development alone.

Viewing the economic necessities aspect and the religious background aspect from a scientific angle, let us examine the Indian social reality. It is amply clear that basically erratic minds and randomly oriented individuals with self-interest as the motive force are "trying" to do planning—essentially an alien concept. The failure of socio-economic programmes in all sectors in the country on a large scale can be traced to this single cause where there is incompatibility of the *available* mental material (erratic) with the *expected* modes of execution (systematic) of the envisaged programmes. (By the same reasoning one may conclude that the success of the various socio-economic programmes in the West and to a good extent in the USSR as well—non-Indian social reality—using a rational/scientific approach is due to linear minds doing planning and executing the plans in a methodical manner.) It goes without saying that only when all the available resources are too meagre and there are too many to share those resources, it is important to plan the economy. In riches, one can afford to indulge in the luxury of opulence and even wastage. It now follows that a poor country such as ours simply cannot economically develop and survive without proper planning.

It would not be out of place to mention that inspite of the Scientific Policy Resolution and the Technology Policy Statement issued thirty years ago, we have been able to achieve not as much as we should have. How much one wishes the Planning Commis-

sion had actually asserted its autonomy instead of succumbing to the vagaries of the political system ! The minor noises made in the recent weeks by some of our 'top'- scientists about re-establishing the links between science and technology and economic development, after three decades of the manifest political will of the day, is only humour of a very high order if not totally to be dismissed in a contemptuous manner as another insincere effort. Nevertheless, if one accepts that science and technology have to be thoroughly exploited towards material welfare of the Indian society then one must agree that a possession of the scientific temper is the prerequisite for economic development. Whether one goes in for modern science and technological off-spring or one faithfully sticks to the non-modern sciences or one makes a compromise between the modern and traditional are points worth debating in the prevailng atmosphere of liberalisation of economy.

The Scientific Temper Statement

It is in the context of the Indian social reality, a statement on the scientific temper was released by Shri P. N. Haksar alongwith some scientists at the Nehru Centre, Bombay in June 1981 lamenting about the retreat from reason that has taken place in all affairs embracing our society. The statement appealed for the inculcation of the scientific temper as the pill for the ills plaguing our society. A prolonged public debate had taken place at the national level on the statement on the scientific temper dealing with all aspects of the impact of the scientific temper and science and technology on our society.*

*The author recently has completed a book (See Ref. 4) which essentially is a critical inquiry into the scientific temper, based on the original statement on the scientific temper and the several responses. Some of the most disturbing events related to the revivalist practices such as 'sati' that have occured in the very recent past in our country alongwith the rise and spread of fundamentalism and communalism instead of the dreamt of secular, welfare state, have hastened the process of finalising the contents of that book for the debate on the scientific temper to resume.

Naturalness Of The Scientific Temper

What is, after all, so great about the scientific temper that we have talked about ? Is it just a new type of yet another alien consciousness approach to the problems the Indian society is facing together with the imposition of science and technology ? Or does it indeed have a rational basis to be applicable to all human affairs as well ? Broadly, the answers may be sought in the following line of argument, looking at the issue from yet another angle. Man is, as of now, a highly emotional being. But still he tries to rationalise the suffering and sorrow (essentially linked to negative emotions) he goes through in plenty with questions based on why's and how's. (No one ever seems to ask any one who looks happy the reason for his happiness!) A causal remedy is necessarily sought to find mental solace and a kind of understanding and peace within himself. In a fatalistic society like ours 'karma' is deemed to be the cause for the sorrow—effect—one experiences. This cause (karma)—effect (sorrow) relationship does sound too simplistic and naive (and even irrational) as the purported cause is invisible and the effect is blatantly visible. In sum, (especially) negative emotions are tried to be understood in a rational framework, and that itself is a scientific temper approach which emphasizes why's and how's. Hence it may be concluded that the scientific temper is a natural consciousness where questions are asked and answers sought predominantly even in human affairs. There lies the originality and naturalness of the concept about the inculcation of the scientific temper. The causes for the various human phenomena have however to be pinned to be due to 'Man'. All other tempers, particularly the religious temper *invoked* at times of distress as such is external to man's mental make up, and hence are invented entities. It may also be emphasized that it is the inquisitiveness of the early man coupled with his own economic needs that has advanced the early civilisations of which some are extant and some extinct.

Advantages Of The Scientific Temper

At the human level, the inculcation of the scientific temper—

receptivity to all available facts at any given time and amenability to reasoning—together with the inculcation of the non-self-oriented temper—involving compassion and a charitable disposition—would hopefully lead to a proper social equilibrium. This would consist of mentally healthy (sensible) individuals with social concern displayed through sensitivity to their surroundings. The possession of the scientific-humanistic temper would elevate a society from a mere (static) organic existence to the (dynamic) psycho-social level where the (inflated) age of the self diffuses for the general good of the society at large without submerging the importance of the individual.

Propagation Of The Scientific Temper : Role Of The Scientist

It is necessary to make the interrogative remark : Who is going to spread the message of the scientific temper if it is accepted that it will benefit the society at large together with the fruits of science and technology ? The new missionary is to be found in the scientist who is already trained in the scientific approach to solving the problems concerning nature. He has the advantage over the others who are not trained in the particular way of thinking and so must take the lead in spreading the scientific temper in human affairs as well. All rationally thinking men also fall in the same category.

Scientists are used to dealing with complicated issues, to sorting and analysing facts, drawing most probable conclusions with the help of all available data at any given time, and revising them if new facts demand so. In a number of cases, they will be able to work out options for political decisions, giving the costs of risks, and the benefits for each option. It will then be upto the public and to the elected decision makers to decide which benefits are desirable and worth the costs, and which risks are considered acceptable. (The nuclear option for energy production in our country is one example that could be considered where the scientists can help the public and the politicians, instead of thrusting their own opinions on the country.)

Added to this, scientists can afford to think in terms of decades, to tackle long range issues, because, normally, they do not depend on re-election as politicians do. Politicians often understand the arguments just as well as scientists do. But, very often, they believe that they cannot afford to follow the path of reason because that, they think, would make them lose the next elections. So it is upto the scientists to inform the public of the long range consequences of our policies, with the scientific temper as the basis.

Role Of Communication

By using satellites, radio, tv and micro-processors, technology can incorporate remote areas into the communication system. For this, the complete infrastructure must be developed in coordination with other forms of communication. The various options must be carefully explored with due consideration to the social a d cultural aspects, cost effectiveness, the available capital and the local capabilities (See Ref. 5). Moreover, the media (both written and audio-visual) have a great responsibility in propagating the scientific temper, with due respect to facts and reason in arguments. Sustained efforts have to be made like those in the case of the Bharat Jan Vigyan Jatha (People's Science Movement) of 1987 wherein the language, idiom, and the art forms the local people are used to have been effectively and successfully employed in spreading the message of the scientific temper. The role of organisations like the National Council for Science and Technology Communication (NCSTC) in this regard is immense.

Especially, the school education has to be geared to the desired goal by encouraging in children an inquisitive, questioning attitude ever ready and enthusiastic to find the relevant answers based on concrete reasoning. This demands a permanent and complete departure from the conventional rote education system we have been pathetically used to.

Informatics

We are told that we will be living in the future in what is known

as 'Information Society'. It appear then, information is indispensable to development. It calls for dissemination of scientific and technological information to policy makers, industrialists, farmers and the general public. Decisive progress in informatics, telecommunication and similar technologies can help to overcome the obstacles to the flow of information which are found in a developing country such as ours. The scientific temper and science cannot move very far without availability of accurate information based on events/facts.

Impediments And Measures

The impediments are many for such a gigantic and worthwhile endeavour—altering the consciousness of the whole society from an ancient (erratic, disjointed) one to one that is contemporary (orderly, integrated). Self-seeking politicians lacking in integrity, vested interests of wealthy industrialists and other powerful exploiters, and also the already existing intransigent attitudes among the semi-literate public and some literate scientists have to be focussed at and fought against.

The inherent antagonism between science with over increasing and ever changing knowledge base and the deeply rooted traditions firmly enterenched in our ancient society has to be minimised through the propagation of the scientific temper. Also, it will be wise of us to learn from the experience of other countries insofar as the disruption of the delicate balance in nature before indiscriminately and thoughtlessly starting new projects on considerations other than scientific, and yet based on science and technology. Dissenting views must be heard and respected in this regard and a certain amount of social pacification is much warranted.

It is the relentless duty of all rational thinking persons including scientists and non-scientists to spread the message of the advantages of the scientific temper by scrupulously adhering to the same—both in word and deed—individually as well as

collectively for a new social reality—Second Renaissance—to dawn in India.

Concluding Remarks

We have chosen to build a welfare state with the help of a temper that is scientific and with the help of science and technology, governed by democratically elected representatives.

We began this paper with a quotation by the philosopher from Greece, the birthplace of democracy, Socrates His disciple Plato tells us : "The Good exists, and only of it can there be true knowledge. Reason, which is located in the Head, is incomparably the most important, for it partakes of the eternal; it is *the most divine* in man. When Reason rules, all will enjoy the greatest share of goods appropriate to their nature. But when Reason rules, man is following the idea of the Good. Therefore not only is it possible for men to acquire knowledge, but they have a passionate desire for it, an unquenchable thirst for the Good, although only a few of them can realise that this is indeed the case".

It is imperative that if democracy has to survive, then Reason must prevail.

Questions Raised

With the help of the background detailed in the paper, it is worthwhile to understand the problems in regard to the spread of the scientific temper and development of our society based on science and technology. For this purpose, the thoughts of Jawaharlal Nehru (See Ref. 6) are reproduced below, and specfic questions formulated and put forward for discussion.

"The real problems for me remain problems of individual and social life, of harmonious living, of a proper balancing of an individual's inner and outer life, of an adjustment of the relations between individuals and between groups of a continuous becoming

something better and higher, of social development, of the ceaseless adventure of man.

"In the solution of these problems the way of observation and precise knowledge and deliberate reasoning, according to the method of science, must be followed. This method may not always be applicable in our quest of truth, for art and poetry and certain psychic experiences seem to belong to a different order of things and to elude the objective methods of science.

"Let us, therefore, not rule out intuition and other methods of sensing truth and reality. They are necessary even for the purposes of science. But always we must hold to our anchor precise knowledge tested by reason...we must beware of losing ourselves in a sea of speculation unconnected with the day-to-day problems of life and the needs of men and women. A living philosophy must answer the problems of today."

There are three main points in the above material to be further probed and reckoned with to arrive at something feasible—a living philosophy—to be applied to the problems of our society.

1. The individual's inner life and outer life, as Nehru submits, are obviously subdivisions of human personality acquired from western thinking. In our own philosophical writings, the words 'inner' and 'outer' are redundant, and all of us are supposed to be parts of that 'supreme reality' which manifests itself in infinite ways and yet remains as such as well. Hence the emphasis on the need to look inwards to reach that 'one and only one' reality and realise it. If what Nehru opined about the proper balancing of an individual's inner and outer life is to be achieved, our own philosophical thoughts have to be abandoned in their entirety, and we will have to start afresh in such a way that the 'learned' elite's consciousness is altered and settled to a non-Indian hypothesis for onward transmission for conversion of the psyche of the other sections of our society. Is this possible? Even if

it is, is it going to be easy ? One cannot afford to have both strains of thinking flowing side by side which will bring obvious conflicts in the ideological sense.

2. This concerns the ceaseless adventure of man, as Nehru yearns that it should go on. This keeps 'Man' at the centre of action, events, and results; and also emphasises the need for sustained efforts on the part of human beings. Our philosophical thinking (barring the *advaita*) and the *puranic* milieu have de-emphasised man as the central figure for any happenings, as everything is supposed to be preordained and controlled by some superior force—say, God. Again, as in the first point above, there is a great conflict between what we have been used to and what we wish that ought to turn out. Needless to say, this does require a great deal of interrogation, and if the issue is to be resolved in favour of 'Man', then again our whole *vedic, upanishadic, puranic* and ritualistic rigmarole and the accompanying practices have to be totally abandoned. Again, is this possible ? If it is, how quickly it should happen for the desired social transformation through the inculcation of a scientific attitude ?

3. This is about the importance of intuition, as Nehru concedes, even in matters scientific apart from other ways of realising truth and reality. It won't be an exaggaration to say that almost every other Indian is intuitive by nature despite the fact that there are data to be analysed and results to be arrived at rather than extrapolate through one's own mental channels and conclude. The kind of speculation we indulge in suits our atavistic background and mental make up, and also perhaps satisfies our individual egos about predictions of happenings although all the time all individuals need not be and are not correct about any particular happening. The scientific thinking proposed to be propagated demands a bit of slowing down of the Indian minds, rely on facts and data present before oneself, analyse in a systematic manner with logic and reasoning, and then only conclude, that too, about the most probable thing

that could result under the circumstances. The present impatient and neurotic racing of our minds would not easily accept the scientific milieu, and even if does accept, is it again possible to spread the attitude that is desirable ?

In short, the ideological set up one envisages and earnestly wishes that it – the scientific temper—grips the Indian masses is totally an alien one both conceptually and more so in practical terms.

How does one do this alteration of the consciousness of the people without enforcing it ?

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ASTROLOGY : THE NON-SCIENCE

A CRUTCH FOR THE GULL

So we had the conference on 'Astrology', recently concluded after the soothsayers have reiterated about the "deserved" inclusion the subject should find in educational curricula along with the sciences—preferably in forefront of all the sciences. This kind of jamboree could have possibly been held only in India. Like all minorities in the country, the astrologers (the believers are actually in majority) too have been agitating for their "rightful" place in society and for "official" recognition of the 'science of astrology'. Some young scientists seem to have protested at the venue of the conferencce about this non-science that is trying hard to pass off as science and to gain some status and credibility the sciences enjoy .

What Is Science ?

As I had explained on another occasion : "Science is the systematic study of the assential processes of Nature. Nature manifests itself in so many ways as to have different branches of science, each branch unravelling the mysteries of Nature in its own unique way. The one thing very common to all these branches is the 'systematic study'. It is then imperative that all the material

Ranged against the article 'Astrology : The Spoke In Science's Wheel', The Illustrated Weekly of India, July 12, 1981 (Appendix-E).

phenomena have to be understood either in the realm of the four walls of the laboratory as is done in the experimental sciences or have to be intuitively built up with the help of mathematical theories. In either case it is always a human being that is involved in investigating the particular process. Thus the study of science demands systematic minds of its pursuers. By that we mean the research worker has to patiently go through the different steps logically and reject those which obviously lead to physically unrecognizable results. Any meaningful result arrived at gets further sanction from the experimenter through laboratory investigations. However, if the result obtained in the laboratory is gotten with utmost precision then the mathematical framework along with physical constraints has to be so modelled as to explain the laboratory results. As such, this is an interdependent exercise, and one hopefully arrives at the truth as one observes it and records. Further, the why 's and how 's of the final result have to be discussed again with the help of the already available information on the topic of study. Thus any obtained result cannot violate the aleady existing laws that have withstood time and test. So there exist a definite cause-effect relationship for every scientific phenomenon, and the law of casuality is satisfied". (*Indian Atheist*, November 1979; pp 56-57 of this book.)

Elitist Study

The astrologer's argument that "astrology's principles are the same as those of any other scientific discipline, and astrology goes beyond other sciences to arrive at conclusions that do not lie within the ken of disciplines of restricted study" is evasive and portrays an elitist approach. And pray, might one ask about the scientific principles on which astrology is based which have been put to scrutiny in actuality in several practical situations ? Further, what is the use of arriving at conclusions that elude the disciplines of restricted study, and how does one arrive at those conclusions ? Does it not become an exercise in futility by yet another kind of elite ? No two astrologers ever seem to have arrived at the same

conclusion, despite the projected scientific base, on any issue worth the prediction, and menacingly enough every second person in our country claims to be an astrologer.

Medical Science And Astrology

It is said that Carl Jung has been enthralled by and had even appreciated astrological data. And it is now the surviving 'inane' psychoanalysts of the Jung school who get indicated by the astrology enthusiasts for not following their master in pursuing astrology and astrological data as a tool for handling mental cases. True, there apparently is a correlation between the phases of the Moon and recurrence of mental illnesses in certain individuals. In the hypothesis put forward by astrologers that "certain planetary juxtapositions with respect to the Moon predispose the person to mental illnesses of varying degrees" is accepted *in toto*, then planets (modern science tells us that they are conglomerates of mixtures of various gases—some swirling, some bubbling, and yet some others well settled) along with the Moon (still considered by astrologers as a planet although it is just the satellite of the earth) are the only ones responible for the mental illnesses found in individuals, and as a result each individual becomes insane at one stage or the other of his life depending on, of course, when and where (mercifully, not how) he was born. This conclusion is simply preposterous, to say the least, and defies all rationality.

The appearance of sun spots during the last International Geophysical Year, we are informed by astrologers, coincided with increase of admissions of cardiac cases and mental cases in hospitals. If two wings of research, Helio-Biology and Cosmo-Psychology, have grown out of this coincidence and if the medical scientists were to probe into the two said new fields how else should they proceed but to follow a 'bounded' approach by using systematic scientific methods ? The astronomers, in fact, have not only been observing and recording the appearance of sun spots but also been prognosticating about the effects of intense sun spot activity, and any astronomical journal would reveal this fact out through

published research papers. And if the medical scientists are not skilful enough or unworthy in their prognosis, as the astrologers seem to be convinced, would it be befitting to create a 'Chair' of astrology in all medical institutions ?

Further, it is an insult to club all the Indian astronomers as astrologers, as it is often done by astrologers to gain dubious credibility, and it is an objectionable derivation which out to be vehemently protested against by all scientists committed to science as a profession and individuals who have adopted a scientific way of life. It is an undeniable fact (shameful though) that many scientists in our country run to astrologers for their future to be forecast, if not for the fututure of the success (or failure) of their theories and experiments they wish to undertake. It is this anti-scientific brigade of scientists which is more dangerous than the astrologers themselves.

Acquisition Of Knowledge And Scientists's Responsibility

Sure, some things in science work and some things do not work instantly; but based on that which works the effects of the processes can be demonstrated undoubtedly to whoever is ready to verify for himself. A scientist does not pretend and tell the lay person that he is a lesser mortal and that he has no business asking questions, however uncomfortable they might be. Questioning is encouraged; answers may not always be found immediately but the human mind is ever alert and constantly searching for plausible explanations thus enriching knowledge by interative processes. Knowledge is nowhere to be found on a silver platter, and it has to be acquired through continuous search and experimentation, questioning, answering, debates and the most probable conclusions based on the available facts and data at any given time.

Relevance Of Scientific Instruments

Many questions have been raised, about the relevance of development and use of scientific instruments, by the enthusiasts of astrology. In the ideal sense, the employment of any apparatus

is irrelevant for the study of any phenomenon. But in practice, human beings have not yet developed the third eye to forcsee and predict exactly what is in store for them and for others. It would be more realistic to admit that we are still on the lower rungs of evolution and just by studying astrology or propagating obscurant views can we claim about the future or the nature of things to come. So long as we are humble about our stance and the status of our minds we have no alternative axcept to devise instruments to help us study the various natural phenomena. Until then any statement condemning the development and use of scientific instruments is highly contemptuous and derogatory.

Recognition Of Scientist's Merit

An astrology enthusiast commented against scientists thus: "Persons who specialize in only one discipline to gain public recognition lose out on all other fields resulting in a shockingly low IQ in general and such persons are insufferable bores at social gatherings". This statement is a highly misconstrued one in the sense that—considering in this case, a scientist as any other specialist has to necessarily work his arse off to discover anything worthwhile leading to name and fame, and he does not work or start his work with the aim of gaining public recognition. A scientist primarily takes up a research problem because it interests his inquisitive mind and excites him to probe further to understand and demonstrate the manifestation of the various forces that operate in Nature. If, as it sometimes happens, in one in perhaps a few thousand cases public recognition does come then it is not the fault of the scientist, and it will be unfair to curse him to have collected his well deserved laurels. Regarding the 'social bore' part of the statement, one can only blame the gin and tonic environment, not at any rate the scientist's gene which he had inherited and over which he had no control—astrological or otherwise.

Media Vis-A-Vis Astrology

It is no surprise if a hundred odd scientists who have spent their

lifetime unravelling the mysteries of Nature had issued a statement in the press sometime ago condemning astrology. They were only insisting that the astrologers follow the rigours of science, scientific principles and scientific discipline instead of conjucturing about the future from a jumble of vague facts and even more foggy calculations. If it is not possible for the astrologer to predict the future with some reasonable amount of certainty from the available data and show that it just does not hold good in some isolated cases only but operates in a number of such cases, then he cannot impress anyone except the illiterate, the obscurant and the gullible however famous they might be in public life. Until this prediction is done in a convincing manner, astrology remains deleterious to the public good giving a boost to charlatans and the like. It is just as well and also appropriate that various magazines and journals of international repute had given due publicity to something really worth only the ridicule the subject of astrology deserves as of now. Indeed, using the very arguments of astrologers, one wonders how they can become the sole arbiters to champion the case of astrology as a branch of science when they themselves might not have had the chance of undergoing the drill of science in terms of formulation of scientific theories and of conducting convincingly demonstrable scientific experiments. Or are the astrologers already aware that the astrological experiments inevitably fail in human situations ? It appears that it is they who have violated the salutary principle of science by treading on the scientific path which they have neither built nor admired, save the cursory blessings they bestow reluctantly to the established sciences which certainly do not require their sanction and which as of today stand on sound bases but are open to scrutiny and modifications as and when new ideas and data keep pouring in. All, including astrologers, are welcome to challenge the existing theories and propose alternate verifiable hypotheses.

Some astrologers have made the accusation that the publishing media being superficial and news hungry print everything in support of what the established scientists had to say. And what

of innumerable newpapers and magazines that thrive on astrological portents ? What a pity it is that the tendentious use by the media of the names of Ptolemy and Chaldeans who were not born (or trained) as astrologers would have been relevant to the context if indeed they were so, and then all would have been well ! Amen !

Free Will Vs Determinism

We are led to believe by the astrology enthusiasts that "The existence of free will today is a myth and a dangerous illusion in the higher reaches of science." This is an yet another absolutist statement just on the verge of panic. As long as human beings are confined to the four-dimensional world, our free will is also bounded, and no scientist has ever denied this fact. There *is* an inherent conflict between free will and determinism (which tells that human action is settled by forces independent of will). Sometimes, one is forced to liquidate his free will although he may not necessarily opt for a deterministic view point. For example, we would not, as adults, certainly leave a child to its fate even if it refuses to drink the milk, once it is there. We will make the situation deterministic by forcing the child to drink the milk although left to itself it has the choice of not drinking, according to free will. We are, however, reassured by the astrology enthusiasts, that it is not our free will but determinism that controls our lives by the positioning of stars and the like at the time and place of birth of each individual and that one has to reckon with this fact. Astrologers in our country seem to have done very well by not only coming to terms with the stars above but also with the stars below—political and, of course, the filmy !

'Statistical' Misleadings

It has been nonchalantly stated by at least one champion of astrology that "astrology employs principles based on statistical certainties and avoids statistical probabilities because it deals with life". By the very word 'statistics' it is understood that it deals with chance or probability for an event to occur among many possible events in a given situation. There is nothing like

statistical certainty but surely there is *statistical probability*. There is a lot of difference in the meanings of the words 'certainty' and 'probability'. It should be emphasized here that no scientist ever tells for certain that a particular experiment (or a theoretical model) will yield *the* result, and he predicts only the probability of getting the expected result. Under this proposed, tested, widely accepted and adopted scientific terminology it is difficult to comprehend the 'new' formulations used to make astrology look like a science. It is very dangerous to mislead the general public projecting wrong definitions simply to prove one's lame point of arriving at highly uncertain future predictions. The greatest thing about science, as different from astrology, is that in spite of the probabilistic nature of the predictions, many things amazingly come true in the laboratory, and this is evident from the various technological off-shoots and material comforts people (yearn to) enjoy these days however spiritual they might be in their thinking, attitudes, pretensions and postures.

Inadequacies Of Astrologers And Astrology

If the astrologer is so precise, perfect, definite and unassailable why not catalogue all the future events, their dates, times and places so that their occurrence could be checked by one and all and so that this kind of controversies regarding the validity (or invalidity) of the scientific base of astrology stop for ever ? One fails to understand why the astrologers of our country only forecast about individual personalities and about their fortunes and never ever about various national calamities that had befallen us : the Andhra cyclone in 1977 or the more recent railway accident that occurred in Bihar, both killing large numbers of people. Couldn't we have been able to save those hapless lot by our astrologers' *scientific* forecasting about the impending disasters and then taking safety measures ? Are the astrologers only famous individual-oriented and not nation-conscious ? If the answer to these questions is in the affirmative, as indeed it appears to be, then we only have hangers on and parasites who thrive on alms from the rich, the powerful and the crooked.

No one is prohibiting the astrologers by coming in the way in this country to adjust to the variations in celestial and terrestrial phenomena that occur from time to time and if they are not doing so, by implication, they are not being scientific or may be that they prefer the *status quo* for personal prosperity. And now to shake the astrologers out of their complacency, here is an experiment suggested to be conducted in the human laboratory : Why not follow up the fate and fortune of two (or more) children born to different mothers at the same time and place of birth (for example, same room in a hospital) since their astrological charts have got to be exactly the same, and prove conclusively that what had been predicted has indeed come true over a period of time in all the cases under study, thus silencing the opponents ? And to make things easier for them, how about the obvious cases of twins ?

It is, till then, astrology which stands on the stilts of apology to pass off as a science while in actuality it is *not* a science and can never become one in spite of shouting hoarse from the house tops. It has also become fashionable; of late, to append the word 'science' to almost every thing, event, place or person to make it look more respectable than actually it is, and this is a devious trend that must be arrested.

I should like to, after all, now submit that—in spite of what *Narada* averred to his master *Sanatkumara* in the *Chandogya Upanishad*—astrology is not the spoke in science's wheel which, in fact, is a solid one without any of the rusted spokes that have been implanted. This solid wheel of science rotates on the axle of thoughts, concepts and ideas, and this axle gets further strengthened as and when new theories are put forward and verified.

Astrology : A Pseudo-Science

To further repudiate the statements often made by astrologers, here is what Prof. J. V. Narlikar, Professor of Astrophysics, Tata

Institute of Fundamental Research, Bombay, had to say* :

"A look at the development of astrology shows that this scientific outlook (not readily accepting any statement without checking it for oneself) is totally lacking. Although astronomers long ago demonstrated how planets move under the gravitational pull of the Sun, the astrologers still continue to ascribe special powers to the planets. Although eclipses are now scientifically explained, the mythical *Rahu* and *Ketu* still feature in astrology. The planets and Moon are now known to be non-self-luminous. They simply reflect and scatter sunlight. The Sun is luminous but the mystery of how and why it shines was solved by the astronomers several decades ago. So there is absolutely no reason *a priori* to ascribe any supernatural power to any of these objects.

"It might still be argued by astrologers that predictions based on horoscopes etc come out to be true. Some would go so far as to treat astrology as an empirical science. It is not difficult to expose the falsity of such claims.

"Almost all advaned scientific branches started in an empirical fashion. Quantum theory is an excellent example of the same. In an empirical approach there is an objective assessment of data, statistical inferences drawn from controlled experiments, testing of theories and their abandonment if unsuccessful. None of these procedures have been adopted by astrologers. Most claims of success are by individuals and about isolated instances. These cannot be taken to represent proofs in the scientific sense."

Thus astrology is *not* a science, and it *does* require certification from all reasonable men; not a clean chit by a few missionaries (or scholars ?) of astrology—a non-science.

Towards Scientific Portents

Should it be then considered ironical that science writers write regularly about the fascinating theories and experiments of science

* See 'Indian Atheist', December 1979, p. 31.

in this 'age of astrology' ? However, this is the kind of material one expects to be presented to the general public which keeps the debates alive, on the origin and the nature of the universe along with challenges to Man to explore further, taking both facts and myths into account rather than the assailable statements made by astrologers time and again.

By projecting the *super merits* of astrology in astrological conferences, a great disservice is rendered each time to all rational thinking persons, discouraging the scientific temper and also indirectly pushing all the scientific progress of this country back to antiquity and middle ages—certainly not ahead into Stanley Kubrick's 21st century. ●

A CRITIQUE OF THE HOSPITALS AND OTHER INSTITUTIONS BILL (1987) : REDRESSAL OF GRIEVANCES OF EMPLOYEES

It is said that oppression was born first and later man so that oppression could be made use of as a tool by man by developing suitable means to inflict pain and suffering on fellow human beings. Among all kinds of oppressions, institutionalised oppression unleased by the State on its people is the worst of its kind. In the executional framework, it is actually the Government of the day, to cover up its own inability to "govern", brings in legislations in the form of obnoxious Bills before the Houses of Parliament to make them into Acts and later enforce them. One such Bill, the Central Government had put before the Rajya Sabha is the Hospitals and other Institutions (Redressal of Grievances of Employees) Bill (1987) which was passed on 28 April 1988. It would, if and when passed, become an Act and hence enforceable. It is said that the Government would like to see its enactment at the earliest. So far, there have been only whimpers from some concerned quarters, mainly teachers and doctors, that it is a "black" Bill and that it should be withdrawn. What exactly is this Bill and what are the ramifications of the Bill when legislated ?

Ranged against the 'Hospitals and Other Institutions (Redressal of Grievances of Employees) Bill (1987)', a summary of which is given in Appendix-F.

A casual look at the title of the Bill would suggest that it is only the Hospitals and other "related" institutions that would come under its purview. That actually the explosive phrase is "other Institutions" is clouded in the manner the Bill is titled. A closer look at the details tells that apart from the employees of hospitals whose grievances are sought to be redressed, the employees of educational, scientific, research or training institutions; of charitable, social or philanthropic services; and of institutions engaged in khadi and village industries could seek redressal of grievances under the provisions of the Bill. Educational institutions defined in the Bill are reported to include any university; any college, whether or not affiliated to a university; any school, whether or not recognised or aided by Government; and any scientific institution.

It is clear that, in reality, the Government wants to stifle the voice of the most articulate section of society, that is, the middle class in service. It perhaps feels that the middle class has been pampered enough, and it is now time to call halt to its demands. The Government further seems to have made up its mind that i) in the event of any individual or collective grievance it would lay down the rules and the mode of redressal of that grievance, and ii) the individual or associations/organisations do not have any role in deciding as to how they can devise the modalities of putting forth their point of view as well as the line of action they would prefer to adopt. To say the least, this approach of the Government is anti-democratic, and it also conclusively proves that it is not the Government "for the people, of the people, and by the people". The following details would bare this fact out.

The Bill provides for the appointment of a person (naturally, by the Government), for individual grievance, as a Grievance Redressal Authority (GRA) and also an Appellate Authority (AA) for every establishment covered under the Bill. Employees having individual grievances may apply to the GRA which will work to pass an order within a period of 60 days of the date of application.

If the GRA fails to pass the order within the above stipulated period, or if the party is not satisfied by the order passed, it can refer an appeal to the AA within a period of 45 days. The AA, after giving reasonable opportunity to the parties involved in the dispute will work to pass a final order/verdict within 90 days of the date of the appeal. In case the AA does not deliver the final order within the above period or if the party still feels aggrieved by the order, a further appeal can be made within 45 days to the One-man Tribunal constituted by the Goverment. This Tribunal is supposed to pass the "final" final order, within 90 days of the appeal. The Bill also provides that, during the period the grievance is being considered through the various stages as enunciated above, no employee shall go on strike or resort to other means of protest like work to rule, go slow, *gherao*, etc as also no employer shall lock out his employees. The Government does not seem to realise that it is not often that employees—particularly the white collar breed—strike work, and it is used only as a last resort after every other mode of protest fails.

So far so good. Someone should convey to the mandarins in the concerned ministry at the Centre that human problems cannot be solved in 45 days/60 days/90 days, and there cannot be any mechanistic procedure laid down based on the principle of hierarchy created by the Government itself. Each human problem is unique in its own way, and the manner in which things are proceeding these days, even getting a file out from any concerned section takes sometimes more than 90 days—much less administering justice within that period. Accords are good for putting down signatures, and execution of the accords has its own limitations and even delays which are mainly structural in nature. Furthermore, when an unsatisfactory and unacceptable redressal grievance mechanism is sought to be imposed, the democratic right of the employee to protest is being taken away and he is made to suffer in a mute manner.

Now, regarding collective grievances : they are supposed to

include wages including period and mode of payment, compensatory and other allowance, hours of work and recess periods, leave with wages and holidays and retirement benefits. The Bill seeks to provide for a Management Council (MC) of not less than 2 and not more than 10 members representing both the employer and the employees in equal number. The employer's representatives will be nominated by the employer, and the employees' representatives are to be chosen by the registered unions or associations on the basis of their proportionate membership of the employees in the establishment. There is yet another condition : only such unions or associations will be able to send representatives who have not less than 10 per cent of the membership of the employees. It is clear that the Government, instead of encouraging unity among the employees, would like to see that the unions/associations are divided and one group may be given more (or less) than another group working in the same institution, which inevitably would give rise to factionalism, bitterness or rancour. The unhealthiness of inclusion of such a condition and the sinister motive behind it based on 'Divide and Rule' policy is more than obvious.

There is also a provision that meetings of the MC shall be presided over alernately by a member representing the employer and a member representing the employees. This appears to be an eye wash if not a puerile naivete on the part of the designers of the Bill. What is important is not who should preside over the meetings but what are the issues involved and how amicably they can be resolved by mutual negotiations no matter who presides. Another holy purpose of the MC is : "to promote harmonious relations between the employers and employees and shall advise the employer to frame by-laws regarding conditions of service etc." If the MC's purpose is this, one fails to understand why there should be negotiations at all regarding collective grievances, for, there should be no grievance in the first place in the "purposeful" set up.

A collective grievance that is received by the MC is expected

to be settled within 90 days of the reference made to it, failing which the grievance for arbitration can be referred to an Arbitrator agreed to by the parties. If, however, the parties fail to agree, the Government will constitute a Board of Arbitrators (BOA) on a request made to it by either party. The Arbitrator or the BOA is expected to submit its award within the period specified in the reference made to it at the time of constituting the authority. This period is left open and it is anyone's guess how long the case might drag on (during which period again there shall be no protest of any kind). As is to be dreaded, the Arbitrator is to be appointed from a list of panelists maintained for the purpose by the Government. It is incredible that if the quarrel is with the Government, a party to the dispute, it maintains the list of arbitrators who are supposed to deliver justice ! The last straw is yet to come in this whole stratarchal, time bound grievance redressal mechanism : "the Government reserves the right to wholly or partially reject or modify the award if it feels that it will not be expedient, on public grounds affecting national economy or social justice, to give effect to the award". Now need more be said as regards the efficacy of the Grievance Redressal mechanism developed by the Government and its sincerity in dealing with redressal of grievances of employees ? The Bill appears more like "Removal of Employees" Bill rather than their individual or collective grievances.

Furthermore, the Bill provides that while the collective grievances are under consideration of the specified authorities, no employer shall alter, to the prejudice of the employees, their conditions of service nor will the employees resort to strikes or other protest measures. One is constrained to ask : what if the all powerful employer (read Government as the Bill concerns the employees of the Government or employees whose institutions receive governmental grants although otherwise they may be autonomous) alters the service conditions of the employees during the interrugnum ? Of course, the Bill being what it is, provides

elaborate penalties for both the employee and the employers for violation of different provisions of the Bill. Here comes the invocation of the most primeval emotion—fear—through the threat of punitive action : imprisonment for one to three months with fine upto Rs. 1000/- is the punishment provided for an employee resorting to strike or other protest measures during the proceedings of the specified authorities, while the punishment for the instigators ranges from 2 to 6 months imprisonment with fine upto Rs. 10,000/-. An employer resorting to a lock out during the proceedings can be punished with 1 to 6 months imprisonment with fine upto Rs. 50,000/-. Whoever heard of the Government punishing itself or the party in power punishing the instigators, usually political leaders, of strikes etc ? Is it not destroying its vote banks by these measures ? So, the punitive action piece should be read upto the half that concerns the employees only, and that'll be more realistic than the intended elaborate punitive measures for both employers and the employees.

The last of the provisions in the Bill is more lethal than dropping of the atom bomb : "No court shall take cognizance of any offence punishable under the Act once it comes into force." Up till now, the employees had some hope of depending on the judiciary system for justice but with this one provision, the courts have been rendered redundant henceforth insofar as redressal of grievances of employees is concerned.

The Government seems to reluctantly agree that there could be individual and collective grievances of employees of Hospitals and other Institutions. But, in no uncertain terms, it has made it clear that the redressal mechanism will be laid down on its terms and conditions. In essence, the Government has adopted this posture : we will lay down the rules of the game; you play it; while playing the game don't raise your voice; if you lose it, it's too bad—even the courts can't save you; we have all the right to reject any agreement that might be arrived at; you may be punished if you choose to protest; however, we wish you well.

The impugned Bill alongwith its provisions including punitive measures is anti-democratic, draconian, and deserves to be thrown out in its entirety. It stifles the voice of dissent, critical scrutiny, and creative endeavours. It hierarchises authority and undermines the importance of the judiciary system where the executive is trying to usurp all powers sans the element of reason. A similar Bill in different guises had been brought forward twice before, and had to be shelved because of opposition. But the present one in its present form is the most comprehensive and most objectionable. It is even worse than the recent Press Bill which the Government had to withdraw in the face of stiff opposition. Because of lack of awareness of the consequences of the enactment of the present Bill there does not seem to be much resistance. Oppression in the form of this Bill has to be resisted and fought against.

THE CRITIC, PERFORMER, AND THE SYSTEM

We often hear these days statements like : "there is awful mess all round us", "the system has collapsed", "we tolerate and live with a lot of nonsense", and so on. We shall examine here the role of the critic vis-a-vis the system, and the role of each individual to influence the system for its betterment by resorting to doing good things and contributing in a positive manner.

The System(s)

In the Indian context, there has alway been confusion about the "system" that ought to exist for our complex society to develop and progress and about the role of the individual(s) responsible for a smooth running of that "defined" system. Unfortunately, the individual in our society once he/she is at the helm of affairs *becomes* the system, and all others at the lower rungs make themselves available in a benign manner to run (?) "that" system. If and when that decision making "top" individual changes, the system also "naturally" changes, and once again the whole machinery gears itself to run the "new" system. Thus we have had "systems" rather than one clearly "defined system" where the role of the top individual ought to be to oversee and direct how well that defined and accepted system is going on the desired and right track. The acceleration or deceleration of progress should be a reflection on the top individual's capabilities, capacities, and drive with a commitment to haul the system along even if in a chugging manner. The role of the individual at the top is not to

create a completely different system each time a new person arrives there but to effectively manage it in a manner so that the society as a whole is benefited. Our ego-centered society has yet to learn that *only extraordinary* individuals and visionaries are those who can *create* a new and viable system. The duty of other individuals, including the ones at the top, is to uphold and run that in a pragmatic, organised manner what has already been created, of course, with proper checks and balances and warranted changes made from time to time. It is a deplorable fact that once a person reaches the top (the means are not all that important !) we try to see in him/her the "extraordinary and visionary" qualities we would like to see in him/her than what he/she actually possesses. Thus we are all the time looking out for Messiahs who can "deliver" us from the "mess". The bare fact that the person at the helm of affairs is neither a Messiah, much less God, nor a reformer with commitment naturally brings out the shortcomings soon enough. Consequently, the people are disappointed and disillusioned, and then the role of the (observant) critic and the need for (often ruthless) criticism become our obsessions however irritating or disconcerting the criticism and however inconvenient the critic might seem.

Critics And Criticism

To notice and lament about the "mess" that surrounds us one does not have to be a social savant. A lot of things that affect us in our immediate day-to-day living like the rise of prices, non-availability of essential commodities, increasing crime rate and violence of all sorts and such social and economic hardships are felt even by non-critics. More often than not, the reasons for sudden social upheavals for the worse may not be—indeed are not—the points of discussion among the hardest hit and the sufferers. The facts are observational, and they are the symptoms of the disease to be discussed and debated by those who can and care to. Here comes the critic (the diagnostician) who not merely observes only and feels the various pulses but also delves into the

possible causes of the deleterious effects, by thoroughly analysing the prevailing situation taking also the past scenario into consideration and suggesting possible remedies including alternatives.

It is necessary to appreciate the thirst for social criticism in the context of the society in which one lives and, if heeded to, it is socially reformative in nature. The reason why we unremittingly hammer at things which are obviously wrong (or non-utilitarian) is not for creating something new or earth shaking but to make the concerned authority feel and act in such a way that the wrong could be righted and the system as a whole could benefit from it. The critical faculty of the critic plays a prominent role in promoting/proselytising that what already has been created or exists—whether it is in a state of "mess" or "awful mess". We must acknowledge and appreciate the role of the critic and the need for criticism in the social context as all of us yearn for a social change to occur and that we all hope (nay, pray) should indeed occur through criticism so as to enable us to rebuild and strengthen the various dilapidated institutions vital for a democratic set up such as ours.

System And The "I"

As has been argued, the role of the individual is limited usually though not unimportant or to be ignored. Even if "I" do something good and contribute in a positive manner to the surroundings "I" live in, what "I" see again only is the mere reverence and the awe my sycophants have for "me" (sorry, "I"), not necessarily following the ideal lifestyle "I" created. If at all, there are several people who like to take advantage of the goodness in "me" ("I"), and as a reward and reciprocation "I" may not be derided openly in which practice they (now my proteges) would have otherwise indulged. And with the death of the "I", everything is back to the square one with emergent splinter groups in operation trying to propagate the lifestyle and philosophy "I" had created, in their own unique and divergent fashions. Each one of them thinks that his is the correct interpretation of the original system "I" had created when alive. One

can exemplify this by saying that the Gandhian way of life is dead alongwith Gandhiji although we have several personalities vouching for Gandhism. The excellent work that Mother Teresa has been doing will meet a similar disintegrated fate (one hopes not) after that angelic personality is no more. One can quote many other examples to further qualify the hypothesis extended here. So, it is indeed a stupendous task to alter the consciousness of the millions to do good by social criticism alone. Here comes the role of the preacher-performer, a role usually different from that of the critic. The scriptures as the base of the preachings will also be of interest to consider and the extent to which they may (or may not) be of relevance, for the good we are after to occur.

Preacher-Performer

The most sincere preacher-performer of this era, Gandhiji, had said that there is potential in individuals to resort to evil acts or to do good. But the present stage of human evolution has not yet reached the level of discreetness in action, wisdom in thinking despite the knowledge boom (or shall we say the "awful mess" that is the education system which it is said is going to be revamped soon, amen !) and the will to do something good even after jolly well knowing that it is indeed proper to act so. So we are left with only a few stray drops of wise people who have created tiny islands although sequestered they might seem. Coming to the point of the Gandhis, the Vivekanandas, and the other stalwart preacher-performers it is an obvious fact that the impact of these individuals has died along with their physical bodies, and all one now listens to is rhetoric and exhortations associated with their teachings as also some mute remembrances on their birthdays and death days. The impact of the presence of the preacher-performer thus appears to be regretably transient.

This brings forth some points to be further elaborated and reflected upon. It may be that the impact of the preacher-performer is not powerful enough to sustain its strength to impress

the later generations of human beings (posterity) to enable them to lead a life according to some sort of *Dharma* as propagated by the individual performer for the stability of the society one lives in. In which case, as said earlier, the individual preachings might have served a specific purpose for a particular period of time in the history of a nation and hence relevant only for that period of time. This fact, if true, puts Jesus Christ, Mohammed and the Buddha in a completely different genre of individuals—as creators of totally new strains of thought and action. Historically speaking creators of new ways of thinking and living in any society necessarily do take up the role of preacher-performer, but all preacher-performers are not necessarily *creators* of new ways of living, and they are only *propagators* of what has already been created for the general good. Should the propagation fail to make the desired impact on the public over a long period of time (in the religious sense), then there is disarray and the inevitable "mess". The ubiquitous critic under the circumstances catapults himself to the forefront, often surreptitiously stealing the role of the preacher minus the performer part.

Scriptural Role

It has been suggested by some that, in the absence of a sincere and powerful preacher-performer, the reading of the scriptures should help us create a (present) positive attitude in the public at large for a better future. Must we fall back upon the scriptures, really ? Let us digress into this aspect a little and examine the role of the scriptures to persuade us into doing good. At the individual level, unfortunately, the reading of any scripture has only confused a lot of people because of their exposition through contradictory and complicated writings. At the abstruse level, it is a case of God telling : "I am, I am not, and I will be." Now where does that one lead one to ? This is a highly abstract and confounding statement though it might sound omniscient and impressive coming from God himself. Soon after the exercise of even undaunted reading, ennui sets in and the individual feels lost. In temples, the routine reading of the scriptures aloud by the pundits

for the benefit of the public (collective level) might have initially put it in raptures but has actually put the listeners very often in a state of slumber, instead of creating the desired awareness and stirring of the mind and the limbs to do something positive. It is a fact that the causal explanation of *karma* from the past-present concept to the present-future concept in the hands of articulate persons like Gandhi, Vivekananda and others has enthused the people of India in the past but the present has become no better and perhaps may become worse giving a chance to the "mess" to further build up and pervade, producing merchants of doom and gloom. Our scriptures also tell us that the escape from our present drudgery is through transcendence to higher states of reflecting, perceiving, meditating, experiencing, and coalescing with the "Supreme Reality" and becoming one with the "Absolute". Thus the very fact of human existence is portrayed condescendingly (I am sure this statement can be negated by quoting some portion of some scriptures or the other to convincingly prove that it is wrong); the need for transcendence from the misery experienced in this world is impressed upon; and the force of spiritual rigmarole is pressed into action. At the conceptual level, all of what has been just said sounds very high falutin and impressive but at the practical level we all indulge in a bit of little "thievery"—only the "little" thievery becomes a magnificent and magnified obsession to meet and fulfill our own personal ends; one can always turn a penitent later to cleanse oneself of the act of thievery. Our scriptures further tell us to look *into* our sevles to find the real "I" and realise it; this *lofty* dictum has degenerated (the reasons can be innumerable) in practice to the *earthly* point that we look *after* our selves rather than *into*. Where does the fault lie? Not certainly in the scriptures or in their contradictory nature of statements, some would say. But what is the solution? The solution lies in the proper and "linear" (as opposed to the existing "circular") interpretation of the scriptures to make the common man understand the inner meaning and beauty of the sayings. So far, the scriptures have fed the cerebral and higher experiential parts of the

human perception. Further, manual labour has never received the dignity it deserves in our society, thus surrendering to and suffering at the expense of the cerebral exercises we get involved in. It is imperative to rewrite the scriptures in simpler terms, avoiding the polemics and diabolical interpretations, so that the ordinary and less intellectual-minded of the public may not only understand and appreciate but also are induced to try to follow the positive guide lines of the scriptures. There is a dire need to have less of Almighty-orientation and more of society-orientation in order to enable oneself to relate to his immediate environment in a positive way rather than to the "Almighty" in an ethereal manner. (Without sounding irreverent to the scriptures, one feels that the *Amar Chitra Katha* series and the Hindi film industry with all its aberrations and absurdities perhaps has brought into sharp focus the chasm between good and evil and the triumph of good over evil for the benefit of the general public more than the long-winded scriptures have done.) Just suggesting to the people to read the scriptures or to listen to others' reading them is not enough and if they do so, more likely, it is bound to be a noisy alternative to singing lullabies.

Suggested Measures

The question to be posed now is: what is the role of the individual —be he a critic, preacher-performer, man at the top, or even a commoner ? in view of what we have discussed.

The critic, whether he is real or pseudo-intellectual, has his role to perform, objectively analyse, and comment upon the current events in society. If the suggestions are based on purely subjective perception and hence biased, the readers themselves will reject those suggestions and will eventually even reject or ignore the writer "of sorts". The choice will then not be that of the writer but will be that of the readers. The critic-exposer may not be in a position to more than just expose the wrong doings, and surely the criticism must be specific and detailed so as to enable the concerned people or authority to follow it up and

rectify those very actions which might have otherwise affected the system. In fact, a critic need not be and is (always) not the performer. He should do his duty as objectively as he can and leave the rest to the executive machinery to come into operation for the better.

In our country we have not been able to integrate our thought processes, our utterings, and our actions. We live at different levels at the same time. Also sometimes we live at an entirely different level other than what our thoughts, our utterings, and our actions outwardly display depending upon the situation, our convenience, and self-interest. There is a lack of integrity in our personalities; and we are a cluster of complex, fragmented and randomly oriented individuals trying to wade in a sharply divided society because of our plethora of preconceived notions picked up from here and there, prejudices and self-generated opinions completely oblivious of the social reality and *all* available information. Furthermore, the congenital laziness that prevents us to shift our bottoms and do something (good) only exacerbates the crisis further. The physical immobility because of docility, indolence or whatever naturally results in the racing of our minds and the ensuing conclusions which are very often no more than mere conjectures. It may be stated that every other Indian is a critic of one thing or the other. Those who are not are busy doing the evil deeds. One school of thought tells us that actually some are genetically predisposed to performing evil deeds. But that is no justification to condone the activities of that tribe especially when they are detrimental to the society at large.

The preoccupation of the mind with the good task to be done becomes an obession (a compulsive one) *only* if one is driven by powerful thoughts created by visionaries and positive-minded, committed individuals. In any case, the minds cannot be made to order to think positively (unless genetic tinkering is endorsed and encouraged). That will be some kind of coercion if it cannot be achieved voluntarily.

It is a sane advice to suggest to judge others only in terms of

their potential for the good in them, and not the weaknesses. Whether it is the social conditioning of our minds after we are born or it is our "samskara", one does not know the exact reasons, there is a lot of non-receptivity in us (perhaps owing to our innate vanity) and also plenty of unreasonableness (perhaps owing to our inborn intransigence) which obviates even a mild shower of praise on others. Diluting the efforts of the few people doing the good things, much less open praising, is the most perverse form of mental torture that could be inflicted upon man by man. In any event, may be it is a reflection of the weakness of the deriding individual himself, or may be our standards of judging others are too high, or may be we like to praise only gods and god-like personalities and not any of the even slightly lesser mortals.

Nevertheless, let's say what we think in our minds after careful thought; let's mean and do what we think and say; let's develop the characteristies of integrity. Let's not develop Jekyll and Hyde personalities. If we have to praise a man let's do it onto his face, and if we have to castigate him let's do so again onto his face. Hypocrisy in human beings is not exactly a virtuous quality, and it cannot be shooed away that easily; it is indeed reflected even in a plane mirror when we look at ourselves—left is right, right is left but the image is not upside down and is intact.

The role of the critic must be that of *Sahrdya* (meaning thereby : of the same or similar heart as that of the performer) as in literature which is nothing but a survey, observation, and documentation of life (and living) in its infinite manifestations. The role of the preacher-performer must be that of "Vishnu" who is the sustainer of life again in its infinite manifestations. If the roles of individuals are properly defined and their respective duties are done without duly transgressing into one another's roles, rules and duties, there shall be no "awful mess" around us then. It is the need of the hour to develop a positive attitude and contribute that little bit of good to the system which each of us can. A lackadaisical and cavalier attitude will only graduate us to "quagmire college" from the "awful mess school" we are seemingly in at the present. ●

APPENDIX-A

EDUCATION

MUAMMAR AL QATHAFI

Education, or learning, is not necessarily that methodized curriculum and those classified subjects in text books which youth are forced to learn during specified hours while sitting on rows of desks. This type of education, now prevailing all over the world, is against human freedom. Compulsory education, of which countries of the world boast whenever they are able to force it on their youth, is one of the methods which suppresses freedom. It is a compulsory obliteration of a human being's talents as well as a forcible direction of a human being's choices. It is an act of dictatorship damaging to freedom because it deprives man of free choice, creativity and brilliance. To force a human being to learn according to a set curriculum is a dictatorial act. To impose certain subjects upon people is a dictatorial act.

Compulsory and methodized education is in fact a forced stultification of the masses. All countries which set courses of education in terms of formal curricula and force pupils to learn them, coerce their citizens. All methods of education prevailing in the world should be done away with through a worldwide cultural revolution to emancipate man's mind from curricula of fanaticism and from the process of deliberate adaptation of man's taste, his ability to form concepts and his mentality.

Reproduced from the 'Green Book', p. 130-132.

This does not mean that schools are to be closed and that people should turn their backs on education, as it may seem to superficial readers. On the contrary, it means that society should provide all types of education, giving people the chance to choose freely any subjects they wish to learn. This requires a sufficient number of schools for all types of education. Insufficient schools restrict man's freedom of choice forcing him to learn the subjects available, while depriving him of natural right of choice because of the lack of availability of other subjects. Societies which ban and monopolize knowledge are reactionary societies biased towards ignorance and hostile to freedom. Thus societies which prohibit the teaching of religion as it actually is, are reactionary societies, biased towards ignorance and hostile to freedom. Societies which monopolize religious education are reactionary societies; biased towards ignorance and hostile to freedom. Equally reactionary and biased towards ingnorance and hostile to freedom are the societies which distort the religions, civilizations and behaviour of others in the process of teaching those subjects. Societies which consider materialistic knowledge as taboo are reactionry societies biased towards ignorance and hostile to freedom. Knowledge is a natural right of every human being which nobody has the right to deprive him of under any pretext except in a case where a person himself does something which deprives him of that right.

Ignorance will come to an end when everything is presented as it actually is and when knowledge about everything is available to each person in the manner that suits him. ●

APPENDIX-B

MERIT PROMOTION : A CLOSE LOOK

AMRIK SINGH

It is rumoured that at the last meeting of the U.G.C. there was a certain amount of controversy with regard to the Merit Promotion Scheme which was introduced in universities some two years ago. As could have been anticipated, nothing conclusive came out of that discussion. Some more data are to be collected and the issue is to be discussed again. One of the things said, however, at this meeting was that it was wrong to describe the scheme inroducd a couple of years ago as Merit Promotion Scheme. In actual fact it was a "Mass Promotion Scheme."

Anyone who is familiar with this scheme and the circumstaces in which it was introduced would not feel surprised at this description. One Vice-Chancellor who had been a member of the U.G.C. at one time and had actively compaigned for such a proposal confessed to me rather sadly a few days ago that he wondered if this was the thing educationists had been fighting for.

There should be nothing surprising about such sentiments. The fact of the matter is that the cult of non-performance has grown so extensively in the universities that any one who is

Reproduced from 'The Tribune' (Chandigarh), May 17, 1985.

familiar with things can turn round and say : "This was bound to happen."

It was also bound to happen for another reason. We operate in a situation where rules, if observed strictly, tend to under-emphasise and exclude high quality and work to the advantage of those who comply with the letter of the law. In any case the whole process of decision-making in universities has got so vitiated that one can rely neither on the quality of the advice tendered nor on the canons of propriety and objectivity.

Look at some of the things that have been happening. In one of the 10 or 15 better known universities in the country as many as 16 selection committees sat between 8-30 a.m. and 11 a.m. on a particular day. At 11 a.m. the Syndicate met. Within one hour after lunch letters of appointment were issued to all concerned. That happened to be the last day of the outgoing years and the whole job had to be completed at top speed.

In another university, a few years ago, somebody was promoted Reader even though he did not have a doctorate. He happened to be active in the teachers' movement and was a thorn in the flesh of the university authorities. By appointing him as a Reader they bought peace, so to speak. As if that was not bad enough, a few months ago he was promoted to the post of Professor on the condition that he would get his doctoral degree within five years.

In yet another university where the prevailing rules were more liberal than those laid down 53 teachers offered themselves for assessment as Professors and 51 of them were promoted. Four of them were not found suitable for promotion. Within a few months, however, their work was reassessed and two of them were promoted.

The significance of these details would become clear, if it was stated that the qualification laid down for promotion to professor-

ship was that the individual concerned had to be outstanding. Put another way, 53 out of 55 must have been found outstanding. Otherwise, they could not have been promoted. The only comment that one can make is that in respect of our univesities one would have to revise one's notion of what it takes to be outstanding.

In one of the Indian States any one with a Ph.D. degree after 10 years of service is put into the Reader's scale of pay (and after another eight years into the Professor's scale). In the largest State of the country the system is that one can go on to become a Reader after 12 or 13 years. In 13 years one can become a Professor. If things go on at this rate, in another 10 years' time we would have more Professors than Lecturers in our universities. As it is in one of the more prestigious of our universities out of 15 persons in the department a full dozen are Professors and two are Lecturers. The only Reader in the department could not be "helped" as he had joined the department just a few months earlier.

What the U.G.C. and the I.C.A.R. prescribed was in the nature of guidelines. It was open to a State to vary the scheme to its own purpose. In the case of agricultural universities there is not even a single Central university.

All of them are controlled by the States. But every agricultural university is not following the guidelines laid down by the I.C.A.R. In almost each case the scheme adopted is more liberal than suggested by the I.C.A.R. although, to be sure, there are also a couple of States which have refused to follow the guidelines laid down by the U.G.C. and the I.C.A.R. In a country like ours these variations are not unexpected.

The point to note about all of these details (and many more can be given) is that there is no relationship between what one deserves and what can gets. This is said with reference not only to this particular scheme.

Despite such liberal terms, one does occasionally run into people who are able and ever gifted but who do not fit into any one of the slots and, therefore, remain uncovered by it. In plain words, one thing we have succeeded in failing to devise is a system whereby hard work and talent are identified and encouraged and sloth and incompetence are discouraged

On the contrary, we have developed a philosophy of education which suggests that things would improve only if the remuneration is improved. That is to oversimplify, to put it not more strongly.

Adequate remuneration for everybody has to be there. What is required in addition is a system whereby good performance and talent are encouraged.

When the proposal was originally mooted the idea was that those who got stuck for lack of suitable openings should be able to ask for an assessment on academic grounds provided they had put in a certain number of years and complied with a few other relevant requirements; in order to regulate everything it was said that the percentage of such cases would not exceed 33.

As is usual in our country, the upper ceiling was taken as the floor. As long as the full quota of 33 per cent had not been exhausted people kept on stressing their claim and getting promoted. In the bargain all academic considerations were thrown to the winds and the persons whose claim to lecturership was doubtful now find themselves described as Professors. Is this the kind of future the country is looking forward to ?

Another point. Even if higher wages have to be given in certain situations, must individuals lacking in appropriate credentials be also given academic designations, such as Reader and Professor ? Nobody stopped to consider this question. Today we find ourselves in a situation where despite remedial steps the future of higher education in the country appears to be sealed for the next two or three decades. Or almost so.

One would like to know what the policy makers have to say in this behalf.

APPENDIX-C

IS OUR SCIENCE REALLY POOR ?

G. S. VENKATARAMAN

Much has been written on science in India. We are told that there is something seriously wrong with Indian science, in general and with the scientists, in particular. Catchy phrases such as "scandal", "fraud" and "sycophancy" frequently used to describe Indian science, are inadvertently doing a disservice to everyone, because they are often based on individual instances and subjective perceptions. I do not mean by this, to suggest that everything with science in our country is what it ought to be, but when criticism borders on outright condemnation, it does more harm than good.

Let us look at the general criticisms made recently. They say that : (i) Indian science is quantitatively rich, but qualitatively poor, (ii) it suffers from lack of facilities and foreign returned scientists get frustrated, (iii) the calibre of our scientists is poor, (iv) fraudlent practices and sycophancy abound, (v) the investments are high with no comparable returns and (vi) the administrative system is not conducive to the development of science in the country. Let us examine these comments in reverse order.

Reproduced from 'Science Age', July 1984, p. 13.

Bureaucracy And Science

It is often said that scienists in India have very little functional freedom and are often caught in bureaucratic pincers. On the other hand, it is said that a scientist abroad can get things done "over the telephone". This is an oversimplification. Limited funds are available abroad too; spending is neither overgenerous nor free-for-all. There are many laboratories abroad which find it difficult to have all the facilities required and scientists have to move to other laboratories to get their work done. While the general standard of infrastructural facilities are, indeed, fairly high abroad, it does not mean that scientists there operate in an administrative vacuum. Successive generations of scientists have spent years abroad and returned and established themselves here, and if we claim that basic facilities are not available, the question naturally is "What have we done all these years ?". Facilities have to be created, not gifted. There is also a need for a constant self-reminder that the pursuit of science is only one human activity and that scientists are part of the community, accountable and subject to the principles of governance and to overall limitations inherent in the culture system.

High Investments And Poor Returns

Research is expensive and there is no free lunch in Nature. What is not often appreciated is that the bulk of the investments goes into providing the basic facilities and the amount that goes into research *per se* is small. For example, crores of rupees are spent on space research and atomic energy and people are led to believe that a poor country cannot afford this type of luxury research. What is not said is that a large part of this investment is required for the construction of satellites, reactors, hydroelectric generators and the like, without which research cannot be done in these areas. When Kalpakkam trips, it hits the headlines. But the elegant and safe sodium technology perfected today goes unsung. One cannot own a house without acquiring one, which costs money. Computation of living costs should not be compounded by the cost of the house, which is a prerequisite.

Fraudulent Practices And Sycophancy

Fraudulent practices and exaggerated claims are often echoed with such force that it gives one an impression that the entire Indian scientific community is a fraud ! Are such lapses peculiar to the scientific community only ? What is the percentage of such incidents to warrant crying wolf ? Amputation of the limb is not the cure for a boil. While no one in a right mind likes to compromise with unethical practices and claims, lapses can also arise due to errors in judgement and interpretation. Such genuine mistakes, which may appear to be lapses, are really stepping stones for the advancement of science. Criticism should not condemn. Such a negative approach does more harm to science than lapses themselves.

Calibre Of Indian Scientists

How good is an Indian scientist ? In calibre and intellect, Indian scientists are as good as any anywhere else. Let us not suffer from a self-inflicted myopic inferiority complex. C. V. Raman, S. N. Bose, S. Ramanujam, Homi Bhabha, M. G. K. Menon, to mention only a few, are all Indian scientists and they match the best brains in the world. It is not the percentage of such people that matters, but that the country has produced them that makes one feel proud. A scientist who splits DNA in a foreign laboratory appears more glamorous to us than the one in our own country who slogs in the field to improve wheat and gram ! It is not what a scientist does, but the relevance of his work to the country under the national priorities that is important. In any walk of life, idiocy cannot be transformed into genius, nor mediocrity into brilliance. No nation can become a concentration camp of geniuses, in spite of the prospective "Nobel Sperm Banks" ! The law of natural selection operates everywhere, and the field of science is not exempt. "The person who asks *how* always gets a job, but one who asks *why* becomes the boss." A nation throws up only a few individuals over others in any vocation. It is to facilitate this natural selection that whole communities are to be maintained.

Facilities And Frustration

A number of young scientlsts who return from abroad with Ph.D. degrees complain of the lack of facilities and an atmosphere conducive to research. While it is true that many of our institutions may not have sophisticated facilities and equipment, there are many others which are first-rate research establishments with a critical mass of research people with adequate training and facilities and which have good research atmosphere. Why then, the complaint ? First, all those who return with foreign degrees and training cannot be recruited into such prestigious institutions. (Nor do all those who go abroad find berths in similar institutions !). Second, most of those who return no longer remain adaptable to the needs of their country of origin and, often, they are not in sympathy with the objectives. The training is not usually suited to the needs of the developing country. They become less resilient to approach practical problems and tend to duplicate the situation as they found it at the laboratories abroad. As such, the young men complain about lack of facilities, lack of appreciation of research and about the waste of their training. Science must become a part of people's life and ethos and scientists must continuously interact between people at all levels. It is necessary to realise that not all scientists who have left our country and settled abroad are "giants".

Indian Science Quantitatively Rich, But Qualitatively Poor

Research is addictive and, as one bccomes more fascinated by it, it becomes an all-important endeavour. There is a facile tendency to dub Indian science qualitatively poor. Computerised comparisons of citation indices are often brought to bear upon this (SCIENCE AGE Oct-Nov. '83 p. 59). Looking at our development in the field of agriculture, space science, atomic energy, telecommunication, medicine, industry and other areas, one can easily appreciate the fallacy of this view. Aryabhatta, Bhaskara, SLV-3 rocket, satellites, DAE's MAPP I and II and the Kalpakkam nuclear power station are all results of the conscious

effort of our scientists and political will and direction. From a meagre 50 million tonnes, we produce today over 145 million tonnes of foodgrains. If these are the outcome of "poor" science, poor science should be cherished !

Science is never static. Nor does it conform to or compromise with individual preference and whims. It continues to grow and its rate of growth is influenced by several factors. Conflicting beliefs among scientists commonly compel them to seek the truth, through experimentation, making many discoveries in the process. The intellectual atmosphere and the scramble for supremacy and identity among investigators also contribute immensely to hastening the development of science. Improved facilities help to look for the unknown and pioneer further discoveries. The combination of these factors have helped and will continue to help the development of science.

This is not to say that science in India is a bed of roses. It has its ugly side but not so much as to lessen its charm, grace, power and impact. What is required is strong motivation, particularly among the younger scientists and this is, undoubtedly, the responsibility of those who have already established a reputation for themselves. "Crying wolf" does not drive the wolf out !

APPENDIX-D (I)

INTERVIEW WITH DR. GEORGE SUDARSHAN :

RATNA RAO SHEKAR

Dr. George Sudarshan by right should've been as famous as Dr. C. V. Raman and Dr. S. Chandrashekhar. But thanks to a series of cruel circumstances he's today accepted by the 'insiders' as a foremost scientist, but the Nobel Prize remains at a tantalizing arm's length. In this wide-ranging interview to Ratna Rao Shekar. Dr. Sudarshan blasts the West's hypocrisy and the Indian scientific community for its servile attitude, and explains why after twenty-eight years, he's back home.

If you did not know Dr. Ennackal Chandy George Sudarshan as someone who has been nominated for the Nobel Prize several times, wandering as he does in a bush-shirt, sometimes even in a lungi, around the Indian Institute of Science campus, you would think he is just another science researcher. Better still because of his long hair and beard, kumkum on his forehead, you would think he is a Sabarimala pilgrim who has inadvertently wandered into the campus. The 53-years-old George Sudershan defies every concept you have of the brilliant scientist, which is really not his fault, but yours.

Though he has lived in the United States for 28 years, he does not have an accent. If anything he speaks English with a Malayali accent. "Even when I was in Bombay I avoided the Indian Airlines accent," he remarks. There is even a certain cadence and rhythm in his English, and he resorts to allusions and comparisons as if he were a poet and not a scientist. He dresses without

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fuss and says ideally he would like to wander around in a lungi and kurta, something he can do without people looking down on him in Madras, where he now stays.

He not only looks the gentleman from Kerala, but professes a fondness for things Indian—Indian painting, Indian music, though he likes to go slow on Indian food. "I don't want to become heavier than I'm now," he says jocularly. He has a deep interest in Indian spiritualism and has read the Vedas and Upanishads. When asked about it he will say "sort of", not out of any modesty, but because for a man like him you haven't read anything unless you have read it through and through and found some new insight.

He likes India so much that he has decided to move back here, even though his three grown-up sons have no desire to do so. He has left the option open for his wife Lalitha, a chemical engineer who teaches at the Texas School for the Blind in Austin. He has given up his positions at the University of Texas, Austin, where he had been since 1969, and is now involved with the Institute of Mathematical Sciences, a research organisation based in Madras. He is the moving spirit behind the Centre for Theoretical Studies in the Indian Institute of Science, Bangalore that he helped establish with Dr. S. Dhawan, a former director of the Institute.

His reputation, somewhat controversial, is an acknowledged fact among Indian and Western scientists. Yet if George Sudershan is not a familiar name or a source of inspiration to Indians, as he should be, as C. V. Raman or Chandrashekar are, it is not because he is any less brilliant, but because his is a case of missed buses. He did not miss the bus. The bus just went past him. He should not only have got a Ph.D. for the work on weak interactions that he did at Rochester between the years 1955-58; but should have got a Nobel Prize for physics the following year. So far he has not got a Nobel Prize. But what is sadder is when scientists refer to 'V-A theory of weak interaction', they refer to the work done by Feynmann and Gell-Mann, even though the Marshak-Sudarshan work is not only more exhaustive but done earlier. All this is because, his professor Marshak, never made the effort to publish the work soon enough.

When it came to his theory of Tachyons—particles which travel faster than light—something worse happened. A man he thought was his friend and confided the research in, simply turned around one day, and declared that Tachyons were the product of his original research. This time it was a case of outright theft by a man called Feinberg. In both instances, George Sudarshan laments, not one scientist stood up for him.

But what is remarkable in the man is he has oot allowed petty politics to make him cynical. There is no cynicism about science, only scientists. There is only hurt that he has not got his share, this lion among lambs as he sees himself. Nor has he allowed his scientific profundity to come in the way of his enjoyment of simple things. "You don't cease to be a human being because you're a scientist," he says. He's not contemptuous that you don't understand particle physics or don't know the theory of weak interactions. If you're interested he'll even talk to you about it in such simple terms that if you still don't comprehend, you must be really dumb.

When you see George Sudarshan walking along the dust-laden paths of the IIS, into his discoveries and destiny, with a spirit that is full of joy and a heart that is simple, you would think : If Einstein were as engaging as this you would surely have loved him.

What was growing up in Keral alike ?

I wouldn't trade it for anything else. I come from a small town called Pakil near Kottayam. Kottayam as you know is a small town, a little like Boston and living there you would consider any other place inferior. And yet streets there are crooked and there is no way for a stranger to find an address, though practically there are no strangers here in Kottayam; you could not do anything revolutionary because everyone knew you. Growing up in Kerala, you developed a love for language and a love for words, this is something no one takes away from you.

Where did you go to school ? In Kerala ?

My mother was a school teacher and because of her job we went from place to place. But she was my first teacher. When I was about five, she stayed home because she was expecting my younger brother. She taught me many things—formation of numbers, letters, multiplications. When I was four I was quite at ease with numbers in lakhs—multiplying and dividing them. That was not particularly precocious, as you now have concert painists at five. My father had a grandfather clock that he used to open and clean. He used to show me the different parts and explain things. That was the best introduction to physics that I had. I grew up in an adult atmosphere, there was no effort to

baby talk to me. I had to function as an adult. It had its attractions. I didn't have to pretend to be a child

Generally you were a well-behaved boy then ?

Well-behaved in the sense, I don't remember the pleasures of beating up or being beaten up.

Your mother then was your first teacher.

Yes and the most important. My father was fond of books, because he grew up not with his father but with his uncle who was the manager of a press. So we had lots and lots of books and even if you didn't have place to sit or play, it was too bad, the books had to be there. So I had all kinds of books to read. I try to maintain the same things now. If we have eight rooms my wife says the kitchen is the only place I haven't piled up my books.

What kind of books do you like to have around you ?

All kinds, not just books, but papers. The idea is to have books around you.

Did you do very well in school ?

Yes, in fact I don't remember a time when I didn't do well. Coming first was considered a routine. It was not even a matter of pride that I was good. I was aware that I could not do so many things. Like I never learnt swimming. I never learnt how to ride a bike.

Was this because you were so absorbed in your studies ?

It was more the fact of not having done it, rather than the fact I was absorbed in studies. In fact, I was not that studious. I read all kinds of things that were irrelevant. You see we were reasonably poor, not genteel poor but reasonably poor. So I made a deal with my friends, that if they bought the texts and the notebooks I would work the problems and give them. So I had all the advantage of a book and they had the advantage of

an annotated text. Once I had done a problem I didn't have to do it again. It was just there.

What were your ambitions at this point ?

I studied in small village schools where people had no great idea what should be done afterwards. You studied through school and college and hoped something would turn up. In my whole life I have not applied for more than one college or job. In fact, I've hardly applied for a job. It's partly the feeling the right thing will come by itself, and if it didn't, it didn't.

That was probably because you knew you were good and didn't have to seek anything.

Partly that. I see some of my colleagues, they are so ambitious. They know all the rules, they work hard. You can see the hunger in them. For example I've been expecting the Nobel Prize for a long time. I feel not only that I deserve it bus have done something for which I deserve it. I don't feel that really drives me. I don't have the killer instinct. Sometimes I think it's high attainment. Sometimes I think it's a lack of development.

You went to Madras Christian College (MCC) and then to Tata Institute of Fundamental Research, Bombay. But in college did you have a clear idea of what yon wanted to do ?

In my school nobody expected to get a Ph.D; it was considered an unnecessary sophistication. M.A. was the highest thing you got. When I went to MCC there were a few more Ph.Ds around. My feeling for science or anything else has been—I must do it because I liked it—not because I wanted to demonstrate something. So I didn't say, 'where shall I do my Ph.D. ?' Some people came from Bombay and said, 'you're a bright fellow, why don't you apply in Bombay?' and I did.

You mean if this opportunity had not come your way you would have continued as a demonstrator in Madras ?

Probably not for long. I would either have become dissatisfied or

found something else. My point is, you did research because you wanted to, not for any purpose. You want to sing in the bath-room because you want to and not because you want to win a prize. Science is a pleasant way of spending time, so why not do it ?

Were you already involved in research in college ?

I would not say research. I was involved in being a scientist.

What kind of research were you doing at TIFR ?

I joined the emulsion group. They were doing research in cosmic rays. That was essentially nuclear physics at its cutting edge. In Bombay there was no chance of my entering the theoretical field right away, because like British traditionalists they believed if you wanted to enter theoretical physics you came from mathematics. This was a poor concept, because if you have all the tools but don't know what it is about, you'll make a poor theoretician.

How long were you at the TIFR ?

Three years. 1952-55.

Then you went abroad ?

Yes, for my Ph.D. work. Once again somebody asked me, 'would you like to come abroad ?' and I said okay.

You mean if Marshak had not asked you to come to Rochester you would have continued in Bombay ?

I certainly did not have the intention (of going abroad) at that time. I was reasonably happy. It was a place of unlimited potential. It had a large library. Since I was interested in many areas, people from other areas used to consult me, though it was not my field. For example, Dr. Ramanna who was not married at that time, used to come early, so would I. He would bring an article and he used to say, 'shall we discuss this ?' I used to be flattered. He was a senior faculy member and I was only a

student. But I must say he always treated me as an equal. So we are good friends over the last 30 years.

So you did not lack stimulation at TIFR ?

Stimulation in this sense, yes. But there was really no teaching. The man who was head of my group, Bernard Peters was a hard-working donkey, but was not a very bright man. He, a Polish refugee, came to India and had strong prejudices, he did not like *Madrasis* !

Otherwise, TIFR had all the world's greatests visiting : Dirac, Levy, Marshak, Puali. So that you learnt from the very best. People who were legends in their time. Meeting them gives you a different perspective. Like meeting Mrs. Gandhi. Talking to her you felt you had a stake in the government.

How did you get to know Mrs. Gandhi ? I believe you used to meet her often.

I met her only after she became prime minister. I was introduced to her by C. Subramaniam who was in the Cabinet then. I met her and we became friends. I did not want anything from her and I don't think she wanted anything from me. I would occasionally write to her that I'm concerned about this. She almost always replied within a week.

Would she talk to you about science ?

Yes. Though she didn't implement any of my views, she did ask my views. She was an easy person to talk to. We would talk about all kinds of things, even spiritual matters. Actually she was a very intelligent person.

Was she concerned about the brain-drain ?

No, she was not concerned about that. She was concerned about something that I'm deeply concerned about too. So much money and so many people, but we don't count (on an international level).

But why is that ? Are we not good enough ?

It's not only that. It's just that we don't count. It's sort of like Kerala's role in Indian politics. We are articulate, adroit, almost cunning; we export intelligent people, but why is that we don't have a say in how the centre is run ? While Bihar or some such place has more influence. It may be different in some other field of science. But in my field I can confidently say, if all post-Independence physics were eliminated, nobody would miss a thing.

But isn't work done here, a link to some theory, in which case how can you not miss the link ?

Actually not. With regard to something like solar energy, lots of people work on it The real test is, can you write a history of solar energy development or describe the engineering development connected with it, without mentioning a group of people, even if they have done significant work ? It's very much like blocking a road. If you block this road does it means you can't go ? You can always take another road. You say this road is not important, especially if not too many people are using this road.

You mean work being done here is being done simultaneously in other parts of the world ?

Yes. The other thing is people are not used to writing obout India. There's a writer by name Bronowski who has written a book called 'The Ascent of Man'. In that book people east of Suez have not ascended at all. Only people from Greece onwards have advanced. And so many Indians are ecstatic about the book.

Why don't we write our own books ? Or is it that our PR is bad ?

Normally we are like the Rajput princes against the Moghuls. We would rather fight each other than the enemy.

Somebody should push our work into the limelight.

No, no. Somebody should take all of us together and say we're not going to enlarge money for research unless we don't go

forward. Let's have some accountability. Why is that we publish in only some (foreign) journal ? Why is that in giving references we don't quote the man sitting next to us ? Why is that we don't consider our duty to propogate our associate's work ? Why is that when we have money we invite someone from abroad and not from Gulbarga ? Don't small towns count ? If they don't count, why don't they count ?

But why is that most Indians do well when they go abroad ?

The question is do they do that well ? Don't take a scientist. I'm one. Take writers and ask what is it that they have done. Is it that they are big on the international scene or is it that they appear big to us ? R. K. Narayan is published both here and abroad. But how many people know Narayan ? We think he's big because the man from Mysore has made it big in Illinois. But what does it count on the international scene ? Does he represent Indian culture ? Does he compare with Gabriel Marquez ? Do people talk about him as they do about Gabriel, not in terms of the Nobel Prize, but before that.

Weren't you nominated for the Nobel Prize for your theory of weak interaction ?

Many times. In fact it still is going on. The last few nominations have been for the two of us along with a Chinese lady called Madam Wu. She did much of the earlier work to identify beta-decay.

What goes wrong each time then ? Or is it that there are more deserving physicists ?

The Nobel Prize doesn't always go to the most deserving all the time. When the nominations come up, there are also other people who have done something else.

Then you should have got the Nobel Prize in the late 50s itself.

Yes, we should have gotten it in 1959, because by that time all

experiments had been done. But in '59 no one would even admit it.

Do you feel the Nobel Prize needs some lobbying in the right circles?

It's moro complicated than that. It's really how the American press perceives us. Pakistan is considered progressive while we're considered as having race riots. In Pakistan it's civil disobedience, not race riots. Here, because there is freedom there are race riots. India is not liked by the international community. I don't know about other walks of life, but in academics they are not liked. Part of it is because they are surprised people of a different skin-colour are thinking about these things. The other thing is India's relationship to Israel antagonizes the Jews. They feel we have no business to interfere. These are the two things that make things negative for us. And in my case it was that I never sought active sponsorship. Naturally my professor is the man who should do it, but he is in the same boat as I am.

Wasn't there similar confusion regarding the tachyons you had first proposed. Feinberg claimed the theory as his own ?

That was such a crude theft. I had a paper that was published in a referred journal and all the data were there. Somebody simply says he had done it.

When you had established everything how can he claim the theory as his own ?

He just claimed that's all. The curious thing was not one scientist in India protested. You see I wrote to *The Hindu*, but not one protested. Isaac Asimov I wrote to him and he corrected it, not apologising for it, but promising to correct it, the next time he mentioned tachyons.

Was Asimov's reference to Feinberg a case of ignorance ?

I think he was ignorant to start with. As to why he was ignorant, in which case why he thought he was an expert enough to write about it, I don't know.

Where did he mention this ? Was it in his book ?

He had written an article somewhere or the other. I really don't know. I'm just not interested in claiming everything as my own. Sometimes when I think about it, I get angry. Other times, I feel, you discover more things instead of worrying about this. You'd think your supporters would take it up. There were all these well-fed Indian scientists both here an in the U.S. You'd think since they were not doing anything great, when there was an idea they'd support it. What is the use of three academies of science, without any academicians ? Draupadi, when she was being disrobed in an open court, she told Bhishma, this is not a court of elders and you are not an elders, because elders protest when some injustice is being done. That's the same situation we have here.

You proposed tachyons in 1962, is that right ?

I wrote it in 1958, same time as weak interactions. I sent it to a journal and they sent it back. It was a case of not being able to fight with the referees. The first referee said it was nonsense. The second said the paper is correct, but it is so obvious. A third wrote back saying, 'I've read all the correspondence and I agree it should not be published.' At this point I simply abandoned it. A few years later, I spoke to one of my colleagues and he thought it was a fantastic idea. He said he'd help me to write in a fashion that would help it to get published. He became the co-author of the article.

But why did everyone accept the existence of tachyons when Feinberg presented it ? Did he present it better than you did ?

No, in fact it was no more convincing. The fact is if I wrote something for the Indian Academy of Science, it would be accepted. But if you wrote, it wouldn't. even though you may have a better idea.

Or was it colour prejudice ?

Not really. It was the fact they know the man.

But you yourself had some standing in the scientific world by then. By 1962 that is.

Yes. What is puzzling about all this is people know who I am. I was a Fellow of the Physical Society, was a full professor for 30 years.

How did Feinberg come upon tachyons ? Did he do independent research ?

It was an outright theft. We are good friends, he's about my age, he used to come to my house. It wasn't as if he didn't know about it. I've spoken at length about it to him. I've given him copies of my paper, he himself was interested in the thing. I'm a little naive. When he sent the manuscript, I did not realise the references were to me, but were couched in such a language that unless you're an expert you wouldn't know I had done it. If I had noticed at that time at least, I could have stopped him. In any case publication in the journal was not important, but the fact he claimed it was something new.

Does it mean, when they speak of tachyons they don't refer to you?

What the good ones do is they don't refer to anybody. This is the same thing with V-A theory.

What exactly are tachyons ?

They are revolutionary objects, because if they exist they would upset what we normally think of things. It is like saying, 'where were you before you were born'. It is not a question we can comprehend and aswer in the normal sense. With tachyons, they upset so many notions we have, it is not at all clear what would happen (if they exist).

Theoretically you are saying they could exist. But no one so far has proved their existence experimentally. Is any work being done ?

So far there has been no compelling evidence for it. Because even if you discover it, it is not clear people will accept it. Science is

prejudiced. It's like my friend Narasimhiah trying to debunk Sai Baba. He's already decided it's not so. He's saying no one else has done this before or science does not know. But one could have said this about wireless : without a wire it can't be done. I'm not saying what Sai Baba does is right. But prejudice is so strong in the name of science.

Were all these the reasons why you decided to come back to India after 25 year ?

Not really. These things have been going on for a long time and I've learnt to live with it. The thing now is, my children have grown up and I can afford not to earn for them Secondly I'm deeply conceened about the problems in the country. I recognise, as few others do that science has not advanced in India. There is really no significant science.

How do you propose to bring about a change ?

For one thing I'm really a lion among the lambs. I've no hesitation in talking about these things, because I know who I am. I do not see myself as belonging to the Establishment. No one has done me a favour. So I don't owe them anything. So I can tell the Indian Academy of Sciences, 'I'm honouring you by being a Fellow !' That's why I didn't go for their recent celebrations. I thought it was not worthwhile..... They imported Chandrashekar and changed the dates to suit his convenience. It was an obliging thing that Mrs. Gandhi died at the time. Chandrashekar did his thing. But he's not interested in Indian science. They brought him, exhibited him and sent him off.

Have you come back to India for good now ? Do you still have to go to Texas.

I have some tail-end responsibilities for which I have to go.

You are now attached to CTS and Institute for Mathematical Sciences. When did you come to Madras ?

In March '81. I've been attached to CTS for the past 10-12 years.

Are you able to do research here too ?

I can work wherever I go. I can do my work under this tree.

But researchers often complain they can't do their work in India.

That's true for people who need experimental equipment. But still you don't wait till the 21st century to do science. You should find a problem you can do here. Nobody is asking you to work in esoteric fields.

But do you think what Khorana and Chandrashekar did could have been achieved in India ?

What Chandrashekar did, could be done in Chikmagalur without any problem. Occasionally you have to get some book. What Khorana did could not be achieved in India without a major facility being built for him. But there is a reasonable facility for that too here now, in Delhi and Hyderabad.

But it doesn't bother you that so many Indians go abroad to do research.

If they can't do it here, they should go somewhere they can do it. But don't become a research associate there. Don't become a scavenger there.

Researchers probably feel they don't have the opportunities here.

What opportunities ? If you feel they don't have opportunities here, don't have institutes here. Don't on the one hand take up all the resources and on the other hand say we can't do it. (If you can't do it) go and teach in a college or go open a grocery store.

Do you think Rajiv Gandhi's thrust into the 21st century has opened more doors and made it more conducive for the growth of science ?

I think so. Till now a lot of fuss was made over ECIL and others. ECIL did not rise to great heights. Now it's all open. But understand this, power reactors and computors are not science. They're engineering. Science is the discovery of the nature of

things, not how things should be used. There is a tremendous confusion in this country about science and technology.

Is going up in space an achievement ?

Going up the Himalayas is an achievement. Going into space is an achievement. Even transistor bombs are an advance in technology. But let us not pretend these have anything to do with science. Fortunately there are enough people in the world who are confused about this, so they'll say India has advanced because they have put a man in space.

It is true that you are interested in spiritualism ? The Vedas etc.

What is physics but a way of looking at the world ? Since thinking about tachyons I have thought what would happen if cause and effect were reversed. It makes sense to me if I read that Brahma is *prajapati* and he is old and Lakshmi is his mother and she's young. You don't cease to be a human being because you know the *Upanishdas.*

What are your interests outside science ?

Women, children, Music. I like South Indian classical music, painting. I like Rukmini Varma and Uma Varma, who are friends of mine. I can talk to them about painting. But I'm not particularly moved by Husain, though everybody says he is a good painter.

APPENDIX-D (II)

INTERVIEW WITH DR. GEORGE SUDARSHAN :

PRIYA SARUKKAI CHABRIA

So, what is a world renowned scientist like him doing in the dizzy, wet heat of Madras ? Bad question this since it indicates that we don't think much of the scientific calibre in our country. What's more, we are subscribing to the fallacy that the best scientific research can only be done abroad, so brain drain is inevitable. "S. N. Bose did his great work without ever leaving the country, as did C. V. Raman. So, it's not clear that you cannot do good work here" Prof. Sudarshan reminds us.

Wooed back from the United States by the late Prime Minister Indira Gandhi, Prof. Sudarshan has forgone money, convenience and comradeship in the hope of energizing latent scientific talent, catalysing his foreign settled Indian colleagues to return, and infusing the best blood into the research centers like the I.M.S. Madras. "The government is interested in supporting science at the highest levels. And I would very much like to assure myself that the work done in India is at the forefront of knowledge," he says.

In a recent talk you stated that the ancient Greeks had evolved a simple atomic theory, but that the one mentioned in the Vedas, if I recall correctly, was more advanced. Could you expand on this ?

No, it is not to be found in the *Vedas*. Why should all ancient Indian knowledge be ascribed to the *Vedas* ? Apart from the *Vedas*, we should pay attention to the *Veda—Angas*, the six

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systems of philosophy—*Sankhya, Poorva Mimansa, Uttara Mimansa, Yoga, Vedanta, Nyaya* and *Visheshika.*

The *Sankhya*, even though it deals with numbers, talks in semi-poetic metaphoses not in scientific terms. It deals more with the concept of *Prakrithi* and *Pnrusha*, the unmanifest and manifest, the unmanifest being abstract and the manifest becoming nature.

Among the ancient Greeks, Heraclitus spoke of "atoms" to say that matter is not infinitely divisible. But what he had to say, except for the word 'atom', has very little to do with today's concept of atoms. Our *Visheshikas*, on the other hand, almost appropriate what we'd call the physical sciences. In it, there is a discussion of *anus* or *kanas*, which came much closer to today's concept of atoms. These *anus* were said to possess *gunas*—qualities—which were part of its atomic nature, rather like the electronic theory of valency in chemistry. This idea is an Indian one. But most people, including Indians, don't know about it. So they keep repeating that Heraclitus discovered the atom.

You've done most of your work outside India, and you still spend a fair amount of time abroad. Why is this ?

In a sense, it really doesn't matter where you live as long as you can work. The question is : What is your work ? Is it only writing, discovering new laws, or does it include trying to elevate others ? Is it that of the sage who went to the forest to seek his own *moksha* ? Or that of the Buddha who said he must remove the suffering of all people ?

When I left India as a young man there was nothing in Madras, not even the possibility of obtaining a doctorate ! But the situation has drastically changed since then. We have today very, very bright people who can discuss the most recent and important developments in pure maths and theoretical physics with complete ease.

My joint director Dr. Rajashekaran, Professor G. S. Sheshadri and myself have brought in exceptional young physicists who are transforming the place. They could choose to be in Princeton, or Chicago, or Paris. But they are in Bangalore, or Bombay, or Madras.

If only I can energize them all ! Inspire them. Protect them. Make sure that when I say I'll take care of them, I will do so, so that they get the opportunities and atmosphere to realize their full potential. If only they can believe this, then a lot of new things can happen.

Though the Institute is an autonomous one, it is funded by both the Government of India and the Tamil Nadu State Government. So, you will be required to deal with bureaucrats and red tapism. Would you comment on these problems ?

Pursuing scientific research is like being a top performing artiste. You have to put all your attention to it. Therefore, one kind word or an unkind one can make all the difference between happiness and unhappiness. Entering the world class scientific community is a very chancy thing. If you don't encourage the right man at the right time, his talent might vanish forever.

We scientists are not asking for special privileges, unlike doctors who want 5 times the average standard of living. But we do want a minimum of financial worries. We also feel very upset when we are confronted by statements like 'Oh, but...that is a Joint Secretary's post. How can we give it to a professor ?' We don't think in terms of posts. Rather, of a person's absolute worth in a particular profession.

This is precisely where I face difficulties—in convincing the Government, especially the State Government of an individual's worth, or the promise of a programme. In India, as in many other countries, most of the things are arranged in such a fashion as to allow limited number of people.

So, I can have a 100 more good scientists without the bureaucrats creating problems. But what I want instead are just 25 outstanding people of world class. Of course, they will have to be given better facilities and atmosphere. Therefore problems. There is a reason for this lack of understanding on the part of many government servants. Most of them are mediocre, and seem unwilling to allow excellence to flourish. Competence, yes, but not excellence. So we have become a nation of competent scientists, not outstanding ones.

I'm going to put up a very stiff compaign, because I've given up a very large six figure salary to come here and work at hardly any salary at all. I'm going to make use of all my connections to ensure that a fair deal is given to our scientists.

Also at the top echelons of the Tamil Nadu Government I met with kindness and promises of all kinds. But many of the intermediary level bureaucrats are continuously interfering with the functioning of the Institute.

I intend to make this matter a public issue by appealing to the Government and the education minister. If necessary I'll communicate with the Government of India. I'm going to make a damn good try to see that science flourishes in Tamil Nadu. And I'm not going to be thwarted by some petty officials. I don't want this Institute to be as good as Cambridge—it should be the best. In truth, Cambridge may be better or worse. That we cannot alter. But we can alter ourselves.

APPENDIX-E

ASTROLOGY : THE SPOKE IN SCIENCE'S WHEEL

Y. KESHAVA MENON

Astrology is a science in its own right. Its principles are the same as those of any other scientific discipline. But it goes beyond other sciences to arrive at conclusions that do not lie within the ken of most scientific disciplines.

Sometime back, over a hundred scientists of 'world renown', of which nearly a score claimed Nobel Prize-winning status, combined to issue an unprovoked statement condemning astrology and its practice as deleterious to the public good. These men of modern science constituted themselves as prosecutor, jury and judge. In violation of principles set for itself by the publishing media, journals even of international repute invested this drivel with oracular dignity and gave it a publicity which must have surprised even the authors. To compound the offence, editorialists moved in with their entire stock of juvenile persiflage to hold the subject to total ridicule.

The qualification of the person to express himself on a subject is of relevance to journals. A sports commentator has no place in this scheme to express himself on, say, satellite communication technology. In the cited case, this satutary principle was completely overlooked.

Reproduced from 'The Illustrated Weekly of India', July 12, 1981, p. 20-21.

In this age of advanced specialisation any one seeking public recognition has to confine himself to intensive and concentrated study of a very narrow and restricted area of a given discipline. The ambitious ones who prove successful in such a world lose out on a lot. That is why most of them have, on subjects other than their chosen area of study and research, shown a shockingly low IQ. Those who have been in the company of such celebrities know what insufferable bores they can be in social life.

The publishing media was conned into taking serious notice of the verdict on astrology, delivered by these recognised men of science, by the surreptitious and tendentious use of names such as Ptolemy and Chaldeans in the text.

To those of us who have studied it, astrology is the coping stone on the edifice of science—the same as Narada averred to his master, Sanatkumara, in the *Chandogya Upanishad.* Astrology is a science that needs no certificate from anyone; nor would it lend itself to be deprecated by reasonable men. It stands on its own feet. Its principles are the same as those of any other scientific discipline. Only it goes beyond the other sciences to arrive at conclusions that do not lie within the ken of disciplines of restricted study.

Writing to Prof. Raman, editor of the *Astrological Magazine,* who is also, incidentally, a Fellow of the Royal Astronomical Society, on September 6, 1947, Carl Jung said : *I must say that I very often found that astrological data elucidated certain points which I otherwise would have been unable to understand.* How many of the psychoanalysts of the Jung school would care to test this better understanding medium stipulated by their master ?

Let us take a closer look at the Jung letter. For a long time now, the medical profession has been persuaded to accept a correlation between the phases of the Moon and mental illness. Many have, however, merely brushed away the phenomenon as coincidental, but it has been of help to medical administrators,

At the approach of the Full Moon or new moon, security is tightened in mental asylums harbouring lunatics with a pronounced tendency to violence.

Planetary Juxtapositions

In astrological parlance the Moon rules, among a number of specified things, the mind. It says that certain planetary juxtapositions with respect to the Moon predispose the person to mental illnesses of varying degrees. The nature of the aberration as well as the probable period of its manifestation are identifiable in accordance with specific rules. Jung himself was not the custodian of a lunatic asylum. His calling demanded the identification of the nature and magnitude of mental afflictions at the nascent stage. It was the *need* for such prognoses that astrology into his repertoire.

It is not merely the Moon's 'affliction' that brings about mental illnesses. To medical personnel uninitiated in the correlation between cosmic forces and man, the Moon is the more easily identifiable of planets that relate to mental illness. In astrology, the Moon rules the mind. The intellect is ruled by Mercury. Jupiter rules wisdom...it can expose a fool at birth.

During the last International Geophysical Year, one of the significant findings of the medical fraternity was that the appearance of sun spots coincided with a phenomenal increase of admissions to the cardiological wards of hospitals and to mental asylums. Out of this grew two wings of research—Helio Biology and Cosmo Psychology. The scope of growth for both is limited by the straight-jacketed system of research and study developed by medicine.

The findings constitute a spectacular achievement for the 'scientist' on paper. It is of no practical value to the groaning tax payer who paid through his nose to make this discovery possible. First of all the scientist must be able to correctly

prognosticate the appearance of sun spots. This entails a study of celestial phenomena which is the province of the astronomer who, in India, is also an astrologer. Even when this is rendered possible, the findings might benefit only a small number of doctors in the medical profession as the phases of the Moon do for administrators in mental asylums.

Sun Spots

In the larger scheme of things, however, it is only a minuscule number of human beings who fall victim to the sun spots phenomenon. It is not within the skill of the medical profession to identify the individual prone to a cardiac affliction at that period. Through a study of the juxtaposition of certain planets with respect to the Sun at a person's birth, it is possible, by the application of the relevant astrological rules, to prognosticate with precision the vulnerability of that to a cardiac ailment and the period of time at which it could manifest itself.

In this act of prognostication, astrology is way ahead of the type of prognosis the medical profession makes, such as smoking leads to cancer or certain types of foods are carcinogenic. For the astrologer, the actual appearance of sun spots would remain irrelevant, but to the medical fraternity it would be of help in their planning activities. The cooperation between the two would naturally be an advance in scientific knowledge.

Astrology is accused of not employing modern statistical techniques in its study. We no longer watch the apple fall to prove to ourselves that there is gravitational pull around us. No statistical proof is called for to assure ourselves that water, when boiled, will turn into steam. All these did need statistical veracity in the early stages of discovery. Astrology, today, employs principles based on statistical certainties and avoids statistical possibilities because it deals with life.

Long before the joker called the meteorologist was thought up, the nature of the tidal bore on the Hooghly river and its

time of appearance had been forecast by astrologers for the benefit of the people living on its banks. Here, again, the phases of the Moon and its juxtaposition with respect to certain other planetary configurations were the determing factors. In astrological lingua, the Moon rules the seas, the water and salt. How is Copernicus relevant to this land of astrologers who had, in the Vedas, predicted the timing of eclipses and asked for the observance of rules when they occurred ?

The maintenance of the meteorologist in his present status and occupation is the most egregious folly of our scientific community. These lotus eaters have the gall to tell us we are fools and then go on from one error to another. Not all the satellites, not all the radars, nor all the statistical data of the type maintained by this community can yield the knowledge of the mood, temperament and directional propensities of the weather god. Weather is of celestial birth and a study of celestial phenomena is a precondition to our acquiring any knowledge of or power over weather.

Free Will

The most vexed question astrology poses to our elite is that of human free will. The acceptance of astrology, they seem to think, is tantamount to the abjuration of free will. There is a lack of understanding in a mind that votes for free will. In the higher reaches of science today free will is a myth and a dangerous illusion.

The founding fathers of astrology took a more liberal if less absolutist stance on this issue. They granted the existence of free will but stipulated that this was confined to the contours of the four-dimensional destiny. There is no conflict between free will and determinism. A child has the freedom to choose to drink the milk or not, if it is there.

The significance of the four-dimensional continuum is that the world lines of all things follow a simple pattern of existence.

If these world lines have a real existence in a real continuum, the whole history of the universe, future, past and present, is already irrevocably fixed. Pushing this view to its logical conclusion, Eddington posited that if you equip a stone with a human mind and shoot it into space, the stone would be 'willing' to go up in space and as soon as the velocity is exhausted, the stone would 'will' itself earthwards. Iron-willed people in history, like Napolean, Alexander and Hitler, went to their shameful doom not because of, but inspite of astrological warnings.

On the testimony of a leading journalist of acknowledged integrity, I have unimpeachable evidence that it had been forecast that Mr. Morarji Desai would assume office as Prime Minister of this country. He was subsequently sworn in to that office on the very day predicted. Even the number of ministers who would be sworn in on that day with him had been predicted.

In exactitude, astrology is head and shoulders above any other extant science. Every other scientific discipline stands on the stilts of apology. Something works and something does not work; but by the employment of sophistry, that which works is made to eclipse that which does not.

There is no denial that it is in atomic science that man has attained the highest sophistication in scientific inquiry. Man has indeed split the atom, and its destructive capacity is now evidence of man's skill but not of his knowledge. When he examines the contents of the atom he is as baffled as he was before.

Unassailable Influecne

A line of argument pursued by detractors of astrology is that the astronomers who feed the astrologer scientific data never employ what are considered absolutely necessary implements of the trade. We forget that a long time ago Eddington came to the firm conclusion, which is unchallenged even now : that the employment of instruments for the study of any phenomenon is self-destructive;

that the instruments interfere with the nature of the object under study. He posited that every bit of knowledge that we have scrounged out of this univese by experimental study could have been fished out of the mind, and that too without the warpings that instruments, by their character, lent to the study.

The founding fathers of the science of asrology had warned its protagonists that constant study is necessary to accomodate the variations in celestial and terrestrial phenomena that occur with time. True, too, there have been no serious studies or research except the application of the mind to this subject for well over twelve centuries in India. But whether we like it or not, stars appear to have not only an overwhelming but an unassailable influence on our lives. Since one cannot just wish these stars away, one had better come to terms with them. ●

APPENDIX-F

REDRESSAL OF GRIEVANCES BILL

The Hospitals and other Institutions (Redressal of Grievances of Employees) Bill passed by the Rajya Sabha on 28th April, 1988 (but yet to be placed before Lok Sabha) seeks to provide a mechanism and machinery for redressal of both individual and collective grievances of the employees of hospitals, educational, scientific, research or training institutions; charitable, social or philanthropic services; and institutions engaged in khadi and village industries. Educational institutions defined in the Bill are reported to include any university; any college, whether or not affiliated to a university; any school, whether or not recognised or aided by Government; and any scientific institution.

The Bill provides for the appointment of a person as a Grievance Redressal Authority and the Appellate Authority, for every establishment covered under the Bill. Employees having individual grievanees will apply to the Grievance Redressal Authority which will endeavour to pass a final order within a period of 60 days of the date of application. If the Grievance Redressal Authority fails to pass the final order within the stipulated period of 60 days, or if the party is aggrieved by the final order, it can prefer an appeal to the Appellate Authority

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within a period of 45 days. The Appellate Authority after giving reasonable opportunity to the parties to the dispute will endeavour to pass a final verdict within 90 days from the date the appeal is made. Further, in case the Appellate Authority does not hand down the final order within this period or the party is aggrieved by the order, another appeal can be preferred within 45 days with the one-man tribunal constituted by the Government. The Tribunal will be expected to pass the final order within 90 days of the appeal. The Bill provides that during the period the grievance is under consideration of any of these authorities, no employee shall go on strike or resort to other means of protest like work to rule, go slow, gherao, etc., as also no employer shall lock-out his employees.

As regards collective grievances, which are reported to include wages including period and mode of payment, compensatory and other allowances, hours of work and rest intervals, leave with wages and holidays, and retirement benefits, the Bill provides for the appointment of a Management Council of not less than 2 and not more than 10 members representing both the employer and the employees in equal number. While the employer's representatives will be nominated by the employer, the employee's representatives shall be chosen by the registered unions or associations on the basis of their proportionate membership of the employees in the establishment, and only such unions or associations will be eligible to do so who have not less than 10 per cent of the membership of the employees. Meetings of the Management Council shall be presided over alternatively by a member representing the employer and a member representing the employees. The Council, it is further reported, shall promote harmonious relations between the employers and employees and shall advise the employer to frame by-laws regarding conditions of service etc. A collective grievance can be referred for settlement to the Management Council at the instance of not less than 10% of the employees in the establishment. The Management Council shall be expected to settle the grievance within 90

days of the reference made to it, failing which either party can refer the grievance for arbitration to an Arbitrator agreed to by the parties or where the parties fail to agree, the Government will constitute a Board of Arbitrators on a request made to it by either party. The Arbitrator or the Board of Arbitrators shall be expected to submit its award within the period specified in the reference made to it. The Arbitrator shall be appointed from a list of panelists maintained for the purpose by the Government. However, the Government reserves tke right to wholly or partially reject or modify the award if it feels that it will not be expedient, on public grounds affecting national economy or social justice, to give affect to the award.

The Bill provides that while the collective grievances are under consideration of the specified authorities, no employer shall alter, to the prejudice of the employees, their conditions of service nor will the employees resort to strikes or other protest measures. The Bill provides elaborate penalties for both the employees and the employers for violation of different provisions of the Bill. Imprisonment for one to three months with fine up to Rs. 1000/- is the punishment provided for an employee resorting to strike and other protest measures during the proceedings of the specified authorities, while the punishment for the instigators ranges from 2 to 6 months imprisonment with fine up to Rs. 10,000/-. An employer resorting to lock-out during the proceedings can be punished with 1 to 6 months imprisonment with fine up to Rs. 50,000/-.

The Bill is also reported to provide that no court shall take cognizence of any offence punishable under this Act once it comes into force.

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APPENDIX-G

THE MERCHANTS OF GLOOM

ARUN SHOURIE

Criticism is often essential. Sometimes, as Gandhiji once pointed out, one has even to use strong words so as to dissuade a person from evil or to wean others from associating with him.

But ever so often many of us fall into the *habit* of seeing only what is wrong in others, of noticing in a situation only that which will worsen it. How well we fit Mao's description of 'The Awful-mess School'—of ones who are forever whining, 'this is an awful mess, that is an awful mess, everything is an awful mess.'

Praise of someone, noticing the strengths in a situation evokes in us not just scepticism, it is unwelcome. It threatens to jolt us out of a habit that we have become comfortable in. We come to look upon the one who offers the praise of another, the one who spots the points of growth in a situation as one who has 'sold out', as one who has 'gone soft', or at the charitable least, as one who is in imminent danger of doing so.

Among other things, this habit reflects mental laziness. If the government retains controls we criticise it for protecting esta-

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blished industrialists from competition, we lambast it for maintaining the controls so that it may milk the system. If, on the other hand, it liberalises them, we lambast it for capitulating to the industrialists, for abandoning socialism. If it takes over sick mills we criticise it for taking over useless units that have already been drained by unscrupulous industrialists. If it allows them to die, we lambast it for not caring for the plight of the workers.

In this way we exempt ourselves from *thinking a matter through* as well as from *making a choice* between incompatible, or at least competing, ends. How much easier it is to set oneself up as the critic-on-principle, how mush easier to use shrill, and then the shriller, word.

Consequences

The habit has predictable consequences. First of course there are the psychological costs for the individual himself. The person who learns to see only the faults of others, to discern only the potential for doom in each situation, surely adds to his miseries. In any event, even when it does not reach a pathological state, whole time criticism provides only a derivative, and then too an insecure, existence : derivative, as the habitual critic comes to depend on the object of his criticism; insecure, first as there is always the apprehension that the listener will turn around and ask, 'If you know so much about how a *raga* should be sung. why don't you sing it yourself ?' and insecure most of all because of the prospect that the other fellow may well turn the corner one day.

Second, the habit leads us into plain error. How many times have we forecast doom, and how many times has it in fact occurred ? How many times have we written everyone off only to see the least likely stand up for the right thing ?

Third, when we see only the deficiencies in everyone, when we see only the difficulties in every situation, we are apt to lose

heart too soon. We ourselves fail to do what can still be done and we fail also to persuade and mobilise others to do what they can still do. Imagine a man whose conduct is exemplary in every way, who spends all of himself in the public weal, but who has got into this habit and who as a consequence beleives that everyone else is a self-seeking scoundrel. Surely, he will end up believing that he is more isolated, more beleagured than he in fact is. I have had a similar experience in working with some of our groups. A meeting has but to start than someone gets up, 'But all this is elitist. We must take the message to the masses, we must shift these activities to the villages'. His passionate denunciation provokes others, 'But who is stopping *you* from starting the activities in the villages ? ..' Tempers rise. Organisations split. And what could be done by activising the middle class too is lost.

Fourth, soon enough 'the awful-mess school' loses the ear of the public. Today, for instance, the reader is saturated with, if not sick of, being told day in and day out by the press what is wrong. He knows what is wrong, he has to contend with it every day. 'I know what is wrong,' he says, 'but what should be done about it ? More important, what is it that *I* should do ? Most important, what is it that *you* personally will do about it ?' He wants answers. If the press is not able to help him find them, it will lose his ear.

Fifth, even if the awful-mess school retains the ear of the public, mere fault-finding cannot but harm public discourse as well as the public itself. For one thing, fault-finding too is subject to Gresham's Law: bad currency drives out good. For another, degeneration, and swift degeneration at that, is inevitable. Today we proclaim the faults of others. Tomorrow we have to do so in strong words. And the day after that we must resort to abuse. The resent vogue—'investigative journalism'—provides a ready illustration. The label has already become a cover for scandal-mongering, indeed for scandalising. More important,

mere fault-finding teaches the people merely to whine and complain and grumble. Ultimately it weakens them. It does not help them go beyond mere grumbling; worse, it convinces many that as everything *is* rotten and doomed in any case, the little thievery *they* indulge in is quite all right.

All these are good enough reasons for shedding the habit of mere criticism, of seeing only the faults in others, the difficulies in a situation. But there is another reason too for shedding it: the habit is just not warranted by the facts.

The Facts Of Life

We see every day how good grows out of evil, advantage out of disadvantage, advance out of a set-back. A minor heart attack leads a friend to re-order his life and thus avoid the fatal one. One road is blocked, one career is ended, a friend is pushed off to the wilderness, but he soon discovers the delights of the forest and charts a new course.

Similarly, we see good degenerate into evil, we see the very trait that one day was the source of strength of a person become his weakness the day after. We see that what is an irritant in one place—sand in our eyes, fire on our palm—is a pleasure in another—sand on the beach, fire in the hearth. We see that what is poison in one quantity is an antidote in another.

Thus the differences are subtle and they are not permanent. More important, in most individual, in most situations, in almost everything there is the *potential* for both good as well as ill. Therefore, we almost always have a choice: we can either bewail the ill in the person, situation, thing, or help develop and build on, or at the very least extract for our own growth, the potential for good in it.

The point can be illustrated in several ways. The reader will recall instances from his own experience that bear on the matter. I will list a few familiar concepts from the scriptures to illustrate

that things are not always what they seem at first glance, that they are not always merely what they seem, that one thing transforms into another, that a stumbling block can be made into a stepping stone; and that we are the ones who lose if we fail to see the potential in them.

The concepts may seem a bit distant from our immediate concerns. But in the end their abstractness will itself be an advantage: for it will show that the point at issue is a general one and is not confined merely to this situation or that.

Reading The Scriptures

Let us start with a couple of the most familiar concepts, and then consider the more general questions—the ambiguities in the scriptures, the apparent contradictions in them—and, finally, the sense in which a book may be considered a scripture at all.

The notion of *Karma*, says the Western commentator, the notion that my present condition is determined by my past deeds, makes these people fatalist, it leads them to believe that they cannot do anything about their state and it reconciles them to their wretchedness. But in the hands of Vivekananda, Aurobindo, Tilak, Gandhi, *that very notion*—the notion that what I do today will most assuredly determine my condition tomorrow—becomes the *reason* for *not* resigning oneself to things as they are; it becomes the *assurance* that, as no effort is wasted, every bit of effort is worthwhile.

The notion of *Samskaras*, say some, is a rationalisation for tying us down to our caste functions. But for others the notion makes the all important psychological point that all actions, including thoughts, leave etchings on the mind, they form predispositions — *Samaskaras* — which reinforce themselves by leading one to behave and think in a pattern; and that for this very reason one can alter the *Samskara* by volition, by changing one's actions, including one's mental processes and perceptions.

Furthermore, they teach us, this is not a matter of doing just the occasional good deed. A deeply etched pattern has to be erased and another etched in, therefore one must be eternally alert and ceaselessly engaged in virtuous action. *Abhisheka*, as Vinoba would say, is not performed by overturning a bucket all at once but by the uniform, unbroken, steady stream. How can a concept that urges deliberate, volitional change be a device for tying one down to functions associated with the caste into which we happened to have been born ?

Samskaras bind one, say some. Here is proof, they say, that the scriptures certify determinism. But say others, the notion merely suggests that at any moment I have a predisposition to act one way or another, that this predisposition results from the patterns that have been etched on my mind, personality, ego by my deeds, including thoughts; that it is to this extent alone that I am conditioned; but that what is present here is merely a *predisposition, not an inevitability.* Consequently, the key is to become aware of the predisposition, to understand what accounts for it, and thus to reinforce and alter it or compensate for it. Far from yielding fatalist determinism, the notion becomes the key to taking one's 'fate' in one's hands through understanding and awareness and deliberate, that is self-willed, action.

'The *Gita* says that each must follow his *Svadharma*, that he should not covet the *Svadharma* of another even if that appears enticing and our own unattractive,' recalls the critic, 'Here is a way to make sure that the lower castes never make an effort to rise above their station.' But *Svadharma*, say others, refers to the duty which follows from the *complete* situation—the individul's talent and aptitude, his very nature, as well as from the time and circumstance of the moment. And as all these change—by the individual's efforts as well as by factors beyond him—the counsel that a person should follow his *Svadharma* is a counsel for alert and incessant introspection, for, as the Buddhists would say, ever-mindfulness, and for deliberate, mindful action. Where is the determinist fatalism in it ?

The scriptures say that 'if we merely perform sacrifices everything will be all right,' says the Western-educated Indian, 'And only the *pandas* benefit from these rituals'. On the contrary, say Gandhiji and the others, 'sacrifice' means the sacrifice of of our evil dispositions, of the desire for fruit, later of our senses, later still of our minds so that we may perceive things directly, immediately, without any preconceptions; that the rituals far from being a substitute for *this* sacrifice are a means to it, that with *this* sacrifice the rituals are empty, that with it even ordinary, day to day, activity is *bhakti*, in that through it we learn to perform our duty in such a way that the action no longer leaves grooves on the mind and the ego.

'*Daan*, charity, is but a balm, a conscience-absolver for the rich,' says the Western-educated Indian, 'You fleece everyone throughout the year and then give a few cows as *daan* to wash away all your sins.' It *could* be this. It could also bolster the ego, 'See, how much I do for others.' But equally it is a means for breaking out of our attachment to things—by making a habit of giving away assets, especially assets that we value, materially or psychologically, we develop the non-attachment that is the *sine qua non*, the first step, for breaking out of the *Samskaras*.

Similarly, the offering to a teacher *can* be a payment, it *can* even be a bribe. But equally it *can* be, it is *meant* to be, like Sudama's rice, something, as Vinoba puts it, that 'represents our heart', something precious that is given without expecting anything in return. Through it we give our love and regard, we surrender our preconceptions, our expectations, our ego, our very *selves*.

Thus to 'surrender' oneself to the *guru* does not mean to grovel but to open oneself, not to debase but to empty oneself so that one may receive. It *can* be taken to mean abdication, but it means an alert, total receptiveness, it means that we open ourselves to the situation, that we be ourselves, that we stop

putting on a show, as the teachers say, even the show of being good and virtuous disciples, that we shed all preconceptions, that we surrender even the preconceptions of what a teacher should teach us, of what a teacher should be. If we do not surrender these, at every moment we will be *judging* the teacher, we will at every moment be *judging* everything he says and does, and the *judging* will itself become an impediment to learning.

' "Surrender to the Lord"—that is plain and simple fatalism, it is an invitation to leave the Lord to take care of things', says our Western-educated critic, 'And that is specially so when it is accompanied—as in the *Gita's yada yada hi dharmasya*...—by the assurance that when things get really bad He will don one of His *avtars* to set them right.'

The exhortation and assurance could work as soporifics, and for many they probably do. But what we are asked to surrender are desires, preconceptions, the hankering after the prospective fruit of what we do. By surrendering these we emancipate our action from them. By surrendering our preconceived notions, even our predetermined resolves, we open ourselves to introspection, to listening, we free ourselves to re-examine the situation.

As for the *avtar* coming and doing our work, the legends teach the opposite. In them Krishna is an *avtar*. But does He, in the same legend, go about doing the work of others ? Quite the contrary, He exhorts all to take up the fight themselves, and He himself is just one of the members of an entire army. Similarly, Ram is an *avtar* but, as Vinoba would remind us, even the monkeys were mobilised to fight so that His forces would win. How then do the legends teach us to sit back, leaving the Lord to set things right ?

Prayer *can* instil dependence. It *can*, and with many it perhaps is even a form of bargaining. But it can also be an aid to humility, a way not of wresting something from an external

being but of awakening the potential within one, the consummation not a show of gifts from outside but a conduct made purer, nobler from within. Must prayer only be mechanical, repetition of a formula ? Is there some insuperable reason why it can never attain to the sage's counsel—"*manka manka chandke manka manka pher*" ? Faith *can* be a substitute for effort. But it can as well be a spur and aid for it, giving the man who has it and toils the confidence that now that he has done all he could the right shall prevail. And when it does not, faith persuades him, not to resign, but to continue his efforts.

Taking care of the cow can degenerate into hypocritical callousness. But it can also be a device for establishing a bond with all animals, for extending our concerns beyond the merely human. Taking care of the *Tulsi* plant *can* become a ritual, a superstition. But just as well it can be a way to establish a bond with all nature.

Idols *can* induce abject dependence. Ever so often they do But that is not the only, nor the inevitable sequence. A sculptor takes a shapeless rock and endows it with form. The devotee endows a simple, prosaic image with qualities. In contemplating the image he meditates on these attributes and thus imbibes them. Is the work, as Vinoba would ask, less creative or the outcome less beautiful than what results from the work of the sculptor ?

Moving beyond specific concepts, consider the fact that on so many matters the scriptures are ambiguous. 'Why does Krishna not speak clearly ?', asks the Westernised critic. But, he learns in time, the aim of the scripture is not to provide a recipe. It is to induce us to think for ourselves, to re-examine ourselves and our circumstance. The demand for a recipe is there in the critics' impatient query. The spirit of the scriptures is in the well known account of the *Brihad-aranyaka Upanishad.* Gods, men as well as the *asuras* ask Prajapati for advice, 'Tell us what we should do,' each group asks him. To each in turn Prajapati

gives, as His advice, the monosyllable 'Da', that is, He gives them not a recipe but a device which will lead each to re-examine his conduct, his situation himself. Each group does so. The gods conclude, 'Indeed we have become very indulgent. Prajapati's advice is "*damyata*"—He is asking us to restrain ourselves.' The men conclude, 'Indeed we have become selfish. Prajapati says "datta"—He is counselling us to think of others, to share and give.' And the *asuras* conclude, 'Indeed, we have become too cruel. Prajapati counsels "*dayadhvam*", that we be kind and considerate.' Prajapati asks each in turn, 'Did you understand ?' Each group says, 'Yes', and repeats the conclusion that it has reached. And to each Prajapati says, 'Yes, you did understand'.

The ambiguity, the numerous and manifest 'contradictions' between one passage and another can be railed at. Bus they may well be a crucial device. Let us assume, says Sri Krishna Prem, that in the scriptures everything had been set out simply and clearly, as in a cook-book. Let us assume further that we had cared to read the cook-book. We would have 'understood' the account at the merely intellectual level, indeed quite as we 'understand' a cook-book. But the ambiguities and 'contradictions' force us to do more than just read and memorise. By meditating on the very ambiguities and 'contradictions' we in the end perceive with our entire being.

Indeed, at an even more general level consider the notion of a book being a scripture, itself. Many are lost in the literalisms of the *Bible*, the *Koran*, the *Granth Sahib* each taking his particular book to be the word of God. Others open the *Koran*, the *Granth Sahib*, the *Ramcharitmanas* every morning to get a helpful hint for the day, as a sort of I-ching. And the critic rails at all of them. But surely these are not the only ways of looking upon the book.

Here is how Aurobindo at the very commencement of his *Essays on the Gita* sets out his view of the position of a Scripture :

'First of all, there is undoubtedly a Truth one and eternal which we are seeking, from which all other truth derives, by the

light of which all other truth finds its right place, explanation and relation to the scheme of knowledge. But precisely for that reason it cannot be shut up in a single trenchant formula, it is not likely to be found in its entirety or in all its bearings in any single philosophy or Scripture or uttered altogether and for ever by any one teacher, thinker, prophet or *Avatar*. Nor has it been wholly found by us if our view of it necessitates the intolerant exclusion of the truth underlying other systems; for when we reject passionately, we mean simply that we cannot appreciate and explain. Secondly, this Truth, though it is one and eternal, expresses itself in Time and through the mind of man; therefore every Scripture must necessarily contain two elements, one temporary, perishable, belonging to the ideas of the period and country in which it was produced, the other eternal and imperishable and applicable in all ages and countries. Moreover, in the statement of the Truth the actual form given to it, the system and arrangement, the metaphysical and intellectual mould, the precise expression used must be largely subject to the mutation of time and cease to have the same force; for the human intellect modifies itself always; continually dividing and putting together it is obliged to shift its divisions continually and to rearrange its syntheses; it is always leaving old expression and symbol for new or, if it uses the old, it so changes its connotation or at least its exact content and association that we can never be quite sure of understanding an ancient book of this kind precisely in the sense and spirit it bore to its contemporaries. What is of entirely permanent value is that which besides being universal has been experienced, lived and seen with a higher than the intellectual vision.'

And from these propositions follows his right to offer a creative interpretation of the text.

Gandhiji is equally direct. He says that the *Gita*, like the *Mahabharata* itself, is *not* a historical work, that the picture of Krishna in the *Gita*—'perfection and right knowledge personified'

—'is imaginary', that while a Krishna may have lived 'the perfection is imagined. The idea of a perfect incarnation is an aftergrowth'. He refers to the *Gita* as the work of a poet, not of God, and adds :

'Because a poet puts a particular truth before the world, it does not necessarily follow that he has known or worked out all its great consequences, or that having done so, he is able always to express them fully. In this perhaps lies the greatness of the poem and the poet. A poet's meaning is limitless. Like man, the meaning of great writings suffer evolution. On examining the history of languages, we notice that the meaning of important words has changed or expanded. This is true of the *Gita*. The author has himself extended the meanings of the current words. We are able to discover this even on a superficial examination... Thus the author of the *Gita*, by extending meanings of words, has taught us to imitate him...'

And that sets the stage for *his* creative reading of the scripture—there was no war at all, he says for instance, the *Gita* merely described 'the duel that perpetually went on in the hearts of mankind, and that physical warfare was brought in merely to make the description of the internal duel more alluring...'

And from where does he derive the authority to offer his—in many ways extreme—interpretation ? 'At the back of my reading,' he says, 'there is the claim of an endeavour to enforce the meaning in my own conduct for an unbroken period of forty years'. 'This desire (to offer to the readers a rendering based on his experience to live the teaching)', he says, 'does not mean disrespect to the other renderings. They have their own place. But I am not aware of the claim made by the translators of enforcing their meaning of the *Gita* in their own lives.'

And here is Vinoba delivering his *Talks on the Gita* to his co-prisoners ;

'The *Gita* has a way of using old philosophical terms in new senses. The evolution of thought takes place by the non-violent process of grafting new meanings on to old words. Vyasa is a good hand at this. That is why the words of the *Gita* have gained a wider meaning; they have remained so fresh and green that thinkers could discover in them different meanings according to their own needs and experience. All these interpretations are possible, each from its own points of view, and, as I understand it, we can interpret the *Gita* for ourselves without having to contradict any of them.'

Is there only one way then to look at a scripture ? Can the critic maintain that everyone reading it or attempting to learn from it is a *lakir ka fakir* ?

Examples of this kind can be multiplied manifold—I have just taken the first few that come to mind on reading the commentaries of Aurobindo, Tilak, Gandhiji and Vinoba on the *Gita* alone. But for our present purpose three points alone need be stressed.

First, more than one interpretation of the concepts is possible; not just that, interpretations of great insight, interpretations that run completely counter to the vulgarised constructions which are the butt of the critic's ire, *have* been urged repeatedly.

Second, that the critic habitually opts for one construction rather than the other is at least in part a result of preconceptions, of conditioning. (It follows, incidentally, that such fatalism as there is, is there not because of this passage or that in the scriptures but because of other, deeper factors). Thus for instance, when he chances upon two passages in a scripture that on the face 'contradict' each other, our Westernised scholar will at once pounce on them as proof of the unsoundness of the scripture as a whole. But the same scholar confronted with the equally apparent incompatibility of two Articles of a Constitution will have no difficulty in applying 'the principle of harmonious

construction' to discover a sense in which both Articles are valid. Similarly, tell the Westernised critic that the *Brihad-aranyaka Upanishad's* account of the advice Prajapati gave to gods, men and the *asuras* represents the objective of the scriptures—namely, to induce us to think for ourselves—and he will shrug it aside as 'fanciful', or, at best, as 'charming'. But narrate to him the following account by a popular Western psychologist of why the Oracle at Delphi was so effective:

'The process was like the interpretation of a dream. Harry Stack Sullivan used to teach young analysts-in-training not to interpret a dream as if it were the law of the Medas and the Persians, but to suggest two different meanings to the person being analysed, thus requiring him or her to choose between them. The value of dreams, like these divinations, is not that they give a specific answer, but that they open up new areas of psychic reality, shake us out of our customary ruts, and throw light on a new segment of our lives. Thus the sayings of the shrine, like dreams, were not to be received passively; the recipients had to "live" themselves into the message.

'During the Persian wars, for example when the anxious Athenians had petitioned Appolo to give them guidance, word came from the Oracle adjuring them to trust in "the wooden wall". The meaning of this enigma was hotly debated. As Herodotus tells the story, "Certain of the old men were of opinion that the god meant to tell them the Acropolis would escape, for this was anciently defended by a wooden palisade. Others maintained that the god referred to wooden ships, which had best be at once got ready." Thereupon, another part of the Oracle caused debate, for some thought they should sail away without a fight and established themselves in a new land. But Themistocles convinced the people that they were intended to engage in a sea fight near Salamis, which they did, destroying Xerxes's fleet in one of the decisive battles of history.

'Whatever the intention of the Delphic priest, the effect of

ambiguous prophecies was to force the suppliants to think out their situation anew, to reconsider their plans, and to conceive new possibilities.' Narrate this hypothesis to him and he will exclaim, 'How perceptive.'

Third, as different constructions are possible and as we habitually fall for one type rather than the other, and as this is the case at least in part because of a predisposition to be hypercritical, what we should be doing instead is clear: instead of using one construction to deprecate the scripture, we should search out the meaning that will help us grow as individuals and also help us reform our environment.

The doctrine proclaims that *Brahman* alone is, that He permeates all. But Manu, and in one or two places even the *Gita* too, disparages the *shudras*. We can seize upon this dichotomy and berate the entire tradition as having been one gigantic hypocrisy. Or we can, as Gandhiji and others did, use the former notion—the identity of the soul in all—to establish the untenability of untouchability. If we proceed as the habitual critic we obtain the excitement to be had from tripping an author, from using strong words. But we preclude ourselves from drawing what we can from the scripture, for our own growth as well as for the reform of our environmet. *We* lose or gain. The scripture is unaffected in either case, it is just an inanimate book after all.

Rules For The Future

Thus there is in almost everyone, in almost every situation and thing the potential for good as well as ill. Public discourse would benefit and relations, in particular among those doing good work would improve a good deal if we observed the following rules.

First, the object of our observation, analysis, commentary should be to discover what should be done, in particular what should be done by our comrades and ourselves. The pseudo-

intellectual's aim for instance, in assessing others, is not to change his own conduct, it is to merely judge the others and to proclaim his judgment to all and sundry. Our aim should bc the exact opposite: what *we* should do, how we should improve *our* conduct, that should be our first concern. At another level, writers, specially those writing on current events, would do well to ensure that each of their pieces sets out clearly and specifically what in their view and as a result of their analysis should be done about the problem they have written about. Readers in their turn should see that if all the analysis and eloquence have not enabled the writer to enunciate clearly and succinctly his position about what should be done on the matter then the author has either not thought through the matter or does not have the intellectual courage to proclaim his choice. (The recent writings of several of our commentators and the statements of most of our politicians on the question of reservations are examples that the reader can easily see through.)

Second, as our objective is to discern what can be done, our minds—and our discourse—should be occupied with task at hand rather than, as is the case with so many of us today with judging others and broadcasting our judgements.

Third, if judgc we must, our reflex should be to notice first not the weaknesses but the potential in the person, situation or thing that may be built upon so that instead of forever making 'the best an enemy of the good, we may make 'the good a bridge to the better'.

Fourth, if the flaws cannot be ignored in a situation our objective in bringing them to light must be not that of exposing scandals, creating sensations but that they may be effectively removed, that those injustices may not occur again. For the press, for instance, and our opposition parties today this would imply, first, that their criticism must be specific and detailed; second, that an equally specific and detailed alternative should be

presented along with the criticism; and, third, that neither should stop at mere writing or hectoring, that writing and speaking must be just devices for the activity that would actually bring the better alternative into being.

Fifth, if similarly the weaknesses in another or the misconduct of another just cannot be ignored, our first reflex should be to see whether our own conduct is not marred by the same weaknesses The other should be not a glass to be stoned but a mirror. And for assessing the relative weaknesses—one's own and those of the other—Gandhiji, as Pyarelal records, enjoined 'the duty of exaggeration', of seeing one's own shortcomings through a convex mirror and those of another through a concave one. If after all this we must proclaim the other's weaknesses to dissuade him from the conduct or to wean others away from him, we should proclaim it openly to the public and directly to him.

Today we praise a man to his face and censure him behind his back. Let us reverse this: if we must censure him, let us do so to his face, and, as Lord Chesterfield once counselled his son, let us praise him behind his back.

Errata

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TOWARD A FUTURE

K. V. Subbaram

Toward A Future is a collection of articles presented by the author in various forums on issues concerning education, science and society. The articles, written in a lucid manner in powerful prose, are thought provoking, creating a deep impression on the mind of the reader.

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