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Eminent Scholar Lecture Series

Dr. P. M. Bhargava

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Centre for Cellular and Molecular Biology (CCMB), Hyderabad

Our Expectations from Schools and How May We Meet Them

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Dr P M Bhargava- A Brief Introduction

Prof Ved Prakash
Vice Chancellor

It is indeed a matter of great honour and a special privilege to have one of the most distinguished scientists, that is, Dr Pushpa Mitra Bhargava with us this afternoon. I am inspired and humbled by the opportunity; I have been given to introduce enigmatic Dr P M Bhargava to you.

He is widely regarded as the architect of modern biology and biotechnology in India.

Dr P M Bhargava needs no introduction to the community of education. Every one knows him either as a scientist, writer, thinker, institution builder, or as a great administrator. But above all, he is widely regarded as the architect of modern biology and biotechnology in India.

Dr Bhargava is founder and former director of Centre for Cellular and Molecular Biology (CCMB), Hyderabad. Dr Bhargava's vision, foresight and selfless efforts were instrumental in not only establishing the centre but also to equip and staff it to uncompromising standards. The care and attention to detail given by Dr Bhargava to the centre resulted in high acclamation for the centre. The centre has received many awards from UNESCO, FICCI and ICSSR for its outstanding work. Besides, Dr Bhargava had held many prestigious assignments and positions with over 125 major national and international standing committees. He is associated with numerous scientific, social and cultural organizations, and is also the trustee of several well-known Trusts.

Dr PM Bhargava is currently the chairman of the Medically Aware and Responsible Citizens of Hyderabad (MARCH), Anveshna, Consultancy Services, Hyderabad, The Sambhavna Trust Bhopal (STB), and the Basic Research, Education and Development Society (BREAD) Delhi.

Dr PM Bhargava has earned rarest of rare distinctions to his credit for his scientific and social contributions. Dr Bhargava was awarded the Padma Bhusan by the President of India in 1986 and the Legion de Honeur in 1998 by the French government. He is recipient of over hundred national and international honors and awards. The list is very long, but I shall mention only a few here. He is recipient of Fellowship of World Academy of Art and Science; Fellowship of National Academy of Medical Sciences, India; Fellowship of all the three Indian Science Academies; Hon DSc (University of Burdwan); National Citizens Award (India); Visiting Professorship, College de France; Life Fellowship, Clare Hall, Cambridge; Wattumal Memorial Prize for Biochemistry;



FICCI Award for Medical Sciences; Ranbaxy Award for Medical Sciences; SICO Award for Biotechnology; Goyal Prize; R.D. Birla Award for Medical Sciences, and so on.

His biographical profile appear in numerous national and international Who's Who. His achievements are of very tall order. He is regarded as a child prodigy to have obtained PhD at the age of 21. He is most sought after person to be invited to deliver lectures. He

has traveled to over 60 countries and delivered more than 250 invited lectures in some 125 institutions. It is difficult to keep count of his lectures in India, which run in thousands. In addition, he was invited to participate (as an invitee) in over 100 international meetings.

He is prolific writer as well. He has written over 125 major scientific papers and over 400 other articles and write-ups on a variety of subjects, and published in some of the best-known publications around the world. He has four books to his credit, including a 500 page monograph on "*Proteins of Seminal Plasma*", published by John Wiley, New York; a national integrated science text book for 11-12 year-olds; and the recent highly acclaimed book, '*The Saga of Indian Science since Independence*' (Universities Press, 2003).

In nutshell, he is one of the most and highly cited Indian scientists.

Our Expectations from School and How May We Meet Them

Prof P M Bhargava

My friend and colleague Mr R P Aggarwal and also my friend Prof Ved Prakash, ladies and gentlemen, I must confess that I feel very humble by looking at eminent people sitting in front of me who are well known educationists. I am only a professional scientist who has dabbled, as it turns out, since the time of our fighting for independence in areas that concern our civil society. It is only in that capacity that I dare to speak to you today.

In 2003, we undertook an exercise to prepare a document called the agenda for the nation. This document was the result of an effort put in by some of the best known names in the country over the previous 20 years or more. In late 1960's, we did not know where the country was heading to. For those of us who had the privilege of taking part in the struggle for independence, being adult then, it was very disconcerting. We said we need a document which will tell us where we want to go? What is the destination? What are our assets? What are our problems? What kind of citizens we wish to produce through our education system? And what steps we need to take so that we may be able to use our assets, take care of our problems and achieve the goals that we have set, without compromising values that we have stated?



Incidentally, this document was prepared and was presented at 10 Janpath. It is now history that it played a role in the success of the present government that is beside the point. What's important here is that when we looked at the problems and arranged them hierarchically by networking them, we came to the conclusion that there were five problems. If we do not tackle and solve these problems nothing in the country can be done. These were:

- Education
- Water
- Energy
- Governance
- Corruption

The point is that you cannot take care of health, agriculture or industry if you do not take care of this set of five problems. In education we did another networking, to find out what was most important in education. We came to conclusion that

it was school education. To put it in nutshell, if this country does not take care of its school education nothing else in this country will ever work. I think this is one single message that I would like to share with you today. What I would like to say is essentially in support of this.

If this country does not take care of its school education nothing else in this country will ever work.

When we talk of school education I dare say that unless we are clear in our mind as to what is the purpose of school education, we cannot design a system that would fulfill the purpose. And to me the purpose is to prepare and produce certain kind of citizens. I would like to share with you the minimum requirements that I would like an Indian citizen to meet, and then build from there as to how can we proceed and how these requirements can be met? What kind of systems we need so that these requirements are met: There are four areas which I believe our citizens should be knowledgeable about.

Firstly, they must understand what knowledge is about. It is amazing when we talk of knowledge, we do not understand what the attributes of knowledge are. We must understand those attributes that form the basis of every thing else. Then we must have certain values that we must define. Then they must have profession related skills, otherwise, they will not be able to earn their livelihood. We must prepare them to have these skills. Lastly, they must have what we today call life skills, which allow them to interact with people in mutually profitable manner. I will like to take these aspects one by one.

Please forgive me, if what I am going to say is common knowledge or common sense. In fact, nothing that I am to tell you is beyond common sense. But the idea is, it has never been put together in this format before. In the first part of the talk, I wish to share with you my perception of the attributes of knowledge. The knowledge is best defined by its attributes. For a citizen of any country to protect his/her rights and discharge his/her responsibilities, the person needs to have a certain minimum amount of knowledge. I think it is axiomatic. You cannot do this if you don't have this. Now what is that minimum knowledge? That is the function of the school to define that minimum amount of knowledge. For anyone to survive gainfully in the wane of ever increasing competition and to maintain one's self respect and escape exploitation, the person today will need to be both a specialist and a generalist. Now let me explain this. When I left the government in 1993, I rented an office to have my own private setup. I decided to check whether in this new building, all the electric sockets were earthed properly, otherwise my computers would give me problem. I discovered to my surprise that though the building was brand new, and had been

beautifully done, not a single socket was earthed. So I went to the owner whom I knew. He said, “I did not know about it”. I said, “Then you have been taken for a ride”. Because the electrician contractor knew that he did not know how to check the earthing, therefore he did not earthed the sockets. The owner of the building had to spend eight thousand rupees to get the whole thing earthed. Then we did a survey in that area where a large number of academics lived. Seventy percent of the houses were not earthed. Even PhDs did not know what earthing was about and they all had been taken for ride. I will give you instances after instances of lack of general knowledge in areas other than your area of specialization, which puts you into trouble. In the world of tomorrow, you may be a cardiac surgeon or high powered economist, even then you will need to know everything under the sun, otherwise you will be taken for a ride. That is how you define the parameters of knowledge. There is this hierarchy between data, information, knowledge and wisdom.

Conversion of knowledge into wisdom requires weaving of experiences of your own and of others into the fabric of knowledge

Newspapers only give information. They do not give you knowledge. For information you need sensible data, for knowledge you need information; conversion of information into knowledge requires collection of information from multiple sources and of multiple kinds. That is what school must prepare you to do, and how to do that.

Conversion of knowledge into wisdom requires weaving of experiences of your own and of others into the fabric of knowledge. If we do not make the people realize this early in their careers, they will have problems. Let me give you an example, all of you are aware of the last census data. The other day my friend Mr Arjun Sen Gupta, Member Parliament, made a presentation, at our invitation at the National Advisory Board, of which I am a member, and analysed the census data. That was an attempt to convert the data into knowledge. He came to the conclusion that 78% of the Indian live on less than Rs 20 a day, and in Dollar parity 2 dollars per day. As the report is going to be made public very soon no newspaper person will report this. That is converting data into knowledge. Now wisdom demands that we should deal with this problem. If we do not deal with this problem, what are we going to do with this country when seventy-eight percent of Indians are living at less than 20 rupees a day in the year of the census. This includes over 80% of the OBCs, SCs, STs, and Muslims of the unorganized sector. You see how data is converted into knowledge.

Ignorance comes as a package. Child is born. But knowledge is acquired in bits. We do not acquire all of the knowledge in one go;

We compartmentalize knowledge as an alibi for ignorance.

there are efforts to be made. Ignorance is thrust upon people but knowledge is acquired. I said, acquired. In fact, when you take the spectrum of ignorance and consider what knowledge does, is, that it makes that area of ignorance smaller and smaller. It does it in bits. Ignorance is like sand.

Example would be Bush's invasion of Iraq totally based on ignorance. Knowledge is like rock. I had the pleasure of meeting King Frank Loyed, the bright framer of modern architecture, and world's most distinguished architect who gave us the phrase "form, follows, function" in architecture. He build the new Imperial Hotel in Japan. When every thing else had fallen down in an earthquake, the Imperial Hotel, where I had the pleasure of staying, stood like a rock. It was based and built on knowledge.

Today, knowledge knows no boundaries. It is a continuum. We compartmentalized knowledge as an alibi for ignorance. So if I am a Professor of Botany and if you ask me to multiply 2.3 by 3.2, I would say, my friend, I am a Botanist. That is mathematics and I am not expected to know that. So all compartmentalization of knowledge is alibi for ignorance. Nature does not compartmentalize knowledge. Nature does not say this is economics, this is politics, this is sociology and that is physics. We do this as alibi for ignorance. In fact the implication of this system of education today in India is, you cannot study physics, chemistry and economics. Why not? The system in the United States, and I hold no alibi for that country, is superb. You can study physics, chemistry and economics and you can even audit courses in political science. Pay fees, do not appear in an exam, but you can take admission in a course. Nothing prevents you from doing this.

There is a direct relationship between a knowledge based society and good governance. And neither have any relationship to affluence.

There is a direct relationship between a knowledge based society and good governance. And neither have any relationship to affluence. If you remember, I think it was in the year 2002, when we had floods in Bombay and floods in Florida. And if we compare the data of the two, it is amazing. Very few people died in Bombay though hundreds of people died in Florida. It took much longer time for the American army to reach Florida than it took to reach Bombay. Bombay was back to normal in 24 hours, and Florida was not normal for months together. There is no country in the world today which is truly knowledge based society. It means that, in no country government is ideal. One of the purpose for setting up the Knowledge Commission by the Prime Minister, which, I believe, would be debated here in September, was to make India a knowledge based society. The higher we go up in the hierarchy of power, greater is the demand for knowledge, not of just one discipline, but of the whole continuum of knowledge.

Unfortunately, the knowledge base is lesser, as you go up in the hierarchy.

This opens the door for exploitation by self-interest groups operating nationally and internationally. Remember, knowledge is your greatest security against exploitation. Be it buying your radio or television set or buying a piece of land, knowledge is your greatest security. And as you go higher up in political or power hierarchy, the knowledge base decreases and you become more and more prone to exploitation. That is the rule we should remember. It is not enough to be knowledgeable or to have access to knowledge. It is more important to use it when required. In fact, implicit in this statement is the critique of the modern patent system. I remember my friend Suzan, who discovered the monogland antibodies, one of the three or four pillars of the modern biotechnology, did not patent his invention. Obviously he got the noble prize. Eight to ten months before he got the noble prize, he was asked in a pet talk when he was in Hyderabad: Dr Wilsine, why did you not patent your discovery? (This already at that time was bringing two billion dollars of revenue every year.) He said, “If I had patented this discovery, not even one percent of those, who are using it, would have been using it today”. It is absolutely true. Probably there is no one in this hall on whom monogland antibodies have not been used for diagnosis at one time or the other. They are used for diagnosis, now are being used for therapeutic purposes as well in public domain.

Knowledge is your greatest security against exploitation.

Religious fundamentalism, terrorism, obscurantism, superstition and irrational practices, are consequence of vested interests that insulate people from knowledge. I will like you to ponder over this. We insulate people from knowledge so that all of this can survive. I think, some one had cited my article “Seven sins of clergy” in the Tribune published on 2nd January last year and made this point in great detail.

“Knowledge evolves and multiplies when shared”.

A knowledge based society is easier to govern, provided that the government intends to be honest, fair, and transparent and people oriented. On the other hand, a selfish or totalitarian government does not want its people to be truly knowledgeable. History tells us this. Whether it is Hitler’s Germany or as I say Bush’s America, we do not want people to be knowledgeable. We insulate them from knowledge. Today knowledge distribution not only in the developing countries but also in the developed countries is extremely uneven. This unevenness provides perhaps the largest base for exploitation within a country and between the countries. Mechanism of knowledge generation, dissemination and use

around the world is faulty to various degrees. This is what provides a fertile ground for growth of exploitation.

A knowledge based society is easier to govern.

The Prime Minister said about the Knowledge Commission that, “we want you to be leaders in generation of new knowledge; we want you to make sure that India is a knowledge based society. That means dissemination of knowledge. We want you to make sure that government and industry make use of the knowledge in appropriate way, in transparent way, and efficient way”. And if out of all that I have said, one message that I will like you to take home, please allow me to say is that “Knowledge evolves and multiplies when shared”. It remains stagnant and decays when confined. Therefore, it becomes an obligation for a person to share the knowledge all times with all people. No restriction of any kind. Knowledge equity within country and between countries is essential for world peace. We do not have knowledge equity in this country. That is why we have so many problems. That is why we need so many reservations. Knowledge inequity is the most important avenue of exploitation and neo-colonialism; it was this knowledge and equity that brought British and the communist here. If we really want one world and peace to be globalised, we must begin with globalization of knowledge equity, so that everyone in the world has access to knowledge and uses that mechanism to acquire knowledge. This would lead to globalization of rights and responsibilities. Everyone will know what his rights are, and what his responsibilities are. Globalization of access of employment and of facilities, this is what will break barriers that divide people arbitrarily. That alone will lead to globalization of peace, and to the concept of one world, which every respectable man dreams of today.

Now coming to desirable values, I will run through these slides very quickly. Those of you who would like to have a copy, I am sure Prof Ved Prakash would provide it.

This is our perception, I am not the only one involved in this exercise as a responsible citizen of India. This is what a modern school system must endeavour to. First, we must understand what the advantages of a pluralistic society are. In fact one of the India’s greatest strength is its human biodiversity. As my late friend Kumar Suresh Singh, former Director General of Anthropological Society of India, who actually succeeded me as President of the Academy of Social Sciences, says in his forty odd series of volumes on , “People of India”, we have over four hundred fifty minor ethnic groups and close to forty major ethnic groups. And now looking at genetic biodiversity, that my friends, colleagues at Kolkata and Hyderabad are looking at, this country has more

human biodiversity than the rest of the world has. Let us recognize this as an advantage. What is secularism, whole idea of internationalism, interdependence of nations? We must learn to distinguish between discrimination and making a distinction. When we are choosing a professor of physics, we are not discriminating, unless we are choosing based on caste, colour, race or religion. The whole idea of impartiality encompasses a relationship between secularism and impartiality. I will expound on it. Whole concept of common good expounds that what is good for the large number of people in the long run, would be good for me too.

Socialism and democracy, you know, is amazing. I have not met a single person, who says that he is not committed to democracy, socialism or he is not secular. Secularism, democracy and socialism are the most misused words. Therefore, it is necessary to define them in great detail, so that we can exclude those perceptions that are not secular. We must understand their implications. On awareness of our constitution, I have asked many PhDs elementary things about our constitution of India and I must say, it is difficult to find an American who does not know what the basic percept of the constitution of America is. That is where they score over us.

Why do we need lasting peace at various levels? What does it do to the human society? About commitment to UN Declaration on Human Rights, I wonder how many people bothered to look at what UN Declaration on Human Right is. About cleanliness, it is amazing, to know that in India, in some ways we are the cleanest country in the world, like personal hygiene. We are also the dirtiest country in the world. Just look at our roads. How do we reconcile? It's worst really. We must understand what this whole concept of cleanliness is. On health and sanitation, the scientific view is balanced nutrition. You must understand the relationship between organization and chaos. We must know what organization is and what chaos is. It is not difficult to explain it even to 11 year old child.

The whole advantage of social organization, I want to read for you, if you allow me, in full modesty. I had the privilege of writing a textbook "Learning Science" in this campus in 1976 for class VI. This book was translated into several languages and, I think, it sold several thousand copies. There in this text book is a chapter on 'Elements and Compounds'. All of you know what elements are and what are compounds. Elements get together and make compounds. Hydrogen and oxygen are elements and when these elements get together, they make water. And now about the way this book was written. It was the first time I wrote a book on

science without using physics, chemistry, mathematics and biology. These terms were not used. It was an integrated science book. We had lots of and lots of problems, you know. The Patel Committee was appointed, and all that, but our book went through, and did not have problems. It began with observations, questions, let-us-find-out experiments, follow the scientific method, and finally about what you learn and how it is relevant to you. In the last part of the chapter, we said the following, and I will read this for you from this book.

“Organising does not mean restriction of freedom. We have learnt that when elements come together to get organized as compounds, the properties of the elements change. Some properties are lost but some are also gained that is a compound. It has some properties which none of the elements had.” If we think a little, we find the same is true of our society. We can compare ourselves to elements, and our families, our villages as compounds. Hydrogen and oxygen come together and form water, water cannot move freely as molecules of water cannot move freely in the air as molecules of



hydrogen and oxygen can. But water can do things which hydrogen and oxygen cannot do. So we can compare ourselves as elements and our families, village, the city and the country as compound which can do more things, things which are of benefit to us, that we cannot do as an unorganized individual. It is possible to convey this idea in school. The whole concept of team work is implicit in what I have just said.

On **freedom vs constraints**, in fact all freedom in the modern world implies constraints but the principles give you the way to determine what freedom is justified and what is not justified. On **rights and privileges vs duties and obligations**, I had a problem with trade unions. They only talk about rights and privileges but they don't talk about duties and obligations. The right to question is fundamental to the scientific method. There are responsibilities that are associated with the rights. You don't question for the sake of questioning. Scientific method gives you framework within which alone you may question. No exception of oneself to a rule. But we see everyday on the road, everybody makes an exception of oneself. He has a right to jump redlight, but I don't have a right to go through red traffic light. He would object to it, if I do it, but he will do it himself. Respect for others and their rights are virtually non-existent. I may say, it is more in Delhi.

On **concern for the problem of the future**; are we willing to sacrifice a little bit of our comforts of present because we are

concerned with the problem of the future? All this has to be built at the school level. We must make the best use of our real accomplishments in the past, while recognizing our failures during the same period. However we don't do this exercise. A young colleague of mine, Chandra Chakravarty and I were persuaded by Chattopadhyay to look at the history of biology in India from the time to Mohanjodaro to 1989. It was a fantastic exercise. We read through pages. It was published and extensively cited. We discovered that our ancestors had many attributes which we have lost. They made many mistakes so we must understand what is glorious in our past and what is that we must reject.

What is modernity? What do we mean when we say no **amenability to change**. There is this built-in resistance to change. What is efficiency? You must define efficiency as an ability to organize one's thought and actions. It is very often said that Indians would say in 20 minutes what British or the Japanese can say in 20 seconds because we do not organize ourselves. We need to work, and recognize what is the **dignity of labour?** What is the meaning and value of leisure? As I was coming up, the gentlemen who escorted me insisted on holding my bag. I said look, we were taught right from day one in school, you do thing yourself as much as you can. We were taught to carry our own bags. What's wrong in it?

Commitment to excellence makes you recognize excellence everywhere, even in you enemy. That commitment must be there in you. Attitude towards **ostentation and show** Prime Minister referred to it in one of his recent speeches. What is **scientific temper?** Mrs Gandhi included it in the 43rd Amendment of the Indian constitution. But what is scientific temper? The amazing thing is that though government had put it in the constitution, but government itself, all the time, is doing things which are not in consonance with the scientific temper. Scientific attitude is needed towards obscurantism, age, authority, understanding and knowing our history and geography. I am amazed and appalled at the lack of understanding of the basic historical events in our country. We confuse history with legend all the time.

Aesthetics! Ladies and Gentlemen, this is a subject which is very dear to me and I keep on telling my colleagues and friends that India has, perhaps, the longest uninterrupted tradition of aesthetics, of beauty and today we are beginning to look at, study, look at again and understand relation between science and art. We begin to realize that aesthetics plays a very important role in modulating all our perceptions about everything else, including our daily behaviour, the way we live, the way we interact with people,

and as I said, India has the longest tradition of five thousand years of aesthetics. We must understand that codes of behaviour, and these are personal qualities. I do not have to mention these to this group. We need to keep reminding ourselves that these qualities we need to develop in ourselves from school level onwards.

It is very often said that Indians can say in 20 minutes what British or the Japanese can say in 20 seconds.

Attitude towards **winning or losing** a competition, recognition of merit and excellence greater than our own, importance of quantification and abstraction, estimation and accuracy, are sadly missing in our so called intelligentsia. CCMB, UGC, NET, CSIR tests got evolved out of the CCMB lab. What we were doing at CCMB in Hyderabad, where I had the privilege of building the lab for many years. We used to get about 3000 applications for PhD and select about 10. One of the question we used to ask was, “Give us the size of this room”. You will be surprised that some of the answers were wrong by a factor of hundred. They had no idea what the size of the room was. We had to ask young women candidates, “How long is your sari, six yards?”. They said, “Yes sir”. I asked “Is this room smaller or bigger than your sari?” It was a very simple question. All measurements are by comparison. They could not understand that where you have to be absolutely correct. If a carpenter makes a mistake of a millimeter, he will not have a god fit. If a tailor makes a mistake of one millimetre, that would not be important. How to quantify? My grandmother, though she was illiterate but she could weigh with her hands. We have lost that ability. It is extremely important ability. I want my children to have this ability. It is so helpful when I go to buy vegetables; I can tell them with plus and minus 20 grams weight put in my hands, whether this weight is right or wrong. My grandmother taught me whether this weight is right or wrong. We have lost that ability.

Now about skills, Ladies and Gentlemen, there are two thousand five hundred vocational related skills known in the world today. In India, we only teach eighty of them in our vocational training institutes. We must have skills related to traditional knowledge, we don't relate to today, and vocations, which are directly useful to civil society, industry and government and of course we have creative skills. We have these three categories of skills: skills which are related to traditional knowledge, skills that are useful to civil society, industry and government, and there are creative skills. And we must prepare our students at school and anyone else in areas, they are specially suited for or interested in. Now let me very quickly make you aware of what are the skills in this country. We have made an estimate, and this has been published- that if we simply use commercialized, ethically, our traditional knowledge, traditional skills, we can generate employment for hundred million people and resources of Rs 600,000 corers a year.

The problem of finding more money for school education will be taken care of. So, for all these skills, there are no courses available today. No vocation teaches you how to make a bangle? Why can't a bangle be exported all over the world? All of them have tremendous export potential. This is a very small part of the inventory of skills that we have. Just look at this: Throwing, relief work, embossing, setting/fixing, turning, traditional painting and frescos, assembly skills, pottery, papermaches, various indigenous uses of plant material such as making of pattals and cloth from parts of banana tree, and traditional toys, all these and other khadi and related activities such as felt making, spinning, drawing of thread, weaving, cording, knotting, terse ling, dying, printing, embroidery, appliqué, quilting, lace/crochet, knitting, tailoring, costume accessories (turbans, bags, belts), traditional apparel and accessories, wood preparation and processing, sericulture, honey making. Then we have household items. The other day I was giving a lecture to a group of IAS in CSD. I said, "We use *Kajol*, many pretty women in audience do that. Then why it is not commercialized?" Why do we have to buy the expensive pencils, when *kajol* is completely harmless, cheap, and it makes you look beautiful. This can be a home product; this can be done on a small scale. I wonder how many of us know this. How much knowledge we have in traditional design in this country? Go to the National Institute of Design and they will tell you this. Why do we not prepare school children for that?

Architecture and building arts, all these are traditional services (Building and Technical Engineering Services)- planning and survey, construction skills and architectural features (Mazomanie, welding and soldering), conservation and restoration, landscape design, interior design, community based systems of transportation, sanitation, irrigation etc. I am not talking of western concepts, I am talking of Indian concepts. Indian companies designing houses will sell in Europe and they are show pieces of the community. All these fine arts and perceptual arts simply have not been exploited and used. We do not train people in these traditional arts, such as story telling. Is there anybody who did not hear stories from their grandmother or grandaunt whatever? Where are those stories? Why did we not record? Why not that Girish Karnard should record those stories or Amitabh Bachhan record those stories. So, when you want to go and buy the stories for your children, you buy them in English. Why cannot we have cassettes and CDs of Indian stories narrated by our people in our languages? Once I went to address Valley School in Bangalore. I was told by the Principal to meet a young girl, who was a fantastic story-teller. If I had the recording machine, I would have recorded and sold the

record. Why do not we encourage these capabilities in school children.

Anyone of you knows how to play chopar? What a pity! What a fantastic game? Why do we not commercialize these games? Well, these are socially relevant vocations. In some it is we offer a course, but in some others there is none. For example, there is no course in rainwater harvesting. And this is one subject that we can teach in Class IXth and Xth. All of these can be taught, including such as car, bus lorry, two & three-wheeler maintenance and repair, bicycle repair, electrical maintenance and repair, AC maintenance and repair, xerox maintenance and repair, computer repair, interior design, landscape design, floral design, carpentry, plumbing, house painting. The creative skills; I mentioned are music, dance writing, design anywhere everywhere.

Next comes life skills, which are every important. I want to relate an example of the programme called Indian Idol. When this programme started and all these young people came in, some of them were very raw; they did not even know how to speak; they did not know how to dress. But after six months, look at the transformation all of them underwent. What happened was that they have acquired life skills. They have acquired the skills to communicate, make a presentation, of conversation, behavioral skills, knowledge of social convention etc. I think our school must impart these life skills to the pupils. Otherwise we will create another class distinction. And also, we should teach other skills, such as the use of computer, use of calculator, use of household gadgets, relating to machines and also how to acquire information. How do you gather information today? This must be part of the school system or curriculum.

Now the question is how do we dot it? At what age? Is it 18 years? You have 18 years to do this. If you do not lay this foundation in just eighteen years, you will not succeed later, leaving cases of exception. There are three pillars; school; family; and civil society. In the first six years, the primary influence is of the family even if you send the child to a school. Later on, the influence of school increases. Time – frame of about 5-6 years at home or pre-school and 12 years at school or college is the system that we have. What is the policy? We have to first make a statement of policy. “Every child must have equal opportunity of going to a high quality school/college for 10-12 years [Class I-XII]. Every single child in the country must have that opportunity. Commitment to this could be that school should be at a reasonable distance, may be one km. If it is not, you should be able to transport the child to the school. That is why we need a common school system. This step

alone can produce parent/ civil society that will discharge their responsibility to the next generation adequately. Now what is the mechanism? We need a law. We have law today in which the child has a right to be educated up to Class VIII. That must be extended up to 12 years of education. There should be obligation to education which means that every child has to go to school unless there are other compelling reasons. For this we have calculated that we need 4, 00,000 central type school in the country. Some of these schools can have sub-schools in the villages for lower classes. These 4, 00,000 high schools should be strategically located, staffed and well equipped and definitions for these are available. We have authors in the audience for these definitions. These are to be government run schools and nonprofit private schools, aided by government.



The management of these schools should be civil society and local government. The management of the school should not vest with central or state authority, which we have today. The management primarily be with the civil society and local government, which means they have right to appoint teachers, and dismiss teachers, and follow a general framework decided by the competent authority, it is extremely important. If that is not so, we will continue to have problems that we have today. These schools are not accountable to panchayats. I have been to enumerable schools in Kutch; once I visited 37 villages, and about 20 schools, not even a single school had teacher that day because teachers were at the District Head quarter. Who cares about the opinions of the Panchayats? There should be no tuition fee. Education should be free . Admission to Nighbourhood school is your right. You can only go to neighbourhood school and you do not have a choice. For example in France you can only go to closest school. And success of France is entirely to school education system, the public school education system.

Emphasis is on quality, knowledge, value, professional skills and life skills that I have just mentioned. And the policy should be to give rounded off knowledge by the time the child reaches 18 years. To class XII, it is rounded off knowledge a little about every thing so that he can build on his/ her own if need be. Well, one-third people will not go for further studies in any society.

Teachers' appointment, qualification must be prescribed by the authority but the appointment of teachers must be left to the local school authority. Language is another issue we have to worry about. In fact one of the good things the National Knowledge Commission has done is to work out and come out with a required language policy but unfortunately what has been stated in the press is not the decision of the Commission. What I said was that in the early years, from Class I to V, we would like the child to be bilingual and use two languages. They have to communicate in two languages, English and the regional language/mother tongue. And after that you start teaching them the third language. But the two - language formula is essential.

Linkage must be to vocational training institutions which mean that a child who passes the Class XII must have used his or her hand in one of the areas (that we have listed) of the interest to the child, and for which school can provide facilities so that he can then relate it later on to the area in which he wishes to specialize.

Commercialization of education is the single greatest obstacle. We should understand that as long as we have commercialization of schools in this country, we will never ever achieve the objective of providing high quality education. May I remind you that till 1960's we had no commercial schools in the country? We had government schools, excellent schools, and there were no tutorial colleges. If one had a problem in comprehending, he would go to the house of a teacher. The teacher would welcome him, gave him something to eat; the question of a teacher accepting any money simply never arose. I say this from personal experience. Numbers of school were very small but whatever we had was excellent. There were also private schools. We had the Claritin Mission Schools, Dayanand Angla Vernacular (DAV) School. Chain of Birla Schools is run by trust, totally as an act of philanthropy. But no commercialization of schools and our children were happy. They did not have to get up at 4'o clock to go to a tutorial college because children then were really taught. Today, even in the so called great schools, where you pay very high amount of fee, children are not taught. You have to go to the teacher, outside of the classes, for private tuition and pay extra money. So as long as you have commercialization of schools, it will not work. What is a common school system?

Common school system is a system in which there is no commercialization of education, in which you have large number of good schools. Every child goes to a neighborhood school, and he has a right to go there, and an obligation to go there. He cannot say that he will not go to these; instead he will go somewhere else. It is a system which maintains some standards. That is what you

have in the United States. In fact in the United States, I have learnt that the cost of property in a particular area depends on the quality of Public school that you have there. Government runs these schools and cost of property is determined by that. So I think, we will like to have a similar situation here. So to repeat, a common school system means, a system in which there is no private education. There is only one kind of schools in the country and your child has to go to a school which is nearby. Therefore your child, and your maid servant's child go to the same school, as was the situation till 1960s in the country. Please remember, when Galbraith was the US Ambassador here, he sent his children not to these expensive schools, but to one of them which will come under the common school system. So did many of us. That was in the 1960s. Now the situation has changed, and what is the reaction? We need a bill. I don't have to tell you the story of what happened to the Right to Education Bill. We have drafted another Bill based on the first bill that CBSE had prepared.

I think some of you know but for others it will be a bit interesting information. Nitish Kumar, Chief Minister of Bihar appointed a three- member commission, a regular commission of the government on common school system, chaired by the former secretary, Muchkund Dubey, president of the Council for Social Development, Anil Sadgopal and your Colleague Madan Mohan Jha, principal secretary of education, Govt of Bihar as members. This commission has come out with a report. I have a copy of the report, a fantastic report. Not only that, this report has been prepared in less than one year's time, it gives everything, including financial layout. They have spoken to Madarsa managements; and to all the different types of schools in state of Bihar, all of them will become part of this common school system. The Bill abolishes all commercial schools. In fact, this document also has a draft bill and they have drawn very heavily on the bill that we have prepared. So a document is available. Now Muchkand Dubey came and told me they need Rs 10,600 crores extra per year. This is in addition to their contribution they get from Sarva Shiksha Abhiyan. I think that Rs 10,600 crores should be provided. My suggestion was that Mr Nitish Kumar should provide Rs 3000 crores from the state government reallocation; let them do reallocation, because good school education helps every ministry later on. And let us ask the Government of India for another Rs 6000-7000 crores, and see if the Bihar experiment works.

Here is something that is already on the anvil. They are determined to have this bill passed. By the end of the year, you will have it in Bihar, the first state. Let us support that state. I have no hang ups on any of the state governments. But if there is a good proposal, let

us support that proposal. We are committed to spending more than Rs 40,000 crores on 30 new universities. Our total expenditure would be more than Rs 150,000 crores over a period of number of years. Can't we fund Rs 6/7000 crores for a state like Bihar. We should be able to do that. What I am saying is that it is possible for us to have 400,000 central schools. To begin with, let us do it up to high school. After 10 years, make it compulsory up to class XII. It is possible to do this. Funds are possible. You need to set up a system. And the civil society must take the local responsibility. As I said, these schools must be run by the local civil society, like the parents of children in that region.

So in conclusion, please allow me to reiterate what I have said that unless this country ensures that every child in the age of 5 to 18 years is in a good school, and the criteria that I have mentioned to produce the kind of citizens we just discussed is satisfied, no other problem in the country would be ever solved. We will not be able to occupy and acquire for us a place in the community of nations that we otherwise, by virtue of traditions, our resources and our assets, deserve. And for that to happen, first thing you have to do is to decommercialize school education as was the situation before 1960s and we need to pass an Act just like the Bihar Act. The proposed Act has a clause that there will be no commercialization of school education. In other words, you cannot run a school like you run a company. Today large number of schools in the country is run like companies to make money for shareholders, de-jure or de-facto that must stop. Until the time, you and I are forced to send our children to the same school where our maid servant's children go, it will not happen. We are not prepared for that. We cannot make exception of ourselves, and if I have to say, one single step that will change the face of this country, it is just this step of having common school system. We will need no reservation in the country. Every child will go to the same type of school. Where is the question of reservation then? Please remember we were committed to have reservations for ten years.

I remember my conversation with Pt Jawaharlal Nehru in Calcutta. He was one of the founders. He said ten years from now, no reservations would be there because ten years from then, he expected that every child would be in a school, which we have not done till today. Again that is vested interest. Not that we could not have done that on the other hand we do not want every child in school. I remember when I supported conditionally HRD minister's reservation proposal, one of our colleagues in Hyderabad called me in the morning, and said, "Dr Bhargava, from where will we get our household servants." His worry was from where will we get our house hold servants. That is the situation we

have. As long as we have that mindset, God save this country and God save us. In today's context, it is easy to deal with because of the advancements made by science. Very few people realize that the end of apartheid in South Africa was on account of this.

I was telling you about my article on Tribune on "Seven deadly sins of the clergy". I had about 150 calls; out of that 100 were very flattering and 50 came down heavily on me. And one of the call was, "Dr Bhargava (can I speak to you in Hindi, to mention exactly) Aap toh Brahmin hein". I said 'Yes Bhargava's call them Brahmin, but why they are I cannot tell you, because there are no genetic Brahmin'. How does one know? Today for a new born child, you cannot make out what caste, what creed because there is no way you can make out. I said, "I do not call my self a Brahmin, though you may call me a Brahmin, since I do not have any proof". Firstly, how do you define a Brahmin, and where are the genetic markers. I can say that man is an albino because he has albino gene. I can see from his eyes. I asked "what do you call yourself". He replied "Aare, I am a Brahmin" I said 'Who told you that you are a Brahmin. what is the proof, please tell me, and as far as I understand you belong to Scheduled Caste.'" He banged the telephone. In science these are very strong arguments.

You know right in this campus, a science exhibition was held. The exhibition influenced two million people precisely for these questions, for which, we have scientific answers today. In fact, in that exhibition, we had begun by eight statements, and one of the statements was, "Is it a bad omen if a black cat crosses your path?" There were interactive panels, and the exhibition was set up in Bal Bhavan. We asked whether the statement is right, wrong or you do not know. It is amazing to know the responses to the statement. The children said it was wrong and adults said it was right. The normal response of a seven / eight year old child was that it was wrong. It did not appeal to his in built sense of reasoning. We have in-built reflective programme which we call reason. That is why school education becomes very important where we prepare a child to counter these arguments. That is one of the functions of school system. As I tell you, it is very exiting for a child to go through these arguments.

I think it is really very sad because we could have done much better in this country. We have simply sensitized people about HIV; we have not made the point that AIDS is not infectious. It is not like measles or chicken pox. A person with AIDS can be part of the society, like anybody else. You know that such a change has occurred about tuberculosis in India. There was a time when persons suffering with tuberculosis were sent to a sanatorium, but today we do not do that anymore, and we do not isolate a person

suffering from tuberculosis because there has been this education about tuberculosis. Everyone can be cured of tuberculosis virtually 100% except that now there are these resistant XDR's; and tuberculosis in some cases has become resistant to every known anti-tuberculosis drug.

So, I think we need education and we have found that if you are able to educate people about HIV, then you don't have that problem. I must say, in Hyderabad, we have a system. In Hyderabad, no school will do this. In Hyderabad, every hospital accepts HIV patients; Apollo also accepts them. This is because we have worked in Hyderabad in educating people, and as such no school will deny admission. Because there is a tremendous social pressure now build up.

As far as the right is concerned, if you look at the Bihar bill, that has reconciled to that. Now coming to right to propagate one's view that has to be within the framework of the constitution. You cannot, for example, propagate the view that one being Bengali, already makes him the best in the country. You can't propagate such a view, and it is against the constitution and against common sense and against known knowledge. I think nobody in the world has a right to propagate what is already as unambiguously established as the truth. You can't propagate anything against that. Can we permit teaching in school saying that sun rises in the west and sets in the east? No, because it is against all knowledge. What the Bihar Government has done is that it has talked to all the Madrassas, all Sanskrit schools, all of them, collectively and individually. They have persuaded them to become a part of the system. So, when they find that it is advantageous to become a part of it, they will become a part of the system. Well, that is a part of the selling strategy. The principle that we have to follow is that if you have something worthwhile to sell, you can sell it for a short time. However, eventually people will discover. So I think, that is a good business principle worthy to sell; but you have to make an effort to sell it. Well, thank you very much for your patience.

Presidential Address

Shri R. P. Agrawal
Education Secretary, MHRD

Prof Bhargavaji, Ved Prakashji, distinguished invitees, distinguished faculty members of NUEPA, research scholars, press colleagues, friends, media friends, ladies and gentlemen,

At the outset, let me first thank Prof Ved Prakash and all of you for giving me this opportunity of being with you this morning and an opportunity to listen to Prof Bhargava. In the opening remarks, Prof. Ved Prakash was very kind to me and said good things, but you see his unkindness that he has put me after Prof Bhargava. I mean, unfortunately, I do not even deal with school education.

Prof Bhargava said that compartmentalizing knowledge is an alibi for ignorance. There again I have been put on a handicap. Let me again say that it was a great experience for me to listen to Prof Bhargava, a brilliant illuminating talk and I am sure all of you have enjoyed it. And if you have to suffer this anticlimax, Prof Ved Prakash is the culprit. Prof Bhargava started by saying that in his mission statement there are four or five aspects. But in my humble view, if I am told that you have just one line mission statement for the country, for me that one line mission statement would be “Educate every girl in the country”. Once you do that, I think rest of things to my mind fall in place. In this knowledge century, it is not the military power or the economic muscles which are going to determine the place of a nation in the community of nations. Perhaps, knowledge power, the brain power, will determine your ranking among the nations. India, though double pink country, is being perceived as a knowledge power by many countries and then I think I would like to quote what Prime Minister had to say about our population, whether it is a resource or a liability. I quote, “For too long we have taken our large population as a social and economical liability. However a well educated, an informed population is an asset. Our challenge is to make every one in the population an asset.” We have over forty percent in the age group of 6-24 years. Whether we can have democratic dividend out of it or hope not a demographic disaster. It will depend on what we do with our education system. Now friends, the strength of a chain is determined by its weakest link. Similarly, the strength of a country would depend on what are the educational levels of our disadvantaged sections. Unless we go for inclusive education, I



think, country as a whole cannot really develop. And elementary education is the foundation of our educational pyramid. So what Prof Bhargava has so clearly told us and indicated in his slides the kind of value systems we have to bring in, the kind of skills that have to be brought in, soft skill, knowledge, I think all these become very important.

One line mission statement would be “Educate every girl in the country”.

Now friends, as you all know, the constitution was amended 86th time. We have now Article 21A which provides for compulsory primary education for the age group of 6-14 years in such a manner as state may determine by law. Unfortunately, that law and statutes have not been enacted. But there is criticism to some extent on this amendment that while it talks of compulsory education, it does not talk of quality of education. I think what it emphasises is that the quality of education, if we are not able to give the same education, at least it should be comparable. The Sarva Shiksha Abhiyan has done reasonably well. The enrollment at the primary level is almost hundred percent. The dropout rate, which used to be over 30-40 percent ten years back, has come down to about 13-14 percent. I think we have done well but of course, we are also painfully aware of the fact that quality of education is still not up to the mark. The children go to the school but the learning is very little, that is the pity. Kotahri Commission has, of course, recommended in 1966 and it has been coming again and again in education policies, that there should be common schooling. Speaking of what Bihar has proposed, looks very good. I am sure we shall make an attempt in that direction. But to my humble mind, some hybrid solution for the time being, perhaps like UK, has to have both private and public schools. What we call public is private schools in India. They have a common syllabus and common examination system at GCSE and A level.

There is some kind of uniformity brought in. Because in a country of our size, we have over 10,000 good schools which at global level can meet the very best.

Now obviously it would create chaos if we have to dismantle all these good schools without creating an alternative of proven good structure. So we have to not only bring down the standards of these 10,000 schools but upgrade standards of our government schools. I think, definitely a question will arise how do we do that. There has to be a national will. Let me take the liberty of mentioning what was the quality of Japanese goods some thirty years back. I think they were all considered shoddy goods. These used to be sold on, including Chandni Chowk, footpaths. I do not think many of us had confidence in that quality. But then, that country as a whole took the challenge and they started having annual quality

improvement programme. Each year the country as a whole was monitoring their quality of goods. That is how today, I am sure, what was perceived thirty years back is totally gone. Why I am submitting this is, because it is not impossible to improve the quality of government schools and government institutions. Let me take the liberty of also mentioning about our institutions of excellence; it is Indian Institute of Science, Bangalore, IIMs and others. Are they not government institutions? How many of the private institutions can stand up and say they are better than IITs, IIMs or IISC, Bangalore.

So I think, in government sector it can be done, provided we have the will power, and we all work together in that direction. But unfortunately till now, education which was supposed to be the social regular, is itself causing social segregation and perpetuating and widening class distinction. Solution of common schooling system or neighbourhood school has to come in. Kindly do not misunderstand when I said going for in a phased manner because you cannot dismantle the existing system today and create a chaos. But we have to move in that direction where education is available to both rich and the poor of the same or near about same quality. In fact, it is mentioned in the Kothari Commission Report itself that this kind of a bifurcation, the richer going to the private, costlier schools and the poorer going to the government schools, is bad even for the rich people. Even for their children it is bad because by segregating the children, parents of privileged children prevent their children from sharing the life and experiences of the children from poorer sections, and coming in contact with reality of life. To that extent they render the education of their own children anemic and incomplete. I think how awful that is.

Education which was supposed to be the social regular, is itself causing social segregation and perpetuating and widening class distinction.

We had such a good exposition, that I would not like to say more or add anything more, but of course, the fact remains that till now it has not got the emphasis because some of us sitting in their room, or rather most of us sitting in the room, have got an escape route by sending our children to schools which give slightly better education. There is no community pressure of people like you and I, who are in a way, if I may say, somewhat leaders in the society, and are putting right pressure so that there is a need for a community pressure to be brought so that all of us work in that direction.

Well I do not need this toy if it is out of ill-gotten money”.

Another thing I would like to submit is that by bringing disadvantaged section in the mainstream, in the same institutions, I do not think we are going to compromise quality or excellence. If that were to be so, IITs would not have been excellent because

they have been having reservations for the SCs, STs for the last several decades. So I think the two can go hand in hand. You can always have some remedial classes or something similar so that the disadvantaged children can also come up. So inclusiveness need not make any negative dent on the excellence. That is how I would like it to sum up. I think Prof Bhargavaji has given very long list of values which we expect from our schools or the students studying in schools should have. Now obviously we do not want the children, who study in schools, to develop, you know the kind of intolerant behaviour or communal feelings. It is most unfortunate that some of the terrorists, who were involved in 9/11, were highly educated. What is the use of that education, if that education breeds that kind of hatred amongst youth? Or what is the use of that education if a child who gets highly educated, does his PhD and demands high dowry. Is that what we need from our education system. I think the education has to be the instrument of the social change. And I would like to recall our Abdul Kalamji, who till yesterday was our president. He has given a very strong message to children. In fact I distinctly remember that in one of those 15th August or 26th January addresses, he told children not to accept any gift given by their parents if these are out of illegitimate or corrupt means. I think if the students or children can go and tell their parents, “well I do not need this toy if it is out of ill-gotten money”, you can imagine what kind of social transformation can take place. The school must bring about the social change, which we desire to have in the society. At this stage, when they are in their formative years, it is so easy to mould them, to bring them to national stream, to give them those national objective, they would try to understand and implement.

I do not want to take too much of your time, but I would just like to submit that schools have a core responsibility of preparing the children for life. In 6-24 years or whatever age you do PhD or beyond it, does not give you enough for your entire life. The knowledge is doubling very fast. In fact it is said that in the earlier part of the 20th century it was doubling in 30 years, in 1970s every seven years, and somebody cautioned me the other day that it will double every 11 hours in 2012. Well if that is to be so, I think schools must give us those with which we can keep pace with this knowledge. I think, and told, you will also agree that in the centuries to come, uneducated would not be those who cannot read and write but would be those who cannot learn, unlearn and



relearn. I think that is the message our education system has to equip our children for future. Thank you very much for your kind hearing. Once again thanks to Prof Ved Prakashji for allowing me to disseminate my ignorance.