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राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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NCERT

Marjorie Sykes Second Memorial Lecture 2009

KAMAL DATTA

Memorial Lecture Series

1905-1995

NCERT

MEMORIAL LECTURE SERIES

Marjorie Sykes Second Memorial Lecture

at
Regional Institute of Education
Ajmer

28 October 2009

KAMAL DATTA

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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OBJECTIVES

The National Council of Educational Research Training (NCERT) is an apex organisation, assisting and advising the Central and State Governments by undertaking research, survey, and development, training and extension activities for all stages of school and teacher education.

One of the objectives of the Council is to act as a clearing house and disseminator of ideas relating to school and teacher education. We have initiated the Memorial Lecture Series in order to fulfil this role and to commemorate the life and work of great educational thinkers. Our aim is to strive to raise the level of public awareness about the seminal contributions made in the field of education by eminent men and women of India. We expect that such awareness will set off a chain of discourse and discussion. This, we hope, will make education a lively subject of inquiry while simultaneously encouraging a sustained public engagement with this important domain of national life.

The memorial lecture series covers public lectures commemorating the life and work of nine eminent Indian educational thinkers and practitioners.

Title Series and Venue of Memorial Lecture Series

Title	*Venue*
Gijubhai Badheka Memorial Lecture	Madras Institute of Development Studies, Chennai
Rabindranath Tagore Memorial Lecture	Regional Institute of Education Bhubaneswar
Zakir Hussain Memorial Lecture	Regional Institute of Education Mysore

Mahadevi Verma Memorial Lecture	Regional Institute of Education Bhopal
B.M. Pugh Memorial Lecture	North East Regional Institute of Education, Shillong
Savitribai Phule Memorial Lecture	SNDT, Women's College, Mumbai
Marjorie Sykes Memorial Lecture	Regional Institute of Education Ajmer
Sri Aurobindo Memorial Lecture	Presidency College, Kolkata
Mahatma Gandhi Memorial Lecture	National Institute of Education New Delhi

We invite men and women of eminence from academia and public life to deliver these lectures in English or any other Indian language. Our intention is to reach a large audience consisting in particular of teachers, students, parents, writers, artists, NGOs, government servants and members of local communities.

The Annexure I (Memorial Lectures–2007-2008) and Annexure II (Memorial Lectures–2008-2009) provide a summary of the lectures organised in the years 2007-08 and 2008-09.

In due course the lectures will be made available on Compact Discs (CDs) and in the form of printed booklets in languages other than English or Hindi in which it is originally delivered for wider dissemination. Each booklet consists of II sections : Section I highlights the purpose of the memorial lectures and provides a brief sketch of life and work of the concerned educational thinker and Section II gives the lecture in full along with a brief background of the speaker.

I acknowledge the contribution of Ms Konsam Diana, *Junior Project Fellow* for helping me in finalisation of this manuscript.

We hope these lecture series will be of use to our audience as well as the public in and outside the country in general.

ANUPAM AHUJA
Convenor

SECTION I

Marjorie Sykes: Educating for Simplicity, Beauty and Equity

Anil Sethi*

Marjorie Sykes (1905-1995) was one of those foreigners who chose to become Indian because India held out an extraordinary charm for her. She first savoured this through the life and work of some of the stalwarts of our national movement. British by birth, Sykes came to India in the autumn of 1928 to teach at Bentick Girls' High School, Madras (now Chennai). She stayed on until the 1990s, absorbed in a wide variety of ideas, activities and projects, inspired as these were by Gandhi, Tagore, C.F. Andrews and various Christian traditions, notably Quakerism[1].

Active and engaging even in her advanced years, Marjorie Sykes painted life on a vast canvas. Spirituality, an involvement with nature, walking and climbing, crafts, languages, dramatics, philosophy, writing, rural transformation, the peace movement, diplomacy and negotiations, Quaker work, the ideas of her mentors – all these concerns occupied her by day and night. She sought

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1 Quakerism: a Christian movement devoted to peaceful principles, eschewing formal doctrine, sacraments, and ordained ministers and believing in the inward authority of experience. The Quakers' emphasis on spiritual equality made them sensitive to social justice. They were empathetic to the cause of Indian nationalism and many of them were Mahatma Gandhi's trusted friends. Sykes was so influenced by the movement and its work in India that she authored the book, *Quakers in India: A Forgotten Century* (London, 1980).

Education in all these and tried to educate people about them. Her educational ideas, therefore, draw upon many of these interests but in the ultimate analysis she strove to educate for simplicity, beauty and equity.

Born in a Yorkshire family of rather modest means, – her father served as Headmaster in poor coal-mining village-schools – Marjorie and her two siblings were raised in comparative poverty but also in thrift, cleanliness and piety. She was educated in the local schools of the Huddersfield area before she was able to join Newnham College, Cambridge with a College scholarship for the study of English. While in College, she would often work with her father on his projects. Her father would try to design practical working models, simple enough for school children to make and operate themselves, through which they might learn about machines encountered in daily life. He would produce for the kids booklets of poems chosen for their humour, beauty or mystery. He would retell history in a manner that would awaken the reader's human sympathies. And in doing all this, he would involve Marjorie who eagerly joined in the stitching of the home-made books, never viewing it as drudgery.[2]

Sykes finished the English Tripos (Honours degree) at Cambridge in the first division with a short thesis on William Blake. She could have easily carried on with higher studies in English but her fascination for her father's work led her towards school teaching. She spent another year at Cambridge, training to be a teacher, at the end of which she looked for teaching opportunities in Africa and Asia. When she was offered a position at the Bentick High School

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2 The details of Sykes's life and work have been taken either from her own writings or from Martha Dart, *Marjorie Sykes: Quaker-Gandhian* (London, n.d.). Dart's book is perhaps the only biography of Marjorie Sykes. I have used the electronic version of the book. It is available through the link to 'books on education' at www.arvindguptatoys.com. Arvind Gupta is an outstanding educationalist, science-educator and toy maker.

at Chennai, an institution run by the London Missionary Society, she gladly accepted it.

Sykes's upbringing and prior training stood her in good stead at the Bentick School. Through her parents she had imbibed how children are zestfully moved by discovery and achievement, by fun and adventure, by imagination and compassion. Her father never stereotyped people, social groups or nations. He also taught her 'to carry out one's duty uninfluenced by personal desire. … There's only one thing that matters – learning to be unselfish'[3]. Marjorie was to learn more about this later in India in the form of '*nishkama karma*'. Furthermore, her Cambridge teachers had inspired her to contribute in some way towards international peace and social justice. Many of them had seen this to be the message of Jesus, to be communicated to young minds and through an education that made them 'think globally but act locally'. In any case, even as a child of nine, Marjorie had abhorred war. She was always to remember the 'heavy sense of disaster that hung in the air' when World War I broke out and how the hostilities had suddenly transformed a beloved German teacher into an 'enemy alien'.[4]

In 1928 Bentick was a relatively small school (less than 350 children from kindergarten to the final class) and a closely-knit community. It had a hostel although all students were not residents. The teachers and students knew one another and 'cared for one another like a big family'. Given Chennai's climate, the school kept minimal furniture and its members rarely wore sandals. They moved barefoot and slept on grass mats on the floor. In the halls of residence, each child's clothing and personal articles fitted into just a small box. Children of various religions and castes were admitted on equal terms and resident children ate the same food from the same kitchen, regardless of caste. It was not unusual for Brahmin

3 Martha Dart, *Marjorie Sykes: Quaker-Gandhian*, p 8.
4 *Ibid.*, p. 9.

students to clear away leaf-plates or clean utensils used by 'low-caste' people.

As Principal, Marjorie Sykes abolished competitions and prizes and 'the self-centred rivalry they provoked'[5]. She emphasised values of cooperation and instituted a system that encouraged the quicker children to help the slower ones in their studies – 'they did it much more effectively than adults could do!'[6] Physical education programmes were not planned to train a few star performers to win laurels, 'but to improve every child's health and skill'[7].

Bentick and Sykes did not draw the distinction between 'curricular subjects' and 'extra-curricular activities' that so many Indian schools have always maintained – a distinction that the National Curriculum Framework of 2005 seeks to abolish. English and music, for instance, were taught together. The sweeping of floors, cleaning the building, and tending to plants were all as significant as learning the three Rs. The former were treated as core educational concerns, something that Sykes learnt as much from Gandhi and Tagore as from her own education.

It was this thinking, followed not only at Bentick but wherever she taught, that made her so excited about Gandhi's first public pronouncement of his educational agenda in 1937. Gandhi's ideas, advocated and practised as *Nai Talim* have received extensive analyses elsewhere.[8]

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5 Jehangir P. Patel and Marjorie Sykes, *Gandhi: His Gift of the Fight* (Goa, 1987), p. 43.

6 *Ibid.*

7 *Ibid.*, p. 44.

8 See, for instance, Marjorie Sykes, *The Story of* Nai Talim: *Fifty Years of Education at Sevagram; 1937-1987* (Sevagram. 1987); Krishna Kumar, 'Listening to Gandhi' in Rajni Kumar, Anil Sethi and Shalini Sikka (Eds.), *School, Society, Nation: Popular Essays in Education* (Delhi, 2005); G Ramanthan, *Education from Dewey to Gandhi: The Theory of Basic Education* (Bombay, 1962); Sitaramayya, *Basic Education: The Need of the Day* (Wardha, 1952); and Anil Sethi, 'Education for life, Through Life: A Gandhian Paradigm' in Christopher Winch, *First Mahatma Gandhi Memorial Lecture* (New Delhi, 2007).

Suffice it to say here, Gandhi urged that the resources of everyday living and work be exploited for educative purposes. Education was meant for understanding and facing life, whichever way it may unfold. But educational practices were also to be constructed through life itself. The Gandhian paradigm implied the learner's active involvement with his or her existential condition and with her society so that she could work out her emancipation from drudgery and exploitation. As Gandhi stressed, 'education is that which gives true freedom'[9] but this can happen only when it succeeds in the 'the all-round drawing out of the best in child and man – body, mind and spirit'[10]. The short paragraph that the Mahatma published on this matter in the *Harijan* of 31 July 1937 stirred Sykes to the very depth of her being: 'Those few sentences drove everything else out of my mind. I was excited, I read them again and again, and I still remember clearly the words that came into my head: "Here is someone talking real sense about education at last!" I looked eagerly for the next *Harijan*, and the next, and followed the controversies which Gandhiji's proposals had aroused'.[11]

In 1939 Rabindranath Tagore invited Marjorie Sykes as a 'representative of English culture'[12] to teach at Santiniketan. This was the chance of a lifetime. Not only did Sykes obtain access to Tagore's experiments in education and community living but she could study how these related to Gandhian methods. There were many links between Tagore and Gandhi and much coming and going between Segaon and Santiniketan. Already well-versed with Tamil and Hindi, Sykes quickly learnt Bengali and easily slipped into the cultural and intellectual life of

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9 Quoted by J.D. Sethi in 'A Gandhian Critique of Modern Indian Education in Relation to Economic Development', *Gandhi Today* (Delhi, 1978), p.126.

10 *Harijan*, 31 July 1937.

11 Martha Dart, *Marjorie Sykes: Quaker-Gandhian*, p. 22.

12 Martha Dart, 'Marjorie Sykes 1905-1995' in Jehangir P. Patel and Marjorie Sykes, *Gandhi: His Gift of the Fight* (Goa, 1987), p.211.

Santiniketan: flowers and frescoes, weaving and wood-carving, poetry and music, dance and drama and the freedom of religious dialogue. Her home proved to be a special attraction for Christian students and women students. The former would drop by to discuss religious perplexities or read the Quaker journal, *the Friend* while the latter sought personal guidance and inspiration from a more informed and experienced, yet extremely friendly lady. In the course of time, Sykes's Bengali became so impressive that the poet requested her to translate some of his writings into English.

Apart from Bentick and Santiniketan, Marjorie Sykes taught at Women's Christian College, Chennai, Sevagram and several other places. From her work, the books she wrote, and from scattered writings about her, one gets the clear impression that she wished to understand and synthesise the world-views of Tagore and Gandhi, especially their perspectives on education. She viewed this as a journey of inward excitement and discovery. Since it is also a journey that illumines Sykes's educational thought, it is well worth revisiting.

Sykes detected differences in the ideas of 'two of the greatest men then living'[13] but she also saw many similarities, something biographers and historians generally tend to miss out. For Sykes, the two protagonists displayed a divergence of background, temperament and emphasis but a convergence of spirit and purpose. Tagore was Krishna the artist, immersed in beauty, while Gandhi was Rama the knight-errant, passionately devoted to the needy. Yet, each possessed an element of the other.

Both worked, Sykes argued, in their own distinctive ways for the same goals: the dignity of self-reliance and the exercise of responsible freedom. Both had a similar vision, that of a free, fearless and rejuvenated humanity. In the tradition of the Upanishads, they regarded outward achievement to be meaningless unless it helped realise

13 Martha Dart, *Marjorie Sykes: Quaker-Gandhian*, p. 23.

inner freedom and joy – for the individual, for local communities and for society at large. They often turned to a particular verse of the *Isoupanisad* that Sykes too found appealing:

> The whole world is the garment of the Lord
> Renounce it then, and enjoy it,
> Receiving it back as the gift of God[14]

For Gandhi and Tagore, enjoyment and renunciation were dialectical. Like light and darkness, they were complementary opposites that lent meaning to each other. For the two men, the motto of life was 'renounce and enjoy!'[15] This renunciation was not that of the Himalayan cave. It meant instead, 'a detached and clear-sighted *involvement* in human affairs'[16] and led them to engage with society through work and art, run institutions and movements and establish dialogue, debate and discussion.

The educational goals of Tagore and Gandhi, and their methods, were deeply interfused with this world-view. Lovers of children and 'eternal children' themselves, they visualised a holistic, integrated, multi-dimensional education where every child's individuality and talents are recognised and given full expression in a free and joyous learning environment. They believed that education should help relieve tyranny and unfreedom. It should enable us to resist exploitation and the centralisation of authority. It should look upon work as play and focus on constructive work. It should use the elements of daily life and work as educational resources. Thus cotton-growing or Baul music can become the fulcrum of a range of teaching-learning activities – in the sciences, in geography, history and economics, in art, craft and literature. While education should create many avenues to the wider world,

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14 Jehangir P. Patel and Marjorie Sykes, *Gandhi: His Gift of the Fight* (Goa, 1987), p. 62.
15 *Ibid.*, p. 63.
16 *Ibid.*, p. 64.

it must be rooted in local needs and culture and must be acquired, at least up to high school, in the mother tongue. For Sykes, then, Segaon and Santiniketan were not as far apart with regard to the essentials as they are often made out to be.

As a practising teacher at school and college, Sykes lived out these ideas. She honed them through their implementation in all the different corners of India: at Santiniketan, Sevagram and elsewhere. Like her mentors, she sharply distinguished between 'education' and 'schooling'. To her, the flavour of the two words was so different that education may in fact mean *de*-schooling. Education, Sykes explains, literally means a 'leading out':

> I picture someone taking a child gently by the hand, walking alongside at the child's natural speed, encouraging new growth and new adventure, cooperating with the impulses of the child's own nature. But in contrast to this we use the word 'schooled' to suggest that the person has been conditioned to do something one would *not* naturally do – some of the poses and movements of ballet, for example. I am not claiming that education and schooling are incompatible; I am not saying that you cannot have them both. But I *am* saying that they are different and that we ought to recognise the difference.[17]

Sykes firmly believed that teachers ought to be first concerned with education, not schooling. She likened a teacher to a gardener (for *kindergarten* is a garden of children) or a nurse (schools are *nurseries*!) who must provide the right environment for the growth of the children. Like an able gardener does with plants or a sensible nurse with her patients, the wise teacher should know when to leave the children alone so that they get on

17 Marjorie Sykes, 'Keynote Address' in Krishna Kumar (Ed.), *Democracy and Education in India* (New Delhi, 1993), p. xxiv.

with their own growing, 'do their own thing' while the teacher steps back to watch, 'concerned to understand but not to interfere'[18]. But in stepping back to facilitate, teachers must help their pupils to refine the habit of questioning, something so natural in humans. They must themselves inculcate the spirit of enquiry. Children love to pose problems and solve them and teachers must learn this from them.

As educators, do we welcome children's spontaneous questions? Through her life and work, Marjorie Sykes reiterated that education was all about questions and problems and doubts, 'about things that don't fit into the normal accepted pattern'[19]. Education is *not* an accumulation of dead facts; rather, we should think of it 'as a response to a series of challenging questions'[20]. Her love of enquiry, of children, of people, of *detached* social involvement, of beauty, above all her gifts of empathy and friendship made her into one of the country's finest educators. That is why her name always walks briskly into any reflections on education.

18 *Ibid.*, p. xxv.
19 *Ibid.*, p. xxvii.
20 *Ibid.*, p. xxvii.

About the Author

Anil Sethi is Professor of History at the National Council of Educational Research and Training (NCERT), New Delhi. He has been a Commonwealth Scholar at St. Catharine's College, University of Cambridge, Cambridge, UK from where he got his Ph.D for a dissertation that dealt with religious identities in nineteenth and early twentieth century Punjab. He has also been a Centre of Excellence Fellow at the Tokyo University of Foreign Studies, Tokyo, Japan.

Anil Sethi has taught at various universities: Delhi University, Osaka University of Foreign Studies, Tokyo University of Foreign Studies, University of North London and at the School of Planning and Architecture, New Delhi. He has researched the history of communalism, especially its linkages with everyday life. He has also helped develop an oral archive on the Partition of India. His interests include the social and religious history of modern South Asia and History Education.

At the NCERT, Anil Sethi has helped develop various History textbooks. He has written a chapter on the Partition of British India for the Class XII textbook, *Themes in Indian History* (Delhi, NCERT, 2007). He has also written for the History textbooks of Class VIII and Class XI. He has lectured and imparted training on History Education and Social Science Education including Education for Peace. His publications include *School, Society, Nation. Popular Essays in Education* (Delhi, Orient Longman, 2005) that he co-edited with Rajni Kumar and Shalini Sikka.

SECTION II

Second Marjorie Sykes Memorial Lecture
What Should We Teach? An Examination of Issues Underlying the Design of College Curriculum

Professor Kamal Datta

Abstract

The College and the University are increasingly becoming part of wider "educational marketplace". Even as the larger market of the national and international economy demands a wider variety of skills for its efficient working, college education in being seen as a stage in the process of acquistion of specific skills demanded by the market.

Set against this is the need, essential to the survival of a democratic form of government and social order, of a mass of people not only literate but capable of "critical thinking.

I would like, in this talk, to examine, in some detail, the notion of "critical thinking" and ask what steps we may take to inculcate such thinking in young men and women. In doing so, I also examine how our present ways of thinking the work of some eminent thinkers of the past. A few of the principles of the design of college curricula then fall in place in a natural fashion.

Marjorie Sykes (1905-1995) was an English educationist and social worker. Born in England, she came to India in 1928 after obtaining a degree from Cambridge University followed by a teacher's diploma. She was a teacher in and subsequently Principal of Bentinck's School for Girls in Chennai. She also taught in Women's Christian College, Chennai, in the school in Sevagram where teaching was based on Mahatma Gandhi's Nai Taleem (though she went there to teach only after the death of Gandhiji) and in Visva Bharati at Santiniketan where Tagore invited her in 1939. She was also a social activist associated with Vinoba Bhave and with the Friends' Rural Centre in Rasulia, M.P.; she assisted Jai Prakash Narain during his peace mission in Nagaland in 1960 and after. She authored several books: biographies of Rabindranath Tagore and C.F. Andrews, on Gandhiji's and Vinoba Bhave's work, on the work of the Quakers in India and a book titled 'Basic Education: its Principles and Practice'. After a lifetime in India, she returned to England only in 1991 when she was becoming increasingly infirm.

It would be appropriate that a lecture devoted to the memory of Marjorie Sykes be delivered by one who has thought long about primary and school education.

I have not. My only excuse for appearing here today is that I have been either a student or a teacher all my life. So mine has been a life spent in the "business" of education - and in thinking about what I have been engaged in.

Changes in the "Business of Education"

There has been a fundamental change in the process of education over the last 60 years or so that I have been known from my own experience. For teachers, it is now less of a vocation or calling than yet another profession. The person of the teacher is of somewhat low importance. Technical aids to teaching of various kinds must be used by the teacher. Mastering these is as important as being learned, wise or sympathetic to students.

For those who manage or run schools, colleges,

institutes and universities, the important fact now is that they run businesses which must be run on sound business principles. They must advertise, be occasionally overseen by management consultants and, of course, turn in adequate profits on investment.

This last requirement is missing for institutions run on public money. At one time, all institutions in this country ran on public money except for a very few. This has changed in the last 30 years or so.

These changes have had far reaching impacts on the central question I would like to address: What should we teach?

WHAT SHOULD WE TEACH?

There is little I want to say about the early years of schooling .They are the most important years in education but I have never been directly involved in the teaching of small children and I would hesitate to talk at any length about something of which I have no direct experience.

I have been primarily a teacher of young adults, young men and women who have begun to acquire very definite views about the ways of the world. They are also, mostly, preparing to enter the world of business, administration, the professions as employers, employees and the like.

There is no one size that fits all. There are some who will finish their education at the senior secondary stage, some at university graduation and some who will go beyond.

Many will, as they leave their school certificates, have decided to stick to a clear professional line. They will be (or try to be) administrators or doctors or engineers or architects or lawyers or accountants and the like. What they need to be taught is best left to those in their respective professions.

But in this country there is the vast majority of the undecided. Some are undecided by choice—they don't know their minds at the time they leave school. But the larger numbers are of those who have failed to secure

places in institutions of professional education. To these immense numbers of undecided, often weakly motivated but intelligent young women and men, what should we teach?

There are two schools of thought. One feels that we must seek out the multiplicity of smaller or lower grade needs of present day society, design courses to meet those needs and concentrate on imparting the skills that are needed to fulfill them. Thus we must have courses on secretarial work, on medical transcription and record keeping, on travel agency work, on design of clothes and objects of daily use.....The list keeps growing as more and more areas of life require something more than mere common sense and a general education for their management.

There is another school of thought which seeks to improve the ability of students to think for themselves in whatever situation they are in. If they can think *critically on their own* and have the basic skills of reading, writing and arithmetic and are literate in computer basics, they can, so this group feels, master the details of whatever their job demands are.

Critical thought

To favour the second of these alternatives is to run counter to much of today's accepted opinion. Life, we are told, is much too competitive for any deferment in the training of essential skills. We are constantly reminded how students in Korea do better at competitive mathematics, how the language skills of European students are better and so on. Instead of asking if these reports are true and meaningful, we should be asking: why do we make these comparisons at all?

If we believe in the fundamental sanctity of each individual—as we must, if we have faith in the humanistic creed which is the basis of all democratic functioning— we must allow for the development of each student's individuality and prevent the possibility of *indoctrination*. This in turn implies the possibility, indeed the necessity,

of independent judgment on important practical, intellectual, moral and ethical issues.

What kind of mental attributes are likely to promote the ability to form independent and reasonable judgments on important issues on which one may be called upon to decide and, possibly, to act? There can be no simple formulaic answer. It is necessary to have access to a wide range of impartial knowledge. A principal function of all education—and on this surely there is little dispute—must be to make the young have this knowledge or, more important, the information as to where this knowledge may be accessed. But this is not enough. There are certain mental habits that must be practised if the accessed knowledge is to be put to profitable use. In trying to form an independent opinion, there must be the ability to look for and eliminate arguments put in to deceive and mislead as well as the ability to discard mere eloquence. Looking for an impartial solution, we must particularly know how to watch out for our own biases and prejudices and learn to view our own beliefs with something of the same detachment with which we often view the beliefs of others and learn to question our own assumptions as we do those of others. Logic and the ability to reason are important but should not be overemphasised. Judgment, which includes the ability to weigh evidence, is as important; for too often we have to form an opinion about matters of which we have incomplete information. Readiness to accept new evidence, discard hypotheses which are inadequate and, most importantly, *to see the world as it is* are mental habits which are not difficult but may require reinforcement.

Much of this requires a degree of *truthfulness* in thought. We are inclined to treat truthfulness mostly in relation to the events of daily life, in how we treat our family, friends and associates. Such truthfulness is important if social and professional life is to be structured on probity. But truthfulness with regard to modes of thought when thinking of more abstract questions which do not impinge immediately on our personal lives is more difficult to acquire. We must learn to distrust our own likes and

prejudices and not believe that the world must be structured around our own desires and wishes. There must be an awareness of human fallibility, particularly with regard to our own thought processes and the conclusions we reach on important issues.

THE WORLD AS IT IS

Among the important preconditions for critical thought is to *see the world as it is.* This must form an essential aspect of what we attempt to teach young minds. Except for a very few exceptionally gifted minds, most of us require guidance as to how to seek the correct picture of the world *as we know it to be today.* This must draw on the works and thoughts of those who have been the pioneers in shaping the present picture of our physical, mental and moral universe. To merely list the names of those I regard as being important among the pioneers would be pointless. On the other hand a substantive discussion of their work and thought is far beyond the scope of such a lecture. I would like to discuss in a little detail our present picture of the *physical and biological world.*

The picture of the physical world which we believe to be true at the present time has followed from the work of Isaac Newton, Albert Einstein and the quantum physicists such as Werner Heisenberg, Erwin Schrodinger and Paul Dirac.

The picture of the biological world is owed principally to the work of Charles Darwin, Gregor Mendel and the discoverers of the structure of DNA viz. James Watson, Francis Crick, Rosalind Franklin and Maurice Wilkins. The picture we have of our mental world is much more hazy and uncertain. It owes much to the work of Sigmund Freud, though little of it is taken as proven truth.

I have been severely selective as I must in a brief lecture. I have no quarrel with a different list of such names. It is astonishing how much of the work of all these natural scientists is owed to their ability to engage in *concentrated and critical thought.*

The natural world

Our present picture of the natural world combines *causation* and *chance* in an uneasy mixture. Isaac Newton is generally believed to be the originator of a coherent scientific belief in causality. Born in the year 1643, Newton was admitted to Trinity College in Cambridge University in 1661 and had an academic record which was none too distinguished. But he was forced to spend time at home by himself for almost two years from August 1665 because the university had to be closed on account of the great plague. Thinking alone, he conceived of the universal force of gravitation holding the planets to the sun, the moon to the earth and attracting all things thrown up back to the earth's surface as well as the laws of motion which bear his name. In the next few years he worked out for himself the mathematical proofs showing that if the force between the sun and the earth was, as he proposed, an attractive one and fell off inversely as the square of the separation, then the trajectory of the earth around the sun would have the geometrical shape of an ellipse. This Kepler had shown earlier in the century using the astronomical observations of the Danish astronomer Tycho de Brahe. In constructing these proofs, Newton used the laws of motion he himself discovered as well as the mathematical tools he needed. In the process he discovered his own version of the calculus—the method of fluxions—independently of Leibniz who was also discovering the differential calculus in Germany.

For us here, the details of what appeared in Newton's *Principia* which was published only in 1687 are not as important as the fact that it revolutionised the manner in which the natural world was viewed. The fact that we can conceive of how the planets are held in their orbits around the sun, that planetary motions are predictable and that the heavens move according to laws which we can claim to understand is something altogether astounding. It slowly gave rise to the feeling, no doubt exaggerated, that the universe is like a clockwork whose complete mechanism awaits our discovery. Such discovery is not, possibly,

around the corner but may be achievable. The age of enlightenment, and reason, of Voltaire and Rousseau, and of empiricist philosophers like Berkeley and Hume may be seen as consequences which flow naturally from the Newtonian revolution.

This causal view of nature was thrown aside by developments in the 20th century. The developments which began with Planck's discovery of the quantum of action in1900 and Einstein's discovery of the photon in 1905 culminated in the discovery of Quantum Mechanics by Heisenberg, Schrodinger and Dirac in the1920s. A totally new picture of natural processes at the sub atomic level emerged in which it is no longer possible to predict the motion of sub atomic particles like electrons, protons and the like with the precision of Newtonian trajectories. There are inherent and irreducible uncertainties in our knowledge of the positions and velocities of these subatomic particles *when we seek them at the same time* which prevents us from following their paths in the same fashion in which Tycho de Brahe followed the positions of the planets. No increase in the precision of our observational instruments will allow us to circumvent these uncertainties. What is even worse, except in very special circumstances, our ability to predict the outcome of events at the atomic scale has to be couched in the language of probabilities. And yet, because of the smallness of the constants of the theory—the constant named after Planck, the mass of the electron, the smallness of the electron's electric charge etc, the *apparent* causal behaviour of events at the scale of direct human perception continues and will continue to be true. Our ability to predict lunar and solar eclipses or of the motion of artificial satellites is not lost because of the calculus of probabilities at the subatomic level. This is an astounding coherence amidst seeming complexities in the scheme of things. It is not that Newton was wrong. Rather, our picture of nature must be much more detailed and seems never to be finished.

The Biological World

It is equally astonishing that the great variety and fecundity of the world of the living which we see around us is amenable to concise description and theoretical understanding. And yet this is what the work of Darwin, Mendel and their successors in modern biology and genetics have provided us with.

Charles Darwin was born in 1809 in an illustrious scientific family but his early career provided no clue to its later brilliance and depth. As an undergraduate in Cambridge University he whiled away his time in hunting and shooting, as was customary at the time for children of well off parents. It was only that he later attached himself to an outstanding botanist, collected beetles and developed an interest in Geology. He was recommended for a voyage as a gentleman scientist aboard a ship charting the coast of South America that he began collecting biological and geological specimens whose characteristics he studied in painstaking detail over the following decades. Again, like Newton, thinking quietly and critically largely by himself , as well as performing botanical experiments, he examined the variation within species and the evolution of one species into another. Slowly he came to the conclusions which we now call the Theory of Evolution by Natural Selection

He started by noting small variations that exist in members of a species in addition to the similarities that show them to be members of the same species. Many of these variations, in addition to the similarities, are *inheritable* traits which is how variations keep increasing generation to generation. We now know of the mechanism of inheritable characteristics through the DNA in our cellular material but this was, of course, unknown in Darwin's time. But he speculated that some of these variations within a species allow their possessors better possibilities of survival and reproduction because they make their owners fitter in adapting to the environment they find themselves in. More and more members of the species then inherit these characteristics and over time new

species emerge. A common ancestry can therefore be found for species that appear to be widely varying and man himself is no different in this respect from other participants in the phenomenon of life.

Recent understanding of the genesis of differences within a species point to the essential role of *chance* in the biological world as well. Variations within a species may arise from *mutations* in genes, from genes transferred from other parts of the population or other species or from *random changes* in genetic material, a feature often referred to as *genetic drift.* This produces *random changes* in the frequency of particular traits in a species and thus affects the chances of the particular trait being passed on. What part the essential and irreducible role of *chance in the quantum world* plays in this is not as yet clear but the fact of radioactivity induced changes in genetic material suggests that it does play some important role.

This view of evolutionary biology is supported by a very wide spectrum of evidence from varieties of life as we know it now, as well as from palaeontological remains. There is no active biologist, in the recent past or present, who any longer doubts the correctness of the premises or conclusions of the evolutionary process as broadly conceived by Darwin. There are, however, a large number of those who hesitate or refuse to see the world as it is or who are horrified by the thought that we ourselves have a common ancestry with other mammals, in particular with varieties of apes. It seems to deny us any elevated and transcendental origins. But as I have insisted, one of the principal functions of education is to teach us to see ourselves and the world with unblinkered eyes. Nothing is gained and much is lost if seek to deny the workings of nature and those who deny the young such knowledge in any way whatsoever do them a great disservice.

WAYS OF THOUGHT

I described somewhat earlier in this lecture about those ways of thought which are attributes of the *critical mind.*

An understanding of the world as it is, I asserted, was *necessary* for the critical mind but by no means *sufficient.* How does one show to young minds the way, for instance, to avoid prejudices and question doubtful assumptions, those of others as well as our own? Unless we learn to do this, at least in some significant measure, much of the worth of learning truthfully about the external world will have been lost.

This is, by far, the most difficult part of the education of the young adult. Through the years of childhood and adolescence with pick up, from the wayside as it were, most of our mental attitudes and preconceptions about our own ways of life and those of others. From proximity and reinforcement by repetition, we view our own habits, ways of life and thought to be superior to those of others who subscribe to different religions and nationalities, live in other parts of the world or even other parts of this country or speak different languages. There is also the obverse: there are other groups to which we, as a group, feel instinctively and unreasoningly inferior. How do we learn to examine such ways of thought and feeling critically?

This is where we turn to the study of history, literature, and philosophy (which must include varieties of religious philosophy). History interests us not only because we have an interest in how we ourselves were like in the past starting with our family history. We also have an inherent curiosity about what societies in other regions are and have been like. The study of history provides an essential corrective to notions that we are or have been unique or the best. I am aware that of the many uses to which the study of history has been put is the intensely nationalistic one of denigrating civilisations and societies other than our own. This has happened many times in the past in our society and in those of others and is likely to happen again. This aberration is no reason to cease to engage in the study of history. We read literature, among other reasons, for pleasure. The range of literature we can access is severely limited by our language abilities even

though a wider range becomes accessible through translations. But why does good and great literature please us? Is it not because it shows us our true selves, many of our innermost thoughts and feelings in ways we cannot ourselves describe? A good poem, a character in a novel written about with power and depth, an essay which strikes a chord— are these not ways in which we are made to recognise our own thoughts and feelings? These are the beginnings of that process of self understanding and introspection which *may*—and I say *may* advisedly – lead on to the ways of critical thought.

Some acquaintance with and understanding of the processes of philosophical enquiry, secular and religious, is part of this development of the critical attitude. Over time, philosophers and religious thinkers have sought answers to the deepest queries that arise in the human mind. They have pursued their queries by various means, by logic and introspection, by seeking to enquire into how the mind operates, how language is structured, how thoughts are guided by language and language by thought. By trying to understand the modes and content of philosophical queries on all manner of questions do we begin to see what critical modes of thought entail. More than this I hesitate to say: the subject is much too vast and prone to much subjectivity.

The study of and acceptance of the rules universe as they are with that curious mixture of causality and chance of which we have spoken earlier, as well as the study of literature, history and philosophy, properly executed, teaches sobriety of mind and a critical viewpoint whenever the mind is exercised. Is there no more to a good education?

The skills of modern life

I turn now to the last of the problems related to the question of what we should teach. I have left it for the end because I find it to be one of the most intractable and difficult to resolve with any degree of wide ranging agreement.

Following the kind of education whose outlines I have

been describing, young women and men in their early twenties would want to start the process of earning a living. Some may be able to postpone it for a few years by carrying their studies a little further but that is a mere postponement of the inevitable. This is a trying time in one's life: we have all had to pass through it. What skills must we bring to make our task simpler than it might otherwise be?

Will it be enough to convince a prospective employer that one has learnt to think for oneself and to think critically, without irrational prejudices and presuppositions? I suspect not. Employers are more hard headed if not hard hearted people. They like employees to fit into particular slots in their organisations and are likely to look for people with more specific skills. Even if we leave out specialisations such as engineering, law and medicine there are more generalised skills such as familiarity with accounting, human resource management, fluency in the use of computers for creating company records on sales and inventory flow and many more and varied demands. Should it be part of the educational process at the college level to impart these some selection of such skills or should educators expect their pupils to pick these skills up quickly on the job? Educators might wish the skills to be picked up on the job but would employers agree? I suspect not. Since educators cannot enforce their vision of education in isolation from the wishes of those who employ the emerging graduates from their institutions, some concessions have to be made. The crucial question is as follows: how far should the educational system go in catering to the demands of the commercial marketplace?

I do not see any simple or short answer to this question. A good balance has to be maintained and there does not seem to be a simple formula for finding the right balance. It will differ from one society to another, from one region to another depending on the socio-economic profile of the region and depending on the level of technological advancement or retardation. If such factors are not taken

into consideration in seeking the correct balance, the educational programme is likely to be skewed one way or another. It may remain too broad and produce thoughtful and philosophically inclined individuals who are of little immediate use to employers. On the other side, there is the risk of flooding the marketplace with narrowly skilled workers who are unable to think for themselves, easily indoctrinated by passing passions of the moment. They are poor citizens and a standing danger to democracy and society at large.

Conclusion

As I end, it must be clear to you as to where my sympathies lie. **I do believe that it is the primary function of education at the higher levels to produce thinking women and men who form the bedrock of a democratic society.** However, nobody who thinks of education as a process which must prepare us for leading purposeful lives can afford to ignore the learning of the many skills which grease the cogs of society in modern times.

How these aims are to be properly interlinked and blended is the challenge that educationists face. They must prove themselves equal to the challenge and worthy of the trust placed in them by society.

I end with the heart warming story of **The Youngest Headmaster in the world : 16 year old Babar Ali.**

About the Speaker

Kamal Datta is a theoretical physicist who retired as a Professor of Physics from the Department of Physics and Astrophysics, University of Delhi in January 2004 after serving on its faculty for over 37 years. He was educated at Presidency College, Kolkata and at Brandeis University, U.S.A. where he obtained his Ph.D. in Theoretical Physics under the guidance of the eminent theoretical physicist and historian of science, Professor Silvan Schweber. His research work covers areas in Theoretical High Energy Physics, Mathematical Physics and Foundations of Quantum Mechanics. He has authored or co-authored more than 45 publications in these areas. In addition to teaching a wide variety of courses in Theoretical Physics at the post-graduate level and to undergraduate honours students, he has lectured at various NCERT summer schools and refresher courses over the past 30 years and has delivered and continues to deliver popular/ semipopular lectures to undergraduates at the University of Delhi. He was invited to deliver the annual R.K. Popli memorial lectures at St. Stephen's College, University of Delhi in the year 2001. He has also served as visiting faculty at several universities in the U.S.A.

Additionally, he has been interested in studying and writing about history of science, science education and in moral and ethical questions which arise in the course of scientific activity. His recent publications in the history of science include the following:

The Quantum Poisson Bracket and Transformation Theory in Quantum Mechanics: *Dirac's early work in Quantum Theory*

Resonance- Journal of Science Education August 2003
The Early Life of Albert Einstein: Seeking the mature Einstein in his youth
Resonance- Journal of Science Education September 2005
The Science and Philosophy of Albert Einstein
PHISPC-CONSSAVY
Series History of Science, Philosophy and Culture in Indian Civilisation
Vol XIII-Part 6 History of Science
Indian Council of Philosophical Research, New Delhi (in print).

ANNEXURE I

Memorial Lectures : 2007-08

Name	*Date*	*Venue*	*Speaker*	*Theme*	*Chairperson*
Mahatma Gandhi Memorial Lecture	17 January 2007	India International Centre, New Delhi	Professor Christopher Winch Educational Philosophy and Policy, Kings College London, U.K.	Individuals Workers or Citizens Reflections on the Limits of School Based Educational Reform	Professor Mrinal Miri *Former Vice-Chancellor* N.E.H.U. Shillong
Zakir Hussain Memorial Lecture	19 January 2007	R.I.E Mysore	Dr Radhika Herzberger, *Director* Rishi Valley School Chittor Andhra Pradesh	Religion, Education and Peace	Prof. B.L. Chaudhary *Vice-Chancellor* Mohanlal Sukhadia University, Udaipur Rajasthan
Mahadevi Verma Memorial Lecture	17 August 2007	R.I.E Bhopal	Prof. Karuna Chanana *Former Professor* at Zakir Hussain Centre for Educational Studies School of Social Sciences, J.N.U.	Women in Indian Academe; Diversity Difference and Inequality in a Contested Domain	Prof. R.S. Sirohi *Vice-Chancellor* Barkatulla, University Bhopal
B. M. Pugh Memorial Lecture	11 March 2008	Laitumkhrah Women's College Shillong	Shri Ratan Thiyam *Chairperson*, Chorus Repertory Theatre Imphal	Theatre Language and Expression	Professor T. Ao *Dean*, School of Humanities, N.E.H.U. Shillong

Name	*Date*	*Venue*	*Speaker*	*Theme*	*Chairperson*
Majorie Sykes Memorial Lecture	8 April 2008	R.I.E. Ajmer Jawahar Rang Manch, Ajmer	Ms Medha Patkar Social Activist	Socialisation vs. Politics of Education	Professor M.S. Agwani Former Vice *Chancellor*, J.N.U.
Sri Aurobindo Memorial Lecture	2 July 2008	Dorozio Hall Presidency College Kolkata	Shri Manoj Das International Centre of Education Sri Aurobindo Ashram Pondicherry	Education for a Faith in the Future	Professor Sanjib Ghosh *Principal*, Presidency College, Kolkata
Rabindranath T agore Memorial Lecture	19 July 2008	R.I.E. Bhubaneswar	Professor N.R. Menon *Member*, Commission on Centre State Relations	Realising Equality of Status and of Opportunity: Role of Government, Judiciary and Civil Society	Professor Chandrashekhar Rath Eminent Writer
Gijubhai Badekha Memorial Lecture	11 September 2009	R.I.E. Mysore	Shri U.R. Ananthamurthy Jnanpith Awardee	My Writing My Times	Professor G.H. Nayak Kannada Literary Critic
Savitribai Phule Memorial Lecture	12 December 2008	Maniben Nanavati Women's College, Mumbai	Dr Sunderaraman *Director* State Health System Resource Centre	School as a Preventive and Promoting Health Centre	Dr. (Ms) Vibhuti Patel *Professor and Head* Director PGSK S.N.D.T. Women's University

ANNEXURE II

Memorial Lectures : 2008-09

Name	*Date*	*Venue*	*Speaker*	*Theme*	*Chairperson*
Mahatma Gandhi Memorial Lecture	28 January 2009	N.I.E. Auditorium N.C.E.R.T. New Delhi	Shri Anupam Mishra Gandhi Peace Foundation Delhi	Raj Samaj Aur Pani	Professor M. H. Qureshi *Former Professor* Geography, Centre for the Study of Regional Development J.N.U.
Zakir Hussain Memorial Lecture	30 January 2009	R.I.E. Mysore	Professor Padmini Swaminathan Madras Institute of Development Studies Chennai	Literacy and Levels of Formal (General and Professional) Education of the Indian Population: A National Report Card	Professor B. Shaik Ali *Former Vice-Chancellor* Mangalore and Goa University
Mahadevi Verma Memorial Lecture	5 January 2009	R.I.E. Bhopal	Ms Kalpana Sharma Former Chief of Bureau, The Hindu Mumbai	Can Media Teach us Anything?	Dr Pushpendra Pal Singh *Head*, Department of Journalism, National University of Journalism and Communication, Bhopal

Name	*Date*	*Venue*	*Speaker*	*Theme*	*Chairperson*
Rabindranath Tagore Memorial Lecture	14 January 2009	R.I.E. Bhubneswar	Professor Swapan Majumdar Director Culture and Relations Vishva Bharati	Education as Empowerment Twins in Search of an Alternative Education	Professor Shantanu Kumar Acharya Eminent Writer
Gijubhai Badekha Memorial Lecture	20 January 2009	M.I.D.S. Chennai	Professor T. S. Saraswathi, *Former Professor*, Maharaja Sayaji Rao University Baroda	Culture and Development Implication for Classroom Practice	Professor S. Jankarajan *Director* Madras Institute of Development Studies
Savitribai Phule Memorial Lecture	29 January 2009	S.N.D.T. Women's University Mumbai	Professor Sharmila Rege Director Kratijyoti Savitribai Phule Women's Study Centre, University of Pune	Education as Tritiya Ratna: Towards Phule Ambedkarite Feminist Padagogies	Professor Chandra Krishnamurthy *Vice-Chancellor* S.N.D.T. Women's University
Sri Aurobindo Memorial Lecture	27 March 2009	Presidency College Kolkata	Professor Jasodhara Bagchi, *Former Professor* Jadavpur University	Education for Women and Women for Education : the Case of Bengal	Professor Sanjib Ghosh *Principal* Presidency College Kolkata
B. M. Pugh Memorial Lecture	27 March 2009	Don Bosco Youth Centre Shillong	Shri P. Sainath *Rural Affair Editor* The Hindu, Mumbai	India in the Age of Inequality : Farm Crisis, Food Crisis and the Media	Ms Particia Mukhim *Editor*, Shillong Times
Majorie Sykes Memorial Lecture	28 October 2009	R.I.E. Ajmer	Professor Kamal Datta *Former Professor* Department of Physics Delhi University	What should we Teach? An Examination of Issues uderlying the College Curriculum.	Professor Bhagirath Singh Vice-Chancellor M.D.S. University Ajmer