

SAMPARK



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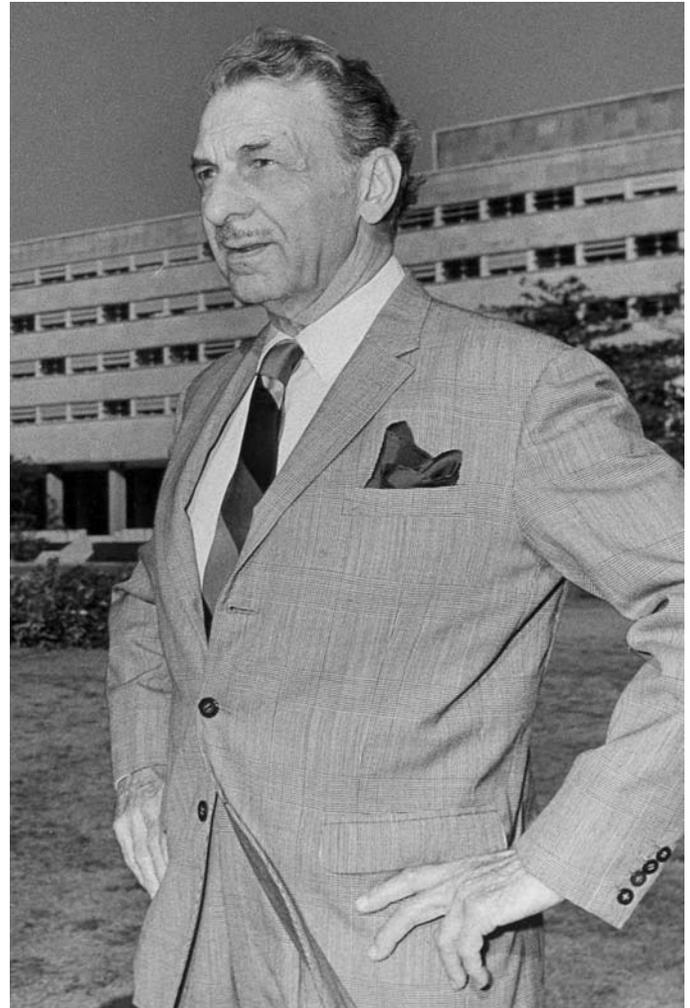
J.R.D. – The Eternal Icon

- Donn Doongaji

As I set to pen this piece, I quite realise that there are many others, seniors and celebrities, who knew J.R.D. more closely than me and, so, would be more qualified to do the writing. All I can claim is that my good fortune had seen me positioned as a junior member of his secretariat in the late seventies. Again, so much has already been spoken and written about J.R.D. in this centenary year of his birth that, at best, my effort cannot extend beyond reaffirming a few of his exemplary qualities. And, finally, there is no escaping the realisation that however extensive the effort, and however hard one may try, it would never be possible to constrict in words the '*spirit*' that was J.R.D.

J.R.D.'s philosophy, and the ethos of the Group he symbolized, can best be described through lines, equally apt for Tatas, that I must borrow from an article I had come across some years ago, the title of which was "*Business as a Spiritual Pursuit*," which read: "*(In Tatas) we have retained the fire of idealism and in its glow we have come to recognise that no wealth or power can be more valuable than our dignity; no loss of profit can be more critical than the loss of our credibility; no skills or qualifications can substitute the integrity of our character.*" His unflinching and unwavering commitment to the highest principles and standards was the light that forever illuminated his path, inspired his speech and guided his actions. Surely there were those who did not agree with his views on issues such as the country's economic model, social concerns such as the growing population and business priorities and practices. And yet, even amongst such, I cannot think of one who could have ever doubted the nobility of his intent. No wonder then, J.R.D. will always remain a symbol of integrity, righteousness, the highest ethical conduct, & credibility.

It amazes one to observe how successive Tata leadership has, for over a hundred and thirty years, zealously guarded, practised and propagated what internally in the Group is referred to as Tata Values, the bed-rock of the Tata edifice. It is this 'spiritual core' that differentiates Tatas from other business entities globally, as they all must struggle to compete and win in a material world.



J.R.D.'s commitment to perfection in whatever he said, did or wanted achieved, bordered on fanaticism. To borrow his own words, he was never satisfied with the second best, in any task, however small. Like Michelangelo, he believed that "*trifles make for perfection for perfection is not a trifle.*" An inconsequential typo in a note or letter would not get past him and back it would come, the word circled in turquoise blue ink (Chairman's ink as we all called it) with the comment: "surely we know our spellings." Once, when complimented for my driving I enquired as to what made him approve of me he said "you did not rest your foot on the clutch pedal all the time." Nothing would escape his discerning eye. It would seem obvious then

that the products and services of his companies had to be of the highest quality, the best in class; not ignoring, for a moment, the quality of corporate conduct that, in my view, remained always of paramount importance to him.

J.R.D. had a deep, enquiring mind. He was curious; curious not only about things that mattered to business such as technology or finance; but curious about places, people, music, medicine, literature, philosophy, religion, the arts, the sciences. He wanted to know just about everything about everything. A lift in his car to children on their way to school was not just warmth and courtesy, which he had in full measure; it was an opportunity to learn what they taught in school, an opportunity to catch a glimpse of the future. Building 'learning organisations' suddenly gained importance not long ago in the management lexicon. J.R.D., by himself, was a learning institution exploring ceaselessly, his thirst for knowledge never quenched. By any standards, therefore, he was truly 'educated.'

"Humility" said Bob Galvin "does not mean that one thinks less of oneself, it means that one thinks of oneself less." If there could be one person that fits this description of humility, it would have to be J.R.D. He was humble in spite of the high pedestal on which he was perched and it was this quality that enabled him to constantly learn. He was far, really far, from being pompous. Unlike so many business leaders and executives who strive to remain in the media glare, he was not a man who cared to bask in the public eye. On one occasion when he entered a reputed clothing shop everyone just stopped going about their business unable to get their eyes off him. Realising what his (charismatic) entry had caused, he said loudly, but politely: "I have not escaped from the zoo. Why don't you ladies and gentlemen just ignore me. I am here to have an Indian style suit tailored for a function at which I am required to be present." That function was the one at which he was conferred the Bharat Ratna by President R. Venkataraman. "He touched power but remained untouched by it."

J.R.D. was unusually warm and caring. Like Andrew Carnegie he concentrated on "the ounce of gold" in his people and he did not focus on the tons of earth that must be mined to reach it. He said: "If I have any merit it is in getting on with individuals according to their ways and characteristics. At times it involves suppressing oneself. It is painful but necessary. To be a leader you have to lead human beings with affection." He inspired performance, he did not have to command it.

Leadership that depends on visibility alone survives for a given moment in time and tends to wither away with its passage. In the way in which he lived, through the strength of his character and the utter sincerity of his words and deeds, J.R.D. touched and impacted not just minds but the soul of all people. He was a leader who

neither craved for nor needed any visibility. His presence was pervasive; it could be felt, always, as it is even this day. And, so, J.R.D. lives on like a blossom perennially in bloom, its fragrance undiminished, **The Eternal Icon.**



Top: Sh. JRD Tata receiving the Prime Minister Pt. Jawaharlal Nehru on the occasion of the Foundation Stone laying ceremony of TIFR Building on 1.1.1954. Others in the picture are Mr. Handoo and Sir S.S. Bhatnagar. **Middle:** With Mrs. Thelma Tata and others on 1.1.1954. **Bottom:** Sh. JRD Tata Speaking at the ceremony. Seated on the dais are Dr. Bhabha, Pt. Jawaharlal Nehru, Sh. Morarji Desai, and Sir S.S. Bhatnagar.



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Clockwise from Top right: Sh JRD Tata at the road naming ceremony (1), in the TIFR canteen with Profs. BV Thosar and R Ramanna (2), with Sh. JJ Bhabha, Prof. DG Karve, Prof. MGK Menon, Mr. GL Mehta and Prof. R Choksi at the presentation of a bronze bust of Dr. Homi Bhabha to TIFR on 24.1.1967 (3), with Prime Minister Mrs. Indira Gandhi and Prof. V Sarabhai and Prof. MGK Menon at the opening ceremony of the Homi Bhabha Auditorium (4 & 5), and viewing the bust of Dr. Homi Bhabha (6).



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Top: Mrs. Tata, Sir S.S. Bhatnagar (1st and 2nd from left) and Dr. Bhabha and Sh JRD Tata (2nd & 3rd from right) in TIFR in 1954. **Middle:** Sh. JRD Tata looking at model of TIFR. **Bottom:** Prof. DG Karve, Sh. JRD Tata, Mr. GL Mehta, Prof. R. Choksi, Sh. JJ Bhabha, Prof. MGK Menon in the Faculty Lounge, Jan. 1967.

(All Photographs reproduced from TIFR Archives)

FROM THE VICE PRESIDENT'S DESK

TIFR Alumni Association (TAA) is completing four years now. It is heartening to note that TAA has started to make a significant impact in many ways in this short

time. While the recognition of achievements amongst the alumni via the initiation of the Best Thesis and Best Teacher awards are important, perhaps the most popular events have been a series of Public Lectures organized by TAA and delivered by illustrious alumni of TIFR. These lectures have taken the spirit of science to the public, especially the youth in various colleges in Mumbai, and have enhanced the outreach of TIFR.

TAA took lead in commencing the Birth Centenary Celebrations of Shri J.R.D. Tata. Fondly known as 'Jeh' among his close friends, he was among the visionaries who founded TIFR with Homi Bhabha and, later, nurtured it along with Pandit Jawaharlal Nehru. Jeh's enormous contribution to TIFR as Chairman, TIFR Council of Management is well-known to everyone associated with TIFR. We think that organization of J.R.D. Tata Memorial Public Lecture series by TAA, starting with the first one on July 29, 2002 by Prof. Yash Pal, the second by Prof. Obaid Siddiqi on July 29, 2003 and the latest by Prof. M.G.K. Menon on July 28, 2004 is a humble tribute to the memory of a great legendary personality and an excellent human being.

TAA is continuously growing and has reached a membership of nearly 300. I am particularly proud to be associated with this dynamic organisation that is constantly evolving. I have had the opportunity of serving TAA for the last few years, and although my current affiliation is with another great institution, viz., the Indian Institute of Technology, Bombay, I am still emotionally bonded to TIFR, which not only gave me education and a successful scientific career, more importantly, made me develop humane qualities.

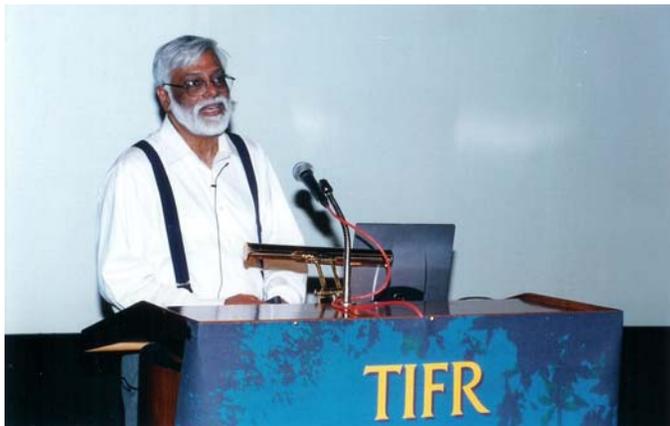
The growth and functioning of any organization depends upon many individuals and TAA is not an exception. Firstly, TAA depends upon the support from TIFR and we are glad that the Director, TIFR, who is also Patron, TAA, has enthusiastically supported and participated in the various functions of TAA. In addition, there are a large number of members and individuals who have helped TAA in many ways. But, there is usually a core group of individuals, who play a pivotal role. In this regard, I would like to place on record the enormous work done by Prof. K. P. Singh as Secretary, TAA, and Prof. A. K. Grover, as co-opted and elected member of TAA Executive Committees, in initiating a variety of activities of our Association.

Finally, 'Sampark' is not only a summary of the year's events, but also a communication medium between TAA and its members. Hence, we look forward to more contributions in the future. With the continuous support of newer members, we are confident that the Association would further grow, and make a greater impact in the years to come.



Prof. R. Pinto is the Vice President of TAA. He can be contacted at rpinto@ee.iitb.ac.in

Adult Literacy: The Technology Angle



Kesav Vithal Nori

TAA celebrated the International Literacy Day, September 8, 2003 by having this public lecture at the Homi Bhabha Auditorium. Prof. Nori is Executive Vice-President, R & D, Tata Consultancy Services, and President TAA.

The computer based functional literacy (CBFL) programme based on 'the theory of cognition' and 'laws of perception' is a novel method of teaching reading skills to illiterate adult, between the ages of 18-50 years who have missed formal schooling. The cognitive process is three-pronged. When reading, cognition takes place (i) directly through the recognition of graphic patterns, (ii) indirectly through sound patterns and (iii) inferentially through feelings and sensations. Under the CBFL programme, learners are taught 400 – 500 words in the language they speak using the puppet show method through a multimedia programme. Adults who are usually acquainted with a spoken language are taught to associate sounds with words and letters. Use of stories, drawings, pictures and music make the learning process interesting. The primers of India's National Literacy Mission in various languages form the bases of CBFL programmes. It exploits the benefits of computers in terms of repeatability, simultaneous blending of spoken word and written language and an appealing graphical interface. Over three years, about 40,000 persons have been successfully taught to read. The programme was implemented in 1100 centres in an area covering one fourth of India.

Project objectives in relation to problems:

The bane of India's development is illiteracy. A third of the population cannot read. Over 15 years ago, India's National Literacy Mission (NLM) mounted a major initiative to tackle the problem. It produced elaborate, well-researched teaching material in all Indian languages, taking into consideration the variations in the dialects of the spoken languages. However, it did not get

very far and failed to eradicate illiteracy at the desired pace. NLM achieved only a 13 percent increase in the number of literates over the last 10 years; it was wide off the mark. At this rate, it would take another 30 years to reach a literacy level of 90-95 percent.

Besides the long duration, the current literacy initiatives, based on traditional pedagogical methodology, call for immense infrastructure investment in terms of trained teachers and school facilities, all at a prohibitive cost. The Computer based Functional Literacy (CBFL) programme is different; it has the potential to wipe out illiteracy in matter of five years. Using one computer alone it can cover 200 persons a year. With an average of 40 hours as time taken to acquire reading skills, the CBFL programme has so far brought over 40,000 adults out of the darkness of illiteracy, the cost per individual learner is the equivalent of \$ 1.00 (about Rs. 45/-).

IT and innovation:

The CBFL programme has been acclaimed as pioneering the third generation of corporate approach to CSR (Corporate Social Responsibility), the first two generations being philanthropy - money for worthwhile causes, trusts that attend to specific needs, etc. and second, identifying a community impacted by a certain business and doing good to it. This is the predominant approach today.

TCS is Asia's largest software and services organization. The CBFL programme is an application of its core competence in innovating uses of Information Technology (IT) for societal good. IT is a multiplier in that capable teachers have been able to manage five to six batches of CBFL training per day and teachers with little or no experience have been able to provide above average instruction. IT has infused repeatability, productivity and standardized quality of instruction, using a simultaneous combination of spoken word and written language and graphical interface. The CBFL programme is based on macromedia's Flash software for creating the backdrop of the puppet show idiom to introduce words and concepts. Computer novices or even those who know little or nothing about computers can easily operate the programmes that run on Pentium 1 machines. Incidentally, this indirectly provides extra life to hardware that would have otherwise have outlived its usefulness. Besides instruction the computers are used to track class attendance and results for all simultaneous batches; habitation-wise improvement in literacy-rates; aggregating and reporting upwards.

Specific target group:

The programme focuses on learners between the ages of 18-50 years who have missed formal schooling.

User need:

By teaching them to read, the CBFL programme has opened the windows of a new world of knowledge and information to over 40,000 individuals in various parts of India, several of who went on to learn to write on their own. There is also evidence of motivation for self-

learning: persons who attended the class have in several cases themselves begun to teach others.

Also, the dropout rate is far lower than that for conventional literacy instruction classes. More women than men have attended these classes. Several express satisfaction with newfound independence and ability to deal with situations in an informed manner. The ability to read has also brought a new sense of confidence for they can verify what it is that they sign or authorise, and they can also keep track of their children's school progress.

Some of our partner NGOs have made competence in the CBFL programme a sine qua non for all who approach them for financial assistance. On a personal note, some elders were delighted that they could now read their religious scriptures and participate in church services as full members of the assembly.

Transferability:

The success of the CBFL programme was reinforced when it was successfully implemented in South Africa through the support of Ms Zanele Mbeki, the first Lady. Ms Mbeki and her delegation visited Hyderabad in May 2002 and evinced keen interest in the programme. In Aug-Sept 2002, a senior team from TCS visited Pretoria to help design, develop and initiate the first set of lessons in the Northern Sotho language, one of the 11 local languages. Valuable assistance was provided to map the sounds and develop a script. A series of possible GUIs for the proposed African languages, and a collage of pictures and narratives representing the African way of life and culture were used. Audio narration and music was integrated in the multimedia labs of CSIR. A theme song composed by a well-known local singer was added and the CSIR programme was then successfully carried forward in S. Africa. The follow-up continued till as recently as October 2003 when President & Ms Mbeki visited India. Now Latin Americans have shown interest in using the CBFL programme to teach Spanish to plantation workers.

Future:

The success of the CBFL is its demonstrated potential in battling the scourge of adult illiteracy in quick time. Apart from progress in the field, the CBFL website has also drawn interest from government and NGOs alike and the software is provided free, together with assistance in commissioning new projects. The CBFL programme was held up as a new paradigm for CSR in an international forum. It has been identified as potential core material to be broadcast all over India via EDUSAT in 2005. Besides catering to government and voluntary agencies we are branching out into more Indian languages.

We now want to demonstrate that illiteracy can be eliminated in focused pockets within the stated 40 hours or earlier, covering 200 adults with one computer per year. For this we are primarily targeting the grassroots class coordinators to motivate them to conduct more than one class a day. As a commercial software

organization, we will work to a point where we can hand it over as a sustainable project to government or large NGOs to take forward, so that we can plunge into newer avenues of social responsibility that are the need of the hour.

ALUMNI HONOURS

Prof. R. Srinivasan Award by IUC-DAEF (2001):

Prof. R. Nagarajan

B. M. Birla Science Prize in Mathematics (2002):

Prof. Nimish A. Shah

B. M. Birla Science Prize (2003): **Dr. M.**

Krishnamurthy

Professor N. R. Dhar Memorial Lecture award,

NAS (2003): **Prof. G. Govil**

Materials Research Society of India (MRSI) Medal (2004): **Prof. P. Ayyub**

Lectureship of Jawaharlal Nehru Birth Centenary

Lecture (2004): **Prof. R. Parimala**

Honorable Mention for the IUPAC Prize for Young Chemists(2004): **Dr. Neel Sarovar Bhavesh**

Invited to be on the Editorial Board of the Journal of Biomolecular Screening: **Dr. Sunita deSousa,**
Team Leader, Biosciences, AstraZeneca R&D

Election to Academies

Prof. L. C. Gupta: *Member of the ASIA-PACIFIC ACADEMY OF MATERIALS (APAM), Russia, and Fellow of the Third World Academy of Sciences, Italy.*

Prof. R. K. Manchanda: *Fellow of the National Academy of Sciences, Allahabad, India.*

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The sense of smell in a fruitfly

Obaid Siddiqi

*Public Lecture on the occasion of **Shri J.R.D. Tata's Birthday**, July 29, 2003, at Homi Bhabha Auditorium, Tata Institute of Fundamental Research, Mumbai. Summarized by Shobhona Sharma.*

Prof. Obaid Siddiqi works on what may appear as a rather esoteric branch of neuroscience- the study of how animals perceive and respond to smells in the environment. How do animals detect the smell of food or a mate and respond in a stereo-typed fashion? Is the sense of smell as important for human survival or is our ability merely a luxury that allows us to appreciate the sweet smell of jasmine or the arrival of the first monsoons? The understanding of the encoding and decoding of chemical information in the brain appears to be much more complex than for any other sensory modality. Prof. Siddiqi described his work aimed at studying the olfactory capability of a simple fruitfly- *Drosophila melanogaster*. This queen of genetics is a valuable model system and lessons from this simple organism are applicable to most 'so-called' higher organisms including man.

Prof. Siddiqi's pioneering work on olfaction was initiated in the early days in TIFR, in the mid-seventies. The first task for his group was to establish behavioral tests to show that fruitflies do indeed discriminate odors. The tests that they designed are simple and provide the flies a choice between two streams one containing odor and the pure air. The flies, which are freely walking in this Y-maze (olfactometer), choose between the two streams of air- one containing odor and the other controlled air. Based on the response of populations of flies, different volatile chemicals could be classified as either attractive or repulsive, and much like humans, flies find high concentrations of an attractant quite repulsive. Using such a paradigm, Veronica Rodrigues, then a student of Prof. Siddiqi, isolated a large number of mutant animals with defective smell performances. These animals with either partial or total anosmias were used to map genes that played important roles in olfactory behavior. Interestingly mutants could be obtained that affected the

response to only one class of odorant leaving all other stimuli unaffected. Using psychophysical tests, such genetically determined partial anosmias, have also been described in humans. Some of the genes identified in flies have now been analyzed and shown to play key roles in the development and/or functioning of the nervous system.

The behavioral preference of the fly is strongly influenced by conditioning and the environment in which it is reared. Prof. Siddiqi described experiments that establish that animals are born with only a basic olfactory ability, which is significantly refined by exposure. Rearing *Drosophila* in defined smell-free conditions results in animals with very weak olfactory ability, which can be enhanced by providing smells to the adult. This implies that the circuits underlying olfactory behavior are not hard-wired but are alterable by experience. Hence it seems that the olfactory repertoire of an animal is akin to Pavlovian [learning](#). Prof. Siddiqi demonstrated how these rather complex issues could be dissected using very simple paradigms such as the olfactory trap. The simplicity of the test is the key to its elegance in providing clues about rather complex issues in neuroscience.

Another simple test that Prof. Siddiqi described is the larval olfactory test. The life cycle of the fly includes a crawling larval stage where the animals eat voraciously and later pupate before finally metamorphosing into an adult. Somewhat surprisingly, these maggots are capable of rather sophisticated smell behaviors. The test consists of a petriplate and the larva is placed in the midst of an odor gradient. The movement of the animal is tracked by a video camera and the path length reports about its olfactory ability. This test is also being used for the isolation of mutants defective in olfaction at the larval stage. The larva can be trained by coupling an odor stimulus with electric shock. As a result of this punishment the animal avoids the 'conditioned' stimulus in a second trial. This alteration of behavior is rather rapid and dramatic and occurs over a period of time indicating the presence of memory. How long will these animals remember the odor associated with punishment and will it continue to have this bad memory even when it metamorphosis from a maggot to a fly? These are some of the questions that Prof. Siddiqi and his group would like to answer in the years to come.

Prof. Siddiqi discussed results from several of the mutant screens that he and his colleagues have conducted over the years. Are we now closer to understanding how smells are perceived? Other laboratories have now identified the receptors that detect odorous chemicals and it seems that organisms devote a significant percentage of their genomes to making a system for smell detection. The wiring diagram from the receptors to the brain is now described and many of the neurotransmitters that are involved in the smell pathway are known. We also know a significant amount about how these pathways are built and imaging experiments carried out by others are beginning to tell us how the

brain decodes information. But the real 'icing on the cake' is our ability to observe what the animal does with this information, and what kinds of behaviors these stimuli elicit. This information is available from the types of experiments that Prof. Siddiqi's group performs, which will help us understand what the 'sense of smell' actually means to this little fly.

SUPPLEMENTARY LIST OF REGISTERED MEMBERS OF TIFR ALUMNI ASSOCIATION

(This list consists of names of new members and those that did not appear in previous editions of the Newsletters available as PDF on TAA website.)

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Search for a Unified Theory

Ashoke Sen

Public lecture delivered on Feb 27, 2004 at the Homi Bhabha Auditorium on the eve of the National Science Day, summarized by Gautam Mandal.



The search for the ultimate constituents of matter began thousands of years ago. By the early decades of 20th century, scientists regarded the atom, consisting of electrons, protons and neutrons, as the basic building block of matter. However, protons and neutrons were found shortly to be composite, consisting of quarks. The current understanding is summarized by the Standard Model of elementary particles, whose basic building blocks include the electron and the quarks, as well as particles like the photon, the gluons and the w and z-bosons whose exchanges cause electromagnetic, strong and weak interactions. Besides these, the Standard Model accommodates other elementary particles like neutrinos, muon, and tau-lepton that are produced by cosmic rays, radioactive decays, collision of high-energy particles etc. It also predicts the Higgs particles which is as yet undiscovered and the search for which is of paramount interest.

In spite of its phenomenal success, there is a significant lacuna in the Standard Model in that it does not accommodate gravitational interaction. Electromagnetic, weak and strong interactions are described by gauge theories that are defined by quantum mechanics, the

special theory of relativity and generalization of the laws of electrodynamics.

The problem with gravity is that unlike for other interactions, the classical theory of gravitation (General Theory of Relativity), when subjected to standard methods of quantisation, gives rise of infinities in the description of multiple exchanges of the mediating particle, "graviton". A naïve extrapolation of the Standard Model to include gravity is inconsistent. The String Theory provides a possible way out of the problem.

The basic paradigm of the String Theory is that different elementary particles are different vibrational modes of a string. Strings can be open or closed, with typical size of the order of 10^{-33} cm. This is so much smaller than even the finest resolving power achieved till now (10^{-16} cm) that strings appear point-like. There are only five distinct possible string theories (Type I, IIA, IIB and two Heterotic theories) that are consistent with both quantum mechanics and special theory of relativity, but they work only if space has nine dimensions.

The good news that immediately follows is that in each of these theories one of the vibrational modes always describes a graviton; thus String Theory automatically includes gravity. Furthermore the String Theory is consistent with quantum mechanics, in particular the infinities encountered in the direct quantisation of general relativity do not appear here. Thus String Theory provides us with a finite quantum theory of gravity.

Nine space dimensions would appear, at first sight, to be bad news since that is six too many. This problem is, however, circumvented by using an old idea of Kaluza and Klein, called compactification. As an illustration, let us imagine a two dimensional world that has the shape of a cylinder of radius R and infinite length. If R is very small (smaller than the resolving power of the most powerful microscope) then the world will appear to be one-dimensional. In the String Theory, six of the nine dimensions are taken to be small, describing a compact space K. When the size of K is sufficiently small, the space will appear to be three-dimensional. The resulting three-dimensional theory will depend on the choice of K as well as which of the five string theories we start from.

Remembering Dr. Raja Ramanna

By

Dr. P. K. Iyengar, Former, Chairman, AEC and Alumnus of TIFR

It is difficult to give expression to my feelings after a long and close association with such an illustrious scientist such as Raja Ramanna, who expired on 24th September 2004, in Mumbai.

Dr. Ramanna was born in Tumkur in Karnataka on 28 January 1925. He had his early education in Mysore and

Bangalore, his B. Sc. Honours in Physics from the Madras Christian College in Tambaram, and his Ph. D. from King's College, London, as a Tata Scholar. In London he also developed an interest in Western classical music, and learnt to play the piano. He returned to India in 1949 to join the Tata Institute of Fundamental Research, as one of the few Indian nuclear physicists in those days.



Dr. Raja Ramanna, with Pt. Nehru at TIFR (from TIFR Archives)

I joined Ramanna in 1952, after doing my M. Sc. in Physics from Trivandrum. We were both young, in our twenties, and shared many experiences, both in academic life and in social life. His early training in England sensitized him to Western culture and science, but at the same time he could see the intellectual degradation due to colonialism. I was greatly influenced by his synthesis of Western thought and technology with Indian philosophy, society and developmental needs. We were keenly bent on the indigenous development of science and technology, and the resultant applications.

What I cherished most in our fifty-year association was his ability to look at problems rationally: scientific, technical and managerial. He not only chose the right approach, but also convinced others of the correctness of his approach. This is what earned him a reputation as a most successful creator of science and technology in the country. These qualities he shared with our founder Homi Bhabha, and the others who followed him: Vikram Sarabhai and Homi Sethna. All of them had a high regard for his abilities, and therefore very willingly passed on to him greater responsibilities as he grew in stature. The testaments to his success are many: He held many responsible positions within the Bhabha Atomic Research Centre, and was its Director from 1972 to 1984; in between, from 1978-81, he went away as Director-General of the Defence Research & Development Organization; he was Chairman of the Atomic Energy Commission from 1984-87. Subsequently he was the Minister for Defence from 1990-92, and till recently was a Member of the Rajya Sabha. He was awarded numerous awards, most significantly the

Bhatnagar Award in 1963, and the Padma Vibhushan in 1975.

In the 50s, the challenge of doing high quality science and developing advanced nuclear technologies was daunting, given the poverty of the country and the lack of expertise. But Dr. Ramanna was never intimidated by this challenge. He believed in choosing the right people, encouraging and supporting them to perform, and cutting down bureaucratic delays and unnecessary rules and regulations in administering science. His science policies were directed towards encouraging creativity in order to make advances in technology at the most sophisticated level. To develop the skilled manpower required for this task, he, with Homi Bhabha, started the BARC Training School, in which every year 200 scientists and engineers were recruited, tutored for a year, and then absorbed into the laboratories and in projects. This was started in 1957, and is still continuing, and much of the strength of the Department derives from this seed that Dr. Ramanna planted.

Out of the uncertain beginnings in the 1950s, if we have today achieved the status of a 'developed country' in nuclear science and technology, it is in large measure a consequence of Dr. Ramanna's ideals, policies and efforts. He certainly leaves behind the proud legacy of a magnificent edifice of scientific and technological achievements and attainments, particularly directed towards the country's energy and national security. But perhaps the even more important legacy is his uncompromising belief in intellectual clarity and rational thinking in every facet of life, and his unwavering belief (which he inherited from Jawaharlal Nehru and Homi Bhabha) that the nation could progress only by embracing science and the scientific temper. The best way to honour his memory is not through eulogies, but by rededicating ourselves to his policies and beliefs.

Raja Ramanna at TIFR

It is indeed a remarkable fact of history that Homi Bhabha, during one of his trips to London in 1947, had identified this young 23-year-old, who had already obtained a Ph.D. from the London University, as one of the promising and potential leaders of the Atomic Energy programme that was just beginning to take shape. Bhabha straightaway offered Ramanna a job and allowed him to stay on in London for another year. Ramanna arrived in Bombay by the steamer *Jaljawahar* on 1 December 1949 and joined TIFR, which was then housed in the Old Yacht Club at Apollo Pier Road, next to the Gateway of India. The so-called servants' quarters of the OYC were converted as the hostel for unmarried scientists of TIFR. Bhabha who had known Ramanna's interests and abilities in music, allotted him two adjacent rooms in the top most fourth floor, one for Ramanna and the other for his piano.

(excerpts)... B.V. Sreekantan

FROM THE PRESIDENT'S DESK

"Mr. J.R.D. Tata's influential support in the genesis of TIFR is well known. Not commonly known was his concern for the state of applied research in India. By its very definition, it needs to be applied to problems around us. In his reckoning, the highest priority of applications belong to those that make a difference to the needs of our country; next in importance were those that would mitigate human suffering – in this regard, he would have been happiest if applied research addressed the concerns of family planning and population control; if neither of the above were within the realm of those involved in applied research, then he felt that they should address the needs of the industry. He expressed these thoughts in a disarmingly simple and direct manner, saying that applied research could be considered effective only when the ordinary man experienced the benefits of science and technology. The Tata Research Development and Design Centre in Pune, started by TCS, was founded on these thoughts. I was fortunate to be associated both with TIFR and TRDDC, and have remained in the Tata fold due to his inspiring vision."



Prof. K.V. Nori is the President of TAA. He can be contacted at kesav.nori@tcs.com

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Do you know someone who is not a member of TAA? Please request him/her to contact the TAA at alumni@tifr.res.in and ask him/her to send the following information with a cheque/DD and 2 passport size photos for a TAA ID card. You can also direct them to the TIFR website at <http://www.tifr.res.in/> for links to the TAA website where the membership form is available.

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Phone no: (Off. and Resi.):
FAX no.:
Year of joining TIFR:
Year of leaving TIFR:
Position in TIFR: Student/Visiting fellow/Scientific Officer/Academic Staff
If student, degree obtained through TIFR: M. Sc./M. Tech. /M. Phil. /Ph. D. in:
Department while in TIFR:
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Demand Draft/Cheque payable to **TIFR Alumni Association** at **Mumbai**

Write your name at the back of the cheque and mail it to : **Ms. P. Rodrigues** at **Room B-114, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai 400 005, INDIA**

[Personal cheques are also acceptable, however, an addition of Rs. 40/- for bank charges for clearing outstation cheques, would be appreciated.]

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Instructions for sending US \$ 25 from USA electronically :

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Account Number 3480 in the name of "TIFR Alumni Association " .

This issue of the newsletter has been co-sponsored by Professor Karamjit Arya & Tata Consultancy Services.



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