



PERSPECTIVE

## Reflections, Refractions and Reactions (PART 2)

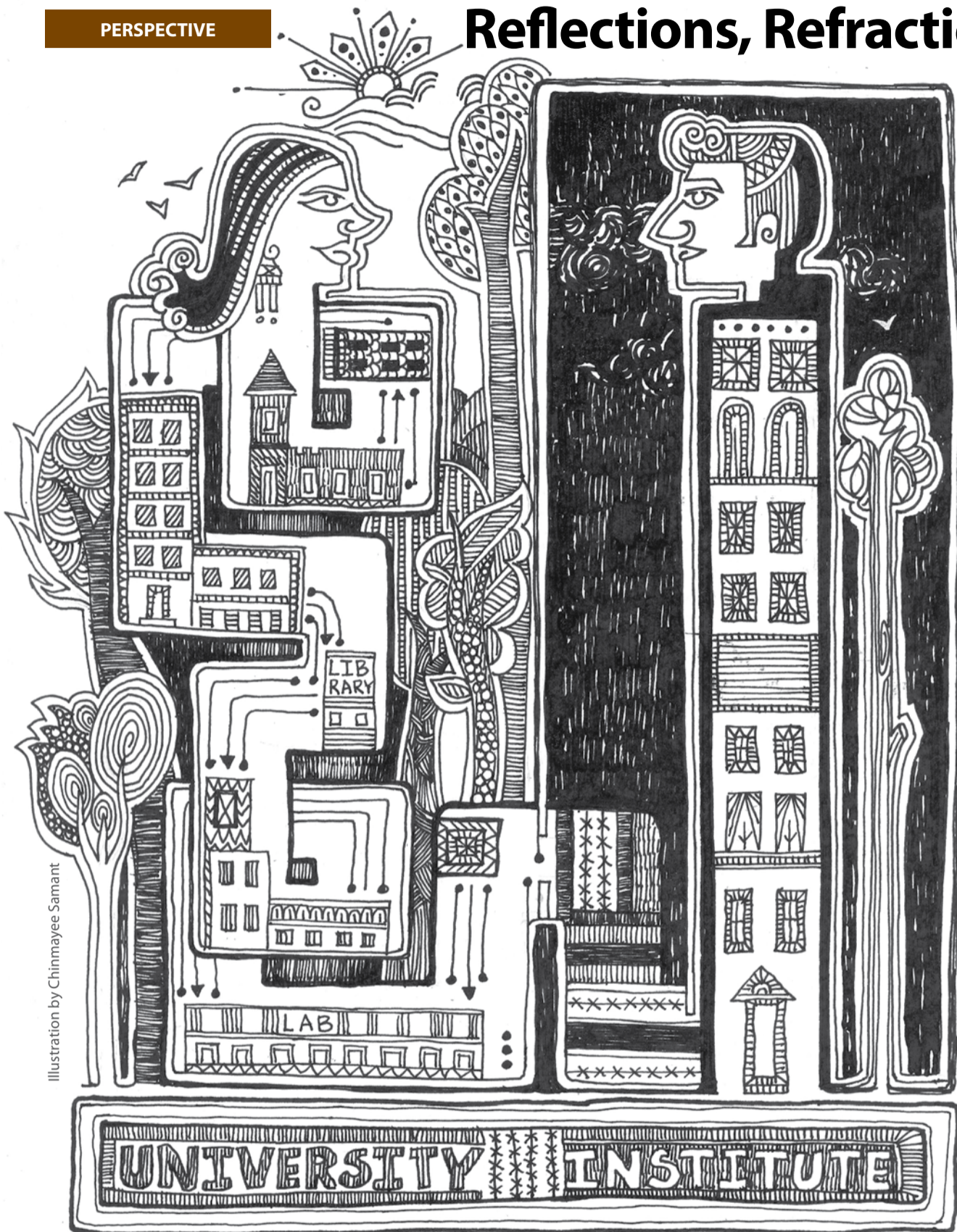


Illustration by Chimayee Samant

On one hand, there is a very real fear that the institute might be spreading itself too thin, and that core areas need to be strengthened before venturing into new terrains. Also, expectations often give rise to inner tensions. In this particular discussion, we looked into the unique dichotomy between the University vs. Institute of Technology model by exploring the views of different stakeholders.

**Jaya:** Is the proposed move towards a university model a welcome one? Does IIT Bombay stand to profit from the wider range of disciplines and ideas? Or will the move risk diluting our traditional strengths?

**Anurag Mehra:** It is tautological to say that any institute will stand to gain from a widening of the range of disciplines. There are logistical issues involved in carrying out

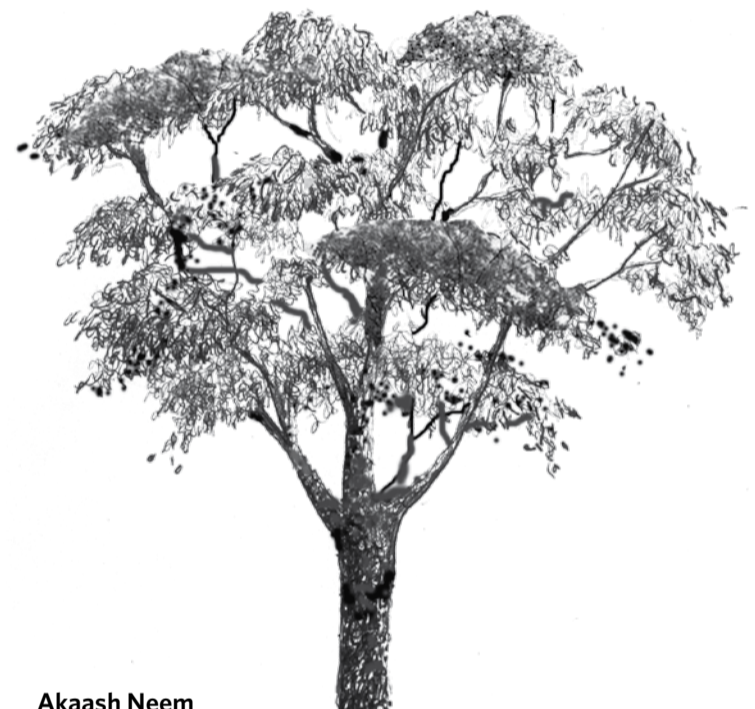
any such broadening of scope. Currently, we seem to be running headlong into doing all these things without any sense of consolidation of past gains/achievements, proper preparedness or planning. Much of this broadening has to evolve naturally, with the building up of the needs of inter-disciplinary work. While here it seems to be more a case of living up to a slogan, imposed by a government which wants to "show" how committed it is without much actual commitment (and money for that matter!). As a result, eventually everything — intellectual and financial resources — will be spread too thin.

**Sushant Sachdeva:** Yes, in a utopian world, I too would strongly agree for such an expansion into a much wider range of disciplines, and conversion into a complete University model. Unfortunately, the current situation is

(contd. overleaf)

In the third issue of Raintree, we initiated a discussion on IIT Bombay's evolving self-image under the broad idea of 'Connect and Disconnect: The world within and without IIT Bombay'. Of the three themes identified to guide the discussions, Raintree has covered the first topic, i.e. Teaching vs. Research. In this issue, we continue the debate while taking up the two remaining themes, i.e. University vs. Institute Model and Fundamental vs. Applied research.

Public institutions like IIT Bombay have to contend with a number of challenges in the new millennium. One of them was recently thrust into prominence, following an articulation by the HRD minister that IITs must evolve into broader-based 'universities of technology'. Such aspirations, however, have to be tested against limitations — both real and pressing — that IIT Bombay faces on the critical ingredients for excellence: resources, talent and funding.



Akaash Neem

One of the tallest species of trees in our campus, the Akaash Neem stands head-to-head with the Eucalyptus and the Coconut palm, also sharing their slimness of build. In Hindi, it derives one half of its name from its height and the other half from its jade leaves, which though serrated and curved, are less prominently so than of the 'true' neem tree. The tree's grey-brown, speckled bark was worked into poor-quality cork in the past, earning its English name, the Indian Cork Tree (Lat. *Millingtonia hortensis*). Though strikingly svelte and fragrant, its milk-white, tubular flowers barely get noticed; being smallish, slender and flowering at a height. Since they bloom in the late evening and fall in large numbers overnight, the best time and place to catch them is at the foot of the tree early in the morning, before they are swept away by the sweeper's broom. They are in season now (and will stay until February), and to see them carpeting the ground — or better still, up among the leaves in loose-hinged clusters — you can go to two convenient spots: right next to the Guest House where the road dips down to Powai lake, and in front of the Gymkhana building, opposite Hostel 11.

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precarious and delicately balanced. There is a shortage of faculty and administration with an increasing student body, (and the resultant lack of hostels, classrooms, etc). In addition, there is a host of new IITs, including the two that IITB has to mentor. This is all happening when unfortunately, IIT Roorkee and IIT Guwahati have yet to establish reputations, comparable to the older IITs. At this stage, I definitely believe that with any step that we take towards expansion, and yes, a lot of the steps that we have already taken, we risk diluting our strengths further (I do believe that we have already significantly suffered!). I am quite pessimistic about the situation as it stands today. I believe that unless drastic steps are taken, we will suffer greatly from the erosion of our standing as an institution and as members of a community that has been proud of the quality of everything associated with the institute.

**“Currently, we seem to be running headlong into doing all these things without any sense of consolidation of past gains/achievements, proper preparedness or planning. Much of this broadening has to evolve naturally, with the building up of the needs of inter-disciplinary work.”**

PROF. ANURAG MEHRA

**Jaya:** Both of you are painting such a grim picture. How would you, Sushil, as a representative of the student community respond?

**Sushil Shintre:** As students, the single largest influence that we had on our lives in IIT was the fact that we got to stay along with and interact with a different and immensely talented bunch of students. And adding on to that already diverse range of students through the proposed University model will certainly be a good idea. But then, this argument will hold only if somehow these students can be accommodated within a single campus. If we leave out this aspect, I don't see any practical benefit in the University model, other than the fact that IIT will initially lend some of its glamour to these new institutions, which in all probability, will be of no consequence if it does not live up to the expectations.

**Mukundan:** I would tend to disagree. Rather than a University setup (which is practically not feasible in any of the IITs at present, because of no physical and financial support available) it is best for IITs to remain what they are currently. Expansion can be in areas where technology plays a significant role. For example, rather than having a Music Specialty department, have the Physics of Music as a research area. This is what differentiates the work done here. Many of the news reports which talk about expanding the IIT into a University model remain sound-bytes, without any thought being put into them.

**Ganesh Samdani:** The feedback of Postgraduate students is that Interdepartmental courses (and IDPs) should be encouraged, as they give a broader perspective on scientific

**“Even if we argue that ‘traditional strengths’ should be consolidated first, my question would be in what enriching way can this be done? Would it be the same status-quo with the threshold levels of research and teaching tolerance?”** PROF. SHISHIR JHA

knowledge, offering variety and allowing us to be exposed to the fields other than our specific research area. However, new programmes at IIT Bombay should not become burdens on our traditional strengths.

**Yashodhan Kanoria:** Jaya, I am also of the opinion that IIT would profit from having a wider range of disciplines. Stronger programmes in the Humanities and Basic Sciences could greatly benefit the IITs. An aspect that perhaps receives less attention than it deserves is the extremely skewed sex ratio on campus. In my view this is unhealthy, and has multiple negative fallouts. Having a broad range of disciplines is likely to lead to a positive change on this count as well, in addition to providing academic balance.

**Jaya:** In an ideal scenario, yes, of course, we'd like to change the male-female ratio, but do we need to branch into Liberal Arts for that? There is also an implicit assumption here that disciplines themselves are gendered. Would anyone else like to respond to this?

**R. K. Shevgaonkar:** I don't see the need to branch into Liberal Arts. Why have more women not come into engineering streams? Performance-wise, girls perform better than boys, yet few take such courses, because maybe their parents don't allow their daughters to live in residential campuses. In the last ten years or so, I've seen interaction between the professors and students lessen. I rarely meet them outside class. So what is the use of a residential campus? I would also like to see better interaction between students and professors.

**“IIT would profit from having a wider range of disciplines. Stronger programmes in the Humanities and Basic Sciences could greatly benefit the IITs.”** YASHODHAN KANORIA

**Sharat Chandran:** IIT Bombay would certainly benefit from a better male-female ratio. But UC Berkeley is not better because it has a better male-female ratio. Neither, for sure, is University of Maryland which has a much better male-female ratio. Expanding IIT because we want a better male-female ratio sounds controversial. I have no objection if IIT ends up being a wonderful place to go, like St. Xavier's in Kolkata, St. Stephen's in Delhi, St. Joseph at Bangalore, or Stella Maris at Chennai. But there should be ONE place in India — maybe not IIT Bombay if you so desire, Yashodhan — where there is only one definition for being there, for faculty and students alike — merit. Okay, make that five places, in the engineering sphere.

**Jaya:** So the assumption seems to be that University model equals St. Xavier's, St. Stephens, etc.

**Shishir Jha:** Much as Prof. Sharat anticipated, a University model could be theoretically welcome, not because I would like the St. Xavier's model, but because I want seriously to teach and collaborate with non-engineers too.

Does this mean arguing for a massive change in orientation of IIT? No. But perhaps this can be achieved by examining even more substantively what technology really means for a country like India. Even if we argue that “traditional strengths” should be consolidated first, my question would be in what enriching way can this be done? Would it be the same status-quo with the threshold levels of research and teaching tolerance?

**Jaya:** So is it about broadening the definition of ‘technology’ and ‘research’?

**Atit Jain:** Yes, a cross-domain atmosphere would help students and teachers find more diverse problems to solve, and more solutions to apply. Maybe you will find some more applications of engineering and technology because of this.

**Raja Mohanty:** I would tend to agree with Anurag, that it is the details of any idea that matter most. I am, however, inclined towards the notion of the University than to an Institute of Technology, with the rider that earlier versions of a University may no longer be valid.

Regardless of whether we are a university or an institute, what makes a place alive is a shared excitement and enthusiasm of being there together. If something could be done in this regard, that would help — and perhaps, a broader sharing amongst faculty of interests which is not just restricted to their fields, might help in achieving what one seeks to do with the University model. Perhaps, encouraging faculty and students to grow not just vertically, but also to build spaces that encourage interactions beyond the classroom might help.

**N. C. Narayanan:** Let's look at it from the angle of ‘Interdisciplinarity’. You take a problem and look at its different dimensions. Apart from the technological aspect, which is one facet, it also has a human and environmental element to it. The politics of these decide who benefits from the technology. All these are interconnected issues. Questions like, what's the cost of the technology, who can afford it, which segment of people is it meant for, does it negatively affect the environment, etc. all come into play when you are considering a technological solution to a social problem.

However, it is important to be grounded in a discipline, and only after that can you transcend to multi-, inter- and trans-disciplinarity issues. For that, you need good undergraduate teaching along with nurturing a broader vision inclusive of other disciplines to “see” and also “reflect”. IITs were originally meant for that goal — the Nehruvian vision. About the University model, learning from the existing university models will be valuable not to make the same mistakes. I agree with Raja that beyond the models, nurturing an atmosphere of shared learning and interactions is what matters. These are choices to be considered as part of building a strategic vision for the institute.

**Jaya:** What's our guess on how many would welcome this transition, and how many would not?

**Sharat Chandran:** My perception is that a large fraction of the SOM, Humanities and IDC group would vote for this trend — that's their dharma. In an inverse way, a small fraction of the ‘core’ engineering departments would also vote for this trend. People like the *Raintree* management would also vote for this trend — their background is also very similar to liberal arts. To back this up, this is exactly the place that the IIT leadership should figure out their vision and mission for (your word was “prioritise”). If they have the clarity, then they should channelise the decision — rather than wait for Kapil Sibal to make that decision.

**Ganesh Samdani:** I am very much of the view of Prof Chandran. I would also expect a bigger fraction of the core engineering departments to vote for this change.

**“Regardless of whether we are a university or an institute, what makes a place alive is a shared excitement and enthusiasm of being there together.”** PROF. RAJA MOHANTY

**Shishir Jha:** With respect to the University vs. Institute model, “small is beautiful” can unintentionally become oases of exclusive excellence, while “large is (splendid?)” can represent the tolerance of lower and lower thresholds.

**Mukundan:** 99% of the population concerned would be against it, for reasons that have been raised previously. ■

SALT 'N' PEPPER ■ DR. ARUN INAMDAR



## Anybody there?

■ JAYA JOSHI



With this issue, *Raintree* is four issues old. You have liked us. We can never resist overhearing or listening to anything about *Raintree*: "The design is good", "The content is bold and meaningful", "It is a bit all over the place"... and so on and so forth. These are good and encouraging, but honestly, we could do with a little more constructive criticism and active participation in the form of contributions sent by you.

With every issue, we try to give you a collection of articles, feature stories, news, humour and illustrations. The opinion pieces mostly find space in the magazine if they are analytical, well researched and present their case well. A lot of effort goes into finding and selecting news pieces for the news section. *Raintree* also attempts to tap the talent of the lesser known but extremely gifted poets, travel writers, fiction writers, photographers and illustrators. Editorial discretion only goes in to selecting the pieces that fit the tone and calibre of the magazine.

The editorial board is flexible and ultimately it is you who constitute the board. All our contributors freely express their ideas, thoughts and opinions, but you, the reader, may have your own. Bertrand Russell once said, 'the fact that an opinion has been widely held is no evidence whatever that it is not utterly absurd'. We agree with him.

We want your frank and pointed opinions and thoughts about the content. What did you like, not like or feel differently about and why? Did something in particular move or inspire you? What was absurd or silly? The magazine, after having looked within and analysed itself, comes to you to be analysed more. To put it honestly, be as critical as possible. The team at *Raintree* abhors indifference and would like to be forever curiously testing new opinions and courting new impressions. So please help us and write in soon with opinions, stories — real and fictitious, articles and criticisms. ■

### OBITUARY

## Prof. Kartic Chandra Khilar Feb 27, 1951— Dec 13, 2009

■ PROF. ANURAG MEHRA Department of Chemical Engineering



Professor Kartic Chandra Khilar, Department of Chemical Engineering, passed away in his Gandhinagar residence after a cardiac arrest. He had recently been appointed as Director General, Pandit Deendayal Petroleum University (PDPU) Gandhinagar.

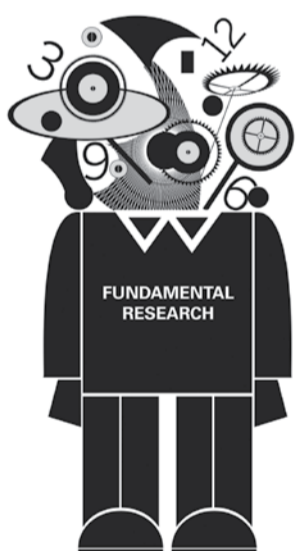
A gentle soul who was an inspirational teacher, guide and mentor, and also an able and committed administrator, Prof. Khilar joined IIT Bombay in 1982 after his Ph.D. from University of Michigan. He did his B.Tech from IIT Kharagpur in 1975 and his M.S from Drexel University in 1977. In his long and distinguished career at IIT Bombay he held a number of important positions including, Head of the Chemical Engineering Department and then later, of the Center for Research in Nanotechnology and Nanosciences (CRNTS).

He was Professor in Charge of Continuing Education Programmes Cell, JEE Chairman, and the Dean (R&D). He was elected Fellow, Indian National Academy of Engineering, in 2004 and was in the editorial Board of a number of prestigious journals. His own research related to flows in porous media, colloids and interfaces, and nanotechnology, and was truly world class. Most importantly he was successful in inspiring a culture of research in young faculty members who joined the institute after him. His entry in the Chemical Engineering department marked the beginning of a new era in which a modern, research-based work culture developed in the department.

May his soul rest in peace. He is survived by his wife Jaya and their sons Kunal and Mrinal. ■

### PERSPECTIVE

## Reflections, Refractions and Reactions (PART 3) ■ by TEAM RAINTREE



FUNDAMENTAL RESEARCH



APPLIED RESEARCH

Illustration by Farweej Bhutia

The eternal debate over Basic vs. Applied research has made its presence felt at IIT Bombay.<sup>1</sup> Any discussion in the current scenario on IIT Bombay's evolving self-image would still have to tackle this critical question — has IIT Bombay reached the right balance between 'curiosity-driven' (fundamental) and 'targeted' (applied) research?

Historically, for the institute, the "absence of a mechanism for rewarding good quality, unpublished and unpatented work had acted as a deterrent to some faculty for not choosing relevant problems for their work."<sup>2</sup> As a result, this adversely affected the development of relevant technologies that could address the needs of the vast multitudes who reside in India's countryside. While IIT

Bombay's achievements in technology development have improved somewhat over the years, the question still holds true — should the institute focus greater attention on targeting more research funding to national priorities?

In our debate we posed the following question — "In R&D, there is an opposition between research aimed at the generation of new knowledge, and research aimed at the development of socially relevant knowledge. Should the institute prioritise between the two, and what are the dangers of disenchantment amongst faculty, students and alumni who don't agree with this prioritisation?"

The responses that this question elicited were quite revealing: they highlighted the varied mindsets of the different stakeholders within the institute. There are those like Mukundan, a Ph.D student from School of Management from IIT Bombay, in whose opinion, "the institute should prioritise and the vision document would provide a good starting point for this. As an IIT, the inherent focus should be on applied rather than fundamental research. Particularly considering the dwindling state support, applied research has to be provided this necessary backup".

Student perspectives on this issue, however, were quite divergent. Ganesh Samdani, who is an M. Tech student, felt that prioritisation should not be done as it would kill the objective of research and the freedom of the researcher. A view echoed by recent alumnus Sushant Sachdeva (Class of 2008) was that there was no need to prioritise between the two. He elaborated, "Researchers have their own personal goals, and different people gain satisfaction out of different

**"There's no debate between fundamental and applied research as long as we're doing quality research. We should monitor quality, but at the moment we're not doing that because a monitoring system is not in place. The number of publications is not the only way to judge quality of research."** PROF. R. K. SHEVGAONKAR

aspects of their work. I believe this decision is best left to them, as long as they work hard towards producing good work". Interestingly, for an undergraduate student like Sushil Shintre (B.Tech., Civil Engineering) this was largely an irrelevant question, "because like most other UGs," he said, "I have hardly been exposed to real research for various reasons".

A part of the problem in this debate is also about how one defines and measures Basic vs. Applied research. For Professors Anurag Mehra (Chemical Engg.) and Sharat Chandran (CSE), the contradiction between fundamental and applied research is not a straightforward one. Many members of the scientific community talk about "targeted" research, but that is not necessarily the same as "applied" research, although neither should be confused with the sort of "blue-sky, wherever-it-takes-me" type of research that we generally refer to as "fundamental," "basic" or "curiosity-driven." (contd. overleaf)

It also needs to be reiterated here that technological solutions to problems are not always the answer in a country where often basic social and economic rights have not been secured. As Prof. Mehra interjects, "... any conflict appears because the socially relevant issues usually do not (necessarily) require very high-tech solutions but political solutions. If the latter are not forthcoming, then there is a tendency by those in power to substitute real solutions with techno fixes. Water, food, electricity are good examples: a large majority of the people have no access to or do not have the financial capacity to buy these fundamental assets because of their impoverished state of existence. Handling these resources in a more high-tech manner (water purification technologies, more efficient electricity generation, food processing/preservation, etc. are all fine to study and develop in their own right (knowledge), but the effect on an impoverished populace is marginal."

Prof. Shishir Jha (SOM) does agree that there should be no prioritisation, but his opinion came with a rider, that "it should not just allow the status-quo [i.e., the freedom to do X or not do X] to prevail either, in the sort of lame way that it happens. Building an exciting research culture will not happen by default and neither does it need to be imposed. It needs to be carefully nurtured".

### Prof. N.C. Narayanan from CTARA points out that the institute's centres can be used to encourage applied research, because core departments, like for instance, the Department of Mechanical Engineering can do fundamental research anyway.

Akshay Mishra (Class of 2002) would disagree that the issue of socially relevant solutions is less a matter of technology and more a matter of political will. Simpler socially relevant solutions do require smart brains, if not linear algebra or matrix inversions. Starting with the traffic jams outside IIT to the chaos in the traffic police headquarters in Bombay, there are areas where IITB can make a definitive contribution. Mishra is of the opinion that we must have "an institute-wide engineering division to solve problems with students, and recruiting done from the industry. Don't make it an incubator. Put the institute's research to practise."

Prof. Raja Mohanty (IDC) also made a valuable point when he pointed out that for an institution such as IIT Bombay, there should be no presumption that the faculty profile is such that there is a good balance between applied and fundamental research. As he says, "Occasional checks may help establish if research is tilted towards any one of these. However, it does appear that we at IIT live in a vacuum of sorts, and scurry back into the sheltered comforts of the lovely campus, every time we venture out into the chaos (or real society?) outside the gates. I think Prof. Mehra mentions the lack of political will in solving societal necessities — and at times it appears that institutes of science and technology can do little to address contemporary issues. What this appears to imply

is that in the long run, such institutes will have lesser stature". However, even if one did prioritise, how does one determine what the basic-to-applied ratio for research should be? Neither do we know what knowledge we are going to need in the future, nor where it is going to come from.

So far as the institute is concerned, this is an issue that is tied to the bigger question of organisational/institutional and individual autonomy. A case in point is the response of Deputy Director R. K. Shevgaonkar: "We should leave the choice between fundamental and applied to individual professors. People have different interests, some want to do fundamental research and others like to see applications of their research".

It is a matter, ultimately, of individual choice. As Prof. Anurag Mehra further points out, "I don't think that the institute can prioritise. Faculty members work in academia for a variety of reasons: fun, science, development, invention ... a homogeneous world view cannot be imposed, as it will immediately lead to a feeling of loss of autonomy, etc. The institute can (and sometimes has through the Planning Commission or MHRD) run schemes that are more socially oriented; interested faculty can participate if they wish."

This is echoed in the views of Prof. Sharat Chandran, when he points out that "Faculty members will rebel any imposition, and rightly so. A good leadership will set specific goals, subtly influence the process, and go after those goals day in and day out. To the faculty, it will not say, go and do everything. It will vehemently protect faculty and students who do just what they are good at. It will hire faculty who share their passion and mission, and make sure it communicates this at the time of hiring."

Individual choice, however, does not resolve the issue of evolving mechanisms to reward applied researchers adequately.<sup>3</sup> Dr. Manchanda has discussed this at length in his book, when he discusses the problems associated with the targeted approach towards developing relevant technologies. It is a systemic issue, reaching perhaps beyond the confines of the institute, but one with which IIT Bombay is grappling even today. Prof. Shevgaonkar mentions that "There's no debate between fundamental and applied research as long as we're doing quality research. We should monitor quality, but at the moment we're not doing that because a monitoring system is not in place. The number of publications is not the only way to judge quality of research". The problem has been perhaps best summarised by Prof. A. W. Date of the Mechanical Engineering Department, and current HOD of CTARA in the following words: "We do have structures and mechanisms for rewarding excellence, but not for rewarding relevance."

Increasing focus on interdisciplinary research is a healthy trend within the institute. N.C. Narayanan from CTARA points out that the institute's centres can be used to encourage applied research, because core departments, like for instance, the Department of Mechanical Engineering can do fundamental research anyway. "At CTARA we deal with technology and development and people from different disciplines come together to work on a problem. If research-

**"Researchers have their own personal goals, and different people gain satisfaction out of different aspects of their work. I believe this decision is best left to them."** SUSHANT SACHDEVA

ers are interested in socially relevant "problems in context" research, we can form teams from other departments. CTARA and other centres are interdisciplinary spaces where there is only Master's teaching and PhD guidance. We train students to look at the context in which technology works to create appropriate technology. Shaping disciplinary experts through good undergrad teaching and encouraging interdisciplinary research to those who are interested in further academic pursuits, like we do in CTARA can co-exist within the larger IIT model". Hence, it is not an "either/or" issue, but a "both/and" one.

As alumnus Yashodhan Kanoria points out, "there should not be prioritisation in either direction. Preferential research funding from government agencies and privately owned companies has already led to de facto prioritisation and biases. All efforts should be made to attract the maximum possible funding, but not at the expense of fundamental research. For a university to be at the top, both fundamental and practical work needs to be at the cutting edge". A view echoed by Atit Jain, yet another alumnus (Class of 2004) is that "importance of either fundamental or applied research can't be denied, and one can't prioritise one over the other (except for some small periods). You may lay greater emphasis on one area in your culture, but that is due to some evolutionary reasons. The priority should be to create a culture of doing fruitful things in either areas (like cost reduction). Students and faculty should be given the liberty to choose any area of research based on their interest, but there should be determined goal and a proper evaluation of the results produced".

There is already a well established tradition of interdisciplinary research at the Institute. This coupled with the recent trend of broadening the disciplinary scope and ambit of activity at the Institute is taking it in new directions and some would contend in the direction of a research university model. Opinions as the first discussion indicated are very much divided on the efficacy of pursuing such a course of action. There are no easy solutions or formulae as there are no definite conclusions to this essay. The opinions thrown up here however are but a reflection of the wide ranging views that exist on these subjects and seek to provide a wider platform where such and other issues can be debated discussed and crystallised. ■

#### NOTES

1. Interested readers may look to Part 4, 4.2, of IIT Bombay's own history book 'Monastery Sanctuary Laboratory: Fifty years of IIT Bombay by Dr. Rohit Manchanda, for a historical take on the subject.
2. Rohit Manchanda's 'Monastery, Sanctuary, Laboratory: Fifty years of IIT Bombay, Part 4, 4.2, pg 243
3. Ibid.

#### IN THE WILDERNESS



The scaly-breasted Munia (*Lonchura punctulata*) is a petite gregarious bird that feeds largely on seeds. It's usually spotted in IIT Bombay around the lake as it frequents open woodland and cultivation.

Photo by Yogesh Murarka, Department of CSE

# Conversations with the Medicine Man

DR. ARVIND MESHAM, Permanent Medical Officer, IIT Bombay Hospital

*Doctors to me are intimidating creatures; perched as they are, on a citadel created by their arcane, specialised knowledge. One always approaches them as a supplicant. Even though the relationship between a doctor is both intensely personal and private, getting that crucial human ingredient that is necessary to build trust between a patient and her doctor is easier said than done. Luckily for us, the IIT Bombay hospital does have a few doctors who are both approachable and efficient.*

*Many of you, who have had the occasion to visit the hospital seeking a cure for some sudden or pressing health issue, might have come across Dr. Arvind Meshram, a man with a ready smile and a patient ear for all his patients. He has a hands-on, empathetic approach to patient care which is so crucial in building trust between a patient and his doctor. Over a relaxed Sunday morning brunch and tea, I got to know a little bit about the man behind the doctor, what had brought him and now keeps him at IIT Bombay.*

Introduction by DAMAYANTI BHATTACHARYA

## Dr. Meshram, tell me a little bit about yourself and how you landed up at the IIT Bombay Hospital.

I am what you would call a true hybrid Indian — an amalgamation of many places and cultures. I am a Maharashtrian, whose forefathers had settled in far off Kharapur in West Bengal, and whose father (a telecommunications engineer) worked in many places before finally settling down in Delhi. My formative years were spent there and I graduated from University College of Medical Sciences (UCMS) Delhi. After I graduated, I worked in a number of hospitals and Nursing homes in Delhi and eventually decided to return to my roots in Maharashtra. Hence, I decided to shift to Mumbai (a city which I had already visited for a short stint of work), and settled down at IIT Bombay Hospital as a permanent medical officer, way back in 1996.

## "I was intensely homesick for the first six months after joining IIT Bombay Hospital. Yet this place works its own magic on everyone, and I was no exception to it."

### Most doctors would want either a large private practice or the challenge of working in a large hospital. Yet you seem happy and content in IIT Hospital. Why is that?

To tell you the truth, I was intensely homesick for the first six months after joining IIT Bombay Hospital. Yet this place works its own magic on everyone, and I was no exception to it. So here I am, (smiles) 22 years later, still very much a part of the campus community. Unlike the IIT Hospital, relationships are very impersonal in large hospitals. Here, relationships are a lot more personal and over time, become more like family relationships. In other words, there is a connection with patients that you would otherwise not find in other hospitals. This, in my opinion, greatly improves the quality of health care provided and is a process which I, as a doctor, find immensely rewarding.

### It is interesting you say that because the thematic focus of this and the last issue is Connect and Disconnect, and I would like to ask you how connected you feel to the main stream of the institute campus.

We are very much connected. Geographically, the hospital is in the heart of the campus and professionally, for me, when different segments from the campus visit the hospital, they are neither staff, students nor professors. They are all patients, whose families I also come into contact with and often get to know intimately. We stay on campus and get to interact with others as families, all of which help in building a more personal and human bond. There is often a great deal of sharing, and I feel as if I am not only providing health care, but also often providing a listening ear to my patients and sharing in their troubles.

This to me resembles a familial relationship rather than a simple doctor-patient one. Sometimes, it also allows you greater freedom to experiment, try things that otherwise you could not do in a larger hospital set up. So I think I am not just speaking for myself, but on behalf of the entire staff at IIT Hospital, all of whom have a great sense of belonging and feel very much a part of the institute.

### What is your workload like? How many patients do you see in a day?

Illness or wellness depends upon how you perceive it. You would be surprised to know that this is also somewhat seasonal. So my workload also varies. During the summer months the load is less, as most of the students are off home. But July onwards, I do see an average of 35-40 patients in a day. But let me interject here that although this is a hospital which concentrates on primary health and care giving, it is probably one of the best among all the IITs.

### Tell us something about you connected to the hospital that most of us would not know.

Well, I found my wife here at the hospital. When I first joined the hospital, her grandfather (who was in coma) was admitted here for a long time. I was one of the doctors looking after him. Every evening I used to change his dressing (for bedsores), and she would visit at the same time to assist me. If it was a romance, it was more of the old world kind, where little was said between each other. I did tell my parents though, that there was this girl I liked, and luckily for me both her parents approached me independently. So to cut a long story short, after a 13 day whirlwind courtship, my parents came down and we got married. The night before we got married, I had night duty. I was wearing mismatched clothes bought at different places and looked a bit funny at the wedding, but I think she has been reasonably happy with me in the ensuing years.

### That is such a cute story, almost like a storybook romance! Are there any other anecdotes about the hospital that you would like to share with our readers?

Well, let me see... there was this sweeper called Mela Mohan at the hospital. Now *mela* in Marathi means dead, so every time we wanted to curse or vent in frustration we would shout, "Where the hell is Mela Mohan?" Poor Mela, but it sure worked. I remember this student who was admitted in the hospital for quite some time and all of us had got to know him. It was monsoon, and those of us who were at the ward for night duty would prepare some quick snack to eat. So there we were, preparing some *bhel*, when this student peeked in. First, he claimed that he couldn't sleep, and soon he started saying that it was because he was hungry. He then requested us for a taste of the *bhel* and before we could protest, almost all of it was gone, while we looked on in hapless bemusement.

### Can you tell us about a few projects that you have taken on that you enjoyed in the recent years?

Halfway through my stint here I felt a little jaded, and wanted to do something that would help me grow in my profession. I enrolled myself for an M.Phil in Hospital & Health System Management at BITS, Pilani. Well, although it was hectic, I did enjoy going back to school. This was especially because I gained new insights about the job, particularly from the patient's perspective, and how friendly or unfriendly the job is (in terms of its administration and management) to the patient. This knowledge came into good use when I was a part of the Hospital Expansion Committee. The expansion plan that we prepared covers the next ten years. As per this plan, although the number of services provided might remain the same, the idea is to increase its quality. For obvious reasons, the increased intake of students presents an additional load, and so does the task of mentoring new IITs. However, only some renovation work has taken place for the hospital's building so far. I also discovered that I enjoy the challenge of administrative responsibility.



Photograph by Rangoli Garg

### What is your typical day at the hospital like?

My duty starts at one p.m. in the afternoon and continues till six p.m. For the past ten years, I had been assisting the specialist orthopaedician, although I haven't been doing that for the last two years. Now I go to the hospital and first see the general patients at O.P.D. After that, I go to the ward to check on patients. I do four to five nights of night duty on an average in a month, which may include a Saturday or a Sunday. During this time, I am on duty for 24 hours straight. This, however, is a light workload compared to most hospitals, so you won't hear me complaining.

### Is there any humorous incident that you particularly remember?

In my early years when I was posted in the casualty ward, a funny incident happened which I remember to this day. Our wing was under renovation, and things were in a bit of mess. No one seemed to know where anything was. Late into the night a woman was brought in, illiterate and in labour. She was lying on the couch. I told her, "Aap neeche jao" in Hindi, and rushed to get a sheet to deliver the baby on. I don't know what she understood, but when I came back she was standing with her legs apart with the baby dangling between her legs! It's a good thing I managed to grab the baby before something serious happened to her and the baby.

### Tell us about an experience that left a mark on you, which has made you the doctor that you are today.

Strangely, this is an event that had nothing to do with medicine, but left a great impact on how I approach my patients. I have tried my hand at a lot of odd jobs. At one time, I was conducting a market research for the Indian Market Research Bureau (IMRB), where I had to conduct a survey for a tobacco company. This required me to stand next to a *paan* shop all day, trying to talk to people who had neither the time nor the inclination to listen to any of my queries. That experience taught me the value of listening and I promised myself that I would give every person who came to me a patient hearing, no matter what.

The truth is you cannot typify a doctor. Each doctor has their own mode of functioning. The pressures here at IIT Hospital are different from a regular hospital outside. Here, the language barrier often becomes a stumbling block, and personally I have often felt the most pressure from students who almost inevitably want to be cured in a day! But irrespective of whether I can help them or not, I make sure that I listen to their problem first.

*Dr. Meshram secretly dreams of an IIT Hospital that has a specialist facility that not only caters to the campus community, but also looks into treating our retired staff and faculty. We wish him luck and hope he realises his dream. And as for you, dear reader, the next time you have a persistent fever that refuses to go away or anything else that requires medical help, head to the hospital and seek the help of our resident medicine man. ■*

HIDDEN CORNERS

# The Changing Wall

■ PROF. RAJA MOHANTY Industrial Design Centre

On the second floor at IDC, as you finish climbing the staircase, there is a wall that is painted white. This wall keeps changing every now and then — rather unusual for walls, as they are meant to stand steady, keep the outside out, the insides in, hold the roof in place and so on. These days if someone shouted, “China!” and asked you to say what that triggered off, you are likely to say, ‘Tiananmen Square’ or ‘Tibet’ or ‘cheap-goods-flooding-gullible-Indian-markets’. But, if you are the sort that responded to the shout “China!” with an equally loud shout of “Lao Tzu”, then this changing wall is just the sort of wall for you.

It is said that hearing of Lao Tzu’s wisdom, even Confucius travelled to meet him. At some point in his life, Lao Tzu

felt that the kingdom was deteriorating and it was time to leave. He travelled on a buffalo and when he came to the Han Gu Pass, the keeper of the pass realised that Lao Tzu was leaving for good. “Please sir!” the keeper begged Lao Tzu, “write down some of your wisdom, before you go”.

Lao Tzu climbed down from his buffalo and wrote, and thus the Tao Te Ching came to embody the wisdom of ancient China.

This wisdom tells us that it is the emptiness within a cup that holds the tea; it is the doors and windows that transform the walls that we surround ourselves with. On the second floor at IDC, is a wall that has no doors and

**Art that is beautiful may well be art, but art that transforms the wall and those who view it, is a window like no other window. It is a window that leads us to invisible realities.**

no windows. Yet once in a while when people express themselves through drawings and photographs, through poems and prose, through abuses and praises, the wall begins to change. And when windows do appear on this wall, people begin to change. ■



Two displays on the changing wall : (Left) Terracotta Mural by Bidut Rai, an artist who lives close to a Santhal village on the outskirts of Santiniketan.

(Right) An art installation by Shilpa Bisht, a postgraduate student at IDC, which had plastic taps mounted on the wall.

RANDOM MEANDERINGS

# Friendly Neighbours

■ NITHYA SUBRAMANIAN Fifth Year Engineering Physics and AISHWARYA RAMAKRISHNAN Fourth Year Met. & Material Science

The Mumbai outside our campus is a concrete jungle, where the occasional street-smart dog or suburban sparrow is all the wildlife we see. But the recent leopard sighting reminded us of how close we live to a National park. Wildlife is indeed all around us, when we bother to notice.

There’s the glossy black crow that raids the dustbin outside my door every morning. I often startle him when I open my door in a sleep dazed stupor, vaguely clutching my toothbrush. He immediately retreats to a nearby tree branch and from there, caws reproachfully till I shamble away.

There’s the squirrel that comes to share the crow’s spoils. He’s surprisingly tame, and lets me get within an arm’s breadth without flinching. We’ve had a staring match, us two. One morning, I caught him with an apple core in his paws, sitting on an overhanging branch and staring at me with beady eyes. I stared back. He ruminatively munched on the core never breaking our eye lock. I broke our silent contest first; I remembered I was ten minutes late for class and so pleaded a rain check. I could swear he held his tail with a faintly triumphant air, as he scampered away.

A few shy sparrows timidly peck around the mess that the crow makes of my dustbin every morning. Then there’s the kitten we found mewling at the hostel gate one day. We took her to our wing, fed her with milk and boiled eggs and

watched her sleep with maternal pride. She would ambush passersby, pouncing upon their legs with tiny claws and wander into our rooms at night and scare us with her phosphorescent green stare. She grew up so fast. We knew that the day she proudly brought a dead mouse to the wing, she had learnt how to fend for herself. Now she’s moved out and only comes to visit on the occasional holiday.

Other occasional visitors include a monkey that peers in at my door in a neighbourly way, from time to time. He appears to delight in startling me, baring his teeth in an ingratiating grin before running away. These monkeys can be very rude though, entering rooms without permission, frightening their occupant silly, ransacking cupboards for food and then sitting in the corridor, eating their spoils, without offering to share.

“Bird-brain!” How I relate to this term now. I returned after an exhausting day at the lab, stunned to hear fluttering and baritone murmurs in my room. With trembling hands, I opened the door to find, quite literally, a bird-brained pigeon pecking at its reflection in my mirror. It took me a good half hour to convince the bird that none of its friends were actually there behind the looking glass, and showed it the door.

My doormat makes for a comfortable bed for one of my furry wing-mates — a docile dog (or so I thought!) I felt a strange sense of power and control watching her jump out of her skin and vanish downstairs the moment I opened my door. Sadly, the tables turned on me when one day I tried chasing the dog down the stairs. She chose to bare her teeth and barked loud enough to scare me out of my wits, then peacefully settled down on my mat once I locked myself up in my room.

Going for a bath, one is ordinarily mentally prepared to see a lizard on the ceiling, or moths flying out. I never



thought I’d see a barn owl, let alone one primly perched on the shower rod and staring at me with its ruby eyes. I promptly shot off and returned with six wingies and three cameras. I guess the sleepy owl didn’t particularly enjoy the paparazzi flash. She flew right out of the bathroom and hid behind the water heater, until the watchman shooed her out the next day.

It’s surprising how when you simply pause and look, you see how much life surrounds us: animal, plant and insect kingdoms, going about their own business, quite oblivious of us. It behoves us to check in on them from time to time, like they check in on us. We are, after all, friendly neighbours. ■

## REVIEW

# Gulmohar Cafe vs Gulmohar Restaurant

■ DR. SIBI RAJ B. PILLAI Department of Electrical Engineering

Gulmohar Garden Cafe looks like a refreshing experience for many whose definition of a garden cafe ended in a few plastic huts between Main-building and SJMSOM.

For someone with an avid appetite for the south-Indian palette, this restaurant serves close to home delicacies, sufficiently urbanised not to bug various regional tummies. Half a dozen varieties of dosa/uthappa/upma are sold at affordable prices (no matter what, they can always be cheaper!) and little compromise is made on the authenticity. Take masala-dosa, for example; though the flour has a distinct commercial taste, the masala preparation and quick service will match some of the good ones back home. One appreciable fact is that the dosa-stone is kept hot all the time. And for those a bit careful about their stomachs, even after a decade of invasion by European and aboriginal bacterial flora and fauna, mine still plays a decent host to the food here.

On the flip side, a Bisleri water bottle costs Rs.15, while the same at Y-point costs its MRP, i.e. Rs.13; I wonder whether the cafe has a bar license. This is a gross violation of the fundamental norm of MRP.

Let us come back to the food. Apart from snacks/chaats, the garden cafe is just an extension of the eatery two floors up. Walk in to both places and ask for a glass of fruit juice. Instead of the fresh one with its squashed taste served on the upper echelons, a ready-made freezing version reaches your table. Ask a Bengali/Malayali how frozen fish compares to fresh. Add to the horror, I am given the same bill at both places.

**To make matters worse, let me ask a question: why is it a garden cafe? One of the first things the owners did was to make a shabby polythene tent over a big part. The rest is muddy anyway.**



Photograph by Rangoli Garg

To make matters worse, let me ask a question: why is it a garden cafe? One of the first things the owners did was to make a shabby polythene tent over a big part. The rest is muddy anyway. This seems to be something synonymous with IITB or Mumbai in general. "We make ad hoc constructions and spend energy, time and money patching it up with more and more ad hoc elements."

This simply looks 'slummy'. The make-shift roofing in the cafe is just one indication. Trace it further and you can see a large steel cage of onions, accessible to cows and dogs alike and some other grocery stuff kept out in open. What

prevents a dog Q-ing up there (remember Q comes after P), unless the onions have a way of frightening them. The muddy side of the true remaining garden should be improved, with seats raised 10 cm from the muddy ground, and the platform laden with sand and pebbles to make the seating area accessible without "swimming".

As a final verdict, a personal one though, the upper Gulmohar is a nice restaurant with decent prices for most items and a welcoming staff, which actually is least expected. The lower one, in almost all sense, is two notches below, except for the tasty chaats. ■

## Skeptic Foodie

■ DR. ANIMESH KUMAR Department of Electrical Engineering

Opened on June 10<sup>th</sup> 09, the cafeteria still seems in its infancy. Given IIT Bombay's lush green, relatively dust-free campus, an open-air cafeteria is an appealing idea. It reminds one of European cobblestoned path cafes, but the environment and food here are of an entirely different crop.

**Order process:** The menu position is awkward, in that it is surrounded by a customer table. You have to squeeze between chairs (on which prior customers are usually seated) and the menu wall to attempt scrutinizing different options. Once you've ordered, you carry the receipt to the service desk. The waiting duration varies between five to ten minutes for snack items like *uttapam*, *paneer pakoda*, or *dahi wada*. Once the order is ready, the service desk shouts item names for waiting denizens' benefit. The staff is usually helpful and courteous.

**Milieu:** After getting the order, you can either sit in the open air below some sun-umbrellas, or inside an asbestos shade. Cleanliness ranges from average to dirty. Often houseflies buzz around, careening their own special songs of monsoons. Electric housefly traps could be useful, but they are absent. The weather of Mumbai does little to improve this experience, since it is mostly humid and a bit too warm. The chairs are comfortable. After eating, leftovers are usually left on the table for the nourishment of crows.

**Quality or cleanliness:** It is difficult to peek under the hood, but quality of food ingredients feels reasonably good to the tongue, that is still to say one isn't sure how good they are for the tummy. Plates are reasonably clean, and a pitcher of filtered water stands nearby.

**It is difficult to peek under the hood, but quality of food ingredients feels reasonably good to the tongue, that is still to say one isn't sure how good they are for the tummy.**

**Taste:** There is nothing extra-ordinary about the taste across multiple items in the menu. To clarify, after trying five-six items, I haven't craved for any again. A common observed trend is the lack of zesty spices. For example, *dahi wada* lacks the topping of sweet and sour tamarind sauce in ample amounts, or *bhel puri* lacks the spicy and hot lingering taste, or *paneer pakoda* is served without any dip or sauce, or *dahi batata puri* is short on sweet and hot sauce. Coffee is served faster though the default order is without the option for extra-sugar or no-sugar. Cold drinks list maintains sanctity by not being "Pepsi only." Extra ice in glass can be requested to chill respective drinks to sub-zero temperatures. Options like sweet lemon soda also exist, and they can be used to savour some cool in the humidity.

**Conclusions:** The seating arrangement is not well planned. Rains can play spoilsport and make sitting under the umbrellas uncomfortable because of all the sludge that surrounds seats. In itself, sitting under the umbrellas with pouring rain is an amazing experience if you're willing to get a little messy. Hygiene in the sitting area is questionable. The food appears good and clean, but it lacks characteristics of being special or worth coming back for too often. ■



Photograph by Rangoli Garg

# Life on Campus : Testing Times for Students?

PROF. REHANA GHADIALLY Department of H&SS

This article is adapted from Prof. Rehana Ghadially's paper on the kinds of stresses faced by students peculiar to campus life, especially life in IIT Bombay. A survey conducted by students also highlights what they consider to be major stresses of different points in their lives on campus. From leaving home to hating laundry and mosquitoes, being disturbed by loud music or snakes, it's a melting pot of new experiences and stimuli to cope with as you enter into this phase of life.

Teaching "Stress and Coping" to fourth year undergraduates is one of the most rewarding experiences because of the positive response from students of its relevance and usefulness. Here, I would like to share with you student perceptions of stress on the campus. This can provide insights into what causes a disconnect between students and campus life.

There are two theories that relate stress with health and well-being. One is that big events in our lives, technically called *life events* such as death of a family member, marriage, jail term, beginning a job, etc, are good predictors of health and stress. The second is that it is the micro-stressors or *hassles of everyday living* that contribute to irritability, anger and distress, which eventually lead to poor health. Let's see what students perceive as micro-stressors or *daily hassles* on the campus. Micro-stressors are the "irritating, frustrating, distressing demands that characterize everyday transactions with the environment".

**Evidence suggests that lower self-esteem, lower levels of fun and playfulness, low vitality, more depression, low levels of happiness and a low sense of internal control are correlated with high perception of daily hassles.**

Walt Schafer at California State University, Chico developed the "Daily Hassle Index" a measure designed for college students. It consists of forty-nine stressful occurrences. Levels of irritation are measured on a scale from zero to ten. Zero represents almost never an irritation, 5 sometimes an irritation and 10 frequently an irritation. The more students' lives are filled with these negative daily annoyances, the greater is the experience of emotional difficulties. *Daily hassles* are not annoyances in themselves; they become so when we perceive them to be such. A sample of the hassles on the index includes occurrences such as: *materials unavailable in the library, missing my family, physical safety after dark, etc.*

I administered this index to my fourth year students and the data presented here covers the period from 1998 to 2008. A number of key micro-stressors are identified along with suggestions for coping with these. The top ten daily hassles (many are applicable to students of other years as well) are: *quality of meals, too little time, getting up in the morning, boring instructor, constant pressures of studying, taking tests, future plans, laundry, writing term papers/lab journals, instructor difficult to understand and being unorganized*, the last two sharing the same rank.

First year students are more likely to experience *life events* in the form of the many transitions they make as they leave home and come to a campus for the first time. These transitions include things like leaving parents, siblings, friends and relatives, leaving a familiar neighborhood, living in hostels for the first time, becoming accustomed to new class organization and teaching styles, etc. The second and third year students are better protected as, for better or worse, they have coped with these transitions and are only beginning to feel the impact of daily hassles.

Students mentioned that the "Daily Hassle Index" does not measure quite a few daily irritants unique to students on the IITB campus. Repeated irritants over the years are the *weather, dogs/mosquitoes/cows/leopards, lopsided sex ratio, computer/internet problems, attendance requirement, and inefficient campus transport*. Some hassles such as *computer/internet problems* have disappeared from the student list and new ones have emerged like *construction work and time restriction on internet use*. By and large, however, for over a decade the profiles of top stressors have been persistent.

Are daily hassles related only to negative emotional states such as irritability, frustration and distress or does this experience impact other aspects of one's life? Evidence suggests that lower self-esteem, lower levels of fun and playfulness, low vitality, more depression, low levels of happiness and a low sense of internal control are correlated with high perception of daily hassles. In other words, if you see daily occurrences in a way that irritates you a good deal and if these persist, the more you will experience poor health, poor psychological comfort and poor quality of life.

Not surprisingly, the cluster of top five micro-stressors are grade related — *boring instructor, constant pressures of studying, taking tests, writing term papers/lab journals, instructor difficult to understand*. The fundamental structure of the educational system is that grades are important. Students making average grades often tell

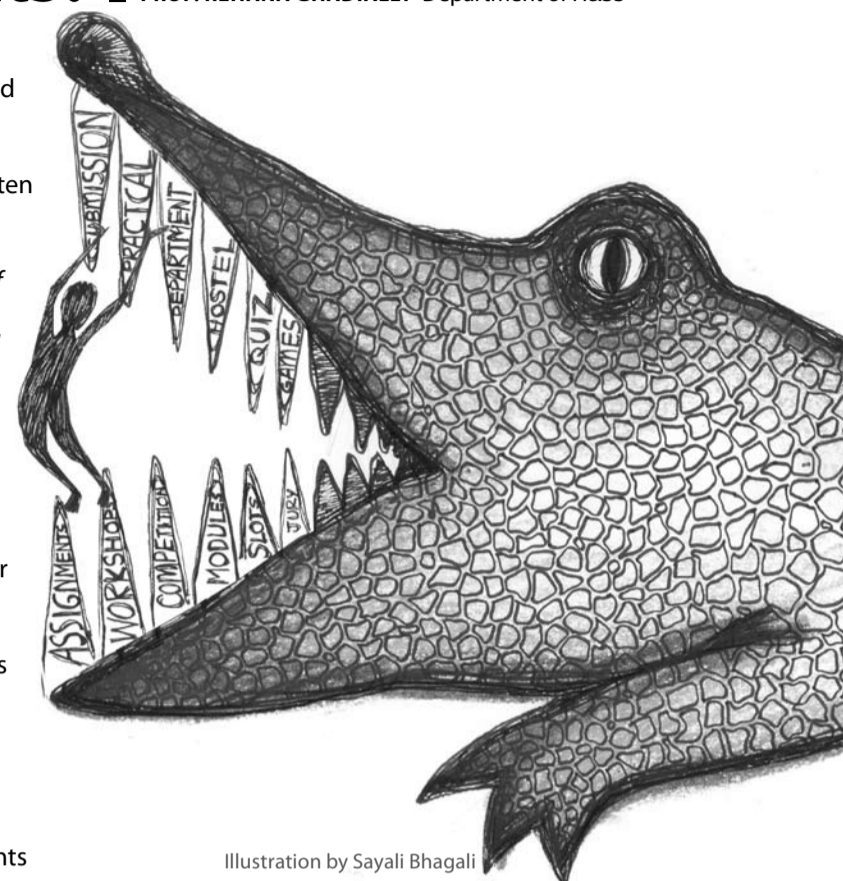


Illustration by Sayali Bhagali

**"A key step in handling the challenge of grades is to make a dual commitment to yourself: to do your very best and to separate your self-esteem from your grades."**

me that s/he was a topper at school. The reality is that practically everyone one on the campus was a topper at school and learning to deal with this is problematic. Test anxiety is a common difficulty associated with grades. Grade pressures are also due to fear of failure as it damages our sense of self-worth. While grades pose a number of difficulties, they are also at the center of a host of aspirations — winning a coveted medal, admission with scholarship for post-graduate education at prestigious universities and the passage to envious jobs in multinational corporations. These difficulties and motivations are tied to self-image. As Walt Schafer who teaches stress management to undergraduate students writes "a key step in handling the challenge of grades is to make a dual commitment to yourself: to do your very best and to separate your self-esteem from your grades".

The second cluster of stressors namely *too little time, future plans, getting up in the morning, being unorganized*, and

## DAILY HASSLES

| BACKGROUND                           | YEAR     | COMMENT                                      |
|--------------------------------------|----------|--|
| Hostel 10 Student Energy Engg UGs    | 1st Year | Piled up Laundry                             |
| Students taking CS 101               | 1st Year | Writing lab journals, completing assignments |
| M.Tech Students in Chemical Engg.    | 1st Year | Instructor difficult to understand           |
| Hostel 6 Students                    | 1st Year | LAN BAN                                      |
| Cricket players aiming for Inter-IIT | 2nd Year | No girls!                                    |
| Hostel 8 Students                    | 2nd Year | Competition                                  |
| CSE UGs                              | 2nd Year | Music from my neighbour's room               |
| MI CGs                               | 3rd Year | Lack of time; Work overload                  |
| Meta UGs                             | 3rd Year | Getting up in the morning                    |
| Hostel 13 Students                   | 3rd Year | Boring Instructor                            |
| PhD Students                         | 3rd Year | Sharing room with 3 other people             |
| Hostel 4 Students                    | 3rd Year | Bureaucracy                                  |
| Students sitting for placements      | 4th Year | Bad mess food                                |
| Civil UGs                            | 4th Year | 80% attendance requirement                   |
|                                      | 5th Year | Job / Future plan / further studies          |

## UPLIFTS

| BACKGROUND   | YEAR     | COMMENT                 |
|--|----------|-------------------------|
| M.Tech Students in Chemical Engg.                      | 1st Year | Something new on LAN    |
| Localites  | 1st Year | Weekends                |
| Sincere Meta students not able to concentrate in class | 2nd Year | Good Marks              |
| Hostel 6 Students                                      | 2nd Year | Social Networking Sites |
| Cricket players aiming for Inter-IIT                   | 2nd Year | Playing Sports          |
| Hostel 13 Students                                     | 3rd Year | Talking on the phone    |
| Meta UGs   | 3rd Year | Winning an event        |
| CSE UGs  | 3rd Year | Cancelled class         |

A survey conducted by **Rahul Srinivasan**, 4th Year, Computer Science & Engineering and **Aishwarya Ramakrishnan**, 4th Year, Metallurgy & Materials Science in 2009 came up with the results as shown in the tables.



*laundry* arise from poor time management. When new students join the institute, among many life changes, a critical one is the need to manage one's time. If these hassles persist it means that students have not learned to manage time effectively. Time management is an effective tool, not only to reach important goals but also get some discipline into one's life.

To manage time productively, one needs a two pronged approach namely challenge beliefs that time is unimportant or there is plenty of time and follow three simple guidelines. Firstly, clarify and prioritize what is your ambition or purpose and translate these into clear short-term and long term goals, maintaining balance among these. In other words have social, academic, community, solitude and leisure goals. Break the goals into smaller targets and schedule these that is set time aside to meet these targets on a daily or weekly basis. And lastly, implement what has been scheduled, which includes things such as avoid procrastinating, focus your efforts break tasks into manageable parts. Interestingly, managing time effectively and grade pressures are related, when you have difficulty getting up in the morning, you may be saying attending classes is not important. Mis-managing time can add to grade pressure. Better time management can do wonders for your life and for your grades.

That brings us to the last two of the top dozen stressors. A fundamental need of quality food goes unsatisfied year after year. This is a deplorable situation. Students (and the institute) must make efforts to improve what affects them and their health on a daily basis. Having alternative eating facilities, training cooks to bring them to their next best

### Experts agree that no matter what the source of stress, the fundamental health buffers such as adequate sleep, a balanced diet and regular exercise need to be in place to ward off the negative effects of stress.

level, introducing variety in the menu – both regional and international, hiring a part-time nutritionist, willingness to pay higher mess bills, together with the recognition that mass produced food may not cater to individual tastes may go some way in improving the situation. The lopsided *sex ratio* on the campus challenges students to reach out to members of the opposite sex outside the campus, build cross sex friendships during the various campus festivals and long summer vacation and access social networks on the internet.

Discussion on the topic of micro-stressors leaves students feeling that life is full of petty miseries and annoyances. But this negative feeling is often balanced out by what some psychologists have called *daily uplifts*. These can go a long way in cheering us up. These unfortunately have been less researched than *daily hassles*. For the last two years the student have provided me with the following list of uplifts (not in order of priority) which brings cheer to their lives; *cancelled classes, no assignments, getting good marks, weekends, getting a treat, winning an event, something new on the LAN.*

The scenario that emerges is that the quality of life on the campus is pretty low. The very aspect that ought to connect students with campus life is academics but this represents more a disconnect as observed from student experience of grade pressures, joy at cancelled classes, weekends etc. Also forming relationships, especially with members of opposite sex, are crucial for the young and the campus lacks such opportunities thereby producing dissociation from the local social scene.

My own experience dictates that students like to keep contact with faculty to a minimum. Having shaken off parental control, more authority figures telling them what is best for them is perceived as undesirable. This leaves them with a limited almost all male students — class and hostel mates, a limited interpersonal situation, that leaves many needs unfulfilled. Along with this, a physical scenario of poor food, transport travails, excessive infra-structure development, etc; can alienate them from campus life.

Experts agree that no matter what the source of stress, the fundamental health buffers such as adequate sleep, a balanced diet and regular exercise need to be in place to ward off the negative effects of stress. Two buffers vital for protection and improving the quality of student lives are at stake — good night's rest and proper food. Add grade pressure and the resulting brew may be damaging. Managing stress has never been easy but the majority of students across the world survive it without paying an unduly high price. How students handle the twin challenges of life events and daily hassles and maximize the opportunities offered by campus life can mold their character for years to come. ■

#### THE WAY WE WERE

## Unholy Holi at IITB

Holi celebrations on campus in the early years were — let's just say — different from now. Some hostels were more famous than others for their *bhang* concoctions, and in this regard, H4 led the pack. There was a certain Dinanath Gawle (mess worker) who would rejoice under the name of 'Dina colada', and concocted a 'Power Holi (or Holy) Drink', which had been first introduced by one 'Power Hiren', way back in 1976. He used not one, not two, but three brand new *naya paisa* copper coins and spent God knows how much time in stirring the *bhang*. The bottom line was that even after the *bhang* got over, no one could find a trace of those coins — or probably couldn't spot them — after having conquered the *bhang*. The two anecdotes that follow are recounted by the H4 freshies from that period.

#### **Shashank Van Winkle**

As freshies, this was to be our first Holi in H4 and we had heard enough stories about the famous *bhang* of H4. True to our expectations, Holi was fun and the *thandai* spiked with *bhang* was tasty. It started doing its job just after a couple of hours. But there was one unimpressed guy amongst us — Shashank — who declared that the *bhang* was a big "flop" and that all the guys who were laughing themselves silly were actually faking it.

This was on a Friday and after lunch, Shashank went to his room (48) for a quick nap, after which he had planned to go home for the weekend and return on Sunday night, in time to attend the Monday morning test. Shashank woke up two hours late from his nap, or that's what he thought — it was 6 pm according to his watch. He still did not feel the "kick" that had been promised to him. Not amused, he packed his bag and started walking to YP to get his bus. Somewhere near H5, he saw an H4 guy walking with a bag towards H4. Shashank laughed and teased him for returning to the hostel on a day when he ought to be actually walking out. Along the way, Shashank met many more guys. Funnily, they were all walking with bags towards H4. Shashank was delirious with laughter, and wondered aloud if the guys had so much *bhang* that they were doing things backwards.

■ BAKUL DESAI Class of 1982



Illustration by Farweej Bhutia

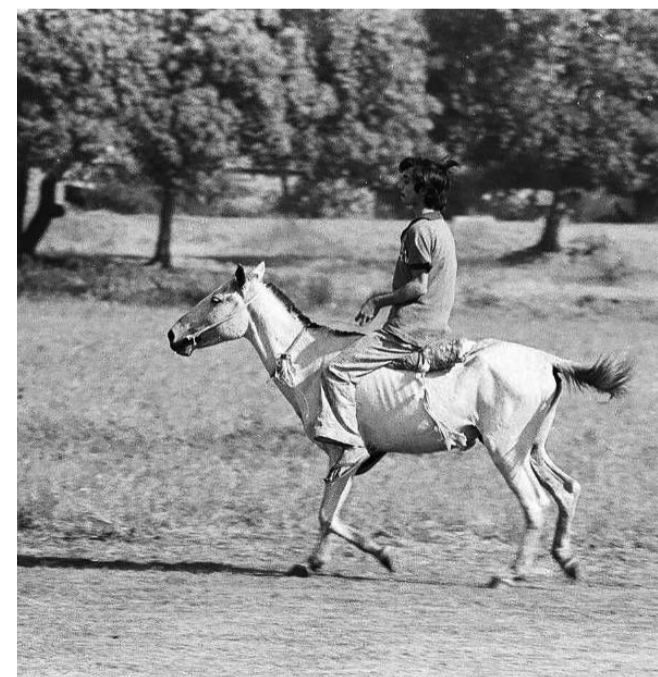
It was only when he reached YP and had crossed at least a hundred guys walking into IIT, that Shashank suspected something was horribly wrong. He did a quick reality check and figured that his Friday evening was actually a *Sunday* evening for the rest of India. In other words, Shashank Van Winkle had slept for 48 (plus four) hours. So much for Dina not knowing how to brew *bhang* with a kick!

#### **On Dogs, Cats and More ...**

In all the four years that we were served Dina's concoction (1981-85), I recall '84 to be the best vintage for this brew. We ended up laughing hysterically for at least a day, and slept away most of the next two days, whenever we were not awake or laughing. I have never seen an animal drunk, quite as much as our hostel cat Bylus, who when lapped some, was stoned and flat on the mess floor on all fours.

### Some hostels were more famous than others for their *bhang* concoctions, and in this regard, H4 led the pack.

When I tried to pick him up gently by his neck, he gathered all four limbs in slow-motion, looked up at me with a really stoned look, meowed in ultra-slow-motion, and then plopped back when I let him go... proof enough that *bhang* had affected all the 'cats' in H4 equally hard! Even our dog Blackie was stoned cold, and I remember that this was the source of many hours of hysterical amusement. By the way, dogs and cats are common pets — a few guys will remember Arun "Organic Chemistry" Kaul, who actually had a horse that he found somewhere. He would go for lectures to the MB on his horse and actually park it in a cycle shed. Here is a photograph of him... Enjoy! ■



## Beyond the Classroom (Chapter 4.2)

As part of our ongoing series, the following is an excerpt from *Monastery, Sanctuary, Laboratory - 50 years of IIT Bombay*, written by **ROHIT MANCHANDA**

*Over the first two decades of its existence, R&D at the Institute was frustrated by a slow start arising from several unwelcome retardants. While it was recording admirable success in its teaching programmes, the Institute's performance in the realm of knowledge creation was lacklustre, and in some phases, lamentable. Some of the most confounding hurdles had to do, ironically, with the assistance we were getting from the USSR to help kick-start our academic enterprise. Another major drag was a paucity of faculty equipped with the training and skills needed to carry out research. Starting briefly with the second factor, this excerpt from Monastery, Sanctuary, Laboratory goes on to examine the somewhat curious case of the Soviet assistance, and the reasons for which it became, on the whole, less a stimulus to research than an impediment.*

Of people qualified to do research, there was an acute dearth in IIT-Bombay all along the sixties. The ranks of the Institute's faculty were peppered with recruits without a Ph.D. to their name – and not infrequently without a Master's. Though they might have been sound intellectual material in other ways, they weren't yet trained in the rigours of research, and could scarcely be expected to orchestrate it. As R.K Katti formerly of the department of Civil Engineering puts it, 'Bright persons from engineering colleges in India without even a master's degree were inducted at faculty level as lecturers. Civil Engineering in particular and other departments in general were packed with faculty with no post-graduate exposure.' The numbers bear out his statement. In 1961-62, for instance, when there was a spate of recruitment, of the 38 staff appointed to the posts of Lecturer and Associate Lecturer, only 6 came armed with doctorates. Very many trained themselves in the ways of research on the job. As late as 1969 no less than 100 faculty were working for their Ph.D. in the Institute's laboratories (and many others had been deputed abroad); and several had enrolled for their Master's here.

One might wonder why the Institute should have been hiring such a disproportionate number of academic greenhorns. One constraining factor was plain availability: should the Institute have set itself to recruiting Ph.D.s, it would have found them rather thin on the ground. The IITs themselves were among the first Indian institutes to offer training towards the Ph.D. in engineering; the universities of the time produced but a thin trickle. Moreover, since the Institute saw itself primarily as a teaching institute, it could also see itself getting by with a largely pre-doctoral staff.

All this meant that subscription to the world of research for many of IIT-Bombay's faculty would have to await the completion of their in-house training, or their resettlement after their stints abroad. The Institute thus incurred a hefty dead time in actuating its R&D campaign. It needs also to be remembered that once they'd been taken on, faculty found their 'noses', as M V Hariharan from Electrical Engineering department has recalled, 'too much to the grindstone', formalizing the teaching programmes, setting up infrastructure, participating in campus development. Even those who might have had research uppermost on their minds had to hold their dreams in abeyance for a while. And for this last category there arose another, and quite unexpected, spoilsport. It took the form of the very ingredient that was meant to give experimental work at IIT-Bombay a flying start: the great fleets of technical equipment presented to the Institute under the UNESCO-mediated aid programme.

### AN ELEPHANT FOR A POOR MAN

The figures surrounding these fleets were impressive; by the end of the UNESCO project the sum of external expenditures for equipment had run to about Rs 2 crore (\$4 million) – no small amount for the time, and one that should have fitted out the Institute in style.

The provision of this aid, and the equipment that rode on it, was naturally celebrated in official documents of the time, on all sides: by the UNESCO, the USSR, the Government of India, and no less by IIT-Bombay. In subsequent documents dwelling on the history of the IITs, too, the purported decisiveness of this aid in getting the Institute started has been remarked upon. Here as elsewhere, though, the figures tell only part of the story. On peering a UNESCO had expended Rs 1.2 crore (roughly \$2.5 million) under the principal aid programme for the acquisition of equipment for the Institute. There was an additional Rs 40 lakh or so (\$860,000) as supplementary aid. Simultaneously, the USSR granted Rs 36 lakh (\$750,000) under a Bilateral Aid Programme. All of this had arrived before 1966. Indian Institute of Technology, Bombay: Final Report, UNESCO, 1966, p. 31. beneath their sheen, a number of home truths stand revealed. We recall, for instance, that the UNESCO-channeled assistance was all in Soviet roubles. We recall also that roubles were inconvertible in the 1950s and 60s, obliging IIT-Bombay's laboratories to be populated with Soviet equipment alone. This umbilical arrangement was held to offer its own advantages; witness this remark in a UNESCO report:

Experience gained here can be seen to show the worth of having one major source for expert help and the furnishing of equipment.. [this was] far more efficient and effective than would have been the alternative method of obtaining separate items from different sources and then adjusting them all to work together.

But efficiency of procurement or assembly is one thing, and utility of the equipment procured quite another. As time passed it became increasingly clear that not all was as it seemed to be. Flaws in the execution of the aid programme began steadily to manifest themselves, even if they weren't quite acknowledged; and amongst the Institute's faculty, what may best be described as a mounting perplexity started to brew.

Fifty years on, when it is possible to view the whole phenomenon with dry-eyed clarity, the causes for this perplexity are brought into sharp focus. On the face of it, IIT-Bombay was in the enviable position of being stocked with an extensive arsenal of equipment from a technological giant of the time, the USSR. The appearance was deceptive. Little of this equipment proved to be usable for research – and in many cases even for instruction and demonstration. When I spoke to those who had had first hand experience of the Soviet machines, they were united in not just questioning their utility, but also in decrying them as more of a hindrance to research than a help. And their chief concerns were broadly to do with the yawning gulf between the purposes proclaimed for the equipment and their fitness for those purposes.

In former Director De's view, 'Many of the instruments weren't tropicalized, so were prone to breakdown. Many went out of order soon, and we couldn't get spare parts. Spares weren't shipped with the equipment, and took much time to procure from the USSR.' Another failing to which he draws attention is that 'most of the Soviet equipment was unsophisticated compared to that available elsewhere and they lost their currency soon. They were of no use for research.'

In design the equipment was far from universal, indeed peculiarly 'Soviet'; and this was where the second major problem came in: that of scale. 'The Soviet Union at that time,' in Dr S.L. Narayanamurthy's reckoning, 'was on a huge mission to match the US, in terms of technology and more importantly, in doing things their own way.' When asked to elaborate, 'My concern was on the scale,' he says. 'What was supplied was virtually medium scale industry magnitude plants, not laboratory equipment. They were just not suitable for a learning environment like ours. The equipment arrived, but we just did not have the money to feed them. It was like,' he draws here on an expressive homespun idiom, 'somebody gifted you an elephant when you did not have money to feed yourself.'

Each department was presented its own pachyderm or two. Chemical Engineering got distillation columns so huge they were never erected and chemical synthesis plants so ravenous the department literally couldn't afford to feed them with the raw materials they required (tellingly enough, there was a time when industry was interested in buying them off the Institute, for they were virtually production scale plants). Electrical Engineering, remembers former laboratory superintendent Mr U.R. Kasbekar, got 'giant production scale' diffusion pumps that couldn't be used because the moment you switched them on you were enveloped in darkness, their thirst for power having tripped the lines; Mechanical Engineering got its own full blown rolling mill; and Dr S. Narasimhan tells of a mini steel plant bestowed on Metallurgical Engineering that required a separate electrical sub-station to run it – which of course was easier required than granted.

Voracious elephants indeed, for rather a poor man. 'On balance,' says Narayanamurthy, 'if one wants to put numbers to it, I think the Soviet equipment was about 70% hindrance and 30% help in our teaching and R&D effort.'

### 'WE WERE NEVER CONSULTED'

What astonishes perhaps more than the fact of the mismatch is that it should have been allowed to occur at all. Didn't anyone protest; was IIT-Bombay content to be a passive recipient of goods foisted on it? The most mildly worded explanation for the apparent acceptance comes from Prof S P Sukhatme: 'Communication with the USSR was never smooth. What came in directly were packets that had to be collected. There was no coordination at all.'

Opinions of a sharper cast apportion the blame more squarely. Narayanamurthy contends that prospective end users of the equipment were never really polled, their views never taken into account. 'We had very little say in the selection of equipment. At least by the time I joined [this was in 1964], we had absolutely no say. Most of the stuff had been shipped, or had been decided to be shipped. There may have been some notional consultation at some level, but it was definitely not through professional consultation between suppliers and potential users. A lot of equipment,' he adds the clincher, 'came as a surprise to all of us. Once there was the omnibus agreement to help IIT-Bombay I have a feeling nobody really looked at what was on offer, what would be useful to us.' Prof Narasimhan is equally emphatic in stating that there was no dialogue in the decision-making. As he remembers it, most equipment lists were drawn up by the firm 'V/o TechnoExport', the mediating party in the Indo-USSR protocols (they are one of the three signatories to the 1958 agreement, the other two being the respective Ministries) – even though they were a commercial and not a technical firm.

In the light of these testaments the claim made by the UNESCO report – 'There was indeed very close collaboration between the Indian Government and UNESCO on the one hand and the USSR Government and the Indian authorities on the other' – takes on a particular moment. The 'collaboration' seems to have been all between governments and 'authorities', with IIT-Bombay faculty nowhere in the picture. Where the Soviet stand is concerned, a revealing aside lies buried in the tracery of Brig. Bose's account of Foundation Day 1959. He quotes a remark made by the Soviet contingent seated in the back of the jeep, during their drive with Pandit Nehru and Kasturbhai Lalbhai around the campus:

The Soviet representatives spoke to the Prime Minister of the need of acquainting the students with machinery to be actually handled by them in Industry after graduating from the Institute rather than simple machines made for educational purposes only. They also spoke of the need for a close contact with Industry during the studentship period. Although noted without further comment, the observation assumes a distended signifi-

cance in the light of all that ensued. Clearly the Soviets were in no doubt from the start that IIT-Bombay's students should be trained principally for the factory floor – and they proceeded to ship equipment of matching description.

In any event, no clear voices of protest were raised at the time; or were so muted as to have gone unrecorded. The Institute's documents, too, were silent on the subject until as late as the tail end of the 1960s. This is perhaps no surprise. For one thing, it would have appeared churlish, even imprudent, to complain. The prevailing sentiment was one of indebtedness: the general feeling was, after all, that IIT-Bombay had been able to spring off the blocks at the time it did chiefly because of the Soviet aid. For another, it was a period when the imperfections of the arrangement were only just beginning to be felt.

When the protests did finally find voice, they came thick and fast. From IIT-Bombay's self-evaluation submitted in 1970-71 to the 1972 Review Committee, here is a representative sample of what the departments said. 'The department is at present in possession,' Mechanical Engineering pointed out, 'of many Soviet equipments which are suitable for big production units... It is to be noted that they cannot be used for teaching and research work. This difficulty has greatly hampered our research and development.' Metallurgical Engineering pitched in: 'Most of the equipment at present in the department was received back in 1958 on the basis of a list drawn up before the Institute came into existence. The procedure for getting spare parts being what it is, the equipment such as Electron Microscope is lying idle for the last three years.' Adding an end-note that conjures a comical picture today but is sure to have packed a poignant sting then, 'It is an interesting museum piece,' scoffed the department, 'attracting visitors but no researcher.'

In sum the Soviet equipment, for all its hoped-for utility in accelerating IIT-Bombay's academic development, placed IIT-Bombay's faculty between a rock and a hard place. In itself of little use, it yet exacted large amounts of time and energy from IIT-Bombay's staff – because it was here, it had to be set up, people trained on it – with questionable returns. 'We used valuable resources,' feels Narayanamurthy, 'to put in place something we knew pretty well we weren't ever going to use. It was a sense one got right from the beginning.' And Dr B.G. Bhat of Chemistry reminisces, 'Virtually the entire Institute was handicapped because of the Russian equipment – our workshops were terribly handicapped. But we worked very hard to get them going. We were gripped by the spirit of starting IIT-Bombay and that is what kept us working on them.'

And so the coda: the poor man, in no position to turn down his debatable gift, found himself spending all his wherewithal maintaining the elephant the best he could. Nearly as vitiating as the direct effects of the Soviet machines and plants were their after-effects. The provision of Soviet equipment had deleterious, long lasting repercussions: according to De the Indian government, pointing to this alleged bounty in IIT-Bombay's laboratories, was loth to disburse additional funds to the Institute for modern equipment all the way into the 1970s. IIT-Bombay thus stood disqualified, for no real fault of its own, from equipping its labs as it would have liked. Metallurgical Engineering's lament testifies to this plight: 'IISc Bangalore and BHU at Varanasi have received bulk grants for purchase

of up-to-date equipment in recent years which has not been granted to us because of the UNESCO aid made available by the Soviet government.'

'The Institute's faculty suffered a lot on this account,' De adds with feeling, 'compared with their counterparts in the other IITs.'

A chorus of disapproval as loud and coherent as this can scarcely be disregarded (and the sample presented here is necessarily a limited one). To hear it is to be compelled to conclude that the equipment component of the UNESCO aid programme, on which the highest hopes had been placed, should go down in the Institute's history as a sterling opportunity lost. It skewed the Institute's trajectory (some might say 'damaged'), especially in terms of its R&D effort; and it was to take IIT-Bombay a couple of decades to stage even a partial recovery from this early handicap.

And if there's one take-home message lurking in all this, it has to be that top-down decision making of this kind, without consulting the end-user, can come to no real good: something that those at the top would do well to remember, but are all too prone to forgetting. Because addled with unsuitable laboratory equipment (and this was no less true of computers), IIT-Bombay got off to a much slower start in research than did the other IITs. It's not possible, thus, to speak of foreign assistance to IIT-Bombay in the same breath as that given to its sister Institutes, where there wasn't the same chasm between intent and outcome.

Yet though this deficit might have delivered a body blow to the Institute's research endeavour, it wasn't quite a knock-out either. IIT-Bombay was to go on to stage a resurgence, be it a modest one, after its effects had waned. And if over the years IIT-Bombay has managed to catch up with the other IITs in volume and quality of research, one needs to credit its resilience in overcoming the odds.

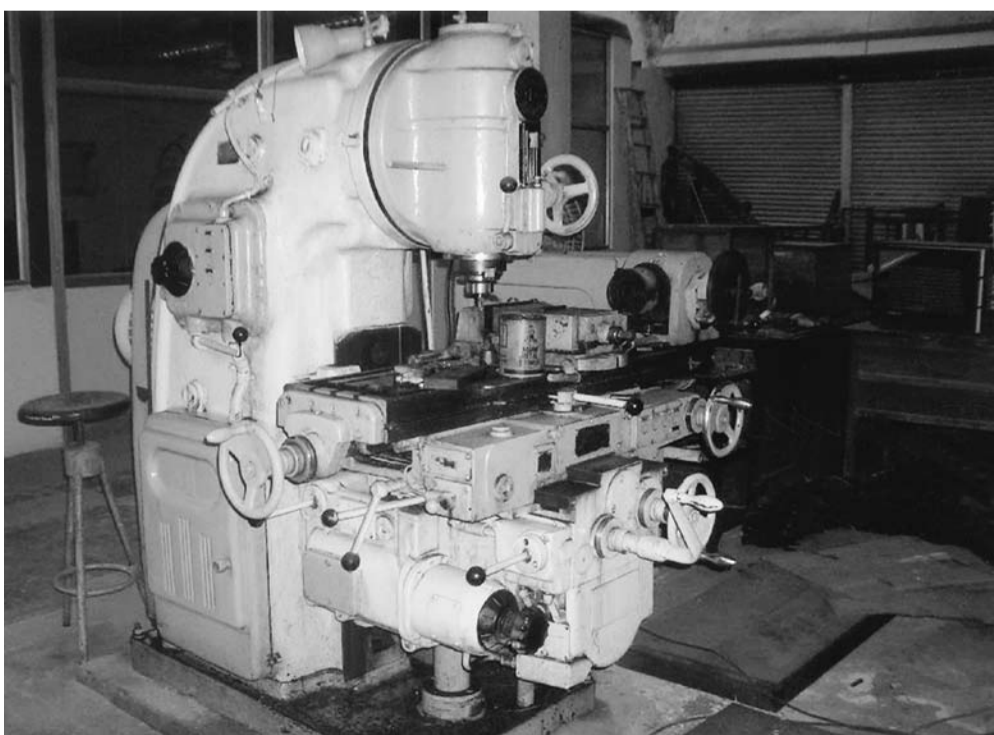
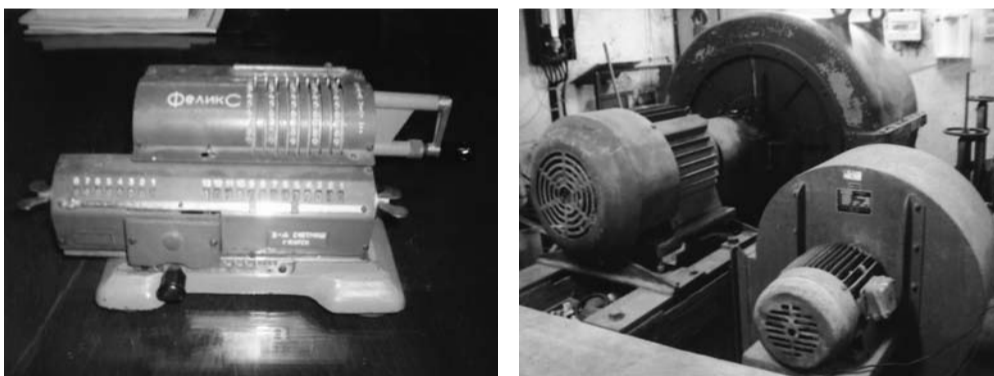
#### WHEN HOLIDAYING IN KERALA... REMEMBER YOUR CYRILLIC

Whatever the failings of the Soviet equipment, they weren't without their hidden gifts either. And as Narayanamurthy was to discover, these could at times be agreeably financial. Chemical Engineering ended up with such a cargo of platinum on their hands (some six kilograms of it) that it started to pose a security hazard. True to Soviet style, much of it was in the form of a giant five litre crucible, 'big as a cooking pot', says Narayanamurthy. Then when he became the department's Head in the early 1990s, Narayanamurthy caught himself worrying about being hauled up if the precious metal somehow went missing. So he went about obtaining the Board's permission to dispose of it by public tender. This fetched the department a 'handsome amount of money for those days' – some Rs 16 lakh – which they put into an endowment, proceeding from then on to enjoy the interest on it.

In the realm of utility, too, there were a few honourable exceptions to the rule. Dr J. Vasi of Electrical Engineering gives the example of one of his first Ph.D. students who, around 1985, needed a very high voltage, high frequency oscillator for his work. Vasi was deliberating whether to have it made in-house or to procure it commercially when his lab superintendent, Kasbekar, said he remembered having seen an old high voltage oscillator lying about somewhere. He proceeded to unearth it; 'but of course because it was this huge Russian thing,' says Vasi, 'he had to get two guys to lug it over. Nobody had used it for at least 10 years but when you turned it on it worked just fine, there was no problem at all. In fact we got some very nice results with it.' (For the Soviet equipment that did in fact get deployed and did in fact work, extreme ruggedness is a virtue most users have attested. Some of these behemoths – and beside them their smaller cousins – still stand in IIT-Bombay's labs in stately grandeur, mute witnesses to the flux of five chequered decades.) For some, the benefits could be rather elliptical. Dr Gaitonde tenders this vignette in his droll style: 'Another problem with the Russian equipment was that all the symbols and labels were in Russian, with the inverted P and the Pi and other unknown characters. But slowly, some sort of automatic image processing happened, and many of us learnt what the symbols meant. That training came in handy when I found myself on holiday in Kerala, where everything was written in those rounded type of letters, and we couldn't figure out our bus routes. Suddenly at one bus station I found the route numbers and destinations in both Malayalam and English. Five minutes of looking was all it took, my brain had done the mapping, and for the rest of the trip there was no difficulty. So the Russian experiment did have its side effects in real life, it was good training in some ways.' Going into the 1970s and all through that decade, we find a marginal improvement in conditions for R&D at the Institute. Teaching still took up considerable faculty time – partly because of the Institute's intensive curricular structure, partly because faculty chose consciously to concentrate their energies on teaching. But the Institute's infrastructure had been put in place, so there wasn't that drain on time. In the matter of people qualified to do research, too, there was marked improvement. Most faculty by now had gained their doctorates. And when Kelkar became Director, 1970 onwards, he insisted on a Ph.D. as a minimum qualification for promotion to the Institute's professorship. Responding to these stimuli, the ranks of faculty were gradually populated with those better placed to conduct research.

Before long, these changes had their expected effects. Between 1970 and 1972 the Institute had only about half a dozen sponsored research projects running, bringing in a meagre Rs 4-8 lakh per year. Subsequently, there were quantum jumps in funding attracted for R&D, such that the decade between 1973 and 1983 witnessed an impressive ten fold rise in extramural funding. Yet these jumps need to be seen for what they were, located in the small universe of IIT-Bombay's R&D enterprise – which had been virtually non-existent until the early 1970s. On the larger canvas, the figures during this interval pale beside those inked in by sturdier performers on the Indian scene, such as the Indian Institute of Science.

(To be continued)



**Not quite feather-touch...** A calculator (top left) and a blower (top right) shipped from the Soviet Union. The calculator, if kept well oiled, still works. The blower was so power-hungry it could never be used. Below, one of the smaller of the behemoths, still sitting pretty in IIT-Bombay's labs.

# Field Trip to Bandhavgarh National Park ■ PROF. SHIRISH WAGHULDE, Department of Met. and Material Sciences

As our jeep climbed up from the Badi Goofa, a herd of *chital* grazing around scampered across the road. But this time it was not due to the mere disturbance caused by a tourist vehicle. Once across the road, each one of them was gazing intently towards a particular area and some started giving the bark-like alarm call and stamping the ground with their hooves. Our presence didn't seem to matter at all. A lone male, who had not crossed the road, and who appeared to be the leader of the herd, also started to stamp the ground and give the alarm call. This was a sure indication of a predator in the vicinity.

Our guide then spotted some movement on the hillock. Sure enough, we spotted a *chital* lying down with a leopard on top of it, holding the deer by the throat. It was still struggling, kicking around every now and then, trying to throw off the big cat. The leopard must have felled it just a few moments ago. After a struggle which lasted nearly four to five minutes, the *chital* lay still and the leopard let its throat go, and sat erect. All was quiet. The alarm calls had stopped and the herd went about its business of grazing. All through, the leopard managed to stay on the side which was away from the kicking hooves of the *chital*. Tired from the hunt, it rested a while near the kill, then walked some eight to ten metres away and sat on a rock, affording us a great view. Though we were watching it for more than 15 minutes, we just didn't seem to get enough of the leopard. But it was getting near closing time of the park and we had to leave.

## Hilly regions, undulating forests and grasslands provide a rich habitat for a variety of flora and fauna.

This once-in-a-lifetime sighting was a fantastic bonus during our field trip to the Bandhavgarh National Park.

The Bandhavgarh National Park derives its name from the Bandhavgarh Fort situated inside the park. Bandhavgarh means "brother's fort" — a gift by Rama to his brother Laxman on their way back from Lanka. The fort and the surrounding forests once belonged to the Maharaja of Rewa. Being their private game reserve, the maharajas ensured adequate protection to the forests and its denizens. The abundance of game can be gauged from the stone plaque in the forest which marks the place where the maharaja killed his hundredth tiger! The park covers an area of nearly 1,160 sq. km., and is a Tiger Reserve under Project Tiger.

Bandhavgarh is situated in the Vindhya Hills of the Shahdol district in Madhya Pradesh. Tourists are allowed to enter the park only from Tala, a village on the north-eastern boundary of the Park. Katni, 92 kilometres from Tala, on the Jabalpur-Banaras line is the convenient railhead, though Umaria, 32 kilometres from Tala, on the Katni-Bilaspur line is the nearest station. Private buses and jeeps are available from both Katni and Umaria to reach Tala. Boarding and lodging facilities to suit every budget are available here.

Visitors are allowed inside the park for two hours after sunrise and two hours before sunset. Movement on foot



inside the park is prohibited. Private jeeps can be engaged in Tala. Taking a guide along is also mandatory. The forest personnel scout the park to track the movement of tigers, which is communicated over a wireless network, and so the chances of sighting a tiger are quite high.

Hilly regions, undulating forests and grasslands provide a rich habitat for a variety of flora and fauna. The good forest cover and the predominant sandstone rock soak in rainwater and then release it slowly. Four perennial streams flow in the park so even at the peak of summer, water can be found in most of the small ponds and waterholes.

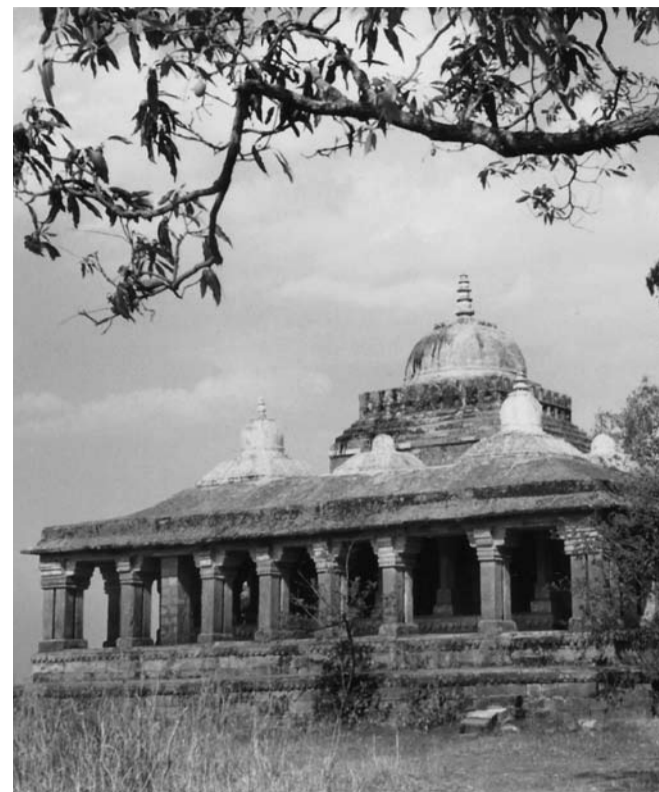
The area is rich in mammals as well as birds. During our trips inside the park, we could easily sight herds of *chital* and *sambar*, packs of Black-faced *langur* and sounders of wild boars. We also spotted jackals, foxes and a couple of barking deer and *nilgai*. Droppings of the sloth bear and hyenas in many areas of the park indicated their presence but we were not lucky enough to see either of them. The Common peafowl, Red Jungle fowl, Blossom-headed parakeet, Red-vented bulbul, White-breasted Kingfisher, Golden-backed Woodpecker, Green Pigeons, the Jungle Babbler, White-backed Vulture, Indian Roller, and Green Bee-eater were some of the commonly seen birds. Notable were the Crested Serpent Eagle, Stork-billed Kingfisher, Yellow-fronted Pied Woodpecker, Adjutant Stork and the Malabar Pied Hornbill.

On the second morning of our stay, a tigress with two cubs was reported to have been sighted in the Chakradhara grassland, just a few kilometres from the main gate, so we headed that way. The tigers were in the grasses and we could not see them from the road. Around seven to eight jeeps had already converged at that point, so we had to await our turn to get on to an elephant and go into the grasses to take a close look at the big cats. They were so well-camouflaged that an untrained eye would have easily overlooked their presence. The elephants moved as close as eight to ten metres from the tigers. The tigress was resting and the cubs were generally playing around. It was an exciting and exhilarating sight. The cats seemed oblivious to the elephants and their riders. As word spread, more and more tourists landed up and the tigress decided that it was time to move. The elephants followed them till they crossed the road and moved on towards the hills. Some eight to ten jeeps were waiting on the road to watch them, leaving very little room for the tigers to pass and the cubs seemed a bit alarmed and hesitant to cross the road.

Though the probability of sighting a Tiger in Bandhavgarh is quite high, it's always a matter of chance — a minute here or there makes a big difference and our sighting of the leopard and that of another tigress and her two cubs drove home this point very strongly.

A misunderstanding with the jeep driver actually helped us spot a tigress with two cubs at Ghodademon. The tigress had been sighted in the morning in that area. In the evening, although we asked our driver to take us there, he drove towards Mehman Pond in the opposite direction instead. On realising the error, we retraced our path and moved towards Ghodademon. It was getting late and we crossed jeeps returning from Ghodademon, disappointed that the tigers did not show up. We carried on all the same and just as we reached Ghodademon, the tigress decided to make an appearance and moved out of the bushes and crossed over an exposed hillock to disappear into a depression below. We could also spot its two cubs some distance away. The cubs seemed more like fully grown tigers and we were told that they were nearly two years old, and might leave their mother's side soon. If we had not taken the detour, we might have left with the other jeeps and missed the tigress and her cubs.

## A misunderstanding with the jeep driver actually helped us spot a tigress with two cubs at Ghodademon.



**There are a number of caves with inscriptions and pictures which are said to belong to the Mauryan period. The temple is quite picturesque and is devoted to Ram, Laxman, and Sita. The "Raja ka Machaa", a stone seat on one of the outcrops of the fort, affords a beautiful view of the forests below.**

Stretching our luck further, we moved down the road to see if we could sight the tigress again. To our great joy, as we turned a bend, we saw the tigress climbing up from the depression. She came up and casually sat on a rock about ten metres from the road, giving us an unobstructed view. She sat preening herself, ignoring us completely. We watched her for nearly 15 minutes, and then had to reluctantly leave to make it to the main gate in time.

We trekked up the fort one day. The climb begins from Shesh Shaiya — a stone idol of Vishnu reclining on the serpent *Shesh*. All along the way to the top of the fort are stone idols of Vishnu in his various incarnations. There are a number of caves with inscriptions and pictures which are said to belong to the Mauryan period. The temple is quite picturesque and is devoted to Ram, Laxman, and Sita. The "Raja ka Machaa", a stone seat on one of the outcrops of the fort, affords a beautiful view of the forests below. We saw tiger pugmarks and droppings on the fort as well. On the cliffs of the fort we could spot a couple of nests of the long-billed Vulture, with juveniles in them and saw six Malabar Pied Hornbills on a single tree. We spent the day on the fort and climbed down in time for the evening jeep.

This ride too had its share of confusions, but turned out to be the most eventful one when we saw a leopard on the kill. From the fort we drove to Badi Goofa but there the driver turned around and started moving in the direction of Sehra. While on the way to Sehra, on a hunch, we headed back towards Badi Goofa and reached just in time to watch the leopard throttle the *chital*.

We had our share of disappointments too. Our jeep broke down and on the road we could identify tiger pugmarks which seemed quite recent. We heard the alarm call of a *sambar* followed by the roar of a tiger that seemed not too far away. By the time we got the jeep started, it was getting dark and we had to rush back to make it to the main gate before closing time.

All in all it was indeed the most amazing wild life wander! ■

## Netting among Words

A presentation on bringing Indian languages on the global map through making computational translation easier was held. This presentation encouraged a bit of research that revealed more about WordNets in general and the Hindi WordNet in particular. Simply put, WordNets are vocabulary databases. Based on the concept of the English WordNet, the Hindi WordNet is a system for bringing together different lexical and semantic relations between Hindi words. The ultimate goal of Wordnet is to capture words of all Indian languages, facilitate translations and help in creating better Indian language search engines.

In the Hindi WordNet, words are grouped together according to the similarity in their meanings. For each word, there is a synonym set, or 'synset', representing one lexical concept. This is done to remove ambiguity in cases where a single word has multiple meanings. Synsets are the basic building blocks of WordNets. Each synset in the Hindi WordNet is linked with other synsets, through the well-known lexical and semantic relations. Semantic relations are between synsets and lexical relations are between words. These relations serve to organise the lexical knowledge base. Domains of tourism, health and agriculture benefit from it as people over the world

gain easy access to information about India. Seizing this opportunity, the Government of India has initiated a nationwide consortium of projects on Machine Translation (MT) and Cross Lingual Search (CLIR). Hindi WordNet is used heavily in Cross Lingual Search involving Indian languages.

Hindi WordNet is fast becoming a helpful resource for language teaching and pedagogy. Teachers of Hindi at the school level are already using the Hindi WordNet extensively. It is the base resource used by many researchers for work on translation and summarisation. WordNet also functions as an online thesaurus which helps writers and journalists. Only a WordNet stores culture-specific words and terms with their explanations that cannot be translated so easily into other languages. The Hindi WordNet is accessed daily by thousands of people. It has triggered work on linked WordNets for many Indian languages. IIT Bombay is also leading the national effort on creation of concept-based multilingual dictionaries in 13 languages, based on Hindi WordNet. This is a significant step towards development of automatic translation systems, which is currently estimated to be a multi-billion dollar industry.

Major search engine companies have acquired the commercial license of Hindi WordNet, which essentially

## Benefits of the Hindi WordNet

**Captures words of the Hindi language**  
**Helpful resource for language teaching and pedagogy, for researchers and scholars**  
**Important in creation of Hindi language and cross-lingual search engines**  
**Pivotal in leading to linked WordNets of other Indian languages**  
**A significant step in machine translation**

signifies that soon, if you put a query in Google in Hindi, it will draw upon all the related documents in English or other languages that you request. The Hindi WordNet can be freely downloaded with Application Programming Interface under *General Public License* from Linguistics Data Consortium (LDC), University of Pennsylvania, which is one of the topmost linguistic data repositories in the world and also from LDC-IL, the Linguistics Database Consortium of India. The project team was awarded the P. K. Patwardhan Award of IIT Bombay in 2008. An International Global WordNet Conference will be held in IIT Bombay from 31<sup>st</sup> January to 4<sup>th</sup> February, 2010.

## The Future is Here

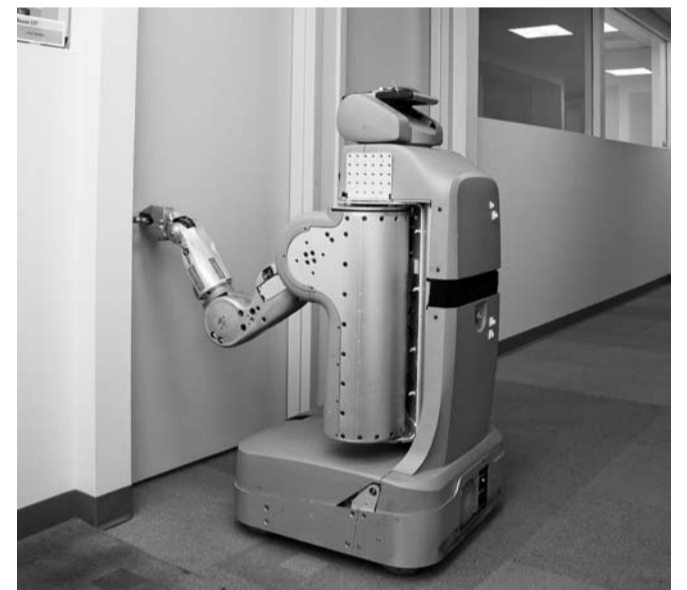
Willow Garage, a Silicon Valley research group celebrated the success of their PR2 mobile robot in June 2009. PR2 (Personal Robot 2) has wheels and can cover a distance of a mile and a quarter per hour. It navigated the company's cramped office, opened doors, entered rooms and plugged its power cord into ten electrical sockets — using its agile arm and hand. Scientists here wanted to see how they could push the limits of hardware, software and systems for robots and whether a robot could perform a certain set of tasks reliably.

Sachin Chitta, one of the people who developed PR2, and an alumnus of IIT Bombay, says about the robot, "A bunch of people were pretty nervous, including me, about what would happen, what the robot would do. People were trying to mess with the robot as it was doing its task by jumping in front of it, blocking its path, but it's a persistent robot, it didn't fail, it keeps trying." Along with being persistent, it's clever as well. If it finds a door locked, it simply moves on to the next one instead of continually trying to open it. PR2 is a completely autonomous robot who demonstrated

the ability to consistently navigate indoors, open doors and plug into regular outlets to recharge. In a 26.3 mile marathon over four days, it opened ten doors and plugged into ten sockets without fail. The robot has the map of the building. From the map it approximately knows the positions of doors all over the floor. It has a sensor that creates a 3D representation of the world around it as it moves forward, and the robot looks for patches that match information about doors. If the door is closed, it assesses where the door handle is and brings up its arm to grab the handle to open the door. While it does this, several checks happen inside the robot in the background to ensure that the robot is indeed opening a door. As it opens the door further, it simultaneously moves into the room. "There are other groups that have opened doors before," said Andrew Ng, a Stanford roboticist with several students who have gone to work for the company. But Mr. Ng also added that this seemed to be "the first robot able to repeatedly and reliably open doors and plug itself in."

Though on the surface, it seems like a small step, it is a giant leap for scientists working in robotics. Since PR2 is designed as a platform to conduct research and build ap-

plications in mobile manipulation in real human environments, it will help many scientists to spin off ever faster into the future.



PR2 Alpha Prototype (Photo credit: Ken Conley)

## OrthoCAD : 3M Trinity

The story behind OrthoCAD is, not surprisingly, the getting together of a brilliant team of mechanical, medical and materials experts, who crossed their individual boundaries of comfort to shape a vision of saving the limbs of young patients suffering from bone cancer. In late 2003, a chance meeting of a professor from IIT Bombay with an orthopaedic surgeon at a bio-materials conference brought them together to discuss ideas on developing medical implants for osteosarcoma patients — most of them children — faced with the choice of either amputation or unaffordable, imported prostheses. Dr. Manish Agarwal, who was associated with Tata Memorial Hospital, had developed an indigenous joint in stainless steel, but it was prone to failures by fracture. In early 2004, he invited Professor B. Ravi of Mechanical Engineering department to witness the first surgery of the latest imported joint, meet some patients and study the failed joints. For several months, they explored various ways to improve the indigenous joint by changes in design and materials, and approached funding agencies to support their work. But they hit a road block, since the project could not be identified with the area of any single ministry.

In December 2005, Dr. Manish received a gold medal for his contributions by Dr. R. Chidambaram, Principal Scientific Advisor (PSA) to the Government of India, who exhorted him to develop the implant in a scientific way in collaboration with an R&D institute. Thanks to another chance meeting of Prof. Ravi with the PSA, a brainstorming

meeting was organised in early 2006, and it was decided to bring out a status report on the national and international status of medical implants.

But there was a missing link: biomaterials. The imported implants were in titanium and cobalt-chromium alloys, and the duo needed a suitable partner. Enter Dr. K. Balasubramanian, Director of Non-Ferrous Materials Technology Development Centre, Hyderabad, who closed the loop by offering his expertise and facilities. In the summer of 2006, co-incidental invited visits to the U.S. by both Dr. Manish and Prof. Ravi brought them together in Pittsburgh, where over many shared dinners and coffee, they evolved the status report. Later, the PSA called the trinity to a meeting, and asked them to submit a proposal for development of indigenous implants suitable for Indian patients. Thus was born the OrthoCAD Network Research Cell for Endo-Prosthesis Skeletal Reconstruction Systems. The funding arrived quickly, by January 2007. Through their hectic schedules of surgeries, teaching, and administrative work, the trinity met over weekends and evolved the pieces of a complete system to design, manufacture, test and implant the prosthesis. The professor of mechanical engineering learnt anatomy, the orthopaedic surgeon used computer-aided design, and NIFTDC director evolved an economical manufacturing process. They put together a team of research associates and core engineers to give shape to the OrthoCAD dream. A new lab was created by renovating the abandoned Tin Smithy shed (<http://orthocad.iitb.ac.in>). Nearly three years down, the multi-disciplinary team has developed a completely new design of a modular



rotating-hinge total knee-prosthesis suitable for the local population, a virtual testing protocol (using finite element method), a physical testing facility (by developing walking simulator machines), novel surgical instruments, a manufacturing system (with rapid prototyping, investment casting, CNC machining, surface finishing and HA coating equipment), and finally, a 3D surgery planning software to ensure the correct outcome for the patients. The team is gearing up for clinical trials of the knee joint, and planning the second phase of the project, to develop a full family of lower-limb prostheses along with surgical instruments and a navigation system.

Within a short time, the OrthoCAD project has emerged as an icon, motivating many other groups in the country to tap into the immense potential in this field. Many more trinities with multi-disciplinary teams are needed to develop the entire range of medical implants and devices, over 70% of which are imported at present.

## Events and Announcements

**Student Gymkhana, IIT Bombay** in association with Staff Club had organised 'Rhyme Time' with Narayan Parasuram of Karadi Tales on Saturday, 10<sup>th</sup> October, 2009. A sing-along event, it was conducted by Narayan Parasuram (an IITB alumnus) one of the masterminds behind Karadi Tales Company, which manufactures audiobooks for education and entertainment, and is also a member of the band, Three Brothers and a Violin.

**Two French movies** were screened, as a part of the Basic French Communication Course being conducted at IITB at the P. C. Saxena Auditorium on Saturday, 24<sup>th</sup> October 2009. They were *Le Roi et L'oiseau* — a cartoon film for children, at 3.00 p.m. and *L'auberge Espagnole* (with English subtitles), for an audience of 18 years and above, at 5.00 p.m.



**Cell for Human Values** had organised a concert lecture by Pandit Nayan Ghosh, Distinguished Guest Professor, on 29<sup>th</sup> October 2009 at the P. C. Saxena Auditorium. Pandit Nayan Ghosh is one of the leading Sitar and Tabla artists of the country and will be spending a year at the Cell for Human Values, IIT Bombay. [photo]

**The Institute Cultural Night** saw performances by Mohit Chauhan, Bhupinder and Mitali Singh on 29<sup>th</sup> October, 2009, at 6:30 p.m. in the Open Air Theatre. [photo]

**IIT Bombay celebrated the Joy of Giving** between 27<sup>th</sup> September and 3<sup>rd</sup> October, 2009. The Joy of Giving Week has been conceptualised and promoted by GiveIndia. The Joy of Giving Week by the Akanksha Foundation was also organised on 1<sup>st</sup> October, 2009 at the Nescafe Coffee Shack (near SJMSOM) from 12 p.m. to 2 p.m. and 5 p.m. to 6 p.m. The foundation sold Akanksha lunch bags for a hundred rupees each. Every bag had a poem and a small pencil pouch in it. The Akanksha Foundation is a non-profit organisation that educates less privileged children. Since its inception, Akanksha has managed to create opportunities for thousands of children through Akanksha centres and schools. Akanksha reaches out to more than 2,500 children through after-school centres and more than 1,000 children through Akanksha-run municipal schools. Contact Akanksha at [fundraise@akanksha.org](mailto:fundraise@akanksha.org) for further information.

**Zephyr 2009**, the annual technical festival organised by the Department of Aerospace was held from 9<sup>th</sup> - 11<sup>th</sup> October, 2009. More than 15,000 students from reputed engineering colleges across the country participated in a conglomeration of Aerospace-related events that included workshops, competitions, paper-presentations, debates and guest lectures by eminent personalities. Zephyr 2009 was a unique platform for the exchange of thoughts and sharing of ideas among engineering communities connected with this fascinating field.

A talk on '**Networking India with Regional Air Transportation**' was given by Dr. Kota Harinarayana, (Programme Director, LCA, ADA) while Dr. Naveed Hussain, Vice President, Engineering and Technology, Boeing India gave a talk on 'Global Technology Collaboration'. A talk on 'Solar Powered Aviation — Current and Future' was given by Eric Raymond, Head of Solar Flight who is currently a world leader in Solar Powered Aviation. In the Boeing RC Plane Workshop, teams learnt the fundamentals of building model aircraft.

For the first time in a college festival, powered paragliding was displayed on the sports grounds of IIT Bombay. The pilot had an attached engine which provided the required



propulsion. A huge wing helped him to take off from the ground, providing a show never seen before. Competitions like the MachInfinity-RC plane competition and various on-the-spot events like an Aerotainment quiz, an AeroRace, a boomerang-making competition and a flight-simulator competition ensured that there was something on offer for all interests.

**Avenues 2009**, the Annual Business Festival organised by SJM School of Management, was held between 31<sup>st</sup> October and 1<sup>st</sup> November, 2009. The event was graced by luminaries like Mr. Ness Wadia, Mr. Rahul Bose, Mr. Prahlad Kakkar, Mr. Ajit Balakrishnan, Mr. M. Damodaran, Mr. Pramod Chaudhari and others. The event also saw participation from more than 150 B-Schools across India, as well as leading corporate houses and working professionals. Mr. Prahlad Kakkar, an Ad-Guru, addressed a packed auditorium on 31<sup>st</sup> October 2009. After taking his audience through laughter, deep thought and laughter again, Mr. Kakkar's speech concluded to a standing ovation. Avenues 2009 launched an **HR event — HRiday**. The event witnessed a participation of more than 100 teams across the best B-schools in India. OPERA, the operations club of SJMSOM conducted YOJNA — a case study based operations event. The Imagine it! Project was back in a bid to cultivate imagination. It featured global creativity challenges and multi-platform media content, including the 'Imagine It!' Documentary Film Series. Pragyaa, the business Quiz, was held at the F. C. Kohli auditorium. Around 100 teams participated in the preliminary round.

**International Design Conference on Sustainability** was organised from 3<sup>rd</sup> to 7<sup>th</sup> November, 2009 by the Industrial Design Centre (IDC). As a part of this international conference on spreading awareness regarding sustainability in India and the world, participants attempted to make the longest graffiti scroll with the theme as 'Sustainability and earth'. The conference displayed the work of designers, design students and others from six continents across the world.

An exhibition titled '**In a planet of our own**' was held at Mechanical Engineering Lawns from 3<sup>rd</sup> to 7<sup>th</sup> November, 2009. The objective of this exhibition was to commemorate the theme of sustainability as practiced across different parts of the world in all its diversity, and how they are derived as localised solutions. Public installations based on Sustainability in the form of mobiles, stair graphics, wall graphics, tessellations, painted surfaces with light and shadow play, objects of everyday life took the viewer through larger-than-life portrayals into the world of elements, using themes such as Nature, Evolution of Life, Myth of Creation and the Tree of Life. They were put on display at the IDC Circle. The sculpture on Recycling is displayed at IDC Entrance. Calligraphic Scrolls had a larger-than-life portrayal of scripts, which had been painted on-the-spot on canvas by calligraphers. They showed the preserved as well as vanishing scripts in Arabic, *Devnagari*, *Modi* and Roman at the Main Building, from 3<sup>rd</sup> to 9<sup>th</sup> November 2009.

### SEMINARS

**Prof. Robin Batterham**, Group Chief Scientist, Rio Tinto Limited, and Professorial Fellow, Department of Chemical and Biochemical Engineering at the University of Melbourne gave an institute colloquium on 'Perspectives

from an Engineer: Making a difference in the Minerals and Energy Industries' on 8<sup>th</sup> September, 2009.

**Prof. M. Ram Murty**, FRSC, Queen's Research Chair and Head, Department of Mathematics and Statistics in Jeffery Hall, Queen's University, Canada, gave an institute colloquium on '**Summation of Infinite Series**' on 21 Oct, 2009.



**Prof. Marc Fontecave**, Head of Laboratory, Professor of the Collège de France and the Chair of Chemistry of Biological Processes, Member of the Academy of Sciences and an Honorary member of the Institut Universitaire de France, gave an institute colloquium on 'Hydrogen: Water, Sun and Catalysts' on 10<sup>th</sup> November, 2009.

**J. C. Bose Memorial Lecture** was organised on 11<sup>th</sup> November, 2009 during which Dr. Probir K. Bondopadhyay, Forensic Historian of Science and Technology, Rural World Communications, CEO, U.S.A., delivered a lecture on 'The Bose Detector of Wireless Waves and Launching of the Communication Revolution'.

Dr. Baldev Raj, Distinguished Scientist and Director of the Indira Gandhi Centre for Atomic Research, Department of Atomic Energy, Kalpakkam, spoke on '**An Approach to Energy Sustainability in India**' at the institute colloquium jointly organised by IIT Bombay and INAE titled, 'Local Chapter' on 6<sup>th</sup> November, 2009 at 4.00 p.m. in the institute auditorium.

**Prof. Rolf Jeltsch**, a Swiss mathematician, visited IIT Bombay from 22<sup>nd</sup> to 23<sup>rd</sup> November, 2009 to interact with students of IITB and also from other institutions. His visit was planned by the Embassy of Switzerland under the auspices



of 2009 being celebrated as the year of Science and Education of Switzerland in India. The objective of this project was to conduct presentations and have interactions under diverse topics, with students of higher educational institutions (either specialised or general) and teachers.

### MoUs

IIT Bombay entered into an MoU with Johns Hopkins University, USA. Specific areas identified at the time of signing this agreement include Bioengineering, Mechanical Engineering, Information Technology and Nanotechnology. The objectives of this MoU are to facilitate an exchange of students (a separate student exchange agreement was also signed), and assist in joint research projects and educational initiatives.

IITB entered into an MoU with Mekelle Institute of Technology (MITM), Ethiopia. The main objective of this MoU is to help improve the quality of engineering education being imparted at MITM and to participate in academic endeavours that are of benefit to MITM.

## APPOINTMENTS

IITB renewed its MoU with University of New South Wales, Australia. The areas of cooperation under this MoU include exchange of students and cooperative research.

IITB renewed its MoU with University of Udine, Italy. The earlier MoU with University of Udine focused on research collaboration only in the area of Microelectronics. The current MoU focuses on faculty and research scholar exchanges, and joint research projects, with the scope having been enhanced to include all areas.

## LAURELS

**PROF. DEVANG KHAKHAR**, Department of Chemical Engineering has been elected a Fellow of the National Academy of Sciences, India (NASI, Allahabad).

**PROFESSORS ANURAG MEHRA** and **SANTOSH K. GUPTA**, from the Department of Chemical Engineering have been elected Fellows of the Indian National Academy of Engineering.

**PROF. ANAND PATWARDHAN**, SJM School of Management has been designated as one of the co-ordinating lead authors for the Intergovernmental Panel on Climate Change's (IPCC) special report on 'Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation'. He will be responsible for Chapter 8 of the report, entitled 'Toward a Sustainable and Resilient Future'.

**PROF. RAVINDRA GUDI**, Department of Chemical Engineering has been selected for the prestigious Herdillia award for Excellence in Basic Research by the Indian Institute of Chemical Engineers. The award will be conferred in IChE's annual meeting in December 2009.

**PROF. V. S. RAJA**, Department of Metallurgy and Materials Science has been selected by NACE International as the recipient of NIGIS Meritorious Contribution award for the year 2008-09, in recognition of his contributions in the area of Corrosion and Corrosion prevention. The award is sponsored by Corrttech International Pvt. Ltd. The award was presented during a recent International Conference and Exposition on Corrosion on 30<sup>th</sup> September, 2009. Prof. Raja has also been elected as a Member of NACE International Research Committee.

**PROF. SUBIMAL GHOSH**, Department of Civil Engineering has been awarded the Young Scientist Award for 2009-10 from Indian Science Congress Association (ISCA). The award will be given in the 97<sup>th</sup> Indian Science Congress to be held in Trivandrum, from 3<sup>rd</sup>-7<sup>th</sup> January, 2010.

**PROF. R. MURUGAVEL**, Department of Chemistry has been awarded the Materials Research Society of India (MRSI) medal for 2010. The award will be presented at the MRSI Annual General Meeting at the S. P. University in Gujarat, during which Prof. Murugavel will also deliver the MRSI medal lecture. At present, Prof. Murugavel is on sabbatical and occupies the prestigious DFG Mercator Chair at Bochum University, Germany.

**DR. GANESANMOORTHY**, a recent Ph.D of the Department of Chemistry who did his doctoral work with Prof. Balakrishna, has been selected for the first '2009 Eli Lilly Asia Outstanding Thesis Award' (Second Prize) awarded by the Discovery Chemistry Research and Technologies Division at Eli Lilly and Company, Indianapolis, USA. He is presently a Postdoctoral fellow at the University of Calgary.

**DR. S. K. SANE**, Former Professor, Department of Aerospace Engineering, currently the Science and Technology Advisor to Nostrum is one of the principal innovators of the **Linear Wind Energy Conversion System** for which the New Jersey Commission on Science and Technology and the New Jersey Board of Public Utilities, USA announced an award of \$ 5, 00,000 on 18<sup>th</sup> November, 2009 by approving Nostrum Energy LLC's application for the Edison Innovation Clean Energy Fund.



**PROF. RAVI N. BANAVAR**, Systems & Control Engineering has been appointed Convener, Systems & Control Engineering on 2<sup>nd</sup> September, 2009 vice Prof. P.S.V. Natraj.



**PROF. RAVI SINHA**, Department of Civil Engineering has been appointed Professor-in-Charge (Placement) on 30<sup>th</sup> September, 2009 vice Prof. Subash Babu.



**PROF. KUSHAL DEB**, Department of Humanities & Social Sciences has been appointed Faculty Adviser to SC/ST Students on 23<sup>rd</sup> September, 2009 vice Prof.(Ms.) Pushpa Trivedi.



**PROF. M. RAM MURTY** has joined as Distinguished Visiting Professor in the Department of Mathematics on 20<sup>th</sup> October, 2009.

**PT. NAYAN GHOSH** has joined as Distinguished Guest Professor in the Cell for Human Values on 22<sup>nd</sup> October, 2009.



**DR. P. VEDAGIRI** has joined as Assistant Professor (Contract) in the Department of Civil Engineering on 23<sup>rd</sup> October, 2009.



**PROF. RICHARD PINTO** has joined as Distinguished Professor in the Department of Electrical Engineering on 21<sup>st</sup> July, 2009.



**PROF. K. S. VALDIYA** joined as Distinguished Guest Professor in the Department of Earth Sciences on 31<sup>st</sup> August, 2009.



**DR. KRISHNA N. JONNALAGADDA** has joined as Assistant Professor in the Department of Mechanical Engineering on 31<sup>st</sup> August, 2009.



**DR. MALAY MUKUL** has joined as Associate Professor in the Department of Earth Science on 9<sup>th</sup> September, 2009.



**DR. SURYANARAYANA DOOLLA** has joined as Assistant Professor in the Department of Energy Science & Engineering on 14<sup>th</sup> September, 2009.



**DR. (MS.) XIAOYU FU** has joined as Post Doctoral Fellow in the Department of Mathematics on 25<sup>th</sup> September, 2009.



**DR. SUNEET SINGH** has joined as Assistant Professor in the Department of Energy Science & Engineering on 5<sup>th</sup> October, 2009.



**DR. (MS.) MANASWITA BOSE** has joined as Assistant Professor in the Department of Energy Science & Engineering on 29<sup>th</sup> September, 2009.



**DR. SHAIBAL KANTI SARKAR** has joined as Assistant Professor in the Department of Energy Science & Engineering on 31<sup>st</sup> August, 2009.

## RETIREMENTS



**SHRI DATTATRAY Y. KULKARNI** has retired after 33 years of service on 31<sup>st</sup> October, 2009. He worked in the institute as Superintendent in the Accounts Section.

*I remember him as a very punctual person. He delivered his work on time. Also, I've never come across a calmer and quieter person who kept his cool under a lot of responsibilities. He was sincere and hardworking.*  
— Shri Lavande, Accounts Department.



**SHRI GOPINATH T. NAIR** has retired after 34 years of service on 31<sup>st</sup> October, 2009. He worked in the institute as Draftary (SG) in the Administration Section.

*He used to do his work very well. He took care of letters and ensured that all of them reached their designated receivers. By nature, though friendly and talkative, he did his work with utmost sincerity in peace and quiet.*  
— Mr. Kove, Assistant Registrar, General Administration.



**MS. SITABAI R. KUSHER** has retired after 30 years of service on 31<sup>st</sup> October, 2009. She worked in the institute as Sr. Cleaner in the Public Health Office.

*She was a good worker. She worked hard and kept to herself when working. She had a good rapport with her colleagues and office team. We will miss her.*  
— Mr. Tambe, Sanitary Assistant in Public Health Office.



**SHRI ARVIND P. BAGAYATKAR** will be retiring after 39 years of service on 30<sup>th</sup> November, 2009. He worked in the institute as Jr. Laboratory Assistant in the Department of Mechanical Engineering.

*He was a very sincere person. As the store-keeper of our central workshop, he had an excellent rapport with first and second year students. With the faculty, too, he was friendly, down-to-earth and honest. Our best wishes to him.*  
— Prof. Amitava De, Department of Mechanical Engineering.

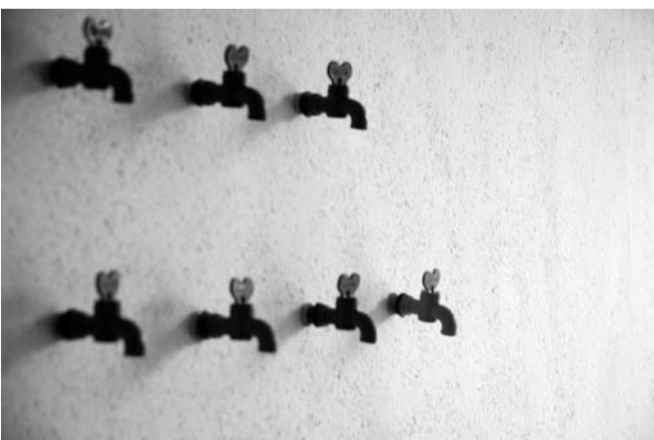
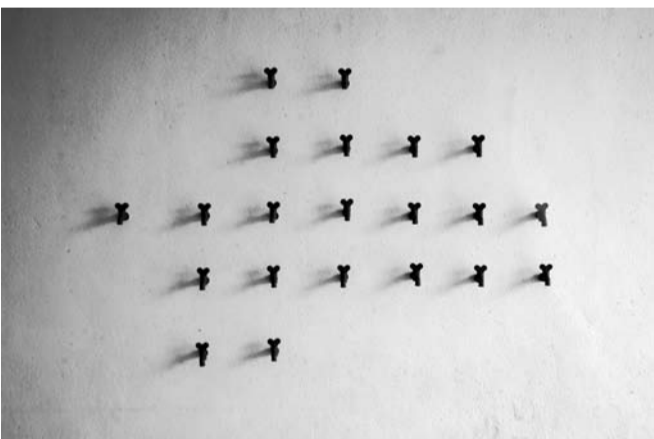
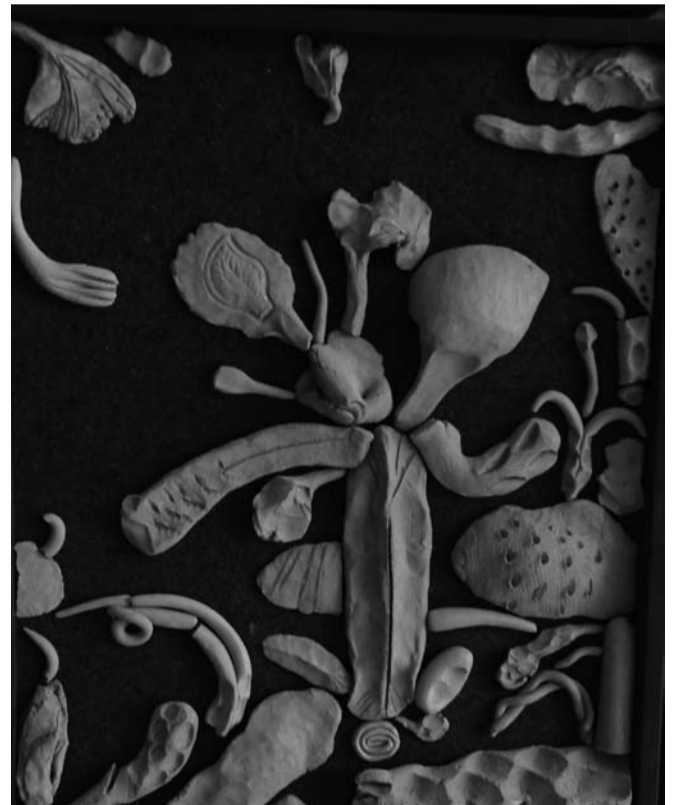
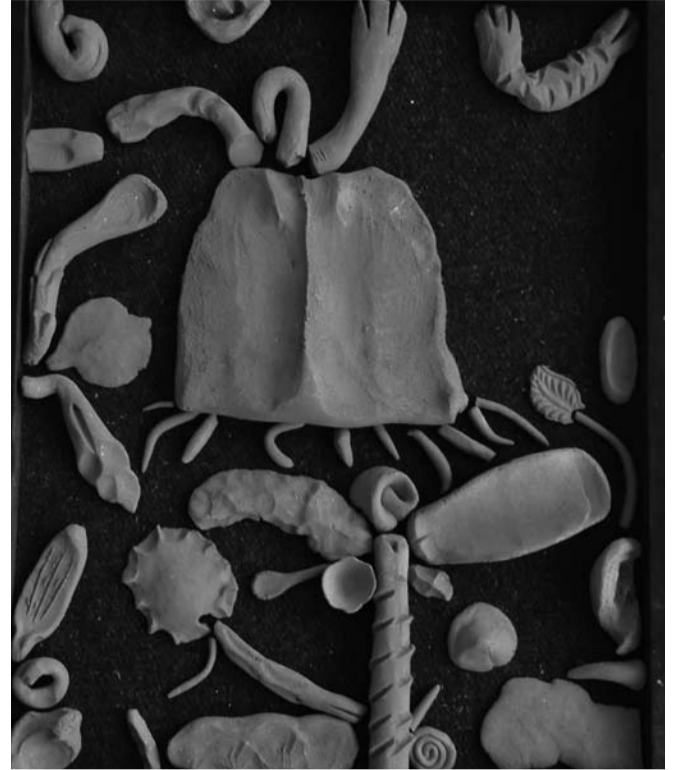


**SHRI VOTHABA M. SALVE** will be retiring after 32 years of service on 30<sup>th</sup> November, 2009. He worked in the institute as Watchman (SG) in the Security Section.

*He performed his duties well, and was a tranquil person. We will always remember him as a quiet natured person.*  
— Mr. Vijay Kumar, Security Officer.

PHOTO-ESSAY

■ Compiled by RAJA MOHANTY



(Above) These works, by the Santiniketan based artist **Bidut Rai**, are made of baked terracotta forms that have been mounted on a plywood base. These forms are difficult to identify for though they resemble some kind of creatures and leaves, they are not that. While the forms may be confusing and lead us to believe that the artist did not quite succeed in his attempt to create identifiable replicas of some living organisms, it is more likely that the effort is a play on the part of the artist to create a visual language. It is possible that some of the imagery is drawn from the creepy-crawly life forms that abound in and around their mud-house.

(Left) In another exploration, **Shilpa Bisht**, a student of visual communication, responded to the suggestion of creating an unusual visual imagery by mounting plastic taps on a blank white wall. The display had 20 blue taps and a single red tap arranged in uneven rows and columns. Again, one may look upon this as something unusual and then ask, 'But what does it mean?' Shilpa is reluctant to answer such a question, possibly because the visual language evokes meanings in ways that are quite different from the spoken and written language. The visual invites us to see, just as all that can be heard invites us to listen. Detaching the need for meaning from the act of seeing and the act of listening is necessary so that one might actually 'see' and 'listen'. Thus, form and rhythm, textures and tonalities are the foundations on which one may create meanings.

Send in your articles, photographs, etchings, poetry, or anything else you would want portrayed in the magazine to [pro@iitb.ac.in](mailto:pro@iitb.ac.in).

MAILING ADDRESS