EDITORIAL

It is with a mixture of relief and contentment that I present this year's edition of Quarks to its readers. The relief is palpable as the responsibility was huge, considering the burden of expectation and the long wait of one year that precedes publication. But the contentment is greater: the pages that follow, I am sure, will be successful in expanding the horizon of our magazine.

The magazine is divided into eight sections. The first section is directed towards all of us who are en route our transition into adulthood with questions of career, future and life after college looming large ahead of us. The following two sections have a common theme: IISc UG - the challenges it faces, its achievements and undertakings. 'Conversations', the next section, is aptly named as it is a collection of interviews taken by the Quarks team.

We have taken a conscious effort to address many issues in the magazine, which, though not directly relevant to us, are bound to affect our lives in one way or the other. Be it a non-preachy treatment of issues like gender issues, marital rape and feminism, or a zanily humourous critique of postmodernism, or a detailed account of the tiff between the authority and researchers regarding the scholarship hike movement – there is a lot on offer for the more serious readers in sections five and six.

This year's magazine is unique because of the participation of professors and instructors in the production of the magazine; we are proud to have Professor Arvind Ayyer of Mathematics Department of IISc and the instructors Sushama Ma'am, Narmada Ma'am and Anish Sir of the UG Department writing for us on a variety of topics ranging from the dichotomy between Maths and Physics as career options to Ancient Love Poetry by women.

Speaking of poems, we also have a rich collection of poems in English and other Indian languages in the section 'In Verse'. The last section, cheekily named 'Not in verse', is indeed a bouquet of prose writings – stories, travelogues and personal accounts.

The production of the magazine wouldn't have been possible without support, both active and moral, from many people who are not a part of the Quarks team. I thank the whole of UG community and the various offices involved in the production and publication of the magazine. Specifically, we would like to thank our Director Professor Anurag Kumar and his office, our new Dean Professor Umesh Varshney and our outgoing Dean Professor Chandan Dasgupta, the UG office, Professor T.A. Abinandanan and the staff of the Archives and Publications Cell of IISc for their unwavering support of this UG initiative.

In the previous four years of the UG program in IISc, Quarks has mirrored the program itself, being the oldest of all the UG initiatives. This year, as the UG program has begun operating in its fullest glory with five running batches, juniors and alums, I hope that Quarks too has become matured and has blossomed into a holistic forum for expressing the many voices of the undergraduates. And I hope too, that this tradition continues, as the printed word will not lose its charm even years later when we look back at our formative years in college with the gift of hindsight and nostalgia.

Yours sincerely,

Subhayan Sahu,

Editorial Team Coordinator.

from the Dean's desk

Umesh Varshney

Dean, Undergraduate Programme

The flocks of the enthusiastic youngsters on the campus, the undergraduates, we are having since 2011, never cease to make me proud. The cover of this fourth edition of QUARKS says it all; they are the volcanoes erupting with ideas and interesting questions, which makes it all worthwhile to interact with them, and to indulge with them. To teach them has always been an electrifying experience. That they are an uninhibited repertoire of multi-talented vigor is pretty obvious from their forays into the areas of arts, literature and journalism they explore in multiple ways, QUARKS being one example. I am glad to see that the pool of this vigor has now reached a fair size. This year we admitted the fifth batch of these students, and we now have over 500 of these energy packed youngsters exploring the campus in unconfined ways. This year has also been special in that the first batch of students we admitted in 2011 has graduated, with most of them having done extremely well in their studies, and enjoying all that the campus had to offer them. About a third of these students have gone out to do their graduate studies in top ranking universities/institutions worldwide. With the option of a master's degree thrown open to them by the Institute this year, a large number of the remaining students have opted to continue here for the fifth year. It has been very satisfying to see that several of the students have already published their research findings in high-ranking journals. And, many more of those continuing for their master's degree are poised to publish even better! Even though the primary emphasis of our four-year undergraduate programme has been to train students as researchers, I am happy to note that several of them who wished to take up jobs, found them in highly coveted organizations.

I am very pleased to have this privilege of getting early glimpses of the fourth edition of QUARKS. I am happy to present it to you all. I am sure you will enjoy the efforts and explores the nascent minds have presented so daringly and engagingly. Happy reading. I am already looking forward to the next edition!

THE TRANSITION STATE

Transition state is the state corresponding to the highest energy before settling into a stable product. Life in college has close parallels, with questions of adulthood, philosophy, education and career often rocking our sail through the challenging waters of college. Listen to the various voices – from professors and instructors to students and pass-outs, voicing the common theme of the life-changing times in college.

PAGE 1

IISc 101

COURSE NAME: IISc 101

DURATION: 4 years (maybe 5)
(Compulsory for one and all involved with IISc)

PAGE 21

UG HIGHS

A patchwork of UG life here in IISc – Pravega, Mimamsa and a few other things.

PAGE 53

CONVERSATIONS

"A single conversation across the table with a wise man is better than ten years mere study of books."

Henry Wadsworth Longfellow

PAGE 103

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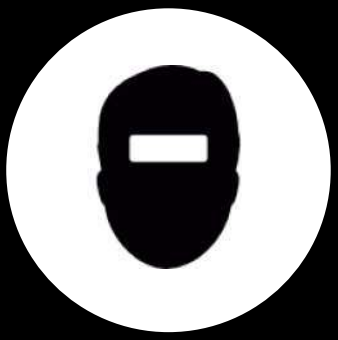


section **five**:

CONSCIENTIOUS CONTEMPLATIONS

section **six**:

SCIENCE, PHILOSOPHY AND EVERYTHING IN BETWEEN

section **seven**:

IN VERSE

section **seven**:

NOT IN VERSE

section one:

The Transition State

ARTICLES IN THIS SECTION:

Ashok Suresh Das

A Leaf in the Wind

"The only constant thing about life is change. The ones who succeed are the ones that could adapt."

This quote is one that I'd come across many times as a school kid and had casually regarded as another piece of grown-up's advice, but looking back at it now, after just a year as an Undergrad, it begins to demand much more respect. Of course, the ability to adapt yourself to different situations is something that you figure out as you grow up, through different experiences: be it something as simple as having your class shuffled to maybe even having to change schools. But let me tell you, no amount of such experience can quite prepare you for the gigantic leap from school to college.

Of course, we all *anticipated* the big change whilst in our final years of school: *Last week of school*, we would say. *Last new school uniform, last assembly, last exam paper..* We would place the word last before so many words that it'd look ridiculous. But we never really understood what a monumental change it would be.

College Life is on a completely different scale as compared to school. The young Undergraduate, stepping out for the first time from the protected haven that is his school, discovers the most important thing about life: living itself. And by living, I don't just mean the day-to-day tasks of washing your clothes or making your bed in the morning or going to the mess to have breakfast every day. You are suddenly being pulled out of your comfort zone in almost every possible area, to the chaotic, constant, bustling stream of life that is your college.

Campus Life begins to rush past you like a speeding train, and unless you manage to run fast enough to catch it, you will be left behind. In a short while, you become accustomed to it: you begin to actually look forward to the things that keep you busy, such as events your newfound college clubs might have organized, the excited buzz of activity related to your college fest, or just the general idea of being a college student itself. Even your academic work, or your daily tasks such as shuttling between your messy hostel room and the lecture hall or the lab, hurriedly wolfing down your lunch to get back to your incomplete lab report due in twenty minutes, staying up late at night to finish assignments due the next day.. Even these kinds of things become fixed into your routine and soon become something you enjoy doing. You are suddenly completely responsible for yourself: no parents to instruct you or help you get ready for class, or make breakfast for you. No school teachers to guide you by spoon-feeding you knowledge. You are expected to fend for yourself, to understand what work has to be done and to motivate yourself to complete it on time. And you will see, as you get into the groove, that you actually begin to enjoy this sense of responsibility.

But the best part about college by far, is the people you meet. You get to interact with such a diverse collection of people, with each person having tons of unique, personal experiences from which you could learn a thing or two. You are now handed the opportunity to interact with some of the best minds in the country. You will meet people with completely different interests and characteristics. Although this might be a bit intimidating at first, you will soon find this feeling fade, as you interact with them further. You will find yourself grateful for just being able to talk with people like them, to find out what makes them different. This is another step of growth: The world is full of unique people, and college is your first step to meeting a few of them.

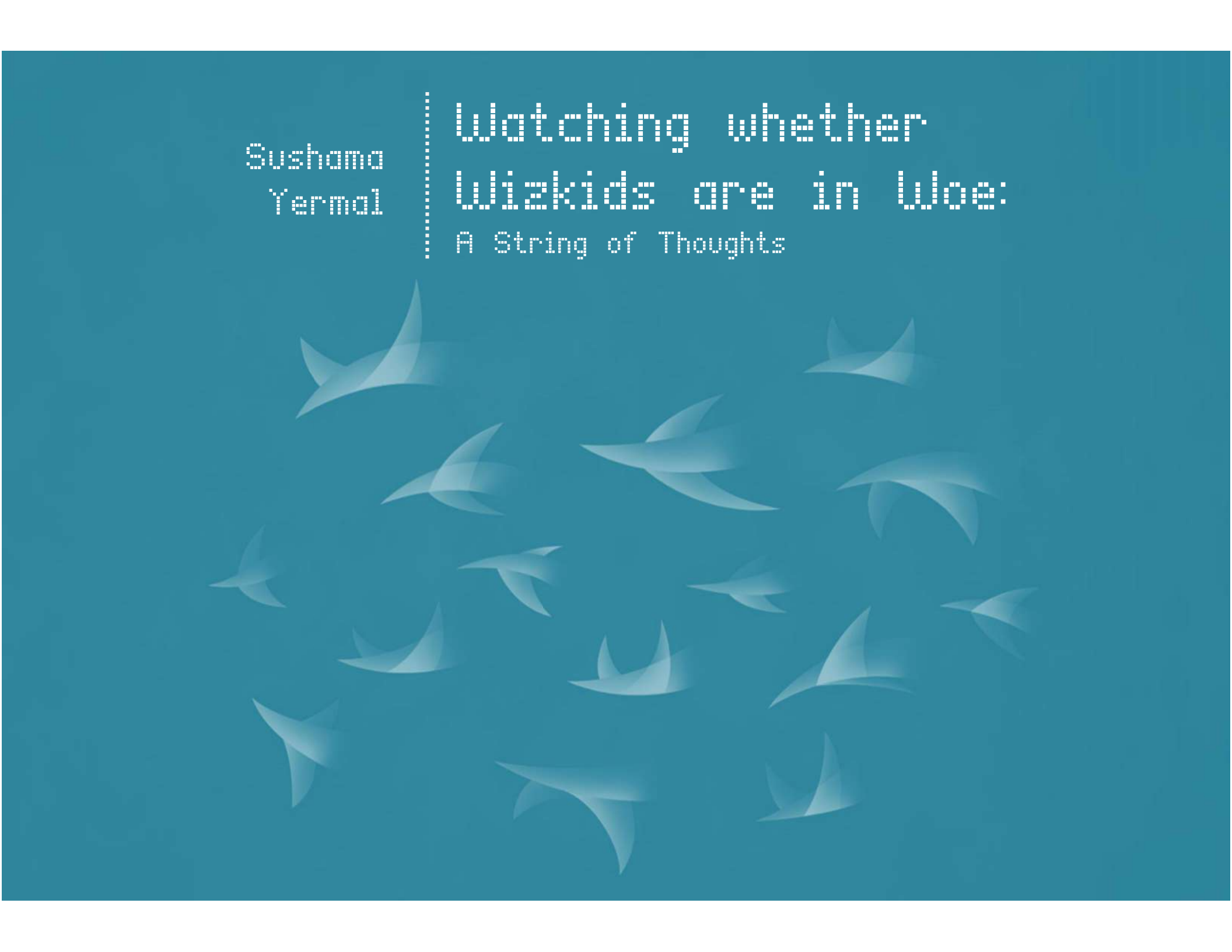
Then there are the close friends you make. It is in college that you meet so many people, some of whom you will find you get along better with than the rest. You will find yourself cherishing each and every moment with them. Some of them will turn out to be your companions through the rest of your life, while at the same time some of them may fade once your four years of college are over. But know this for a fact: The bonds that you build during this phase of your life are some of the strongest you will ever make.

Yes, life in college is drastically different from the cushy lives we all must have led at our schools. But this sort of change is always for the better, as we realize after a month or so. Soon you find yourself missing your school life less and less, as you get caught up in this chaotic but structured whirlwind. You begin to adapt better and better, while enjoying the whole transition process as it happens. You learn to go with the flow, bending to allow change without letting it break you, like a Leaf in the Wind.

Sushama Yermal

Watching whether Wizkids are in Woe:

A String of Thoughts



Securing admission to the undergraduate programme at IISc itself testifies to the aptitude of such students in learning the basic sciences. Many of them are also endowed with the right attitude to engage in fundamental research. The institute being a busy hub of this activity, one would expect all of them to thrive here and make the best use of a marvellous opportunity. Indeed, most students find their four or five years on campus a demanding-yet-happy situation. But such an undergraduate life does not seem all rosy for a handful of these youngsters. Here I compile some general observations and share my considered opinions about this suffering minority, in an attempt to help in alleviating their troubles.

The society at large measures contemporary success in material terms. For a young student, the terms seem to be high scores in public exams and entry gained into prestigious courses. Having faced enormous pressures of this kind and reached this far, our Studenteens are often expected to continue with 'performing' well: which translates to obtaining the best grades in the shortest possible duration and entering renowned doctoral programmes or finding high profile jobs. If we step back in time and think about how humankind evolved, we can see that a young adult is originally meant to cater to somewhat different goals! As a social being, s/he must learn to live harmoniously with others by pursuing a productive and fulfilling vocation. A perfect example of such a society may be only imaginary, but when the ambition to stay ahead of others replaces these basic goals, a severe conflict develops both within and between individuals.

PERSONALITY ISSUES AND PERSONAL PROBLEMS

Several incoming candidates would have enjoyed praise and recognition in their school or community as high achievers. In spite of being humble by nature, they are habituated to an exalted treatment. While studying with highly competitive peers at IISc, some see for the first time what it feels like to be not the brightest or the quickest learner around. A good number of them are equipped with - or quickly learn the balance of – the attitude required in the face of such a changed scenario. A fraction of them find not being the centre of attention disturbing to various degrees, especially when they are far from the comfort of sharing their feelings with family members. By the time students complete high school, most Indian families would have hardly prepared them to stay away from home – this brings another set of troubles the youngster needs to tackle: adjusting to a new place, taking care of one's routine/health/chores, freedom of choice in activities versus absence of monitoring, to name a few. Hence it becomes important that they pick up a healthy, responsible and stress-free way of life.

And learn to choose friends well - both among peers and older individuals. As end of teenage also signifies the beginning of adult life, undergraduates need to surely understand when (and how much) to trust someone! This is crucial in growth of individuals as well as a harmonious social life.

Knowing when to cope by ourselves and when to seek help becomes very valuable when dealing with either professional or personal difficulties. Relying too much or too little on ourselves or others harms us badly, bordering on unsociable behaviour. This may also trigger rather hostile responses by colleagues and others, feeding the imbalance further, making it hard for the individual to find external support when in need. As can be expected in any large-scale human endeavour, chances are that such problems go unnoticed. I strongly urge students to pay attention to this aspect of social adjustment both at introspective and community levels. Individuals with such a problem often require counselling by friends or professionals.

When faced with tough challenges, weak minds tend to give in to distractions. Losing one's focus and falling prey to wasteful activities or picking up harmful habits can ruin large chunks of valuable time along with money and health. Teenagers are especially prone to these dangers. Resolving to overcome such tendencies and allowing strong-willed individuals to monitor us goes a long way in avoiding such pitfalls.

Some people seem to disagree with the fact that falling ill and taking days off is a part of normal life. They either end up worrying too much about it to the extent of going into a depression or use it as an excuse to reduce one's effort in studies. Both these extremes are entirely avoidable. When ill-health is genuinely hindering our purpose, we must learn to convince others, including the parents, of the gravity of the situation and take a break to recover. In such cases, it may help to remember that learning to be a scientist can never be a ride that must be completed within a previously determined length of time!

ACADEMIC FOCUS

The focus of this undergraduate programme is on training the aspiring young minds to take up fulltime academic research in natural sciences. When students aim to earn a degree quickly by means of obtaining high scores in tests, the original goal of understanding how science is done becomes a secondary intention, thus spoiling the whole idea of the programme. The true task of ambitious teachers is to guide the students to analyse any given phenomenon in detail and question the inconsistencies in how it has been studied. I find it heartening that several of our Studenteens steadily make progress with this Real Learning as opposed to gathering and memorizing information. Only good depth of understanding can make the learning stable and useful in the long run. To this end, it is imperative to regularly review one's progress and consult the teachers routinely, instead of worrying about test results when it is too late. Hence it is important to choose courses and projects in such a way that they allow exploring a variety of areas and provide an opportunity to learn for one's own satisfaction rather than following the so called latest trends.

Raring to be at 'the cutting edge of scientific research' is often a consequence of what the student hopes to do after obtaining the BS degree. Standards of entry to eminent graduate schools or industrial jobs sometimes mislead students into thinking that they need to know every buzzword – often without bothering to go to any depth of thinking. From my vantage point, this attitude looks detrimental to the goal of building a good career. This conflict frustrates the students while looking at options of courses and careers. In this regard, it may be useful to realise what is expected of science students at each stage: undergraduate stage is the only level where the student is free fulltime to accumulate a vast breadth of knowledge with a firm grip on the basics in each field of study; at the postgraduate level it is important to master a large number of techniques in a given field, while staying aware of progress in a vast variety of areas of human learning, even if they are apparently unrelated to one's topic of interest. The confidence and versatility seen in such a person becomes evidently preferable to any employer – be it in an academic institute or industrial firm. When every individual acquires such skills uniquely, there won't be any room for meaningless comparison with others. Encouraging everyone to do the best for oneself is far more beneficial than making a number of people attain falsely idealised traits.

THE BROADER CANVAS

At any point on the road of science, one is free to stop and change directions. Continuing on a path just because of shyness to explore what we find more interesting is a disservice to ourselves. It is futile to think that moving on to another field is a blemish to personal reputation – but it surely helps to remember that taking up any profession has its own ups and downs. We find many examples of late-starting, field-switching individuals who have achieved their best in science, humanities, technology or fine arts. Society can benefit from any individual doing his/her best in any field! It would be a shame to lose someone's contributions just because s/he is unhappily stuck elsewhere. While I would very much like all our students to continue in scientific research, I do hope they will overcome any limitations to recognise their true calling and enjoy the bright future awaiting them.

College Life

Moshir Harsh

About two years ago, when I left home, I was excited, nervous, scared and really happy- all at the same time. And why wouldn't I be, for I was about to make a transition into one of the best and one of the most important phases of my life-I was finally going to college. Be it the movies that portray over and over, how awesome college days are or the fabulous stories that seniors tell you about their college life or even the Buzz-Feed pages that build up a great air of expectation about college life. But not all expectations are always fulfilled.

College is one place where you truly experience independence for the first time in life. College life is the 'firsts' of many things: first love, first kiss, first sex, first big fight, first shrugging with police, first bike, first big time hangover, first Goa trip with friends, first trouble with a professor or with the administration, first big failure in life, first rift with friends, first team win in the sport you love (basketball for me), first trophy win representing your college, first exposure to drugs, first participation in a college fest, exploring your hidden talents for the first time - be it photography, drama, Youtubing, graphic designing or simply going to the comic-con dressed as your favourite character and countless others. And not all of these happened in my two year stay here at IISc (I leave it to the reader to wonder which ones did). College is really the only time in life when you can try out things for the first time and be irresponsible for (probably) the last time because you know your parents will not look out for you and people don't have great expectations from you. You don't have any responsibilities; the mistakes you now make will not likely have very far reaching consequences. So why not make some, instead of regretting never trying.

More importantly, college is about a transformation from a boy to a man or from a girl to a woman. You learn to be responsible and face the consequences of your actions or inactions. The various experiences that college puts you through prepare you to deal with life outside the campus. I feel, most of us- the undergraduates here, haven't quite matured the way you would expect from someone about to finish college and a lot of us still have a naïve attitude towards life. Statements like, 'I can't come to the movie tonight because my mother doesn't allow me to go for late night shows', or even 'I don't know how to drive a motorcycle' make me feel that it is high time we grew up and faced life. I sometimes wonder that some of our parents would have married young, probably just after college. Do you think that we have matured even a bit like them, let alone enough to start a family? The mere thought of it terrifies me. Here at IISc, we are a much protected community, where life for a lot of us is limited to the hostels, OPB, probably a lab and occasional trips to New BEL Road. We as a community of students do not have much interaction with the outside world or with students from other colleges. We do not send contingents to college fests, they do not invite us to various events they organize (my plight, since I am a quizzer) and most people do not even know of the existence of an undergraduate programme here.

I understand that academics and research here at IISc are very important to us (they are important to me as well), most of us have joined this place of our will and a lot have joined against their parents' and we all want to excel. But both the authorities and we must understand that too much academic involvement keeps students from developing in other dimensions that they are supposed to in college. Taking a lot of credits and simultaneously working in a lab takes away whatever little time we get to do other things that should matter. When IIT graduates can become top-selling authors or entrepreneurs, I imagine IISc graduates could also achieve similar non-academic feats in the future. The authorities also need to understand and follow a normal course structure where they should teach the course according to the syllabus, not elevate the course standards just because the students can take it. This puts undue pressure on the students and we need to avoid taking so many graduate level courses and then sulking to make it through.

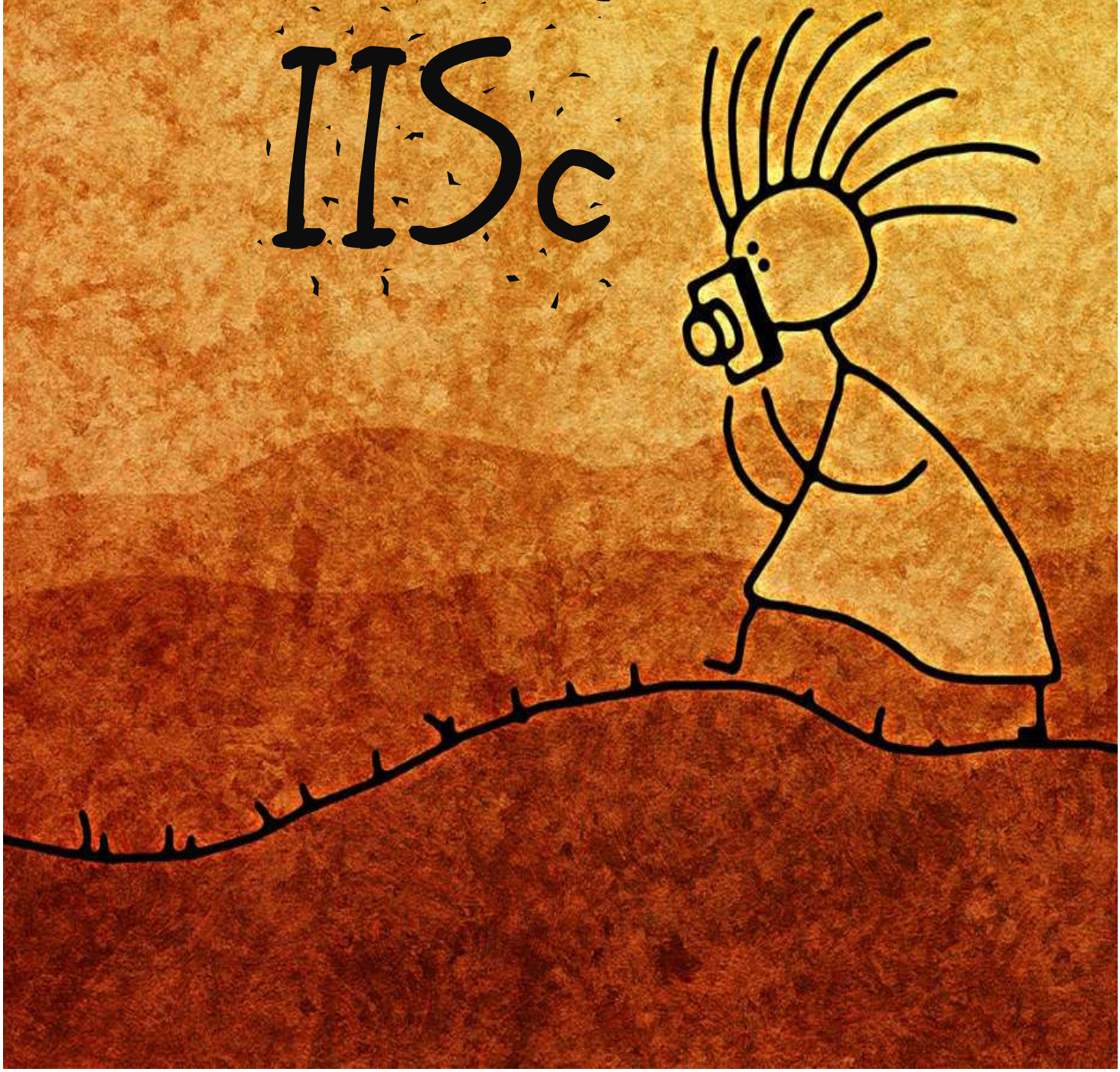
We undergrads idolize the graduate students and try to follow their lifestyle- we try to work as hard as them in the labs along with our coursework and essentially 'sacrifice' our undergraduate years, without realizing that the graduate students must have enjoyed a fair share of undergraduate time in their respective colleges. A lot of undergraduates spend time as a couple, isolated from other friends and do everything together from attending classes, to going to the library, to eating all meals together. This has clearly been influenced by the culture of graduate students without realizing that their relationships are more mature, many would probably result in a marriage. But are such serious relationships healthy at our age, where we shut out the world and spend all of our time with only one person?

Any decent college has at least ten times the number of undergrads that we have. So it is very easy and quite natural to find 'like-minded' people- people who naturally behave and think like you do, who are probably interested in the things that you are interested in- be it bikes, adventure trips, gaming or just an occasional marijuana. These people become friends for life and it is with *them* that you can hang out and try out various things that you have always wanted to. Unfortunately, IISc UG has too few students to facilitate this and hence one does not always end up pursuing his/her non-academic interests because of the lack of company coupled with extremely busy work schedule. A man is known by the company he keeps, but what about when you are forced to keep a certain company because that is the only company available?

One reason for introducing the undergraduate programme was to break the mundane atmosphere prevailing on campus and make the campus more dynamic and lively, but we have followed suit and instead of changing, we have adapted to the old campus lifestyle. We seriously need to start doing some crazy stuff on campus- I do not want anyone to think that I lived a boring college life when I tell them about my college days. A big apprehension I had about joining IISc was that the life here could be quite 'what it is here right now!' and might not provide a holistic college experience. I fear my apprehensions are coming true. As my father says, 'There's an appropriate time for everything in life. It's good if the things are done when they should be'. I would conclude by just saying, 'Do not try to live the life of a graduate student in your undergraduate years. You will be a graduate student one day, but these undergraduate years will never come back again. Make the most of them.' As my favourite quote by Mark Twain goes, 'In 20 years, you will be more disappointed by what you didn't do than by what you did.'

Neha Kondekar

A Journey called IISc



I was a part of the Class of 2015. Yes, I am forced to use the word 'was', since the four years of my undergraduate education are now behind me. I will be off to start another chapter of my life; but before I do that, I wish to leave behind some sort of a message, especially for the incoming batch. This article will give a fleeting glance into the life of an undergraduate at IISc to my prospective juniors, whom I address in the second person here onwards.

Firstly, welcome to IISc! Someone else may or may not have pointed this out before, but let me make this clear-each one of you is lucky to be here. Only about 1 in 10 students who aspired to be here were successful in doing so. This number might be way lesser than that of the IITs, but believe me, you are just as privileged. State of the art labs, some of the finest teachers across India, and not to forget, the most beautiful place in Bangalore – the IISc campus.

The first few semesters here will be like playing during PT class in school, in an open playground. You will be made to play as many games as possible. Some of you may like it, others won't. Coding the Dijkstra's algorithm, counting ants crawling up their anthill, soldering and tuckering so many bread-boards, actually handling the human brain and learning so many other countless things. Even today, I don't understand why we were taught all that, but as Steve Jobs once said, 'You can only connect the dots looking backward, not the other way'.

Despite the PT class analogy, the next four years will be an adventure. There will be numerous experiences; from not doing well in one mid-semester exam to being outstanding in your final year project, from not getting the dream job to being admitted to your dream graduate school. There will be days when you will kick yourself for joining this program and there will be others when you will boast about being an IIScian.

I can't take you through the details of the adventure- you will have to discover that for yourself. Each one of you will have a different story to tell when you are at a stage like mine today. I just want you to take home the message that at the end of the day, all that will matter is your attitude. Pessimism will take you down; even the IISc tag won't help.

And it's a no brainer that courage, perseverance and willingness to learn will take you places and I can assure you that IISc will be the launching pad for your flight.

If you haven't already, make note that all of you will be paid to pursue your studies. That's a big thing for an undergraduate in India. Be thankful and make it count. You will also be expected to pursue internships. Those will be tremendously helpful to make new and important contacts for life and no doubt, to get some hands-on experience in the industry, to explore new places and so on. Plan your summers well and believe me, it will pay off handsomely in your final year when you will be on the lookout for jobs or graduate schools.

I am sure you must already be aware of the fact that the undergraduate years might be the last time you will have a real, large gang of friends. A few years down the line, you might be the bread winner for your family or be confined to a cubicle, bad-mouthing about your boss or stuck in a foreign land, banging your head to make your experiments work. If you curse IISc during your undergraduate years, I suggest you instead make merry thinking that there might be worse days ahead :P. Do make the most of the time you spend here. Eat out (the mess is pretty bad), play and party, hang out, but at the same time, keep your responsibilities and goals clear.

There are innumerable experiences which I would have loved to share, but I will keep this article short. I believe that a good education potentially makes a more mature and responsible adult. And like a cherry on the cake, IISc ensures that it gives the best possible environment to budding scientists like us. I hope that most of you will reciprocate the favours to your future alma mater ;) I wish you all the very best for your future endeavours. I don't think this article was like a 101 for you, but guess it helped!

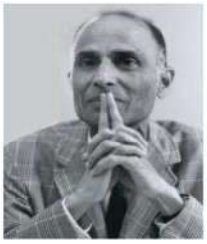
THE UNCERTAINTY PRINCIPLE OF CAREERS

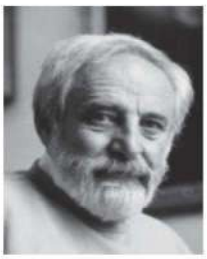
Arvind Ayyer

THE UNCERTAINTY PRINCIPLE OF CAREERS

ARVIND AYYER

1. Introduction





What is common to the Indian-born American harmonic-analyst and representation theorist *Harish-Chandra*, the prolific geometer *Raoul Bott*, the only theoretical physicist to be awarded the Fields medal *Edward Witten*, and the 2014 recipient of the Shanti Swarup Bhatnagar award in mathematical science *Kaushal Verma*?

It turns out that none of them started out in mathematics. Harish-Chandra and Kaushal Verma started out as physicists. The former obtained his Ph.D. under Paul Dirac, one of the founders of quantum mechanics and quantum field theory. Raoul Bott studied electrical engineering as an undergraduate, and Edward Witten, although officially a physicist, started out as a history major with a minor in linguistics, of all things! In fact, it would be difficult to find a reputed mathematics department in the United States where a significant fraction of faculty did not get their undergraduate degrees outside mathematics. But wait, there is more: the same statement could be made of virtually any scientific, engineering or humanities discipline. It is extremely common in academics to switch fields.

The first question one can ask is *why*? Is this a failure of the education system? I have only given Indians and Americans as examples above, but this happens frequently all over the world. Does this mean education systems all over the world are hopeless? First of all, there are well-known examples of people who knew what they wanted to do very early on in their childhood, stuck to it, and did great things in their respective fields. I am certainly not qualified to evaluate the education system in India, much less all over the globe. I do however, want to address some misconceptions about what an undergraduate education here at IISc and in other places, is meant for. Since my background is in mathematics and physics, I will stick to these subjects.

Before I start, I would like to make it clear who my intended audience is. I am primarily writing for the sincere, but confused student who is seriously considering doing research, but does not know what that

entails. I hope that this article will help convince the UG/PG student uncertain of their current "interests" that he/she is not alone, and that this uncertainty is not cause for despair.

Many of you do not have the background to know enough about the subject you are majoring in. Even though IISc has the emancipated idea of allowing you to choose your majors after the third semester, introductory classes in the subject are often not indicators of the kind of research one actually gets around to doing as a full-time scientist. I hope that explaining my own background will give you some idea of the non-standard ways in which people get into academia, and give you hope that choosing one field for your major at this stage does not mean you are stamped for life. Of course, ultimately it is your own hard work, creativity, discipline and some luck that will decide whether you do well in your field or not.

I will first describe a little bit of my background to set the stage. I will then give an example to give an idea of why I switched fields to mathematics. Finally, I will end by re-emphasising what I think students could learn from my experience. It should be clear that everything I write is my opinion, and I do not claim to represent the majority in either of these fields.

2. Background

I grew up in Bharuch, a moderately-sized town (pop. 3.7 lakh) in Gujarat. My parents are themselves technical people; my father is a metallurgist and my mother is an organic chemist. I had an interest in science very early on, and I read all the science books I could get hold of. We had a ton of those at home because my father bought a lot of cheap Russian popular science books (e.g., *Physics is Fun* by Ya. Perelman). There were a few mathematics and chemistry books, but they were mostly about physics, and quantum mechanics in particular.

I got very interested in Physics primarily because of these books and decided to enrol for the Integrated M. Sc. program at IIT Kanpur, when I got through the JEE. I enjoyed all my classes including humanities, because they all taught different ways of thinking about different aspects of the world. By the time I was graduating, the only thing I was very sure about was that I did not want to have anything to do with either industry or experiments. I had taken many courses in mathematics and high-energy physics, and, although I had not grasped some of these courses as well as I should have, I decided to do a Ph.D. in string theory, since the subject seemed both elegant and fundamental.

I joined Rutgers University (in New Jersey, USA) for my Ph.D. and, since I had taken sufficiently many courses, I was eager to start "contributing to science"! The difficult part about research is that most problems are either too easy or too difficult. Finding the sweet spot takes experience, courage or plain dumb luck. I didn't have any experience and I wasn't lucky in those times. Starting research on one's own is almost always a formidable task. Professional scientists have faced and met that challenge at some point in their lives. For some, that time is before their Ph.D.'s and for some, after. In my case, and many others wanting to work in string theory, it happened exactly at the time of the Ph.D.

I drifted for a long time, before finding a problem I could solve. Unfortunately, the problem was not of interest to any string theorist there, but I managed to get some combinatorialists interested in my problem. It is to the credit of my future co-advisor, Doron Zeilberger, who was open to listening to a problem from a physics graduate student, that I found my true calling. I then managed to convince my other co-advisor Joel Lebowitz, who was a joint appointee in both the mathematics and physics departments, to officially take me on. It is here that I really hit the jackpot! I was working with two giants in the fields of combinatorics and statistical mechanics, even though I had joined Rutgers to work on something completely different. One thing led to another, and I finally earned my Ph.D. basically working on problems that I enjoyed.

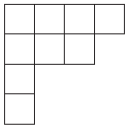
To avoid any misconception, I should clarify that I have nothing against string theory or any other branch of physics. Good physicists often have deep intuition about phenomena, and these, once put on a rigorous footing, become theorems or conjectures that many mathematicians think about. I just learnt a little late that some of the problems I find fascinating are just not of interest to most physicists. In particular, I like my rigour "well done". ☺

Let me illustrate this with an example. Hopefully everyone remembers what *permutations* are. A simple way of saying what a permutation on n letters is, is to say that it is an arrangement of these n letters, one of each kind, in a line. The set of all such permutations on the alphabet $\{1, \ldots, n\}$ is denoted S_n. For example, $S_3 = \{123, 132, 213, 231, 312, 321\}$ as a set. A more sophisticated way of saying the same thing is that S_n is the set of bijective functions from $\{1, \ldots, n\}$ to itself. The advantage of this point of view is that S_n can now be thought of as a special set called a *group*.

For groups, there is a huge machinery called *representation theory* developed in the late 19^{th} and early 20^{th} century which helps us understand their structure. Without getting into too many details, let me just say that in the particular case of S_n, the important objects are *partitions* of the integer n. A partition is just a representation of n into other positive integers which sum to n. For example,

$$\{(5), (4,1), (3,2), (3,1,1), (2,2,1), (2,1,1,1), (1,1,1,1,1)\}$$

are all the partitions of 5. Note that $(3,2)$ and $(2,3)$ are the same partition, and we fix the convention of writing the entries of a partition in weakly decreasing order. A partition can also be represented pictorially by what is called a *Young diagram*. Without giving the formal definition, let me illustrate it by a figure and hope it will be illustrative. The Young diagram of the partition $(4,3,1,1)$ of 9 is



Associated to a given Young diagram of a partition of n, one gets an integer relevant to S_n by counting all possible fillings of the diagram with numbers 1 up to n which increase from left to right and from top to bottom. These fillings are called *(standard) Young tableaux*. For instance, this is a particular Young tableau of the same partition,

(2.1)

1	2	4	9
3	5	8	
6			
7			

Now, the combinatorial problem one is interested in is the number of Young tableaux for a given partition. For instance there are 5 tableaux for the partition $(3,2)$ given by

(2.2)

1	2	3
4	5	

1	2	4
3	5	

1	2	5
3	4	

1	3	4
2	5	

1	3	5
2	4	

A priori, this looks like a difficult problem. However, it turns out that there is a complete and beautiful answer to this question.

The *hook* of a square with coordinate (a,b), denoted $H(a,b)$, in a Young diagram is the set of squares to its right and below it, including itself. The *hook number* $h(a,b)$ is the cardinality of $H(a,b)$. For example, the hook of the square with coordinate $(1,2)$ (the one containing

2) in the example (2.1) above is

$$H(1,2) = \{(1,2),(2,2),(1,3),(1,4)\},$$

and $h(1,2) = 4$. How, here is the miraculous *hook length formula* for the number of Young tableaux $d(\lambda)$ for a given partition λ, given by

$$d(\lambda) = \prod_{\substack{s \text{ a square in the} \\ \text{Young diagram of } \lambda}} \frac{n!}{h(s)}. \tag{2.3}$$

One can check that $d((3,2)) = 5$ and verify (2.2). Several things about this formula are puzzling. First of all, it is not obvious that this formula gives an integer! Secondly, it is not clear why hooks have anything to do with counting tableaux[1]. This was first discovered and proved in the 1950s by Frame, Robinson and Thrall and caused a sensation among mathematicians. In an attempt to better understand this formula, several different proofs of (2.3) were given. There are now several algebraic proofs, many bijective ones, and even a probabilistic one. There are also many generalisations of (2.3) to other kinds of tableaux.

This brings me to my point. Physicists (particularly those doing high-energy physics) need to know basic representation theory and some of them know this formula very well. However, most of them think of this purely as a tool for calculations, a black box if you will. I have seen physicists doing such calculations at lightning speed in order to get an answer to some question they are interested in. To be fair to the physicist, he/she cannot afford to get sidetracked in such niceties since they are trying to understand some real system in the real world. If they end up staring at nice formulas all the time, they would end up wasting far too much time to make progress on understanding the real system. On the other hand, I get hooked[2] on to this one step of the calculation and wonder at its beauty!

3. Takeaways

The most important moral of this story, to my mind, is that 18 or even 21 is too early an age for most people to make up their minds about what they would want to do. By saying this, I do not mean that they are completely clueless; just that in this age of super-specialisation, one often doesn't have enough information to make an informed choice. One sometimes has to admit one's mistake in career choices, and take the courageous step of changing one's area. In economics, there is the notion of a *sunk cost*, which is some investment that has gone

[1] A completely satisfactory answer to this question is not yet known!

[2] pun not intended.

bust. The situation is not exactly the same because one does internalise something, however subconsciously, while studying a subject.

The second point I want to make is something that is not emphasised enough. Your enjoyment of your classes in a particular subject (and maybe even your marks in the exams) does not necessarily correlate well with your research abilities in that subject. This seems like a tautology in sports or arts. Just because you are a big fan of Sachin Tendulkar or Anurag Kashyap or Tyeb Mehta or Mahasweta Devi does not mean you can play cricket for the Indian cricket team or direct an inspiring film or draw a beautiful painting or write a thought-provoking short story. Why should it be the case that because you got good marks in your introductory biology class, you are a budding[3] biologist?

The last, and related point is a converse to the second one. If one excels at something and finds (often to one's surprise) that others are either not very interested in it or just plain terrible at it, there is a good chance for a career in that area. Of course, the actual "success" or "failure" (whatever that means) depend a lot on circumstances. For instance, if you have a natural aptitude for programming in *Python*, you would have had a far better chance of success doing it for a living in the early 1990s rather than now.

To conclude, my personal take on education is that it is nothing but a voyage of self-discovery. As Aristotle said, "Knowing yourself is the beginning of all wisdom." If you have learnt something about yourself that you did not know before you started the journey, then consider it a success!

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[3]pun intended

section two

IISc 101

This **Section** contains:

- 42 Things to do before you leave IISc by UG Fifth years
- Canine counts in the campus by Sridevi V
- The complete gastronomical guide for the foodies in IISc by Sagnik Dasgupta & Ishan Agarwal
- Perspectives from an exchange student by Ashok Suresh Das & Gautam Aditya Kavuri
- Jubilee Garden by Ashok Suresh Das
- Queer IISc by Subbulakshmi S & Sahana Rao
- UG Hangouts (three-article series)
- Waste Disposal in Campus by Shriya Pai
- Where Ability meets Opportunity by NBD Team

42 THINGS TO DO IN BEFORE YOU LEAVE IISc

Courtesy: Fifth years

01 Climb to the top of the main building.

Meet Vamsi at room no. 60, N Block. 02

03 Find your secret hangout spot in Jubilee Garden (peaceful to stay in the night).

Fail in a couple of subjects and get the taste of life. 04

05 Go for photo walks in the campus and around.

Cycle to the most beautiful locations around IISc and the city. 06

07 Interact with the PhDs and the seniors – only place in India where you can rag them. They are the friendliest and most helpful seniors ever. Break the ice with seniors by organizing events with them – Pravega, Samanway, Talent Show, Spectrum – you name it!

Celebrate birthdays in Gymcafe and the now-secluded Faculty Club. Or for a completely different kind of pleasure, organize it in the hostel's bathroom with a bucket of water ready for a water fight. 08

09 Play lots of Hockey or any other sport. Or pretend, at the least. Go to Gymkhana and try out Badminton, Football, Billiards, Hockey or any other sport that you always wanted to try but never had the opportunity. IISc even has an Archery Club.

10 Play DOTA, Counterstrike, FIFA all night. The UG community often has online gaming competitions. If you can gather a few like-minded people, start your own competition.

11 Have pets like *Canis familiaris* or *Felis catus.*

12 Stay up all night and bunk class the next day.

13 Make remote controlled cars or dream to make them after the Electronics course in spring.

14 Talk to the Bicycle Baba.

15 Miss breakfast and run to Kabini 2 minutes before the 8:30 class in the morning for a masala dosa.

16 Bunk labs once in a while and copy lab reports from wonderful partners!

17 Download at high speeds through iiscwlan (With great Wifi Speed comes great responsibility)! One word – DC++.

18 Zoom around in zoom cars.

19 Create beautiful magazines. Paint. Write poems. Sing. Dance. Join clubs and classes. IISc has a very active music club – Rhythmica, a drama club – Rangmanch and a dance club as well.

20 Have intellectual debates on the hostel terrace at night. Or with a steaming cup of filter coffee in front of you at Prakruthi.

21 Go for bird walks in campus early in the morning. Watch out for the paradise fly catcher near N block/Jubilee Gardens. Walk down Arjuna Marg between 5.30 and 6pm and listen to the cacophony of the birds.

Lie on the terrace of the hostel and watch the stars. Another great place to stargaze is the New Physics Building terrace. There are quite a few Astronomy enthusiasts in the campus. 22

23 Explore the archives section of the main library. Explore the Archives and Publication Cell to learn more about IISc.

Stay at the library till closing time and then shift base to SERC for studying or watching movies. 24

25 Walk. Around the campus. Morning, evening, night. Take a walk along the jungle road from Faculty Club after an early evening rain. Stand on the Gymkhana overbridge and watch the red carpet of Gulmohar flowers on both sides of the road during summer. Visit Jubilee Gardens at dawn and during rains.

Enter all buildings possible on campus in one day. 26

27 Write poems at midnight in the moonlight under the street lamp on Gulmohar Marg or inside Choksi Hall!

Join NoteBook Drive and teach local students. Feel proud as you watch your students learn how to use new English words in sentences after a stressful NBD spoken English class. Also, go for the NBD Children's Day Celebration in less privileged schools around Bangalore. 28

29 Watch live football in the lab and get scolded by your Prof.

Meet your crush at the innumerable nooks and crannies in the campus. Empty library room. Choksi Hall. Gymkhana Grounds. 30

31 Help organize the pro-nite of Pravega by staying at Gymkhana grounds at 3am. Volunteer at the food stalls for the extra coupon. Volunteer to frisk people for the pronites. (You can give a hard time to your least favourite TA. But at your own risk.)

Be a part of a group project (in Humanities you have no other choice). Discover what kind of a group member you are. You could be the most active worker, the silent vigil or the opportunist. Join a group of people you are not the best friends with and see how it goes. 32

33

Help organise Pravega – the annual UG fest. We have place for all kind of people – from a physics nerd to an outgoing person with impeccable social skills (you can be both at once as well!) Working for Pravega will bring you closer to the seniors; you will develop skills that can't be taught in courses and get some idea about how the administration procedures occur in IISc. There are other perks as well – ranging from getting to know people from other colleges (friends, crushes and everything in between) to developing PR skills by talking to companies. You could discover the designer in you or the DJ – and Pravega is the right platform for you to explore yourself.

This is not something we advise you to do, but will happen nonetheless. Discover the extremely creative person in you when you suffer from the last minute anxieties. Be it group projects, some event you are organising, assignments or submitting articles for Quarks – the UG community revel in the last minute.

34

35

Mess food is okay, but everyone gets bored with it. Order food from home delivery websites with 50% discount by using multiple fake accounts. Have regular Pizza parties in the hostel.

Make instant noodles, soup, tea, coffee in your room with your kettle. One can never overstate the importance of coffee at midnight when you have two assignments to solve before the morning.

36

37

Play loud music or have jamming sessions in the hostel at night. Also bear the brunt of the security guard's wrath at you making loud noises only for a great laugh afterwards.

Make paper planes and have a flying competition on the last day of session

38

39

Arrange for a projector and have a movie night with others. Another great way to use a projector is to play Fifa on the big white wall.

Organise batch trips to amazing places in and around Karnataka. The most fun ever. Period.

40

41

Find Slender lorises in the forest patches across IISc campus.

Last but not the least – make good friends for life. Enjoy your stay in IISc!

42

CANINE COUNTS IN THE CAMPUS

SRIDEVI V

Every year, IISc plays host to yet another batch of puppies just as it welcomes new students. And we adore them little chaps, for they are cute and cuddly and oh so lovable. Then they start growing up, lose all that puppy fat, become lankier and more and more adult like, and all that puppy love fades mostly into a kind of accepting nonchalance, and in some cases even fear.

Here's the scenario: Around August of last year, there were seven puppies in the area that leads to the gymkhana bridge, and the mother was a weak puny creature who could hardly have given birth to seven fat puppies as those. There were people who fed them and made them shelters. But one by one all the puppies disappeared, hopefully taken by people who wanted them as pets, until only two were left, and then they disappeared too . Around the same time there was an abundance of puppies in front of the C and D messes, about 6 of them, all frisky little creatures providing much entertainment and joy to the mess goers. At first one puppy was found to have collapsed and unable to walk, and was taken to the vet by considerate students, who pronounced that it couldn't be saved. It was left to die. Then one by one, they all died of the same condition: Canine Parvovirus infection, a very fatal disease to which puppies are highly susceptible and against which most pedigree dogs and pets are vaccinated within the first few months of their birth. It is highly transmissible amongst dogs (non-transmissible to humans, rest assured) which explains why all the puppies vanished. Now only one of those puppies remains and is quite wary of human contact. The same thing will happen again this year. More puppies will be born, in fact there are already at least two new litters, as the dogs on campus haven't been spayed or neutered and we will continue to pet the puppies, feed them, play with them and gradually forget about them as they grow, believing that they can fend for themselves.

It is not enough that some of us feed the dogs occasionally and pet them when we please. What happened last year - the death of at least twelve puppies is something we should remember. It is simply a shame for so many young lives to be taken when they could have so easily been saved by vaccination against Parvovirus which is mandatory for pets. It is better to simply spay/neuter adult dogs if we cannot ensure the quality of life of the puppies.

The problem with having many puppies in a litter is feeding all of them - it is difficult for us as well as the mother dog to manage such a large litter, and in a year, one can find several new litters in the campus. If all the puppies do survive to adulthood, there is not going to be enough food for the dogs to forage on and the groups of dogs are going to become extremely territorial.

Apart from this issue of escalating canine populations and their subsequent poor standard of living, there is also the issue of a few aggressive dogs on the campus which have been known to chase people and on occasion give them a nip or two. Most renown of these aggressive dogs is the one that resides in Prakruthi whose fluffy appearance and the likeness to Hachiko (for those of you who don't know, Hachiko was the dog that kept waiting faithfully for its master even after his death) might deceive you, but beware of this dog. There have been several people who have been at the receiving end of its teeth (including myself). Though these dogs might not be rabid, it is nevertheless a huge concern. Spaying/neutering can address some of these aggression issues in dogs. One of the things that make IISc's campus truly enjoyable is the abundance of friendly dogs and puppies, but if we want that to continue, we have to make some efforts to ensure our safety as well as that of the dogs.

It falls on us to be responsible for vaccinating the puppies or getting the adult dogs spayed or neutered. It is known that spaying/ neutering dogs makes them less aggressive and hence safer, giving lesser cause for concern. It is not a new thing for institutions to hold vaccination drives for the dogs on campus. The Karuna Animal Welfare Association of Karnataka whose offices are located in Hebbal regularly conducts Anti-Rabies vaccination drives and animal birth control programmes. We could collaborate with such organizations and the Bangalore Veterinary College to conduct a vaccination drive for the dogs on campus, maintaining a registry of the dogs that have been vaccinated. At the end of the day, we all love to pet a happy dog and being safe while doing so is important.

The complete gastronomical guide

for the foodies in IISc

SAGNIK DASGUPTA & ISHAN AGARWAL

Food. That is a common topic of concern for one and all who join any college. Apart from all the worrying about academics, courses, scholarships, the degree awarded, sports facilities, future prospects and the like, here is one topic that brings a frown of concern on almost every parents face and a doubt in the mind of any fresher.

With all due respect to the mess staff (and they actually do a very commendable job), we would like to present a foodie's guide to IISc, with first hand experience of all the feeding places within campus and all the little tips and bits of advice that might make your debut into IISc's gourmet scene as smooth as possible.

What if you are not really a food fanatic, you might ask... Well, let us just assure you that if not this article, then just a few weeks of college life would probably make that change. Well, let's begin the tour.

(Just one caveat - if you order any dish anywhere involving cauliflowers and find everyone around you just join in it's got nothing to do with you.)

Prakruthi

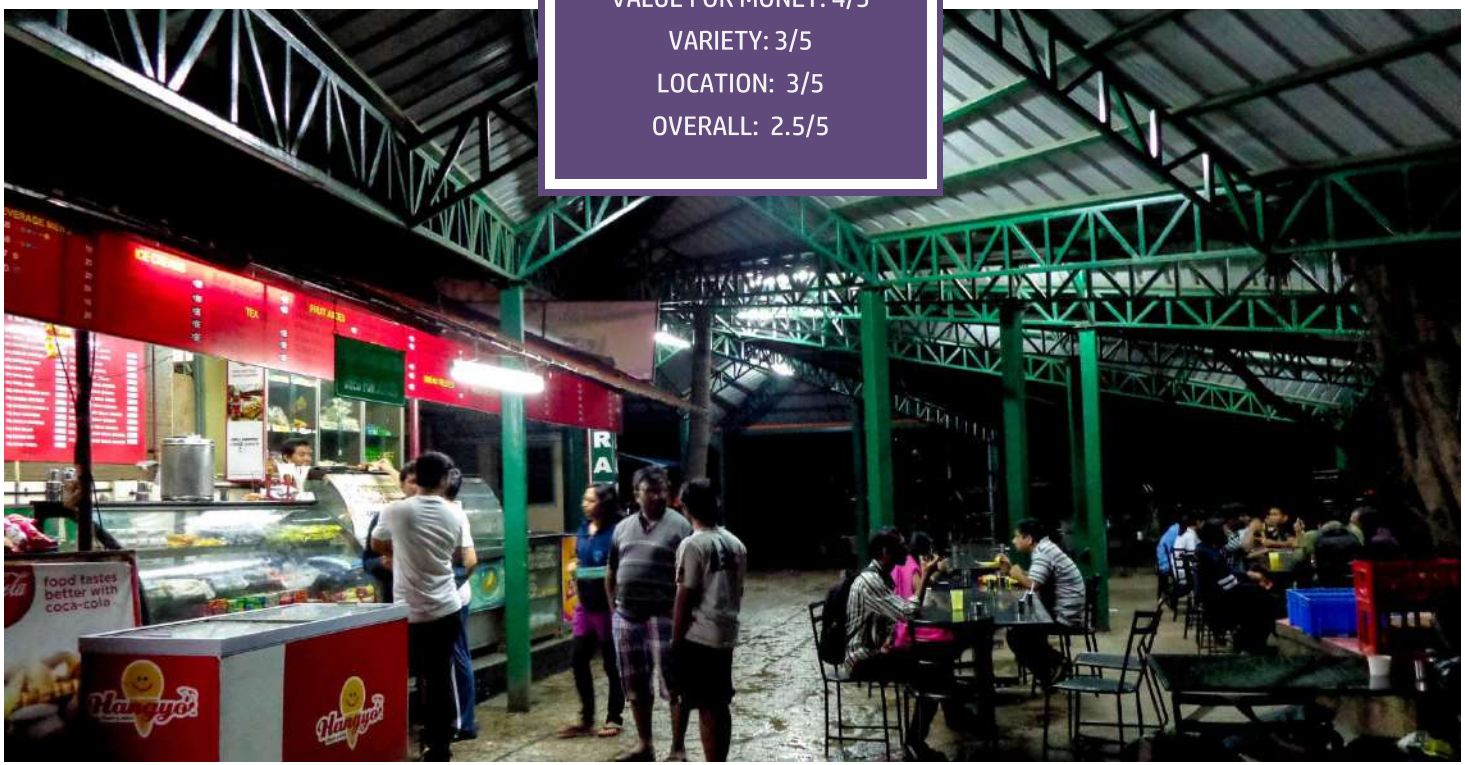
Prakruthi. Nature is what that translates into. Not that there is much greenery in the surroundings of this eating place, but rather the name is suggestive of its strict vegetarian menu. What should be noted is that this place is the staple source of food for many on campus. Both North Indian and South Indian food is available as are noodles, fried rice, Manchurians and the like. Juices and milkshakes are on offer too. Prakruthi opens at 7 am, but at that time, vadas and at best idlis would be available. However, remaining open and serving chats of all kinds till 2 am is a noteworthy feat, though the quality of most of these dishes is definitely below par. The newly developed Snacks Parlour can beat this place when it comes to food quality anytime; it's only the more suitable timings of Prakruthi that have allowed it to retain some sort of a niche.

Prakruthi has much good to offer. Although the meals are not great, nor even good, but they are passable. And it serves food in decent amounts; a bowl of noodles and a Manchurian or just a single North Indian Mini meal would suffice for one person in most ordinary circumstances. If you are on a tight budget and are looking for filling food this is certainly the right place. With a wise choice from the menu one can manage well enough with 50 or 60 rupees for a single dinner. What is more, Prakruthi is quite close to SERC and is just adjacent to the campus bookstore and thus manages to attract a lot of crowd merely because of these location based advantages. When it comes to pulling an all-nighter at SERC, one would be glad of this humble place's existence; even if it is just to buy a packet of chips and a soft drink or two.

In summary the food here is nothing more than average. The ambience too is nothing to speak of. Another point to note is that only vegetarian food is served. Yet Prakruthi retains much of its popularity and would probably continue to do so. It is, if nothing else, a convenience.

RATINGS FOR PRAKRUTHI

AMBIENCE: 1.5/5
QUALITY: 2.5/5
VALUE FOR MONEY: 4/5
VARIETY: 3/5
LOCATION: 3/5
OVERALL: 2.5/5



Nesara

Nesara is probably the only true fine dine restaurant within the campus. It is the only one with waiters, a copy of the menu at your table, and all the other paraphernalia that give it the feel of an actual restaurant. The menu is a substantial one and dishes vary from average to good in quality. One thing to note is that the best dishes do not even figure on the main menu! For example, the 'fried ice cream'; opinions about it differ, but it is something that should be tried at least once.

The restaurant's location is excellent - as it is so close to the UG block, many students find themselves heading over after a long day of classes and labs. Also, given the food quality, the dishes are quite reasonably priced; 100 to 200 rupees would fetch you a full meal. However, one major disadvantage of Nesara is that service is quite slow. It can easily take 20 minutes or even half an hour for your order to arrive. During peak hours or on days when the mess is closed, waiting times may even stretch far beyond that.

If you want to be economical and also get some good food, dosas are the thing to order at Nesara. Within a budget of 50 odd rupees, one can fill one's stomach with the delicious dosas served here ranging from plain to rava to onion and to special favourites that are served only on particular days; like the mysore masala dosa. Some more specialities are the honey crispy vegetables and the 'nutty cauliflowers'. The menu also advertises stuffed potatoes and a few other such special dishes, but the authors have always had the misfortune of finding them 'not available'.

Nesara, apart from Gym-cafe is also the only restaurant where non-vegetarian food is served on campus. Thus, during, say, lunch time or early in the evening, it is the only place to go if you want non vegetarian food. They serve, in the non-vegetarian category, a good chicken sweet corn soup, as well as many standard dishes like chicken and egg noodles/ biryani, chilli chicken, etc.

All in all, this is probably the best place to eat 'out' within the campus. The food quality is satisfactory or even better and the quantity is decent. It's true that one could probably order food from one of the restaurants outside campus, and if one did so wisely, one might not end up spending much more either. However, this is still a great place to drop into after classes or to meet up with some friends for dinner. All in all, it's one of the better places to eat in campus.

RATINGS FOR NESARA

AMBIENCE: 4/5
QUALITY: 4/5
VALUE FOR MONEY: 3/5
VARIETY: 3.5/5
LOCATION: 3.5/5
OVERALL: 3.5/5

Gym-café

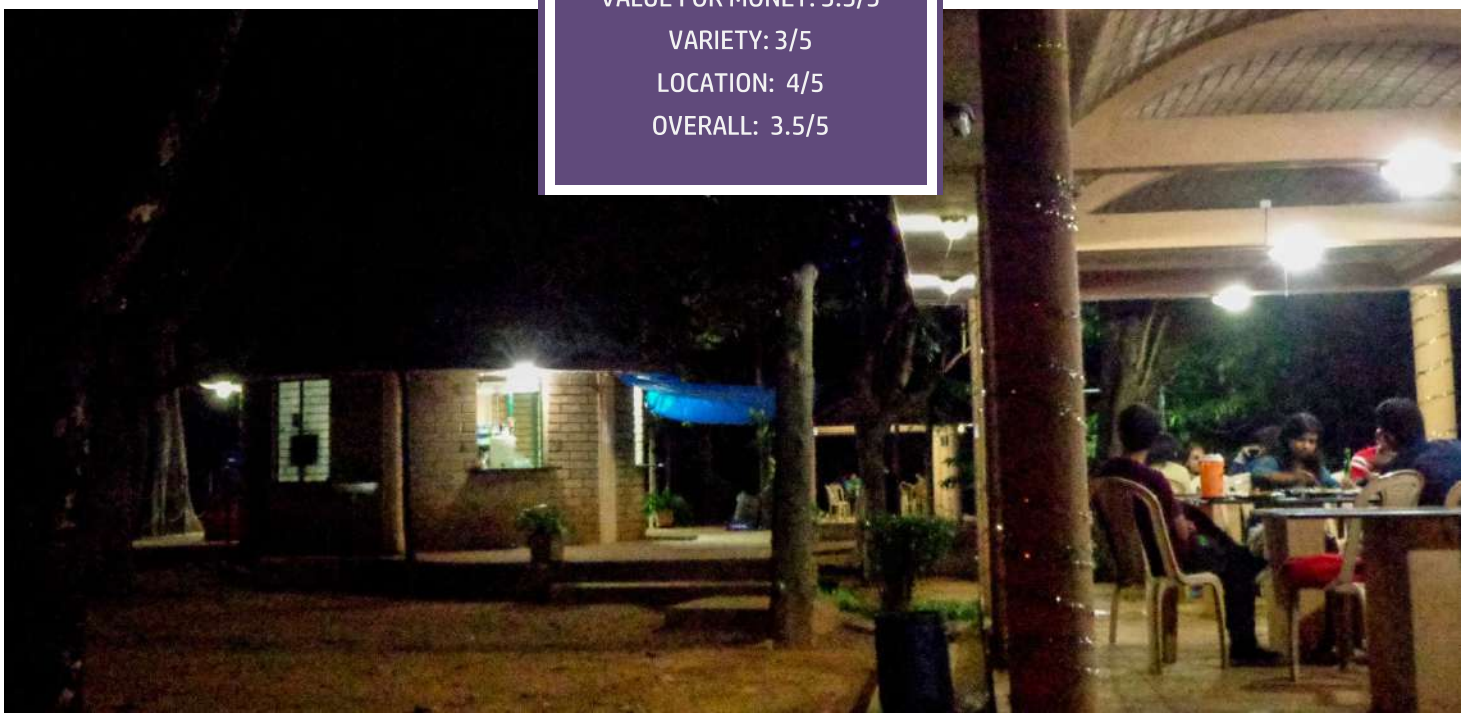
If IISc's Gymkhana were a portmanteau of "Gym" and "Khana", this would definitely be the "Khana". Regarded by many as the night time food hub, this place starts getting busy closer to midnight. In many terms, though, it is more like a fast food joint rather than a complete restaurant. Besides Nesara, this is the only other food destination within IISc to serve non-vegetarian food. The place isn't much, just a few concrete sheds with plastic chairs and apparently granite tables, but the ambience is the least of the points to make about this place. From snacks like fries, sandwiches, burgers and rolls to complete main course items like fried rice, noodles and rotis along with their countless variants, Gym-café has all the food essentials and then some. Need some sides to go with your food? Sure! Prefer South Indian cuisine like idlis and dosas? No Problem! Whether you want a small snack or a humongous meal, gym-café's got you covered. Thus, to serve such a multitude of customers with wildly varying appetites, gym-café remains open all the way from 6:00 PM to 2:30 AM. Most items are available all the time, although some non-vegetarian items do often go out of stock at around 2:00AM. Despite its relative distance from the departments, close proximity to the hostels makes this a much desired eatery.

The food quality is quite satisfactory for the price you'd pay for it. The sandwiches and burgers, despite their simplicity, have a very desirable taste. The most famous here, though, are the egg puffs. Understandably, these are also the first of the items to get exhausted. The sides are a bit on the expensive side but are still far less expensive than at a restaurant like Nesara. The quality of similar items though, are slightly better at Nesara, but then that is a very subjective remark. Soft-drinks are available as are mixtures and chips. Tea and coffee are available in two variants, normal and double, the latter being a taller tumbler.

Summarising, Gym-café is not the best food on earth nor is it the least expensive, but its close proximity to the hostels and its convenient timings make it a perfect hangout for night owls as well as for the occasion of birthday parties.

RATINGS FOR GYM-CAFÉ

AMBIENCE: 2.5/5
QUALITY: 3.5/5
VALUE FOR MONEY: 3.5/5
VARIETY: 3/5
LOCATION: 4/5
OVERALL: 3.5/5



Nisarga

This is the newest of the eateries in IISc. Opened on 16th January 2015, this place has had been subject to a lot of hype, but couldn't really live up to its, at times, rather tall expectations. This is another place offering a fully vegetarian menu. The ambience here is actually nothing extraordinary, but nonetheless pleasant in general. There is seating, both, indoors as well as on the porch.

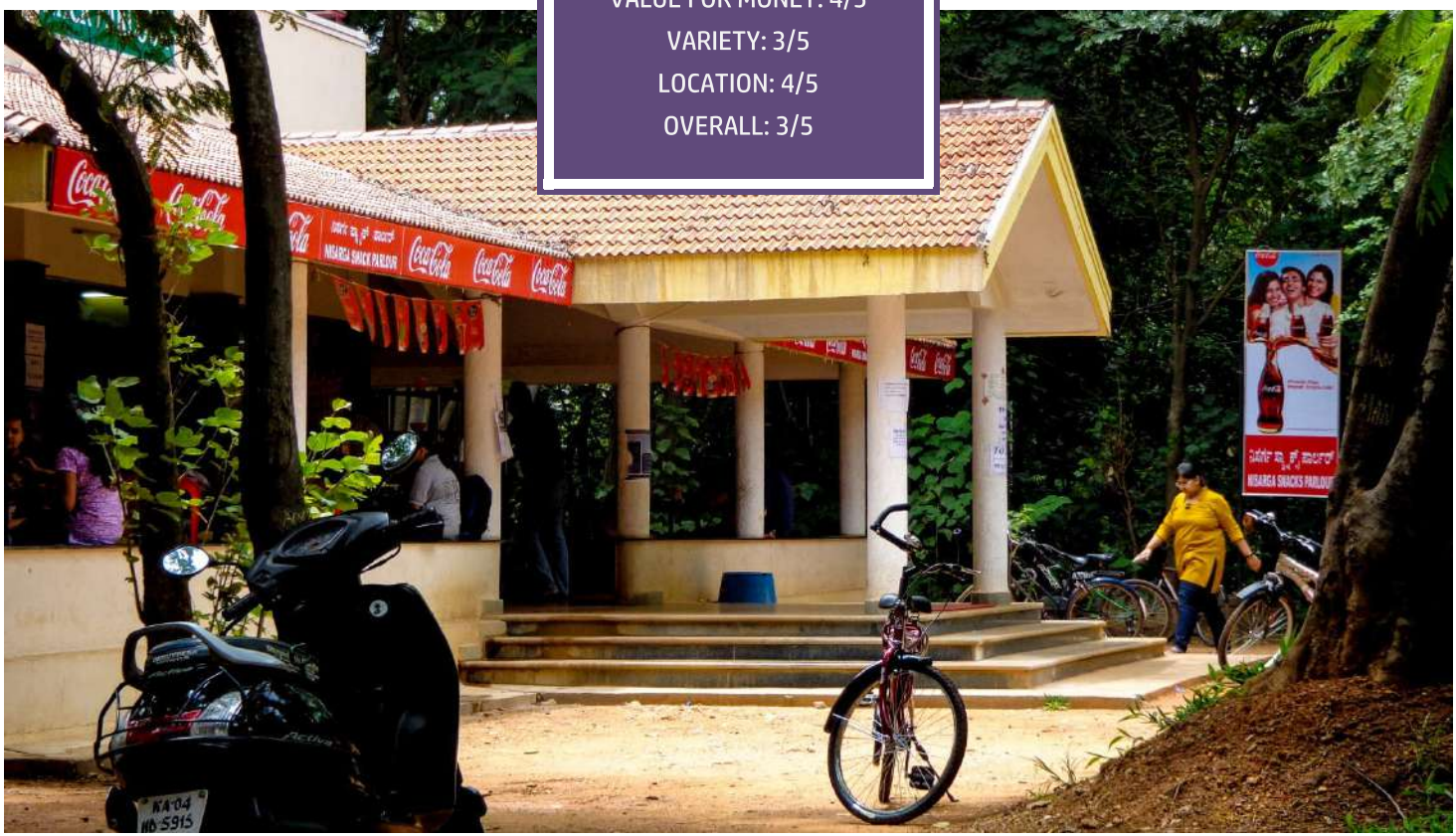
This destination has a moderately vast variety of items on the menu, despite the fact that, more often than not, several items turn out to be unavailable. Lunch meals are available in two variants, a plate meal and a full meal, the latter, obviously, being more extensive. The South Indian menu, here, is rather complete. The newly introduced vada pav has also had a fair share of success. Like Prakruthi, this place too has a dedicated juice cum chaat bar. Many do note that the chaats here are offered in a smaller quantity than in Prakruthi but are nonetheless passable.

What makes this place so popular, though, is its close proximity to three major departments of IISc, namely Biological Sciences, Physical Sciences and the Centre for Nanoscience and Engineering. Expectably, there is a huge crowd during lunch time owing to its sheer convenience. Need snacks while returning from your departments (something undergrads doing their summer projects in IISc can relate to can relate to)? This place is the place to go as it's *en route* between these departments and the hostels. A further convenience is the fact that they serve from breakfast to dinner.

Overall, this eatery is, clearly, nothing extraordinary, but the low cost and proximity to departments makes this place successful.

RATINGS FOR NISARGA

AMBIENCE: 3.5/5
QUALITY: 3/5
VALUE FOR MONEY: 4/5
VARIETY: 3/5
LOCATION: 4/5
OVERALL: 3/5



Ashok Suresh Das &
Gautam A Kavuri

IISc

Perspectives from an exchange student

The Quarks Team had an opportunity to interview James Weiss, an exchange student from the Brandeis Science Scholar's program, a part of the Brandeis-India initiative. James could give us an insight into what it means to be an exchange student as well as the differences one faces when studying in India and studying abroad.

QT: Could we start off with a brief account of your life… say up to college? Just for introduction's sake?
James Weiss: I'm the youngest of four children, the only one born in Kansas, the others were born in Michigan, and my parents are from Philadelphia, and they slowly started moving west, as my dad got different professorial jobs in different universities until we sort of ended up in the middle of nowhere…um…being Jewish we didn't really fit in with the local population, so all my friends were sons and daughters of professors while we were in a predominantly agricultural town.
And when I graduated (high school), I was one of three hundred students to go out of state for university, and that was only because I got a good scholarship to Brandeis University…

QT: So how were your first two years there?
JW: I came to college thinking I wanted to be a doctor…so I was a biology student, and I was also interested in French and Chinese, so I took the highest levels of each of those languages. And due to this fellowship I was part of, I got the opportunity to work at the Hebrew University of Jerusalem (of which Natalie Portman is an alumna), in the summer. That summer kind of solidified my suspicions that I would be interested in neuroscience. Up to then, the first year, and in the summer, I had worked on yeast genetics, so when I got back, I began work in Eve Marder's lab, where she does neuro-modulatory work, and I really enjoyed that, so I decided to double major in neuroscience and biology. Then, after my sophomore year in college, I went to work in a different lab in Taiwan, which was sort of inter disciplinary between virology and stem cell research. I went in thinking I would be interested in that, as my dad is a stem cell professor, but I really didn't like the pace of their research, and I think I like neuroscience more.
Since coming to IISc, I've been doing an internship at NCBS, at Vatsala Thirumalai's lab, where there's a couple of projects going on with the development of neural-circuits and Purkinje cells and their functions, and I've loved my research there. Also, she used to be a post-doc in my current boss' lab, so that's how I know her.

QT: We see that you've been travelling all over the world for your internships, is this very common with students from the States?
JW: No...(laughs)..no…in fact I don't know anyone else who's done this.

QT: So why the urge to travel?
JW: It's probably because growing up, I felt isolated and trapped growing up in Kansas, and when I got to college, I suddenly had opportunities to travel and do research, which are my two passions, so, I've really taken every opportunity to do both of them. Only because of scholarships though, so…apply to scholarships!

QT: Tell us about the program that helped you to get here, to IISc.
JW:I'm part of the Brandeis-India initiative, which gives grants to people who wish to do anything, that will help improve connections and relations between our University and the Subcontinent, so that gave me some money. There's also some incentive from the program we're on, the Brandeis Science Scholar's program (a part of the Brandeis-India initiative). I also got a computational neuroscience traineeship grant, which was the most useful…and it will also continue once I go back to Boston, to my lab. And I went to Taiwan and Jerusalem on my Lerman-Neubauer fellowship.

QT: So what are the technical details of the exchange program in particular?
JW: So we're technically still Brandeis students, so we fall under the umbrella of all the resources our university provides, and I guess there's no other university partnered with your university, so it's really helpful because the credits that we get here are automatically transferred to our transcript at our other university, which is very useful because there aren't many study-abroad programs for science students, most of them are for humanities. This is especially so if for example, you're a pre-med student and have requirements like "has to take biochemistry" to stay on the premed track, you can take care of that while simultaneously studying abroad.

QT: How about telling us your experience with the exchange program that brings you to IISc?
JW: So I'm taking two courses here 2nd year Physiology and 3rd year developmental biology. We don't really stratify by year. But most of my time, I'm over at NCBS, as that's really my number one priority. But…it's unfortunate that I don't get enough time to make friends at IISc, so basically I end up only sleeping here, and nothing else.

QT: So have you been out, exploring Bangalore?
JW: Oh yeah, I have a few friends through NCBS, and more that I've made somehow throughout Bangalore, so I've been exploring yeah, both in and out of Bangalore.

QT: Where all have you been?
JW: I went on a one week trip to Dharamshala, Amritsar and Delhi. Also, Annie (another Brandeis student) and I went on a trip to Goa together. We're also planning on travelling all over for three and a half weeks once the program is over, so…yeah.

QT: Would you be interested in giving us a comparison of the teaching and assignments here in IISc and back home?
JW: I would say that it's much more reliant on the independence of the students. I think in America, the curriculum is spoon-fed to you a lot more. This has its pros and cons…I mean, you don't have to put in that much effort to learn new stuff, but I think it's nice, because I'm putting much more effort to study here, than in any University course in America, so…
Also, one thing I think is sort of funny is that the kids in my class seem really scared to answer professors questions, and maybe it's because they don't want to look wrong in front of the professor and other students, but I think it goes to the other extreme in America, because sometimes the people almost seem too comfortable giving very incorrect answers, or asking very off-topic questions, so maybe we should have a little more fear in us (laughs)..

Located in what is now a secluded and rarely visited part of the campus, Jubilee Garden could in some sense be termed as the “Forbidden Forest” of IISc (minus the giant spiders, thankfully). It’s not strictly forbidden, but venture in at your own risk: the chances of encountering various types of snakes and other insects of different shapes and sizes is unnervingly high.

Jubilee Garden was officially inaugurated in 1984, which means that it is fairly young, when you take into consideration the rather illustrious past that IISc has had. Enter the gate and you’ll find a plaque that tells you that the gardens were opened on December 10th, 1984. This is the date on which IISc held its Platinum Jubilee Celebrations, to commemorate the 75 years of scientific research that took place within the walls of our institute. These celebrations were witnessed by eminent scientists and other important figures from all over the country. The chief guest was the then Vice-President of India, Mr V Venkatraman (Originally Mrs Indira Gandhi was supposed to inaugurate the Platinum Jubilee, but she was assassinated in October 1984. Professor CNR Rao has written a brief account of this in his book, “Climbing the Limitless Ladder: A Life in Chemistry”. There are a lot of other interesting tidbits that one can find about IISc in this book: For example, this one: “One of my early accomplishments was to get rid of cattle freely grazing on the campus. The employees who owned the cattle did not like the new arrangement, but it had to be done to save the gardens and the overall atmosphere of the campus”. There is also a mention of Jubilee Gardens: “A platinum jubilee garden was created over an area of around 12 acres in a corner of the campus.”)

The Platinum Jubilee function was also addressed by JRD Tata, who was then the President of the Court of the Indian Institute of Science. One remark he made during his address on that date stood out:
“….whether the Institute has lived up to the Founder’s dream and fulfilled its intended role of leadership in the development of scientific research and education in the country. The answer to the question cannot but be a reasonably affirmative one. The Institute has not only been from the start, and remained throughout, a leading centre of higher research and training in science and technology but it has proved to be a fountainhead and cradle of scientific talent in the country from which has emerged a succession of men of outstanding technical skills, many of whom later manned and directed the national laboratories, Institutes of Technology, management institutes and other educational institutions established in the country”.

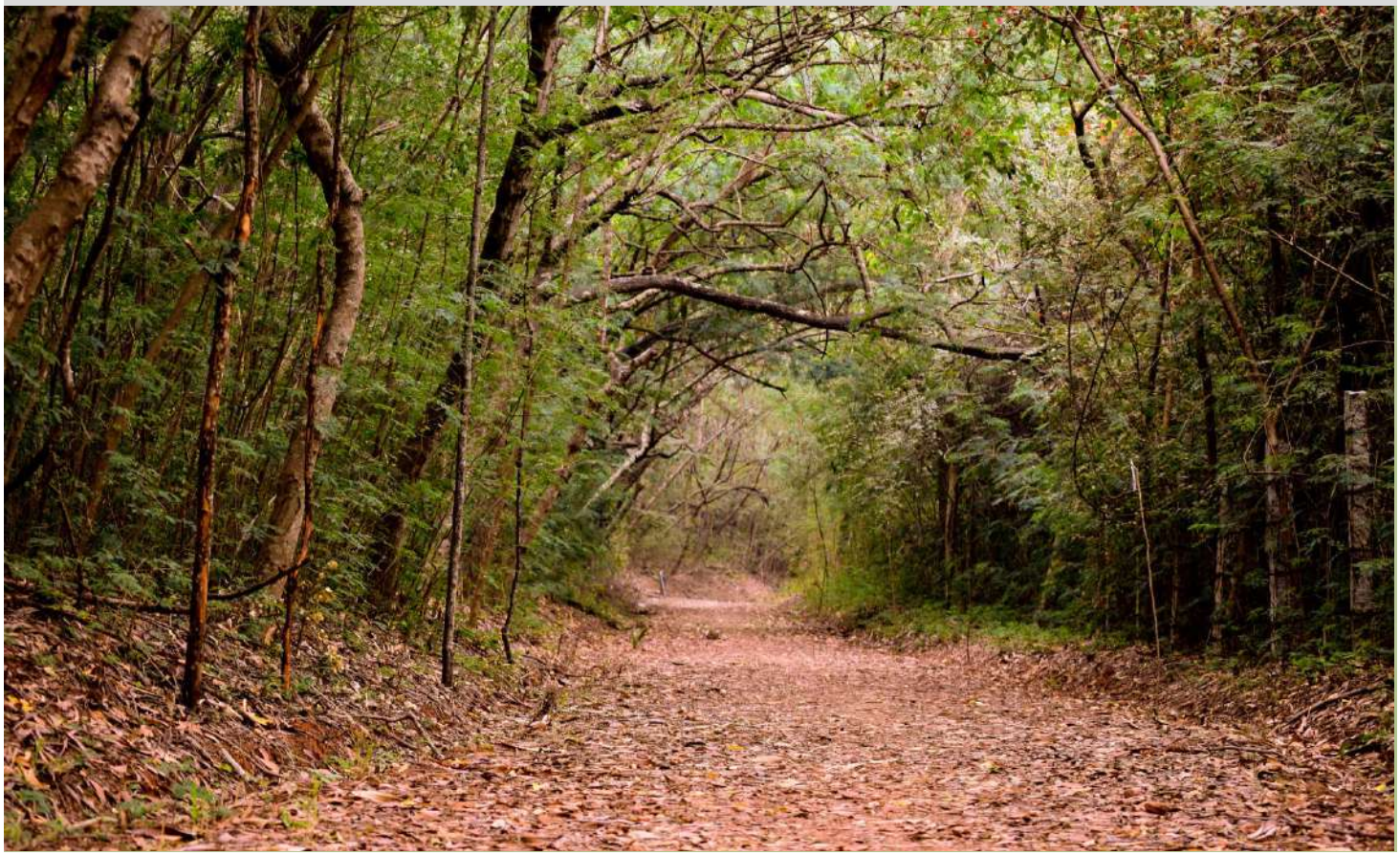
(Tidbit Fact: SERC was created around the same time by the MHRD, to commemorate the Platinum Jubilee of the Institute).

Jubilee Gardens was well maintained till approximately ten years ago. It was then left to itself, and it has almost found its way back to the wilderness it once was, now overrun with snakes and other creatures. I recently found out that the reason for the large (although I must say that they're good at hiding: I've only seen one snake in all my visits) number of snakes here is not just that the area is secluded. Apparently the Jubilee Gardens area, once they stopped maintaining it, was used to rehabilitate captured snakes. Snakes would be rescued from places such as the Vigyanapura Campus area of IISc, where a number of snakes had been killed when they entered apartments, and would be released in Jubilee Gardens.

The virtually undisturbed environment does attract more than your average snake and insect, however. You will occasionally find groups of students and nature enthusiasts flocking to the gardens to catch sight of some rare species or the other. There was even a butterfly walk organized by the Naturalists Club of IISc.

If you ever have a list of 'Ten things to do in IISc before you leave', there is one experience you simply must add to this list: visit Jubilee Gardens at dawn. (I would urge you to add more such things to the list such as "walk through a field full of fireflies", but let's stick to the topic on hand). You will truly feel as though you're in a fairy tale, as you make your way through the grass glistening with dewdrops, as you experience the last vestiges of the midnight chill slipping away, giving way to the comforting warmth of the sun. It really does feel poetic.

Any tour of the vast campus of IISc would be incomplete without fully exploring Jubilee Gardens. The whole area has a certain unnatural beauty to it. The fact that it is not manicured and has almost turned into "Jubilee Forest" has added to its beauty. It is hard not to feel at peace when you're surrounded by so much greenery. So do put on your shoes, pull up your socks, and enter the rusty gates and go explore. And on your way out, do remember to stop and admire the lake beside the garden.



SUBBULAKSHMI S &
SAHANA D RAO

TO BE AND NOT TO BE

A report on Queer IISc, the campus's queer rights student body

The recent ground-breaking ruling of the US Supreme Court, legalising gay marriage, sent cyber shock waves across the globe. With everyone pitching in their support by changing their Facebook profile pictures or celebrating pride with #LoveWins, the internet was awash with all colours of the rainbow. However, people were quick to point out that closer home, the reality was starkly different and there was indeed precious little to celebrate about. Which got us to the question: how inclusive is IISc as a campus?

It was heartening to discover that the Institute had just not been the pioneer in various fields of science in the country, but also had been the birthplace of the country's oldest student body for queer rights. Queer IISc was started in 2000 as a platform to address and discuss the concerns and issues of Lesbian, Gay, Bisexual, Transgendered and Queer students, alumni and staff of the Instiutute.It has since grown into a student body with more than seventy members in its fold, dedicated to provide a support system for anyone who seeks help, and to ensure that the campus remains a safe, inclusive place for everyone.

Conversations with members of the group, the Queer IIScians, shed much light on the activities of the group. The group, with all its ancient beginings, had sadly become inactive and dormant for some time- only to be 'resurrected' recently by the fresh crop of members. It was no coincidence that this timed with the arrival of the first batch of undergrads to the campus:many members had felt that with the coming of eighteen year olds, most of them away from home for the first time, a proper support system had to be in place. To paraphrase from one of the conversations we had with a member - "the post-puberty age is when one comes in terms with their own sexuality and this could be an extremely confusing time." Remembrances of their own lack of guidance and support in the growing up years had many members working hard to ensure that the new kids on campus had a group to seek help from.

The informal body, consisting mostly of students, with some faculty and alumni on board, has no hiercharchy whatsoever. Any issue is usually discussed in the online forum- and every member has equal say in the proceedings. The activities of the group have primarily been movie screenings, periodic meetings and panel discussions (the last one was on the reinstatement of section 377 of the IPC.) Once, there was a talk by a student actively involved with student queer groups across campuses in Canada. However, the primary focus of the group remains providing help to those ask for it. And, it's not always about providing answers to the questions or giving expert advice- but just being there, helping a person come to terms with their sexuality or even themselves. Anyone is free to write to the group (anonymously or otherwise) and expect their issues/ queries to be addressed. The group is also committed to protecting the privacy of its members, and the anonymity of those who wish for it.

So how helpful is the Institute management? Members reiterate that they haven't really approached the administration for recognition/help so far. But there is the one time they had sought the SEXUAL HARASSMENT COMPLAINTS COMMITTEE (SHCC) for clarification whether they would be ready to intervene and help in case a queer student faces sexual harassment and the Committee had responded positively, saying they would surely help.

Institutes across India now have such student bodies, many of which are actively involved in both awareness generation and addressal of queer rights and grievances. IIT Bombay has an informal student group, Saathi*, for the LGBTQ community residing in IIT Bombay Campus and/or officially associated with IIT Bombay, while IIT Madras has Vannam**. Similar student bodies have sprung up in other national institues also. So are these groups harbringers of change which would help usher in a less prejudiced, more tolerant society in the years to come?

Whatever the future may hold, there is no doubt that these student groups, by addressing taboo issues and taking a stand for inclusiveness, are at least, in principle, sending out the right signal that individual rights, freedom of choice and expression cannot and should not be forfeited, and that being 'different,' being queer, being yourself, is not such a bad thing after all.

**http://www.saathi-iitb.org/about-us*
***https://groups.google.com/forum/#!forum/vannam-iitm*

Queer IISc **can be reached at:**

geekyqueers@gmail.com

UG Hangout Places

ARTICLES IN THIS SUB-SECTION:

OF TAMIL SUPERSTARS, CIVILIZATION AND THE MAHARAJA OF MYSORE

NAREN MANJUNATH

If one were to do a Google search involving 'clash of civilisations', the odds are (I have not checked) that one would be served a selection of results involving invasions, conquests (preferably bloody) and the odd computer game that combines both. What one would most certainly not expect to see would be references to places no more than a stone's throw away from home, places that form the vital gateway between the blissful seclusion of the Institute and the madness and hurly- burly of the world outside.

Yet if anyone were to ask me (no one has, as yet, but never mind), I would beckon them away from the history-creating, epoch-making, Google search-defining moments of ages past, and instead point them to the most famous of IISc's surrounding localities, one that captures the spirit of Bangalore through the years as perhaps no other. For in Malleswaram, it is not hard to find the sleepy, easygoing essence of the city that our elderly generation once loved and now love to reminisce about. But this city is now locked in a terrific struggle for existence with the infinitely faster- moving, uncompromising city of the present, and the entire neighbourhood is marked by the scars of this battle. On either side of Margosa Road we see old coffee shops and sparkling new cafes, scrupulously modest newspaper stalls and glitzy arcades, venerable old breakfast joints and scrumpilicious fast food takeaways, all jostling for space and customers. But every now and then, a relic of the old days is brought down, kicking and screaming, to be replaced by another of the new-fangled outlets that add colourful hoardings and displays to the surroundings in exchange for memories. This is civilizational shift, my friends- a war between past and present- and slowly but surely, the present is winning.

In circumstances such as this it is surprising and unexpected that some of Malleswaram's most loved eateries are still of the old-and-fast-slipping-away kind. Well, maybe not that surprising. And perhaps not altogether unexpected, given the sheer number of them that still persist. But whatever it is, the longevity of these outlets in the face of adversity and competition is undeniably impressive- they have outlived the Emergency and the end of the British Raj, and it is rumoured that some of them are even older than the longest- serving PhD students of IISc.

In this period, they have also become popular- not quite as mindbogglingly popular as, say, a Tamil film superstar, but popular enough that, like some Tamil superstars, they are better known by their initials than by their full names. I am of course alluding to the finest restaurant that ever existed on 7th Cross, Margosa Road: CTR (or, rather less impressively, Central Tiffin Room).

I remember my first visit to CTR vividly. I'd had a wonderful dream the night before, where I had walked into a room full of French fries and mushroom omelettes and extra cheese pizzas and what have you, and just as I was sinking my teeth into the first morsel someone knocked on the door, and I woke up drooling on the pillow. It was Sunday morning, and somebody was shouting for me to get ready to go to this famous breakfast place with amazing masala dosa. But I was angry that I hadn't been allowed to finish my dream in peace, so I took a long time to get ready, and I was slightly happier when I saw that I had held everyone else up before leaving.

CTR was started by three brothers in the 1920s and even in its early days gained a healthy reputation by serving persons of such eminence as the Maharaja of Mysore. Filmstars may change their names to something that can sell better, but dubiously, CTR went the other way: in 1992, it changed its name to the utterly nondescript Shree Sagar, a name so common no one uses it in this connection. There must be four or five in Malleswaram alone. In the time- honoured tradition of Bangalore breakfast joints, it satisfies at least one of the following:

The fundamental characteristics of a sakkath (fantastic) breakfast outlet (at least one must hold)
a) It has built its reputation on a single item which is responsible for most of its business. (eg. Hotel Janardhan, Race Course Road- Masala Dosa, Vidyarthi Bhavan, Gandhi Bazaar- Masala Dosa, extra butter version)
b) The owners seem very anxious to ensure that you eat your whole week's worth of chutney; indeed, there is a boy designated for the purpose of chutney refills. (Veena Stores, Malleswaram, Dwarka Hotel, N.R. Colony) Sambar is not even an option in some of these places.
c) The waiters are at pains to be rude and supercilious, as if to remind you that they don't need your money- we're famous already, aren't we? (MTR, Lalbagh Road, the uncrowned king of breakfast in Bangalore, with an ego to match its reputation. You should definitely give it a try, though. The owners of the popular Maiya's chain, by the way, are from the same family.)
(Caution: the converse is not true. For example, Nesara satisfies (c))

I'll skip the details of our journey- I don't think I can afford to bore my readers with too many more complaints- and jump straight to the entrance of CTR itself. After the customary long wait outside we were shepherded into a tight corner with two tables for an estimated dozen people, and my first impression was that CTR was a prime candidate for (c). The waiter had a fabulously annoying routine of coming over when called, hanging about impatiently for a nanosecond or so and then disappearing the instant someone put their head up to mention their order. This gave me a sneaking suspicion that the hotelier used (c) as a means to achieving (a): after all, when you witness the above vanishing trick three or four times, the only recourse is to shout 'Twelve masala dosa coffee!' the next time the waiter comes around. Devilishly cunning.

To be fair to them, though, it makes the business a fair bit smoother- no sooner had we finished the order than the waiter had Apparated in front of us with a huge tray of dosas dripping in ghee. There were two different chutneys. And no sambar. It was as if CTR had been made with the intention of achieving sakkathness in every possible way. And every bite was delicious- it would be the first and the last time that I willingly consumed such hazardous quantities of ghee and still liked the dish.

The food had a strange stupefying effect on all of us- we walked out of the hotel dazed and sleepy, oblivious to the stares of the passersby as we barged into each other like a bunch of drunks. The girls did the smart thing and made away in an auto, while we chugged up the unending slope of Margosa with ever-diminishing speed. The CTR experience was once-in-a-lifetime, and until I could ascertain that I had no obvious symptoms of heart disease, it would remain so. But my word, the food really was worth serving for another ninety years- the old guard of Malleswaram was in no mood to give way yet. Down but not out, it was still the pride of the neighbourhood, the saviour of pure taste, the cure to all Sunday morning ills-
'Who wants a softie?'

For the second time that day, my gastronomic fantasies were rudely interrupted, and I saw myself outside a McDonalds, the unoccupied bench now looking especially inviting. In that split second, just as I had done to a mushroom omelette a few hours ago, I calmly lifted CTR out of memory and walked robot- style to the counter, with only thoughts of ice- cream in my head.

Civilisational change, folks. You can't beat it. Not if you're the Maharaja of Mysore, not even if you're CTR. But maybe if you're a Tamil superstar. And maybe that's where the analogy ends.

YOU AND THE NIGHT AND THE MUSIC

AGNIVA DASGUPTA

"The place is small, not very crowded. The ambience is what it should be. You stand there, silently gazing at the group who are moving towards the stage. They take the stage. They start playing. Your feet start tapping. And you realize the money you just spent on the gate is worth every bit of it."

Despite common perceptions of Bangalore being a spoilsport when it comes to nightlife (courtesy – everything shuts before 1 o'clock law), the night time music scene in Bangalore is actually pretty good. On one hand, you have a number of creative and energetic bands, solo artists and other musicians coming up, enthralling audiences with their compositions, while on the other hand you have venues, mostly pubs which have sprung out to provide a platform for all these gifted musicians to showcase their talent. For anyone one who likes live music, Bangalore has quite a lot of places to offer. It would be extremely cumbersome to mention all the places, so a few locations which stand out are mentioned.

* In addition, all these places have good food as well. So one need not worry about going to Gym Café (and having an upset stomach the next day) after coming back.

COUNTERCULTURE

When it comes to live music, very few places are in the same league as CounterCulture. Their website states, “CounterCulture began as a restaurant, a bar and an open space.’’ And in four years it has grown into Bangalore’s finest music venue. Located in Whitefield, on the outskirts of Bangalore, (Thanks to Ola Cabs, one can actually return from that place at night) this place has launched quite a few Bangalore based bands, Parvaaz for instance, that went on to achieve great success. It has held events that celebrated all the different genres of music including, Blues, Jazz, Rock and Metal. CounterCulture were also the first to start the “Pay for the Arts” Initiative.

What makes CounterCulture so special is the atmosphere – the sound, the stage, and the lights. The stage is big and spacious, the speakers are excellent and the lighting is top notch. With both an indoor as well as an outdoor setting, it is a very unique experience for the audience. Recent events included Indie March Festival, An Ode to the Blues, and the likes of Wayne Krantz, Thermal and a Quarter, Mad Orange Fireworks, Girish and the Chronicles, entertaining audiences among others.

B FLAT

Indiranagar is one of the more elegant (‘’posh’’) localities of Bangalore. So, be it good places to dine out, clothing stores, or places to hang out, Indiranagar never disappoints. The same holds for live music too. Indiranagar plays host to a number of pubs renowned for live music, which includes the likes of - Vapour, The Humming Tree, and Roadhouse among others. But the place that stands out among all these is B Flat.Small and cosy, the ambience there is very good. The stage looks slightly squashed though the sound and lighting more than makes up for it. The audience comprises mainly of music enthusiasts. The food also deserves a special mention.

HARD ROCK CAFE

The most well-known live music venue in the country, Hard Rock Café is located at the heart of the city, right next to M.G. Road. The stone building looks very beautiful from the outside. Large, spacious HRC has a restaurant, an open courtyard and a signature Rock Shop. The whole place is filled with “memorabilia from some of modern music’s biggest heavyweights, including items from contemporary stars and rock legends” (courtesy, their website). The sound is loud, but one gets used to it after some time. Hard Rock Café is the closest you can get to a complete rock n’ roll atmosphere.

So the next time you have a free evening, do drop by one of these places and experience live music like you never did before.

Also, RIP BB King, music will never be the same.

HOMO SAPIENS' BEST FRIEND

Gautam A Kavuri

One year ago, when I first arrived at IISc, I was very surprised when one of my friends told me during lunch that we would have a lab session in the afternoon that day. I would later come to find out that this would be a regular feature. Throughout the four years, and beyond; now I am an accommodating kind of guy, but asking me to work at these odd hours is stretching it. Sleep, it is said, like human rights and a few swear words in your vocabulary, is much more fun to have than to not have, unlike a mess card or a 200 kilo guy on top of you. As a direct consequence of this, and the universally accepted maxim that "If it's fun, it's probably good for you", afternoon is a time for siesta. And just so there aren't any lingering doubts, if you're doing anything else, you're either deluded, or it's not the afternoon.

Through my early months here, if there's one thing I realized, it's that almost everyone was treading the path of delusion, especially in the afternoon. Now, this is something that no place of learning wants, especially in the afternoon. It seems to me then, that the most important thing to do, before it's too late, is to find a solution to this dreadful malady. To that effect, for the rest of this article, I will detail how you should really be spending your afternoons.

The first thing you need to do to pull off a successful siesta is prepare. Preparation is key. A nice way to start is by getting yourself a good bed. If you're still using one that you bought a few years ago at the annual street sale at the institute, first get your hands on a few liters of kerosene, or petrol or something like that. Next, take your mattress deep into jubilee gardens. Next, you'll need to find a monkey and convince it to burn your mattress. All you have to do then is record the incident and post it on YouTube so that you can't be booked for arson. In fact, you might even make some money off the video, if it goes viral, and you'll probably get the insurance money too!

Choosing a new bed is a slippery art. One must have a lot of practice in order to negotiate the tricky slopes of softness vs firmness, and grapple with parameters such as depression slopes, and spring back times. One must also take into account things such as the diffusion coefficients of gases through the mattress, and how many trees were cut down and how many liters of water used in its making.

All this is further complicated by the availability of mattresses in different colors. As a beginner, this can be a bit intimidating, but I suggest the use of a simple metric to determine the optimum mattress. You take a friend along to a mattress store, and lie down on a mattress. You then ask your friend, who is preferably equipped with a stopwatch and a ton patience, to time you as you fall asleep. To do this scientifically, of course, you'll need an EEG recording setup that you will need to carry into the store. Further, you'll need to rate each mattress on a different day, to ensure that results aren't affected by the previous trials. After a couple of months of this, you should have enough data to make your choice, and feel safe in the knowledge that you have spent your money well.

A good mattress, though, does not a good siesta make. There are a range of other things to worry about. A pair of thick, dark curtains will help keep the light, and any thoughts of impending doom about your attendance falling below 80%, out. A pair of good speakers to play some soothing music, such as AC/DC's Thunderstruck or Aerosmith's Crazy, before you retire for a snooze, would be a good investment. Rock helps drive irrelevancies (most of the stuff you're thinking about now) out of mind and helps you focus on the one thing (nothing) that will help you sleep. All you have to do is pull your curtains across your widows, play your favorite bands (which must be either Led Zeppelin or Black Sabbath) after turning your speakers to eleven (so as to benefit siesta-goers up to twenty rooms away), lay back on your carefully chosen mattress and…wait a minute though, I still haven't told you anything about one of the most vital things that affect the quality of your siesta: Food.

I would love to elaborate here on how you can come to obtain the more elusive, better tasting individuals of this class of objects, but as this has already been done in great in the magazine, I'll just tell you that you should ideally be stuffing yourself before a siesta. Go crazy. Siestas, as it is common knowledge, are one of the best forms of exercise. A recent study reconfirmed common knowledge by concluding that afternoon nappers have a reduced risk of heart attack, officially putting siesta-goers in the same category as ultra-marathon runners and mountain climbers. Obviously then, calories should hardly be a worry to you during the preparation for your siesta.

Now that we have covered the bare essentials, all that remain are the dozens of little things, like mood lighting, and scented candles in your room, where I presume you will be doing most of your siesta-ing. One thing I must warn you about though is not to overdo it, just keep it simple. In fact, to that effect, let me tell you a little story about one friend of mine.

My friend was, as most people start off in stories, happy to begin with. Believe it or not though, he wasn't a regular practitioner of the siesta. In fact, he had only a rookie's knowledge of the subject. Needless to say, when I found out about this, I told him all about the afternoon nap, and how it would bump his happiness up several notches, while simultaneously decreasing his risk of heart attack. He was instantly hooked. Who wouldn't be? On a fundamental level, what can a man want more than the pursuit of happiness and low cholesterol? And so began the saga of many a somniferous noons. But my friend wasn't just content with the mild to not-so-mild euphoria induced by the plain-vanilla-siesta; pretty soon, he wanted more. When he first told me about this, I didn't fully understand, and suggested that he perhaps get a better mattress, or thicker curtains, but he was never satisfied. Eventually, I had to let him go, as I had other initiations to oversee. It was only months later that I learned of his fate… I will not go into detail here of course, as you are already no doubt well acquainted with the facts through your local news-dispensers. Let his example serve as a warning though, that you must never mix cauliflowers and horse-meat while binging for your siesta, if you want to wake up fresh a few hours later and enjoy your evening…

Waste disposal in the IISc campus:

A talk with Dr. Hoysala N. Chanakya

SHRIYA PAI

Dr. Hoysala N. Chanakya is a Chief Research Scientist at ASTRA, IISc. His main area of research lies in understanding anaerobic fermentation systems that help in making biomass-biogas plants a sustainable option, especially for energy-starved rural areas. He aims at developing the technology and processes required to make modern biomethanation plants for weeds, crop wastes and agro wastes a recurring reality. Research and Development (R&D) in his field is largely spread over four areas- biogas for energy, sustainable technologies for rural and peri-urban India, water purification and appropriate agricultural technologies.

The IISc campus is well-known for its lush greenery and prime location. It is forested yet civilized, old yet lively and vast yet well-tethered. One is left wondering what bugs could intrude into the tranquillity of our home. In this interview with the Quarks team (QT), Dr. Chanakya (HC) discusses a major concern that plagues the IISc community (and the country as a whole) -the issue of waste disposal on campuses.

QT: Sir, first tell us a few things about yourself. How did you get interested in the field of developing sustainable energy resources? Was there any particular incident in your life that brought you to this field?

HC: Well, during my PhD itself, I wanted to work on oil-producing yeast. That time around, the rate of waste water production in the country had shot up and there was a drive to tackle it. I felt that it was possible to use oil-producing/oleaginous yeast to take up the excess carbon found in waste water to produce oil. Interestingly, this strain could accumulate 60% of its body weight as oil. But this yeast was not readily available to the public.

And this was when I got associated with IISc through Prof. Amulya Reddy, who was looking for someone who could work on modern non-cattle-dung -based biogas plants . And remember, India gave the world its first biogas plant!

QT: So what were your graduate studies based on?

HC: I did my masters in Microbiology, and I worked on ethanol. It was interesting, because we made beer and rum as part of our research and naturally, I was indeed a sought after person by my fellow researchers!

QT:(laughs)

HC: The real thrill was in making alcohol - because when you make these things yourself, you don't feel like drinking them (chortles). Instead, you take a different route altogether, and use them for motors and other energy processes.

But the actual challenge came about when Prof. Amulya Reddy made this offer. They had just started this centre at that time, circa 1974, and their dream was a bit Gandhian-in wanting to make not only the resources, but also the technologies used, as local as possible. He (along with those who started this centre) dreamt of bio-methanation plants that could take care of all the rural energy requirements.

QT: When did you join IISc? How has the campus changed over the years?
HC: Somewhere in 1980, we slowly started a lab in IISc dedicated to anaerobic digestion. And I had moved from working on ethanol to industrial processes in 1978.
This campus still continues to make everyone proud! It is an absolute green cover, except for the few new buildings. I would say that the attitude of people towards this campus has not changed, for we all want to preserve its beauty in some way or the other. For example, there is still directed effort towards solid waste management. And as before, we want our campus to be in a better shape as compared to other campuses.

QT: Since when did you get involved in the Solid Waste Disposal / Pollution Control board of Karnataka? What has that experience been like? What are the major changes that you've brought in place?
HC: Although solid waste management is handled to a certain extent by the PCB, that is not its main charter. Solid Waste Management came to my lab because we were building biogas plants for leaves and at that time, a main part of collecting garbage was street-sweeping leaves. Some of my friends who ran NGOs were already tackling this problem and were finding it hard to make vermicompost because of the stink that came with food components in the wastes they were attempting to process. They suggested that I design a biogas plant that can overcome these teething problems of decentralized waste management.
Converting the design of the IISc anaerobic digester into a technology was really the giant step because the digester, when modified to take in urban solid wastes, needed to be tested for a couple of years to verify and validate its functioning through all seasons and conditions. We ran our biomethanation plants for almost two years using wastes collected by my NGO friends at Sadashivnagar and this led to the revelation that our plants were suited to urban wastes as well. But there were no takers because composting does not work very well with a reduced leaf component. The composition of urban waste has changed over the years-there is more rice now than leaves. Even now, I am not aware of anyone who can make compost with waste that has very low lignin component.

QT: Can you compare between the waste disposal scenario in IISc and the rest of the city? Also, how does it compare with other research/academic institutes with similar requirement for resources, in the country and abroad?
HC: Without a doubt, IISc is doing much better than the rest of the city! At least people here don't want to litter the place and so, it is easier to deal with them (grins). Most people here are conscious of their surroundings and that makes all the difference.
IISc has been trying to be a role model for other campuses in the country since 1998. An official committee was set up back then to ensure that the campus always remains environment friendly and litter-free. But there is technical possibility on one hand and human interest on the other and they don't always go together. We still have some trouble arriving at a consensus on how certain things need to be implemented. And since our problems are unique, we can't copy another campus, especially a Western model. Our food and environment encourages rapid fermentation and waste food here becomes rather 'fragrant' very rapidly - in 8-12h. Whereas elsewhere, this waste could be kept for as long as 48-72h!

QT: We are all proud of our beautiful campus. But we will ask you a question that already contains an assumption - do you think we are doing enough to preserve this campus? In what ways are we lacking?
HC: No, we're not - we can do a lot better. The first thing is that the idea of keeping the campus clean must be imbibed into our thought processes. And quite surprisingly, it is not about the lack of intent or of awareness. As always, it is about prioritizing and is a matter of principle. In practicality, one must also worry about making the situation conducive to following the rules we set for ourselves.

QT: We see a lot of dump-yards within the campus where heaps of used gloves, empty and not so empty chemical bottles strew the ground. Are there any steps being undertaken to solve this problem?
HC: What you see, is an institute in transition. The Institute has consciously decided to get rid of conventional concrete dust bins. The policy of the Institute has evolved in coherence with the way its people behave. For example, food wastes are disallowed in the waste-huts. The messes and canteens are required to collect their food wastes in barrels and handle them differently.
The solvents, bottles and gloves that are strewn around, still need an autonomous waste disposal policy that is rigorous yet exercisable. It is easy to implement expensive strategies that provide an immediate solution to our problem, but we have the responsibility of setting up a model. Being a leading institution of the country, IISc needs to describe a strong policy accessible to others. And here is where we find a lot of difficulty.

QT: At first sight, the flora on campus is enthralling. However, it seems that a lot of trees fall each year in the monsoon season, and not a lot is being done to cure that problem. Also, there is a bunch of new construction works going on in the campus which must have required trees to be felled. What are the ways to go about this scenario? Is there anything being done?
HC: Firstly, the green cover that we boast about has been put by people (our own faculty) and I am led to believe that this is only half as old as the institute. Every year, we are bound to lose certain trees and the choice is between allowing the land to recuperate naturally and attempting to restore balance by planting a tree of our choice. For the simple reason that it is not clear which tree will be uprooted by the rains in this termite-infested region, it may be injudicious to dictate the maturation of the tree cover. This is also the problem of Bangalore- I am certain that no one can reliably predict which of these trees will die in a particular year and hence make any claim of 'euthanized replacement'.

QT: We would like to move to a more specific question - in an institute that uses so many potentially harmful chemical resources, what is the Institute policy on disposal of these wastes?
HC: When the committee was set up in 1998, there were no rules at a national level regarding the disposal of most of the troublesome wastes. Today there are reasonably well understood guidelines, although these are directed towards industries and not research Institutions. But we at IISc ensure that the spent solvents, oils, etc. are also being recycled on a voluntary basis. Also, there was a campaign to treat e-wastes properly. And more recently, through CiSTUP, there has been a department-wise initiative on the recycling and disposal of paper and plastics. I am sure it will soon emerge in full swing in all the departments of IISc.
Modern teaching techniques and standardized assay procedures do not permit harmful chemicals to be used at large scales in a research laboratory - you will not be able to publish if you used such 'environmentally unfriendly' assay procedures. And a good part of research itself focuses on the use of green chemicals. To put things in perspective, what used to be litres of waste, has now come down to a few mL or even µL.

QT: How impactful has this Green Chemistry alternative been? Also, what is the effect of considering alternate energy resources?
HC: The type of tests being carried out in research laboratories has moved largely from the methods of titrimetry to instrument-based analysis, where chemical analysis is being replaced by optical or other instrumented methods. And the three orders of magnitude of reduction in wastages from any laboratory speak for themselves.
The Institute consumes a lot of power and we are slowly moving into the domain of photovoltaics. To quote an example from my department, I'm glad to say that we are now equipped to run an entire village on bioenergy. At this point, it may not be a sustainable alternative for such dense energy requirements as at the institute level, but it's a start. Some hostels in IISc can boast of being one of the first places to have solar panel installations in Bangalore!

QT: Sir, how about the disposal of radioactive wastes on campus?
HC: Well, we have a radioactive waste dump in IISc which was rejuvenated by Professor Kondaiah from MRDG way back in 1998. It has been streamlined and run from 1998 and the Department of Atomic Energy Commission monitors it. The waste disposal procedure used here adheres to standard guidelines, norms and specifications related to these wastes but are not made available to others for reasons of general safety and capacity.

QT: Referring to the Biology Department in particular, what is the protocol for handling radioactive wastes from there? For example, in several laboratories, mutagens like Ethidium Bromide are believed to be disposed directly into the sink. Can you please comment on this?
HC: The handling practices adopted for such materials by different laboratories also define how the wastes are to be stored, handled and disposed. With so much awareness about the environment and personal safety around, wastes of this kind from laboratories are now collected by licensed authorities on a regular basis. Before setting up a lab that will require dealing with radioactive materials, a great deal of attention is given to the manner of waste disposal and maintenance of the lab in general.
The new Biological Sciences Building has its own waste water treatment plant and this ensures that the hazardous wastes from these laboratories do not get mixed up with the other wastes. All said and done, it is in the end, the responsibility of each individual laboratory and individual users of such chemicals to follow the protocols assigned.

QT: On a slightly different note, what are the challenges in urban waste disposal systems in modern India? How does it fare compared to other countries and what are the problems that are specific only to our country?

HC: This is a very difficult question to answer! Because we don't know what our intended direction of change is. Primarily, the point of difference between our urban wastes and that of other countries lies in the increased fraction of food wastes. Today, between 70 and 90% of primary waste is in the form of fruit and vegetable wastes, fresh food and primary grains rather than the ready-to-eat food found in the West. In the 'developed' cities of India, there is predominantly food waste and therefore composting is a lot more difficult or sometimes even inappropriate. Therefore, a uniform method of waste disposal for various parts of the country is not easily realized. Also, in other countries, there is greater discipline in the segregation prior to disposal of, say, plastics and food at the household level. Here, there is no common agreement on the same-on whether they should be burnt or recycled or even banned.
As of now, it seems like there is no single technology to collectively and effectively handle large quantities of 'mixed-up' semi-solid food- bearing wastes. Carting such 'wet' and 'dripping' wastes across the city to distant rural areas exacerbates the problem within and very often becomes aesthetic, olfactory, environmental and very rarely even a health hazard. Further, in India, there is a much larger level of consumption of medicines and the tendency to stock medicines in our homes creates additional complexities in disposal of expired medicines and their packages. We are even divided as to how to manage an increasing burden of sanitary wastes. And that's where we stand today. We are strongly polarized between the 'ideal' and the 'practical'.

QT: How is India reacting to this situation?
HC: India is waking up to the situation, partly due to the changing nature of the wastes and secondly due to emerging issues in waste management. Metros like Bangalore have been showing the way forward. There is a growing tendency to address issues in a decentralized way and to make it more 'humanistic', participatory and people friendly. Waste management rules are being revisited. E-waste management rules are being enforced and stronger opinions are being pitched. It is unfortunate that the people handling such roles and performing such tasks are not adequately informed and follow somewhat 'crude' procedures. And since income or primary cost is often the dominant motive, there is rarely a question on shaping the afterlife of a marketed product in the mind of its manufacturers.
Unlike in the West, there is no stringent company policy on the return of used plastics and glass, there is a rather superficial understanding of this notion and we need time to transform instincts into an actual movement.

QT: As the new kids on the block, what can the UG students do to make a change in IISc? After all, when we come back to the campus after 20 or 30 years, we would like to be welcomed by a campus as beautiful as it is now!
HC: It's all about having the right spirit! If this can be made a part of your daily routine, then it begins to define you and shape you. Your concerns will blossom into positive and volunteered action. You then become young ambassadors of novel practices and technologies pertaining to waste in its entire chain of production, handling, recycling and disposal. Just like it hurts you to see someone not falling in queue or someone breaking the law, you should take it upon yourselves as both your responsibility *and* your privilege to keep this campus clean.
It is easy to ask for a social change *and* a change of attitude. But this is a place with a history and something drastic will only tamper with the balance in play. As we try to change our institute's physical structures, we will have to adapt into the appropriate spheres.
And what's to say, you have already "inherited" this campus!

WHERE ABILITY MEETS OPPORTUNITY:
NOTEBOOK DRIVE

A thousand smiles, the joy glittering in the eyes of little students, the volunteers filled to the brim with enthusiasm, an experience to cherish, lessons taught and lessons learnt. NoteBook Drive over the last 12 years has evolved from delivering books to transforming lives.

NBD, as we are better known, was started in 2002 with distribution of notebooks in one Government school inside the IISc campus. The group has grown to being a movement of its own, rather rapidly, to encompass 21 primary schools, 5 high schools, over 100 teachers and more than 3000 students in its fold.

The motive of the group is to match ability with opportunity. The focus is on students who belong to the economically backward strata of the society. The aim is to help the young minds harness their full potential. Our goal is to ensure students do not drop out of education and learn the right things in the right way at school. Our efforts are guided towards nurturing their budding dreams.

The path we have chosen to achieve these goals include various activities like notebook distribution, providing scholarships, mentoring science projects, teaching English and communication skills, organising cultural events among others. A new activity was added this year: computer training. Computers donated by few volunteers and some purchased from a second hand vendor were installed in 3 schools supported by NBD and regular classes were conducted in these schools. Introducing the students to technology has helped them gear up to face the fast changing world.

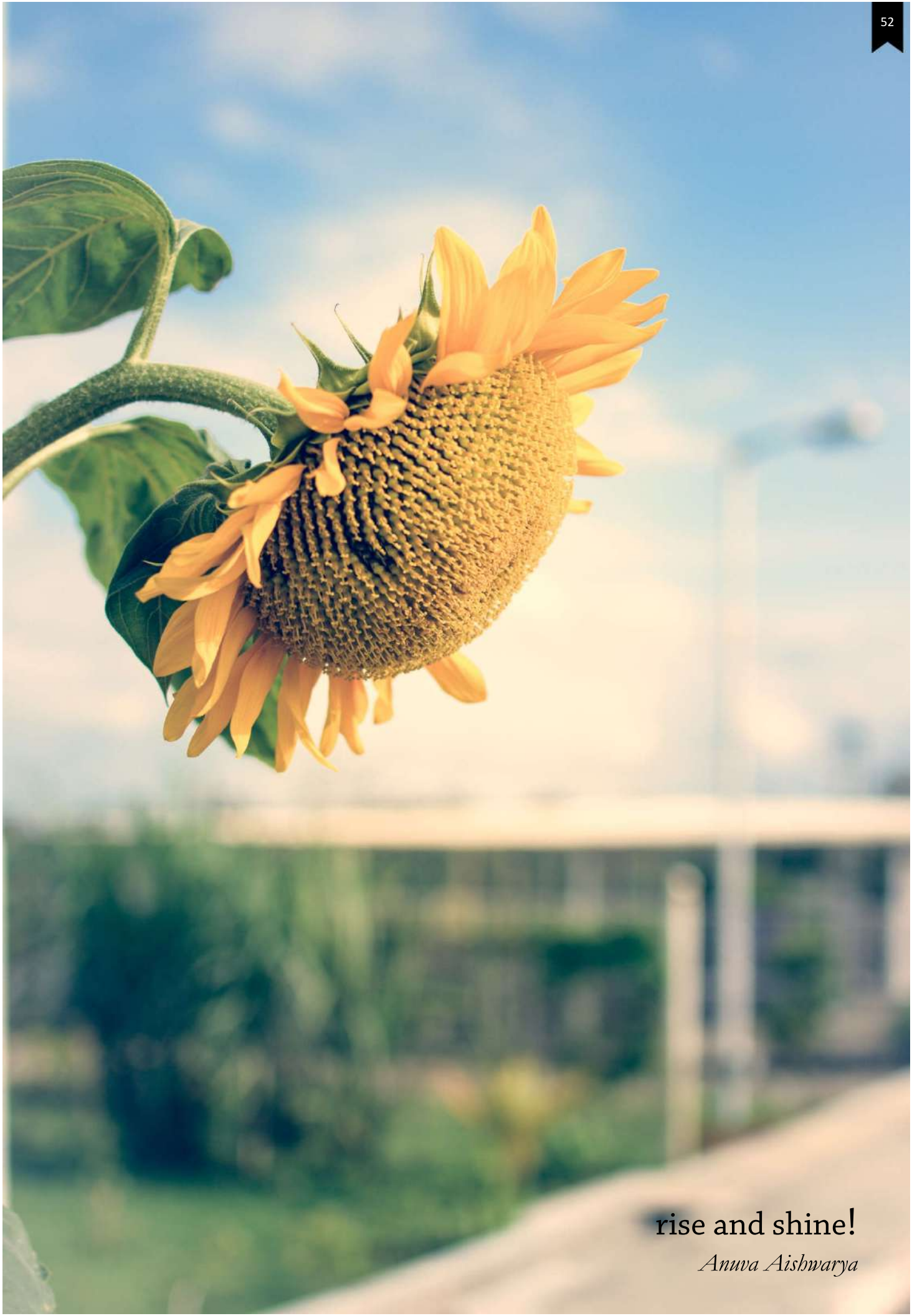
Of late, the focus of NoteBook Drive has been on the quality of the activities, rather than quantity. There has been a lot of thought put into improving the impact of the activities and their usefulness to the students. We seek to present to the students a method of learning that is not boring and yet comprehensive. Innovative methods of teaching contributed by the volunteers have gone a long way in making this happen.

It is indeed satisfying when the teachers in these schools call to inform us that their students have done very well in the exams and that their school has topped the block in the overall results. The teachers have also welcomed the intervention of NBD in their schools. Their repeated calls inquiring about our visit to their school is testimony to this fact. The teachers' training session that was held the previous year has also been extremely effective with the students being the biggest beneficiaries.

This year, unlike the previous years, Children's Day was celebrated on the same day in all 25 schools. The task was never going to be easy with 3300 children to be reached out to spread across a region 15 km wide and a large truck of goodies to be delivered to them. What made it possible was the support of over 130 volunteers on the same day, a new high for NBD.

Volunteers are not just the backbone but the heart and soul of NoteBook Drive. The support that NBD has received from the entire IISc community, staff, alumni and outsiders has been enormous. A big thanks to one and all who have contributed in this effort. Looking forward to seeing an increased participation in the upcoming years as well.

It is said that education liberates one from the darkness of ignorance and illuminates life with the light of knowledge. Knowledge guides one towards a more enriching and meaningful life. Knowledge is a potent weapon that shapes the life of an individual and the progress of the nation. Thus facilitating the receipt of knowledge by every student in the country is an absolute necessity. It is indeed a big challenge and a huge task that lies ahead of the citizens of this country. As is often said, a journey of a thousand miles begins with a small step. Here is one such step.



rise and shine!

Anuva Aishwarya

section three

UG

Highs

This **Section** contains the following articles:

- The Fourth and Fifth year paradigms by Sriram C & Shriya Pai
- Mimamsa by Sayantan Khan
- Pravega

THE FOURTH AND FIFTH YEAR PARADIGMS

SRIRAM C & SHRIYA PAI

In what became a fitting end to the academic year 2014-2015, IISc was spectator to the graduation of its first batch of undergraduate students. There could not have been a vision more purposeful than this one, which arose as a result of the centenary celebrations of the Indian Institute of Science, back in 2009. To quote the former director, Prof. P. Balaram, “This is IISc’s biggest experiment and the students were the guinea pigs”. He adds, “And now I am glad to say that our experiment was successful and that you have made us proud!” From a batch of 83 students, 27 are going to various places to pursue higher studies or to take up jobs and the remaining students are staying on to obtain an MSc degree. In either case, these four years seem to have been a roller coaster ride of experiments, challenges, recognition, disappointments and expectations-both met and unmet.

In this article, we survey some of the prospects for the fourth year and beyond, the new challenges in a journey entirely uphill-whether it is in a different university or here at IISc. Although the structure of the undergraduate programme has been well-formatted, there is a floating opinion of dissatisfaction regarding existing Institute contacts with other universities, provision of ample scope for non-academic placements after graduation, having an active placement cell and doing the right kind of outreach. Just, what is the immediate step in providing a better outlook for our passouts? We quizzed some of the trailblazers of IISc UG and their responses were a mixed bag.

Sunandha Srikanth, who is headed to University of California, San Diego, to do her PhD in Biology, is excited about the refreshing experience that awaits her. She says, “I feel that apart from a change of research topic (and having to fend for myself completely), the process of doing research is going to be the same (or extremely similar). I do, however, hope to expand my knowledge, make new friends, learn about other cultures and learn to surf!” One low point of being a part of the pioneering batch, she says, was the lack of people to consult with. However, she does maintain that the entire experience has moulded her to become more tolerant and resourceful.

Proper career counselling seems to be a popular demand from both the graduating batch and the senior batches in general. Well, it is indeed valid to question what it takes to woo labs and universities abroad for internships. Praveer Tiwari, who is staying for the fifth year to obtain an MSc and currently working in ICTS on Gravitational Wave Astronomy, claims that the extra year will help strengthen his academic profile. “An extra year would ensure a strong project in my field and thus in my graduate applications.” he says. Like many others, he campaigns for a graduate cell that would provide resources to the students in helping them to look for universities around the world that match their academic profiles. In many cases, the students do not insist on any specific help from the institute in their fifth year. Krishnan Iyer, working in the field of Biophysics and who has already a PhD offer from NCBS, is deferring admission by a year to take some advanced courses in Condensed Matter Physics and in other fields of Physics. He says, “I will be joining NCBS for a PhD after my MSc. Since I have already qualified the interview and taken a deferral, I will not be needing support from IISc in this respect.”

The undergraduate community needs to be informed about the choices they can make-whether it is too late to switch gears or whether the field allows for experimentation. Athmanathan Senthilnathan, who had majored in Mathematics in the BS programme, is now off to the University of Tennessee at Knoxville for a PhD in Ecology. He says, “During my PhD, I am supposed to be a TA for a course on Mathematics for the Life Sciences.” The programme is unique in providing a good interdisciplinary flavour to its students and given the plethora of options, it is important to be aware of them. And we cannot agree more with Athmanathan when he says that he could confide in his mentors here at IISc and that he now hopes to broaden his perspective in his new endeavour abroad.

Balancing scales and addressing the most obvious question: Pursuing research outside India after the fourth year, or staying here for one more year-which seems to be the better deal? Pranav Garg, who is going to the University of British Columbia, Vancouver, hopes to completely immerse himself into the research community. He feels that the faculty here could have helped him to connect better with the people in the places to which he applied. Being one of the trailblazers (read as first batch guinea pigs), he’s sure he’ll be missing out on the best years of IISc UG as they are yet to come. And at some level, the question of whether people are *actually* ready for a PhD at the end of four years is inevitable. Prasanth Kumar, gives another perspective to the subject at hand. Firstly, he wanted to apply for a PhD in Europe which requires an official MSc degree. Additionally, he was unsure of getting a PhD position after a BSc. (Research) degree. And for those who are still doubtful about the field they want to pursue in their respective majors, in addition to those uncertain of their track record, should definitely stay back for an MSc degree to utilize the one year of IISc education well.

There are several undergraduates who wish to venture into non-academic areas. For such people, active outreach during Samanway, employing staff contacts and wooing companies would be a real boon. Some students are really attracted to the engineering component and they should have ample opportunities when they graduate. Amitabh Shrivastava, a student from the batch of 2015, has decided to join a start up company called Mad Rat, a toy company funded by Google. Except for an occasional mention, the issue of placement opportunities seems to elude the undergraduates at IISc. There will be no dearth of people looking out for job openings and for more institute-powered opportunities in general, just as there should be no inadequacy in outreach in the years to come.

In passing, we surveyed our passouts and veterans for nuggets of wisdom for their juniors. And we leave you to think about what they said:

‘The Institute provides a plethora of options and each one deserves exploring. While studying has its own importance, a lot remains to be gained by interacting with peers, seniors and members of faculty. Approach everything with an open mind and be prepared, in many cases, to have your views partially, if not completely, changed. Enjoy the ecological, intellectual and cultural diversity on campus. Live to the fullest on campus!’ - Himani Galagali

‘Talk to enough people. If shy, read a lot. Spend time introspecting. Step back from your daily life and think about what you are doing and why you are doing what you are doing.’- Athmanathan Senthilnathan

‘Everyone has things they are good at and things that they want to do well. Recognising these qualities in others will help make friends, recognising them in oneself gives direction and meaning to life.’ -Pranav Garg

‘Work hard, play hard and most importantly, enjoy every moment of your time at IISc. You will definitely miss this place once you leave; I already do! ‘- Sunandha Srikanth

MIMAMSA '15

ANOTHER YEAR OF MIMAMSA:
A postmodern view of peer expectations

SAYANTAN KHAN

That's what it has come to now. Or at least that's the general perception of Mimamsa in the undergrad community. For those who aren't familiar with Mimamsa, it's a quiz organized by IISER Pune where four, not three , teams vie for the first spot. In principle, that is.

Thing is, if you're an undergrad here, sooner or later you'll end up hearing about Mimamsa, probably from a senior. And they'll tell you, you won't even have to ask, all about IISc's unbroken winning streak. And you'll try to end the conversation as soon as possible, saying things like “How nice”, “Oh really” and the kind. And after the conversation is done, you'll put it away like some mild curiosity. All this will probably happen somewhere in the vicinity of September. Then slowly, the months will keep changing, and before you know it, it's December and people have started registering for the quiz. But before you can register, you learn that you need to form a team to even register. And forming a team requires teammates. Three, in this case.

Picking teammates is yet another challenge. You could go the way I did, and pick people based on their relative strengths. Or you could procrastinate, and pick three people at random (willing, of course) on the eve of the final registration date in a fit of deadline induced panic. Honestly, I'd like to see such a team next time. Makes for a much better story at least. A group of misfits against the rest. After all, who doesn't like to see the underdogs win?

We had been called many things, but underdogs wasn't one of them. Our planning (or rather plotting, as someone put it) began rather early. Three members of our team were already decided by the early months of first semester. I'd approached Chaitanya (henceforth referred to as Tappu) and Rajsekhar and put forward my proposal of forming a team. That was it, 75 percent of the problem was solved. Rajsekhar would deal with physics and chemistry, I'd deal with math and physics, and Tappu would deal with everything else. But we still needed a biology specialist (my reasons for not using the word 'biologist' will become clear in a while). After much deliberations and countless team meetings, we came to a conclusion. We had no idea who was good at biology. So we let things rest for a while, deciding that we'd eventually figure out who to pick. And after a month or two of class, we realized Arunavo was pretty darn good at biology. And it didn't hurt either that he was a dab hand at chemistry. So there we had it, our team was formed, and it was a pretty good looking team at that.

Fast forward to December. We were going along happily with our lives (at least as happy one can manage when you have endsems breathing down upon your neck) when Tappu got this bright idea of actually starting to prepare for Mimamsa (just when I thought holidays were gonna be more relaxing.) So we assigned ourselves chapters to study over the vacations and that was the end of it.

Fast forward to January now. I come back, dreading the moment when someone asks me how well I'm prepared for Mimamsa. I just couldn't gather the willpower to study over the holidays. But then as it turned out, no one else had either. So here we were, a few days away from Mimamsa, absolutely unprepared, and positive that we would be ones who broke IISc's winning streak. Things were looking bleak.

Came the day of the prelims. It went pretty well, especially the math section, which was handled by Tappu. We were pretty confident that we'd make it to the finals. So we weren't particularly surprised when we got an email few weeks later telling us that we'd gotten in. However, the email said we would have to present a talk on a topic of our liking.

Now we were faced with our first real challenge. Picking a topic for our talk, but we couldn't just pick any topic. The instructions they'd sent mentioned that the topic should be simple, at least, simple enough for a high schooler to understand. That really stumped us. We weren't sure what exactly would qualify as a topic simple enough for a high schooler, yet sophisticated enough to present at an inter collegiate forum. Rajsekhar had a nice idea of studying the physics behind the locomotion of microorganisms, or how the cilia and flagella function, at least the physics behind it. Then Arunavo had a bunch of ideas, ranging from quantum computing to biomaterials. But the problem was, our proposed object fell into two categories. Either they were interesting and too sophisticated, or they were simple enough for a high schooler, but sounded a little, dumb, for the lack of a better word. We asked around for ideas from our instructors as well, including Professor Anish Mokashi, our physics lab instructor and Professor Srinath, our biology lab instructor. They came up with some more ideas, which we added to our growing list. However until the eve of the day when we were supposed to send our finalized topic to the Mimamsa organisers, we hadn't decided on a topic yet. We couldn't make up our mind on what to choose, so we decided on a whim to pick a topic at random, and we ended up picking was biomaterials. To be more specific, we were focusing on some applications of biomaterials in other branches of science and technology. Rajsekhar and I were focusing on high density data storage using DNA and proteins and Arunavo was focusing on improving batteries by using viruses.

We had a couple of weeks to prepare our talk before we went to Pune, so we got to work right away. In about 6 or 7 days, we had our presentation ready and we had time to spare, so we thought we'd have a practice session here at IISc with our instructors and some of our classmates as well as the previous year's Mimamsa team. The first session did not go so well, with us long overshooting the time limit of 30 minutes and the presentation itself lacked coherence and a clear sense of direction, according to our instructors and seniors. That came as more than a mild shock to us. We had less than three days before we left for Pune, and our presentation was in shambles. We got to work right away and stayed up practically the whole night, shortening the presentation, as well as making it more coherent and eliminating some errors that had crept in. Needless to say, we missed classes that day after pulling off the all-nighter, but by late afternoon we were ready for another go at the presentation. This went much better, for one, we made it under the time limit. There were still a few minor flaws, but the major component was done.

And so we set off to Pune. We were received next day at the bus stop by the volunteers from IISER who then took us to the campus. There we were told we would be briefed at night and we had the entire day to ourselves. So we did the most logical thing and went to Tappu's house for lunch. After spending the afternoon delightfully watching Arunavo and Tappu (whom we had to actually call Chaitanya throughout the duration of the visit) compete against each other in the matter of who can eat the most pav bhajis, we headed back to the IISER campus.

That night, we met the other teams, the teams from IIT Bombay, IIT Madras and CBS, during the briefing session where the rules of the quiz were outlined. The quiz would span 14 hours, divided over the course of two days and six rounds, three on each day. The first day would start with the biology round, followed by chemistry with lunch gap in between and would be immediately followed by the buzzer round. The next day then would start with math, followed by physics and then the final rapid fire round. The teams were to present their expositions in the gap that followed the first round each day, before and after lunch. After the briefing, we were assigned rooms with projectors where we could practice our expositions for as long as we wished without any disturbance. We ended up adding the final few elements to our presentation there, and by midnight we were done and went to sleep, to make sure we were not sleep deprived on the important day.

The next day we woke up more than a little nervous in apprehension of the quiz. The earlier night we had asked our hosts for mango bites. The deal with mango bites was that, we had an almost superstitious belief that if you had mango bites with you, nothing could ever go wrong. We were a little shaken when they'd said it might not be possible to get mango bites at that time of the night. We were just on our way to breakfast when we were greeted with the piece of welcome news informing us about the availability of our mango flavoured luck. Needless to say, that brightened up the entire team's mood, given our superstition.

And thus started the biology round. We got off to a rather shaky start with us messing up a lot of questions we shouldn't have messed up. Especially a direct question which was nothing but a question about infinite series in the guise of a biology question. We were rather surprised when we were told our answer was wrong (although it later turned out our answer was actually correct, we did get credit for that). And thus, the biology round closed up upon our rather mediocre performance. All of us were a little shaken, but we consoled ourselves by the fact that there were five more rounds to go.

Immediately following the biology round was the exposition by IIT Madras. We got our notebooks out and prepared to take notes since not only was the presenting team awarded points on their presentations, but the spectating teams were also awarded points on the kind of questions they raised. Their presentation was on the physics of tides and tidal waves. It was a pretty detailed presentation and they hadn't hesitated to put in a lot of the nitty-gritty details. After their presentation and the questions that followed, we broke up for lunch. We were supposed to present immediately after lunch, and because of that, we couldn't quite enjoy our lunch, with all of us a bundle of nerves. Despite our apprehension, our presentation went surprisingly smooth, and we finished well within the time limit. After the presentation, we had to answer the questions raised by the other participants as well as the judges. The questions were insightful, though not particularly challenging. And that concluded our presentation.

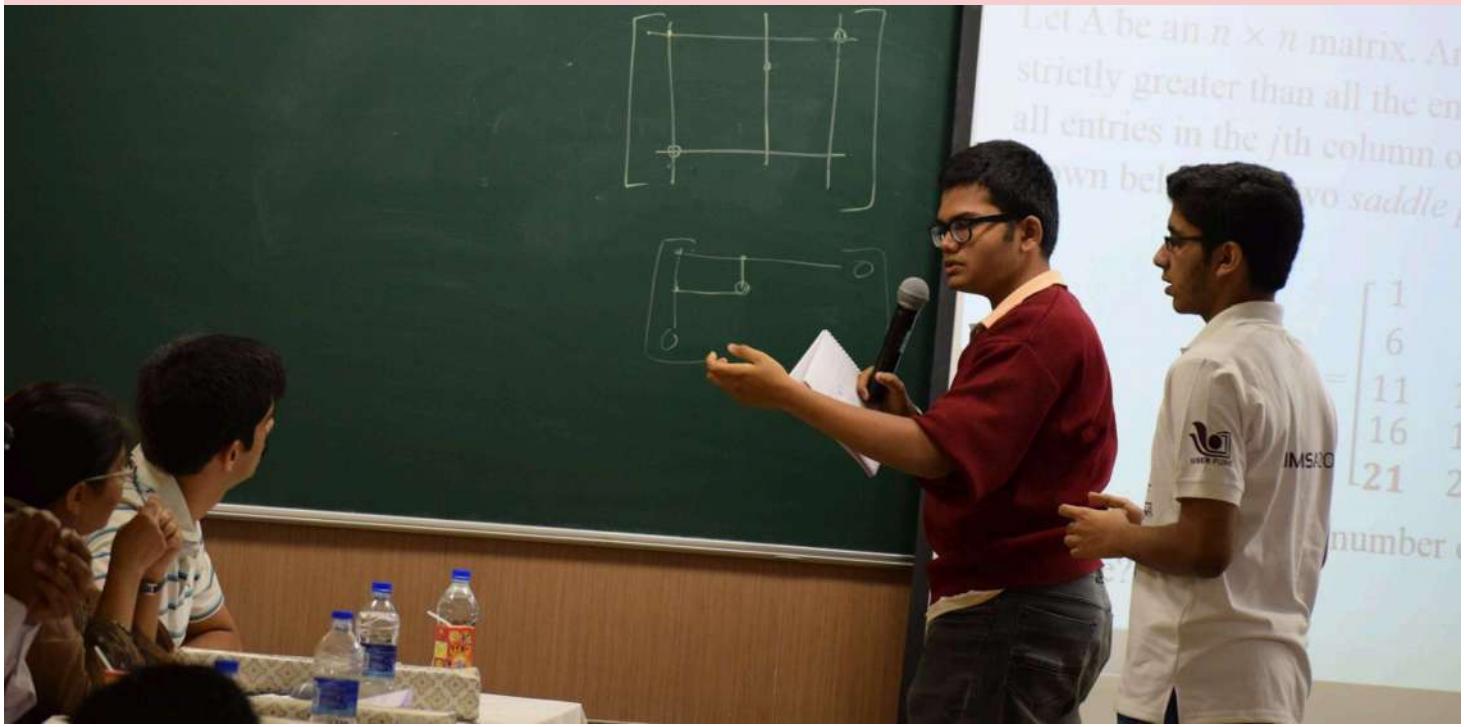
The chemistry round started immediately after our presentation. After the fiasco that was the biology round, we had plenty of reason to be apprehensive about the chemistry round. But our apprehensions were misplaced. We got off to a much better start, thanks to Rajsekhar's and Arunavo's prowess in organic chemistry. And you know things are going rather well when you see me answering chemistry questions (although that was probably because the question was Lord of the Rings themed, and being an LOTR nut, I could answer the question).

And so the chemistry round stretched on until 6 pm, when the organizers decided to postpone the buzzer round until the next day. And then they displayed our scores at the end of each round. To the great astonishment of no one, our biology round scores were dismal, we were in the measly third spot. However, the feeling of elation we had during and after the chemistry round was well justified by our spot on table, we were on the top, and by a respectable margin at that.

With the quizzing over for the day, it was time we experienced the Mimamsa organizing team's famed hospitality. First they took us to an Indo-Polish fusion concert that was happening there in the IISER campus. Then after the concert, the Mimamsa core team took the participants for dinner to a restaurant outside the campus. There at the restaurant, we properly got to know the other teams, and soon enough, we were chatting away like we'd known each other forever. And then came the onslaught of the nerd jokes. The Dirac deltas (the full explanation of that joke will probably be censored by editor of this publication), the lemons (lemmas?) of Zorn, and various other terrible puns too painful (punful?) to recount. And then came the story of the biologist. Any biologist reading this article, no offence intended. This is a story the guys from CBS told us. So there was this physics professor in CBS, who, after explaining something mathematically intensive in class, followed up the explanation with the question, "Did the biologists get this?". This condescending behaviour particularly irked one young naive biology major, who after one such remark too many, sent out a strongly worded email to the said professor and cced it to the entire class as well. However, what the biology major was unaware of was that the professor just meant it as a joke, and the rest of the class knew that and was fine with it. So the email the guy sent blew up in his face, and ever since then, a biologist is someone who doesn't get a joke.

So with more lame jokes back on the way, we ended that day on a good note. We were not particularly worried about the next day since that would be math and physics, the two subjects which we were pretty sure we'd ace. So we were rather relaxed when we walked into quiz hall the next day. The first round was the buzzer round, and buzzer rounds in general call for some strategy. There's a whole spectrum of strategy for buzzer rounds, but they fall in roughly three groups. There are the cautious players, who only buzz if they know the answer absolutely perfectly, and even then, they take their time. Then there are the desperate players, who lack restraint and press the buzzer nearly every single time, regardless of the fact that they know the answer or not. And then there are the conservative players who fall in between these two extremes. We decided to go with conservative strategy in this round because being too cautious could reduce our lead, and so could being desperate. And the strategy worked out pretty well for us. We made it through the round with our lead even more than it had been going in.

Next was the math round, and it went exactly as we had hoped it would. Perfectly. We managed to answer nearly every single question that was asked, and our proofs were pretty neat as well.

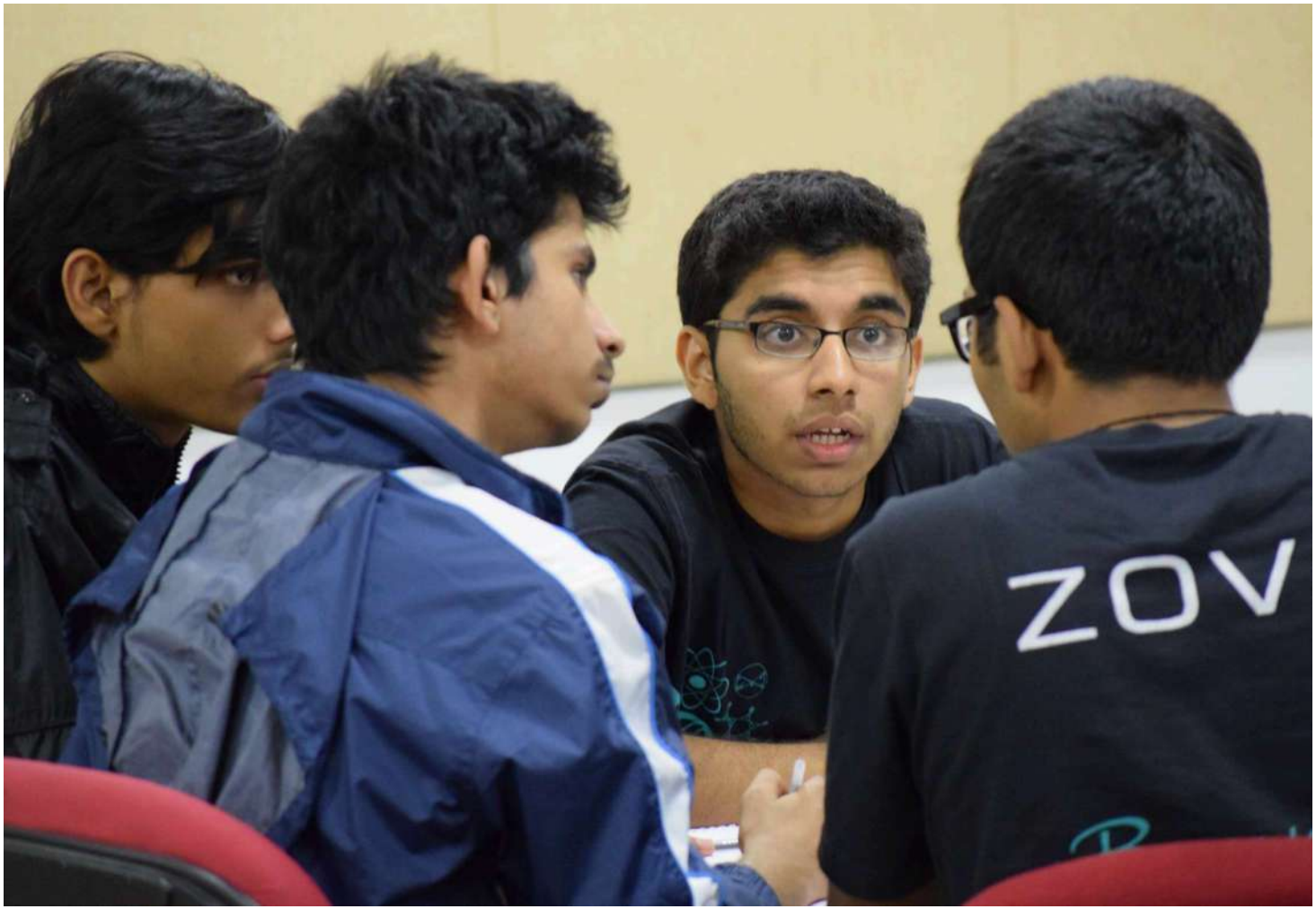


Following the math round was the presentation by CBS. Their talk was rather interestingly titled, “Mathematical Models of Love”. Their idea was a rather interesting one, treating love between two people as a scalar valued real function with associated coupled differential equations. Then they went on to analyze the solutions the equation, associating with each kind of solution a lover personality, and showed how all of that fit in with conventional wisdom about love and relationships.

Again, like the previous day, we broke up for lunch. And now with no spectre of an impending talk looming over us, we were able to appreciate how good the food really was. It’s stuff like that that really makes it worth coming for Mimamsa.

Next up was the talk by IIT Bombay about symmetries in modern physics and Noether’s theorem. The talk was very technical, with more than a fair bit of algebra being thrown around. As such, the other participants couldn’t really ask very meaningful questions about the talk, but the judges’ questions more than compensated for that.

The physics round was rather uneventful, with all teams performing equally well and we didn’t really make an effort considering the massive gap in score between us and the trailing teams. Honestly, at that point, even if we had stopped answering, we still would have won. And after the physics round, the rapid fire round came up, which had rather interesting results. IIT Madras which was in the third position, managed to climb up to the second spot in the rapid fire round, barely edging out IIT Bombay. And that concluded the quiz, and the results were declared, and to no one’s surprise at all, we won, and by a pretty huge margin. Then followed the usual formalities that follow a quiz, prize distribution and what not. But we were free the moment the quiz ended. The burden had been lifted from our shoulders. The burden of expectation, it was gone. And it shall be gone for another year until some foolhardy group decides to take that burden upon themselves as we had, and if someone does, my fortune smile upon them because this is a heavy burden to carry, indeed.




Pravega

A BABY NAMED PRAVEGA

It is rightly said that babies bring home joy. Born just one year ago, this baby named Pravega has brought more than just joy to the lives of many IIScians. It has given us a new platform to show our creativity and a new reason to discuss science. Not only has it taught us how to interact with people and to work in groups, but also (and more importantly) filled our lives with enthusiasm.

The best thing about working for Pravega is that we significantly contribute to the way in which it is organized. Had it been some other fest, there would have been a tried and tested route (and oh, life would have been much easier). But here, we are paving our own paths and this adds to the excitement because it is often about crafting solutions to the very many problems that we face. Others boast of their big fests, but here at IISc, we are the creators of a legacy. And some years down the line, this will have been an initiative to extol. And hard work to belaud.

Through Pravega, we dream of making IISc known outside Bangalore for reasons other than just science. If students participating in Pravega enjoy those three days, they might realize that pure sciences are fun and could con-

-sider making a career out of it. A good show for three days will make known the fun-loving nature of the undergraduates at IISc. Maybe we can take our undergraduate course to a whole new level of popularity among the students.
Working with fellow IIScians has been a great experience till now. And looks can be deceiving - I would have never expected some of the geeky-looking people to be so keen on taking initiative. We could really stay up the whole night working together and still not get bored because the eagerness is infectious. We all do different kinds of work, but whatever we do, we never forget what our top priority is, which is having fun. And the work is not limited to science. More important work includes getting the fest funded, talking to different companies, approaching speakers, getting permissions from institute authorities, publicizing the fest and much more that is certainly outside any form of instruction.
Pravega for us does not span only those three late winter days; it spans over months of hard work and fun. It lets us diffuse from our course curriculum, which is really important because all the creativity lies in transit. So if you are already a part of the Pravega team, keep up the good work and if you are not, do join us because you have no idea what you are missing out on.

Abhijeet Krishna

JAI PRAVEGA !

TECHNICAL AND FUN EVENTS:

- Biology
- Chemistry
- Engineering
- Mathematics
- Physics
- Miscellaneous

BIOLOGY

Colours From the Grey

Sridevi V

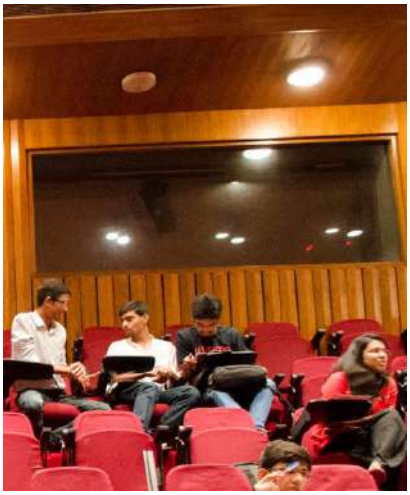
Colours From the Grey, a popular Biology event from last time, seems to have established a reputation for itself, with many teams from last year returning to stake their claims. The idea of the event was to test the conceptual knowledge of the participants in Biology and succeed it did! The prelims had a myriad of questions from molecular biology, genetics and ecology which had the teams huddling together and scratching their heads. Out of the eighteen teams that participated in the prelims, five teams were selected for the finals, four of which were from St. Joseph's college (I know right?). The second round was supposed to be conducted on a computer interface with teams racing against each other to answer questions. Despite some unforeseen technical glitches, dare I say minor, the event managed to rise to the occasion, the occasion being the refusal of the software interface to work. The participants had to fall back on good old paper and pen to answer the questions, which in fact some of them found to be better. The questions of the final round were termed mindboggling by the teams. Sushmita Chandrabhas, Bhavya Dharmaraj and Bharat Ahuja from St.Joseph's college, old patrons of CFTG, secured the first place while Shilpi S, Aishwarya and Shraddha Hegde also from St.Joseph's bagged the second place. Sushmita, Shreya and Sugandha from PES Institute of Technology were in the third place. Considering the current trend, we can expect some of this year's participants will come back next year craving for more. I would say CFTG has definitely become a traditional event of Pravega with a steady following.

WHO'DUNNIT

Agniva Dasgupta

Day 2 of Pravega played host to the very popular Biology event Who'dunnit. This event appealed to the logical and deductive abilities of the participants who got the chance to play Sherlock for a day, that too for a skillfully crafted murder scene. The turnout for the prelims of Who'dunnit was huge with as many as 70 teams (each team had three members) battling it out for a chance in the second round – The Forensic Round. In the prelims, the participants were given a bunch of questions that would test their logical and reasoning skills. Maximum participation was observed from St. Joseph, PESIT, RVCE and Christ University. Out of these 70, the top 5 qualified to reach the next round – the Forensic Round. This is where the real action began. A real crime scene was staged, and all the five teams were given the case file of the murder. The victim was a professor and his daughter, and the suspects included his son-in-law, younger daughter, lab student amongst others. The most interesting part was that the participants could actually interact with the suspects and some other characters also like bartender, ex – lab student, etc. These characters, using subtle hints, would direct them to other characters and unravel some layers of the plot. A small-scale laboratory was also set up where the participants had to use their analytical skills to identify the mechanism of murder. Using all these and a significant chunk of grey matter they needed to arrive at a conclusion and then proceed to the Final Round, where they had to present their case in front of the judges. Then, on the basis of the Judges' verdict, the teams were marked. It was the three students from St. Joseph who came up with the right conclusions using sound reasoning. They correctly concluded that the murderer was the professor's ex-student and the murder was an act of vengeance as the professor had stolen her research and got the credit for his daughter. They also concluded that the mechanism of murder for the daughter was using the poisonous compound Abrin, and that for the professor was methanol poisoning (which they verified using chemical tests). All in all it was a very entertaining and creative event which was enjoyed to the fullest by the participants.

BIOLOGY



LexicoBio

Subbulakshmi S

"...L,Y,S,I,S"

A peek into the seminar hall at the J N Tata auditorium at the last day of Pravega'15 would have left anyone confused for sure. For, it would have revealed the sight of about twenty-odd collegiates, reciting alphabets with surprising dexterity and clarity that would have put many a first grader to shame. A closer inspection would have revealed the truth: 'LexicoBio,' the classic spell bee contest with a twist, was underway. The highly popular biology event from last year's Pravega was back, and amazingly enough, it had lost none of its sheen.

The prelims for the event consisted of a pen-paper round: twenty biological terms with varying levels of difficulty were read out, and one had to get as many right as possible. The prelims were closely contested, as could be seen from the difficult time the organisers had evaluating. The finals consisted of two rounds - the first was a conventional spell bee wherein each contestant got two words, or rather two complicated biological terms, to spell. Those who got both the words right, had a go at the final, most interesting , and, to your passive onlooker, most entertaining round: here, one had to spell as many words right within a minute. Seems simple enough? The catch however, was that the word had to be spelt out in reverse order. So, a word read out as dialysis, should be spelt as s,i,s,y,l,a,i,d.

Not surprisingly, this round offered quite a bit of laugh- worthy, almost comical moments, with each contestant trying their best to get each word right, without sounding ridiculous or hysterical. The event, by managing to rise above the biology-spell bee conundrum, turned out to be the surprise hit of this Pravega season.

CHEMISTRY

Molecular Murals

Shriya Pai

Figures and patterns made from self-synthesized chemical paint-embellished T-shirt canvases in the Inorganic Chemistry lab (and the Biology lab) of the UG Block. Evidently, a typical painting event was too mainstream and so this one had a twist – to use the inorganic salts and solutions provided to synthesize your own colours and to paint with them on T-shirts. The success of the event was marked by the sheer number of participants. With over 35 teams taking part in this joint celebration of art and chemistry, the response was overwhelming. It was a four-hour-long ride of complementing salts with solutions, written equations with performed reactions, inorganic chemistry with art and competition with fun.

The participants were judged on the basis of their painting, the reactions they wrote, the number of colours produced and the consistency of the colours produced. Mr. Riyaz Komu, a renowned artist and sculptor, was invited to judge the event, along with Dr. Bitasta Das from IISc. The first prize winners were from PESIT, and their painting on a woman holding balloons was well-appreciated by the judges. The second prize went to a team from Clarence High School and the organizers awarded a prize based on public vote and this was given to a team from St. Joseph's.

It is not usual for salts, solutions and glue to bring life to T-shirt paintings. But this was indeed the high point of one of the last few events of Pravega. With this event being such a fine blend of colour and chemistry, we can barely wait for it to happen again.

CHEMISTRY

Carbon, Carbon Everywhere

Shriya Pai

This novel hit from last year was back. And that too, with a twist. A good response marked a good start. And with around 25 teams participating in the prelims, the craving for carbon was brought to the fore. The event devised an entirely new game with balls and sticks. This was the twist and it proved to be quite challenging. The participants had to also answer questions on enzyme catalysis and in this case, ingenuity was the key ingredient.
Professor Tushar Chakraborty from the Organic Chemistry Department of IISc was the judge. He appreciated the participants for their effort and said that it was a great experience. The event came to a close with a team from St Joseph's College emerging as the winner.
Modelling is fun. And so is dating. Carbon dating.

Sustainability: The Next Exit

Shriya Pai

'*For a greener tomorrow*' – at least that's what the Pravega man in Seminar Hall C of the JN Tata auditorium said on the very first day. Sustainability Challenge, the first of the Chemistry events unfolded in full swing, with over 30 teams participating in the first round.
With chemicals abound, can there be green around? This was the defining theme of the event, the final round of which was an engrossing group discussion. With the teams exhibiting no parsimony in strengthening their argument, each finalist team produced a decisive effect on the judges and the audiences alike. The participants found the rebuttal very challenging. The participants faced concurrent industrial problems that were crafted to tickle their brains.
The technicality was a rollercoaster ride in this event, but the overarching theme of Green Chemistry was the heartbeat. The judges were overwhelmed by the concept of the event and had encouraging words for all the participants. All in all, it was one hell of a rocker and the Chemistry Team learnt to love its new child. The one that was born this 2015.

GNIDOC

Sayantan Khan

Sometimes, the best way of taking your events forward is by going backwards. Gnidoc (that's just coding backwards, in case you didn't notice), the reverse coding event, was scheduled for the afternoon of the first day at the UG Complex. After some delay, mainly because the organisers had underestimated the huge number of participants that turned up, the prelims were under way with a written round, consisting of two sections. The first section had sequences of numbers, and the participants were supposed to figure out the rule that generated the sequence. The second part was more involved, with the participants supposed to write a program that generated a particular given output. This round had more varied questions, from participants decoding numerical sequences to decrypting encrypted messages.

So with the prelims out of the way, the real fun could begin. Each of the five finalists was given a computer, with 5 programs on it, but no source code. And then they were set loose. They had 3 hours to figure out 6 programs. And they had a compiler and a text editor. What else does a programmer need anyway? And so the participants coded away, for the next 3 hours, all immensely focused on their screens. At the end of that period, the results were clear enough, with only one team solving all six problems, and taking the neat Rs 15,000 purse that came with the first prize. What was most impressive was that that particular team, Vishnu Narayan and Vijaya Raghavan from R V College of Engineering, played with one less person than the other teams. Bagging the second and third prizes were teams from R. V. College of Engineering (again) and our very own IISc.

ENGINEERING

Lazer Maze

Subbulakshmi S

The end of one of the many corridors of OPB, all dark except for bright rays of green light, looked tantalizingly close. Even as I moved slowly forward, a siren sounded, indicating that the game was up. I had accidentally brushed against the brilliant bright laser beam, leading to instant eviction form the game.

The 'Lazer Maze,' two days old but already with a huge fan following for itself, was definitely not for one as clumsy as me. Yet, walking through the corridor attired in a fancily modelled light-emitting shirt, is an experience that you would not want to miss. Boxes full of Pravega goodies waited for those who successfully reached the end!

High Tide

Subbulakshmi S

Even as the breathless crowd watched, the tiny little boat maneuvered a difficult curve with style. Contrary to the old adage, time and tide stood still as the engineering event 'High Tide' got underway on the very first day of Pravega. The day-long event featured eight teams battling it out to the finish line. The rules of the event were simple enough: each team had to steer their self-made, remote-controlled boats through the various obstacles and checkpoints. The PET bottles-turned boats, as they seamlessly sailed through the race course, were propelled as much by the enthusiastic crowd support as they were by their in-built propulsion systems. Testing not just the participants' ability to engineer a remote controlled propulsion-based system but also their maneuvering skills, the race was an instant hit with the participants, many of whom enthusiastically doled out suggestions to make the race track bigger and more challenging. After all the initial few rounds, the competition narrowed down to four teams, each team bent on proving its mettle. Equipped with the knowledge of the race course outline along with the check points beforehand, the teams were expected to build boats which would best serve their purpose. Taking into account the size of the racing arena, smaller boats had an advantage over the bigger ones. It came as no surprise then that it was one of the slicker, more compact boats, which managed to course its way to victory. Amidst much fanfare, the event came to an end, with the promise of returning with a bigger and better format next year.

Connect the Dots

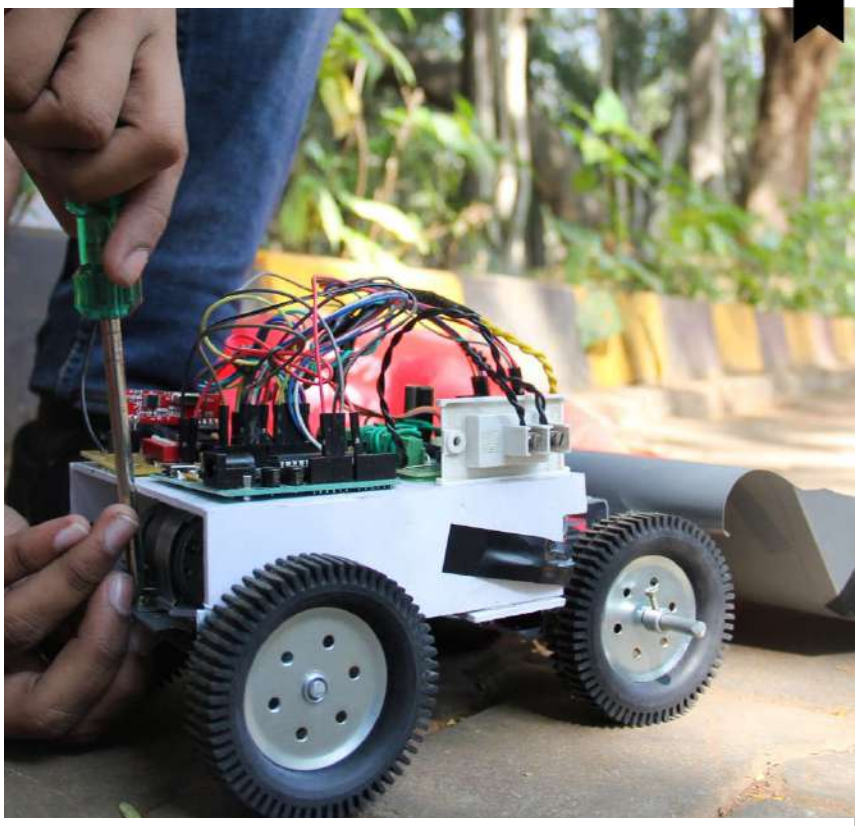
Sayantan Khan

It'd just been one day of Pravega, but events were picking up pace faster than ever. The second day featured the second of the major programming events, Connect the Dots. Connect the Dots is a treasure hunt styled programming contest, with a series of programming problems, each only accessible if the previous one is solved. That this event would be popular was evident by the sheer number of registrations before the event as well as the geographical diversity of the participants, from Chennai to all the way to Surat.

However, before the participants could test their mettle in front of their computers, they had to get through a preliminary written round. The preliminary round consisted of problems from various domains of theoretical computer science, from complexity theory to graph theory to enumerative combinatorics. To get through, you not only had to be good at programming, but had to have strong fundamentals in mathematics as well.

As for the finals, five teams managed to get through. And all of them were itching to get their hands on a keyboard and code away. And so began the event. The teams had to solve seven problems in sequence, each problem harder than the previous. And the catch was, they couldn't even open a subsequent problem without solving the current one. All the teams were off to a good start, with all but one team solving the first problem within ten minutes. Then things started getting a little trickier, with the teams taking quite a while to solve the next problem. And so it went on for the next three hours. One team managed to get way ahead of the others, solving all 7 problems with 15 minutes to spare. At the end of the event, the positions were clear. The team from R. V. College of Engineering, the same team that won Gnidoc on day 1 of Pravega, had managed to win this contest as well. The team that came second was team of PhD students from IISc itself, and the third place went to the two member team from Chennai Mathematical Institute.

ENGINEERING



Fifth Gear

Naren Manjunath

Bright, clear, with a light breeze and no hint of clouds- perfect racing conditions at the J N Tata parking area on the last day of Pravega. The competition was going to be intense throughout the day at Fifth Gear, the premier racing event of the fest, with the teams lining up carrying a lively assortment of wheeled contraptions, waiting to test them out.

The qualifying round was a deceptively simple-looking 8- shaped track that the participants had to go around without disturbing the barriers that lined the route. There were a few sweaty moments, but most teams managed to qualify for the main event. The track was straight out of a fantasy racing manual: there were blind turns, tunnels, muddy stretches of road, an obstacle- filled chicane and, most impressively, a large vertical loop in the centre of the track that the cars would have to navigate across. This was a test that called for strategy as well as skill: there were extra points for taking the riskier obstacles, but too much bravado would result in the loss of precious time.

As the teams slowly started getting their cars onto the track, the tension in the crowd swelled along with the number of onlookers. Each successful navigation of obstacles drew cheers from those present, and a loud roar scattered the birds perched on the nearby trees when a team managed to cross the imposing wheel for the first time. The action was breathless and intense from start to finish, and the spectators got their money's worth- just what you would expect from a high- octane car race.

MATHEMATICS

The Auction

Ishan Agarwal

The Auction - this exciting Maths event was one of the sleeper hits of the first day. The coordinators were apprehensive whether this brand new event will draw much attention - but boy, were they in for a shock! With many spectators around, the finals took place with 13 teams - a much larger number than expected - selected after a well fought out prelims.

The event was a second price auction, the highlight being that the highest bidding team got the goods being auctioned at the second highest bidder's price. This led to an interesting situation with teams trying to outsmart their competitors by various means: sometimes by saving their cash (which was initially allotted equally to all teams) for buying goods in the later rounds at dirt cheap prices, by bidding higher than even the amount of cash that they had. Many other interesting strategies were at play to take advantage of the second highest price rule.

In the prelims the same rules had been used only with slower rates of depreciation of cash value/appreciation of goods value and hence all the finalists had got the hang of the event before the finals. As a result, the viewers were in for a well fought and engaging final with the teams designing and implementing whatever strategy they thought would give them the highest total value at the end of the auction.

The event had many tense moments especially when ties occurred with the teams having to raise their bids in the event of a tie. With teams being disqualified if they had ever to pay more than their current cash value and many arguments ensuing, the event drew a significant number of spectators. The Auction had a fitting end with the last bid running into a tie many times and provoking an agony of suspense and debate for one and all.

PHYSICS

The Armchair Physicist

Ishan Agarwal

"Sadly we do not have any armchairs here, but we do have an ample number of physicists," with these words began one of the most interesting and enjoyable events of Pravega, with the five finalist teams battling it out over five rounds of quizzing and demonstrating their ability to think on their feet. More than fifty teams took part in the prelims which attempted to test the theoretical knowledge of the participants. Finally five teams were selected, and the finale took place in the cosy Seminar Hall A of the JN Tata complex. The contestants were posed with questions which required them to use their knowledge of physics and put their thinking ability to the test in various contrived innovative situations.

The cherry on the cake was indeed the excellent quizmaster Professor Venkataraman of the Physics Department, whose experience with the subject as well as his lucid explanation of the answers was universally appreciated. The real challenge of the event was the fact that the teams got only a couple of minutes to work out the problems. This was a quiz with a difference because not only did the teams have to give the correct answer, but also provide a clear and logical justification for their claim.

The quiz was a closely fought affair with the teams demonstrating some good thinking skills and solving problems such as the very last question of the quiz: a short excerpt from the movie Gravity in which teams had to notice that in space one cannot "cry" because the tears would simply accumulate around one's eyes in a blob.

Overall the quiz was a grand success with the audience and the teams thoroughly enjoying themselves. The audience actively participated and often even solved questions that all five teams could not. The explanations that the teams came up with and subsequent discussions with Professor Venkataraman were thought-provoking, and educative and left all enthralled.

PHYSICS

Dexter's Laboratory

Subhayan Sahu

For the Physics team of Pravega, the first day began with volunteers scampering around the OPB area putting up posters for Dexter's Laboratory in all the registration desks. It wasn't without doubt and apprehension that the volunteers were working for the event from the morning – the Pravega fever hadn't really reached its peak in those early hours and Dexter's Laboratory, being one of the first technical events of the day, had the risk of not having enough participants. However, the looks of worries were the first things to go when a motley crowd of science and engineering students from various colleges from India appeared in front of the Old Physics building to take part in an event that was a revamped version of last year's highly successful Experimental Physics. 29 teams, with many familiar faces from last year, took part in the prelims which consisted of challenging MCQs on various topics in Physics and a laboratory procedure that they had to decode.

6 teams were selected on the basis of their prelims marks for the finals. The finalists were mostly from Bangalore, with one team from NCBS and one from the University of Hyderabad. The finals included two experiments – both Nobel Prize winning ones, experiments that shaped Quantum Theory in its initial years. They were asked to analyze new models of these well known milestones of 20th century Physics. A team from NCBS, Bangalore opted for the Bonus question which made the finale end on a very interesting note. The Bonus question required them to take a reading in an experimental setup they had not seen before, without a proper handout – that too in just 15 minutes. However their decision to risk it turned out to be lucrative as they stood first, courtesy the extra 25%. The team from RV College stood second while the three from Hyderabad came third. But everyone left with a broad smile on their face – satisfied with the event, that challenged their grey cells.

Physics Yarns

Spandan Dash

The art of problem solving in Physics requires ingenuity and patience. On the last day of Pravega, there was an abundance of both of the qualities to be found in the participants who endured a grueling preliminary test among more than 45 teams to come up among the top 6. Not to be deterred there, the 6 teams continued their marvelous performances even in the nerve-wracking three and a half hour final round. The questions were tough and so were the principles of the participants. Each team was given one question to discuss and solve in 45 minutes and later present it to the rest of the teams as well as the audience. The question answer session was at the end of each presentation and was also the source of most of the fireworks. Questions burst forth, answers were precisely determined, sound physical principles were built and at the end all of the teams left energized by their revised and expanded view of the Physics involved in real life. The ultimate winners were the IISc UG team and they were closely followed by the teams from Christ College and RVCE, who came joint runners up.

MISCELLANEOUS

Fun Zone

Gautam A Kavuri

Sherlock Holmes, in 'A Case of identity' remarks, "It has long been an axiom of mine, that the little things are infinitely the most important". The fun events at Pravega were no exception. Small on prize money and publicity, but huge on entertainment and excitement, they were the clear winners in terms of footfalls at the MLH/Food-Zone area, filled with heavyweights like the R.C. Boat race, GNIDOC and Mad Ads on Day One and Connect the Dots on Day Two. As interview after interview revealed, participants marveled at, and reveled in, the sheer variety of the contests.

The Archery event, which was organized by Vikrampal Singh and Shabaz, both PhD students of IISc, hit all the right spots with the participants, who had to aim at a Bull's eye around 15 – 20 ft away. The best marksmen were given E-Bay coupons and Gatsby goodies, staples at all the fun events.

Also very popular was the 'Selfie Spree' contest, which required contestants to snap 20 selfies in 20 minutes, each with one of 20 different things, like dogs, cycle stands and coordinators, in the background. It saw around fifty registrations on the first day, and one winner of the ultimate prize: a Pravega mug, for successful completion of all 20 shots. The selfies were uploaded on Facebook (#pravega).

'The Chef Within' proved to be interesting at least for the non-participants, who got to be food critics for a day, and graded the prepared salads.

Liquid N_2 ice-cream, where volunteers helped attendees make instant-ice cream by rapidly cooling a mixture of milk and sweetener, wowed dozens of Pravegans on Day One.

Also on display was a 10' x 10' Snake 'n Ladder Board, complete with a monster die that gave the age old classic a whole new spin.

Slow cycling and card stacking, which moved from OPB to the MLH on Day Two, rounded up the events that turned the MLH lawns into the centre d' attraction at Pravega.

MISCELLANEOUS

Innovative Solutions, 3M: Talk by R Krishnamurthy

Pranav Kantroo

The speaker, Dr. R. Krishnamurthy, began his talk by introducing 3M to the audience and discussing what the company is all about. He introduced a few of the company's consumer products that are directly visible to us in the market and some back-end products that are used by other industries. He explained that a large chunk of the company's resources went into research for finding solutions to problems and packaging these solutions in the form of a product for use by the consumers. He then shifted to elucidate on the company's long history and some of the most important products developed by them.

He then explained that the company conducts research by developing functional modules of working technologies that are woven together to create new and innovative solutions. He represented this idea in the form of a periodic table of technology modules. He emphasized that a larger part of the challenge lies in continuing the work culture of innovation, when one has geographical barriers. He mentioned the idea of a web forum to discuss research projects being conducted around the globe by the company, to bridge the distance divide and enhance collaboration. The talk was followed by a question-answer session with the audience where he discussed the idea of dependence of the optimal solutions to a problem on the context of where it is to be applied.

MISCELLANEOUS

Science Quizine

Shankar N. Sivarajan

Under the aegis of Thejaswi Udupa, who is apparently legendary within quizzing circles, over a hundred teams participated in the science quiz in Pravega, the Science Quizine! Eight teams secured a place in the finals, among them were the returning champions, but before the finals began, there was a prize for the best team name, which was won by "Schrodinger's Guesses".

The team names chosen by the finalists weren't too bad either, including "Schrodinger's cat vs. Pavlov's dog", the "Sex Pistils" and, a nod to the appellation of our Noble and Most Ancient Fest, "May the Mass times Pravega be with us."

The first question asking about the effect of the separation at Thingvellir in Iceland, a question which incidentally none of the teams on stage answered correctly (the formation of the Atlantic Ocean); it set the tone for the rest of the quiz. All the questions were firmly grounded in the scientific fields, under a sufficiently liberal definition of science encompassing geology (the aforementioned question of Thingvellir), astronomy (recognizing and connecting pictures relating the Perseid and Leonid Meteor Showers) and biology.

A few of my favourite questions in the quiz were regarding the symptoms of the fictitious Renfield Syndrome, the not-so-fictitious Leibenberg Syndrome, the unusual relationship between the spadefoot toad and the horsefly, and the sociopolitical impact of the bloodfluke in 1949. (If you knew the answers to any of those, congratulations!) Knowing more interesting facts about "science" now than before the quiz, I thoroughly enjoyed myself, even though I normally abhor quizzes that focus on celebrity gossip like, say, the name of Olivia Newton-John's grandfather (terrible example, considering that it's Max Born, but you get the idea).

MISCELLANEOUS

The Terribly Tiny Tutorial

Subhayan Sahu

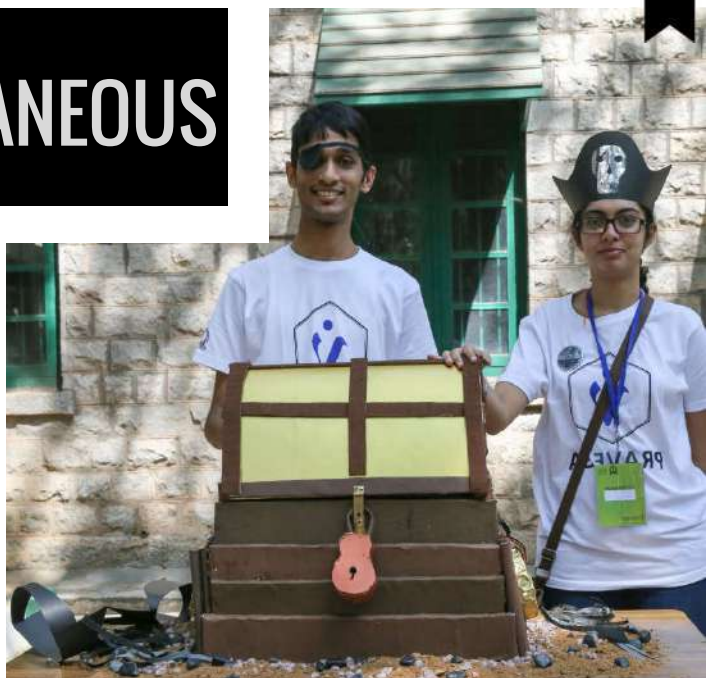
They came.
They wrote.
And, they conquered.

The not-so-tiny internet forum of Terribly Tiny Tales, cultural partners of Pravega '15, arranged for a Terribly Tiny Tutorial for its many admirers on the second day of Pravega. The one and a half hour long workshop enraptured the audience in the Seminar Hall A of the JN Tata complex.

Anuj Gosalia, one of the founding members of the social tweet-sized storytelling forum, dressed in a black hoodie with the characteristic ttt design, spoke about how this flash-fiction forum came about. A student of Commerce, Anuj and a few other like-minded friends wanted to rebel against internet idiocy and wanted a platform of their own. So, in the summer of 2013 they started the page which has now become the toast of literature-lovers on the internet. A group of 18 dedicated members, ttt aspires to cater to the need of the internet generation – generating intellectual micro-content with a strong storytelling component.

Towards the end, he asked the people present there to come up with a tiny tale containing the word 'begin'. What followed this twenty minutes long assignment was an enriching session of decoding the secret behind getting the perfect micro-tale. When Anuj was asked at the end of the tutorial to express his thoughts on Pravega, he said that if one word can capture the essence of both the two year old fest and his own two year old venture, it is #growth.

MISCELLANEOUS



Treasure Hunt

Sahana Rao, Sriram C. and Pranandita Biswas

Just as the Pravega ship embarked, a bunch of curious people in pirate hats and eye patches took it upon themselves to safeguard the gleaming treasure chest from the throngs of onlookers who could do nothing but stare and take selfies with. All this was in preparation for the itinerant extravaganza – the Treasure Hunt.

Late next morning, over 500 registrants flocked towards the desks at the Old Physics Building to participate in the prelims of the Treasure Hunt. The contestant teams were to solve rebus puzzles and find their way to one of the four designated engineering departments, where the best teams would be selected for the final. A brain racking and frantic rush ensued and within an hour, we had a list of potential finalists. After a lot of deliberation by the coordinators, 8 teams were selected to be the finalists.

The 8 teams promptly assembled at OPB with their tummies full. B-Twin cycles were arranged for all the 8 teams (each comprising four members) with the help of Namma Cycle. Once the first clues were distributed to all the eight teams, the thirty-two participants sped off on their racing bikes. In no time, one team cracked their first clue, and the finals officially started. Other teams also, gradually but steadily proceeded to crack the clues and in half an hour, all eight teams had set off on their separate trails in pursuit of the 'treasure' along with the parallel scavenger hunt. The clues were simple but logical and so everyone needed to think out of the box. After a hectic but energetic two and a half hours of cycling, one team successfully finished cracking all the clues and found the key which was strategically positioned on the map so that the 6 clue places formed an X with the key placed in the center. The winning team was given the choice of not ending the event so as to complete their scavenger hunt as well. By around 5.45, the entire event came to a grand finish with around 50 students huddled around the chest. Once the three locks were opened and the lid was raised, a resounding 'Ooooh' was let out by the dazzled crowd. The gleaming chest was filled with gold coin and gold bar chocolates, a parchment of the map, imported chocolates and scores of yummy candies upto the brim. Grinning, the winners surrounded the chest and looked thoroughly satisfied with their treasure. Other chocolates were given to all finalists and extras were gleefully shared by the volunteers. The entire prize pool of 10,000 rupees was split by the first three teams and thus the memorable event came to an end along with a lot of moments to remember.

MISCELLANEOUS

Idea presentation for school students

Spandan Dash

The Seminar Hall B resembled a fortress on Day 1 of Pravega. There were four groups of three students each, each of them eagerly waiting for the opportunity to show their strength. Strategies were being made, points pondered upon, answers were being discussed to probable questions and last minute efforts were being made to modify their presentations.

The rules were simple: each group had 15 minutes to showcase their presentation on their chosen topic of either waste management or water resource management. And boy, they came up with the goods. One team showed a video of a place where recycling bottles was turned into a game called a 'Bottle Bank Arcade'. They stressed that such ideas of fun induced activities will go a long way in curtailing inefficient waste disposal activities.

Another team opened with a bang by doing a short skit on the common Indian mentality on garbage disposal and stressed on a change. Invoking Gandhiji's dream of a clean India, they showed the hypocrisy of the common person who wanted a clean India but was in no mood to contribute.

It clearly had been a fantastic event and the judges were impressed. The runners-up trophy went to Manas, Subhankar and Sourya of the GEAR Innovative International School team and the winners were the RVK School team comprising of Akarsh Balaji, Chirag B. Miskin and Chandravaran Kunjeti.

However, through their innovative and engaging solutions the teams reinforced the idea that they were all champions. More importantly, they also reinstated the belief that the development of new ideas for the benefit of the common man, even at the school level, is not dead.

MISCELLANEOUS

Talk by Dr. R Balasubramaniam

Pranav Kantroo

Dr. R. Balasubramaniam is a development scholar and activist; he is most well known for his pioneering development work with rural and tribal people in Karnataka. He was an invited speaker at the Pravega Lecture Series of the first day.
He started his talk with a series of questions to the audience addressing the issue of inequitable distribution of resources among the masses of the Indian populace. These thought provoking questions resonated very deeply with the audience and brought home the point that we live in a strange world where we can talk of sending probes to Mars but are unable to provide hygienic sanitation facilities to our people.
He went on to propose ways to evaluate the notion of progress and understand our current situation in that light. He explained that the concept of economic growth has limited scope and does not encompass the full scale of the progress that a society has made. He emphasized the importance of developing human and social capital for the welfare of the society, and illustrated through an example how a single man could help weave a social fabric that would tie together prosperity and well being for many.
He then turned to say that the welfare of the society starts at the level of its elementary constituent- the individual. He gave a five-point formula for transforming oneself to a leader that leads the society and works towards social upliftment, attributing the ideas he presented to Swami Vivekananda. In a way, he reconciled the apparent conflict between our traditional knowledge and modern science.
His talk was followed by a series of questions from an eager audience. Overall, it was an amazing experience.


Cultural
events
and
activities

Literary Decathlon

It was Day 1 of Pravega 2015 and the JN Tata Auditorium was seen buzzing with activity, where teams had gathered for the first major event: The Literary Decathlon. The first of its kind, this event was an amalgamation of a bunch of literary challenges, such as cryptic crosswords and other word games, along with testing speaking skills and quick wit during the onstage rounds. Offering a refreshing change from the other technical events that filled Pravega's schedule, participating teams found themselves stumped by the intricacies of the preliminary round question paper that they had to crack, in order to qualify for the finals. The teams had to be repeatedly fed clues in order to help them proceed. A total of nineteen teams, most comprising three people and a few teams of two, battled it out in the preliminary round. Six teams were selected for the onstage finals, which commenced at 1:30 pm. The finals, consisting of nine events, began with a traditional spell bee. This round had a few teams tripping over their own tongues as they tried to spell both simple and complex words in a loquacious dictionary style. In the second round, we witnessed team members try to captivate the audience in Just A Minute. Fictionary, the third round, had the teams trying to beat the dictionary by providing definitions of their own to outsmart the competition.

The other rounds for the event included buzzer rounds of rebus puzzles and a few traditional party games like Taboo and Jumble. The more unheard of word games such as Ghost and Summit kept the teams on their toes at all times.

The programme concluded with a debate round, in which team members were assigned a specific character and had to justify why they should be awarded the Nobel Peace Prize. In the end, the team comprising Aditya Hebbar, Pranav Garg and Sathyaageeswar S from IISc emerged victorious.

Ashok Suresh Das

LASYA

Sahana Rao

The third and final evening of Pravega 2015 was welcomed by a full audience at JN Tata Auditorium eagerly waiting for the fest's dance competition, *Lasya*. The event kicked off with a performance by team '*Jhankaar*' of Nitte Meenakshi Institute of Technology. This theatrical contemporary dance titled '*Samvitti* - the judgement' depicted the life of a common girl who is wrongly accused and misjudged by society, but forces them realize their folly through her grit and determination. The judges took a moment to compose themselves after this compelling performance and the audience was struck by a tacit realization of the persuasive power of dance. After the applause had subsided, the next team '*Srijoni*' from IISc, was invited on to the stage who performed an Odissi portrayal of the ten incarnations of Lord Vishnu, the God of preservation. This performance was greeted by enthusiastic applause indicating that it had lived up to the expectations set by the previous group. The next team on stage - 'Sanskrithi' from PESIT had everyone in the crowd tapping their feet to Agam's *Malhar Jam*. Through Indian classical and contemporary dance, they described the beauty of nature and how it holds the key to aesthetic, intellectual and spiritual satisfaction. The atmosphere of the auditorium underwent a drastic change with the electrifying Bhangra dance by our very own Yaara da Tashan who swayed their hips and grooved to peppy Punjabi and Bollywood songs. The audience then cheered on the youngest group of participants from Natyalahari School of Dance dressed like court dancers who performed a Mysore Jathi, an invocatory Bharatanatyam piece.

The flamboyant costumes and agile movements of the next group who called themselves 'Footprints' from R V college of engineering, treated us to an entertaining tribal-inspired contemporary dance. Their dance 'The Hunt' encompassed the changes that the concept of hunting had been subjected to over time. The defending champions, team '*Lasya*' from M S Ramaiah Institute of Technology, were welcomed on stage with much cheer (such wow. Lel). Clearly determined to live up to the fame they had garnered from their winning performance last year, they delivered a soulful performance drawing parallels between the distraught *Draupadi* during her *Vastrāpaharana* and the struggles of the modern woman in society. The final performance of the day saw the trendily dressed 'Dance Troupe' from NIT Trichy pop 'n' lock their way to the second place, winning ₹25,000. The first prize of ₹35,000 was won by the star performers of the day - *Jhankaar* from NMIT much to their and the crowd's elation. The defending champions, although beat were not completely unsuccessful as they managed to secure the third position as consolation. The audience, after this visual extravaganza merrily marched towards the next and final event of Pravega, the pro-night.

BATTLE OF THE BANDS

The scene was an idyllic late afternoon – the first day of Pravega was coming to an end. It had all the makings of a fine evening. The venue was the vast levelled cricket ground at the IISc Gymkhana. The event, of course, was the much-anticipated Battle of the Bands finals, for which preliminaries had been held earlier in the cities of Delhi, Kolkata and Bangalore. And four teams were prepared to duke it out in this face-off of epic proportions of drum rolls, guitar riffs, and vocal intricacies.

"More treble on the lead monitor", and the like were the plaintive calls of the bands going through their respective sound checks as the beginnings of a crowd milled about near the stage, anxious to start. The event finally got off to an energetic start with Chrome.o.soul, from Chennai. They started off with highly fresh and innovative original compositions including the delightfully named Beef Biriyani, which was a hit with the crowd. This was followed up by a jazz based retake of Michael Jackson's Beat It. The band, who quoted the famous pop star as the main inspiration for most of their songs, were clearly enjoying all the attention that went their way, and mentioned that later. Their music involved very catchy, funky tunes and were backed up by powerful vocals and incredible beat transitions on the drums.

Their performance was followed up by What's In A Name from Bangalore, who presented tight garage rock. The main feature of their performance were their rhythm build ups, and their nicely layered tunes. Their vocalist was very impressive too. They played three original compositions which included Groove Shark, and Change, and followed it up by a rendition of Jimi Hendrix's famous Voodoo Child, which set the crowd wild. The atmosphere was by now approaching that of a large gig. The band was really blown away by the crowd response to their performance.

Next up were Stereonoid from Delhi. They played to the crowd's heartstrings, performing sound check to Nirvana's Smells Like Teen Spirit, which sent everybody into raptures. Describing themselves as a post – grunge outfit influenced by Pearl Jam, Alice in Chains, Audioslave and Red Hot Chilli Peppers, they presented three energetic original compositions like Woo You, Eyeful Of Rain, and Still alive. The defining features of their music were the throaty vocals, incredible dexterity on the bass, and sharp, quick drum sequences. They were well received by the crowd as well, and they later described the venue as "huge".

The final act of the competition was performed by Crazy, from Bangalore, who brought alternative pop rock into the mix. They had very clean, snazzy tunes and beautifully constructed guitar melodies. They set the whole crowd on their feet with their own composition, Go With The Flow, which people liked so much that they had to perform an encore.

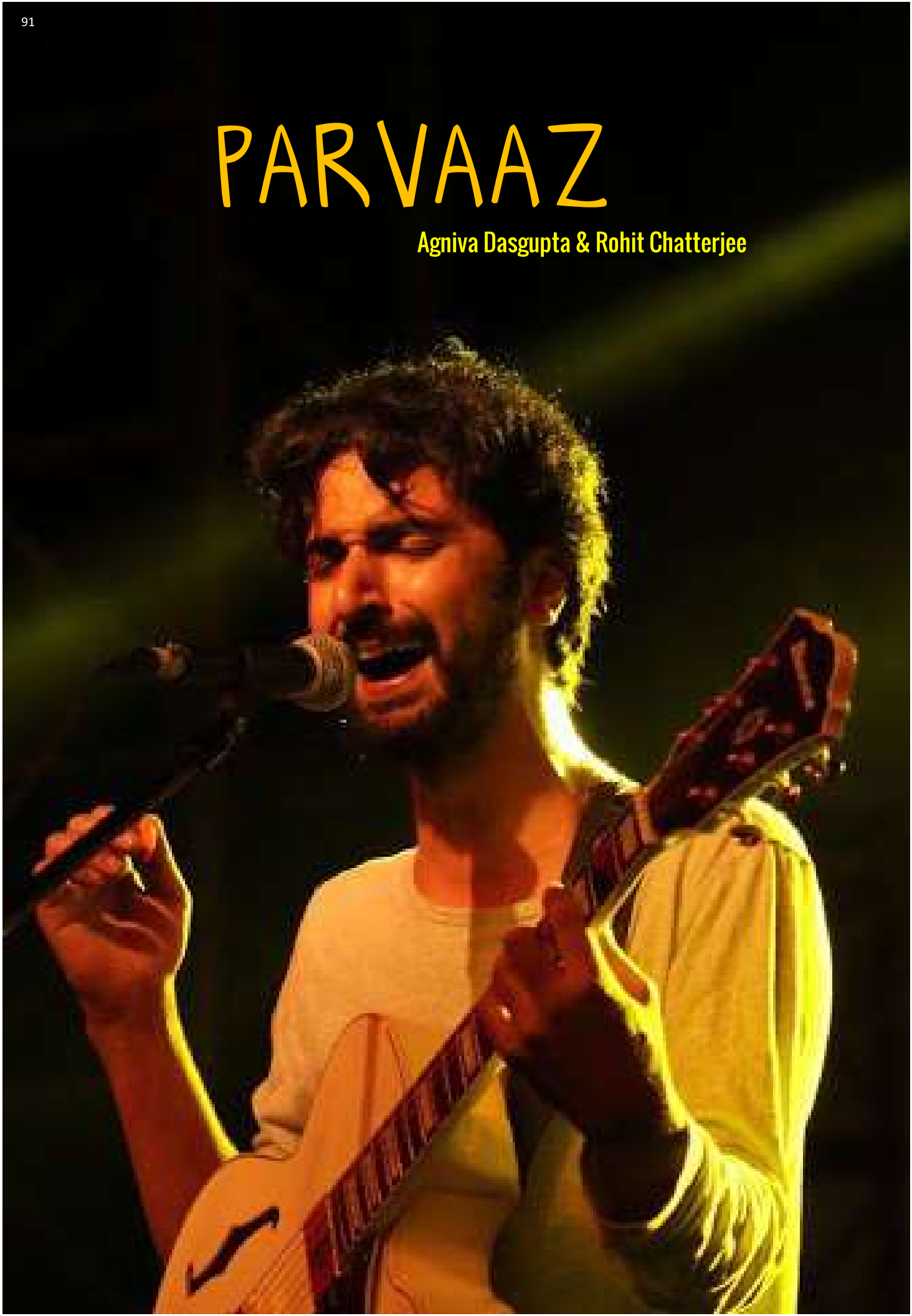
This brought the events to a close, and soon, the results were declared by the three eminent judges -Narayan Shrouti, Kamal Singh, Prakash K N, all ex members of well-known bands. Chaman Singh from What's In A Name, bagged both the Best Vocalist and Best Guitarist awards. Rahul and Reshwin from Chrome.O.Soul were adjudged the Best Drummer and Best Bassist respectively. Finally, What's In A Name were declared runners up, and Chrome.O.Soul were adjudged the winners.

It was an enriching and entertaining experience for all involved, and everybody went back with their fill of good music.

Agniva Dasgupta & Rohit Chatterjee

PARVAAZ

Agniva Dasgupta & Rohit Chatterjee



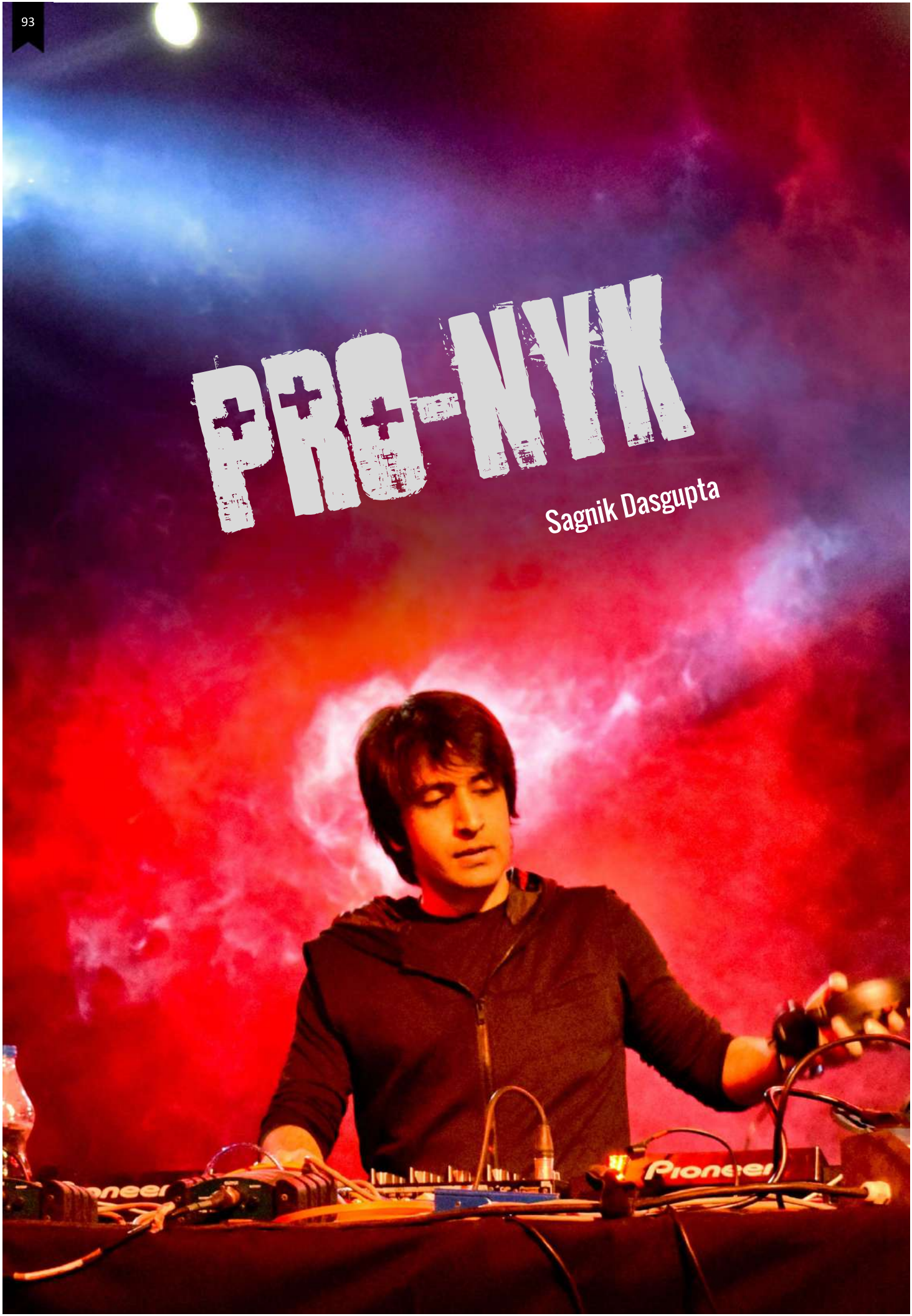
The first pronite of Pravega played host to the popular cultural event: Battle of the Bands, which saw 4 selected bands from all over the country fight it out in the Gymkhana grounds.

The finals was headlined by Parvaaz, a Progressive Rock band from Bangalore. They took over the stage for a limited period of an hour, but when they left the stage they had enchanted the crowd with a mystic blend of powerful vocals, guitar riffs influenced by the likes of music legends like Pink Floyd and very unique and soulful drum beats. Their tracks included Behosh, DilKhush, Roz Roz, among other brilliant compositions. The crowds were in particular impressed with very smooth transitions in their songs and the innovative use of music effects that led to amazing build ups of each of the songs. They succeeded in creating a sound that resonated with every single individual in the crowd.

The response of the crowd was also highly appreciated by the band itself, who later expressed their joy in playing at such a beautiful outdoor concert. Parvaaz also expressed the high regard that they feel about contemporary Indie bands, describing them as sources of inspiration as well as great to play with. The audience for Indie bands, according to them, is growing at a healthy rate. When enquired about the very specific audience that they have, they commented that the unique fan base stems from the kind of music that they play. Their compositions are, in their words, based on “our lives and experiences we’ve had.” They compose their music first and then write the lyrics in harmony with the composition, which explains the complex, layered structure of each of their songs.
It is clear that this band, who are now five years old, are destined for greatness, and along the way will keep on rocking crowds with their soulful music.

PRO-NYX

Sagnik Dasgupta



The night was calm, too calm. The imminence of an approaching storm hung over us all. The tranquil evening was stirred up as DJ Ansh, artiste eminent of Bhubaneshwar, dropped electronic tracks that spiced up the atmosphere at the gymkhana grounds. The excitement was kicked off with a selection of Bollywood mashes that got the crowd moving. Hands in the air, feet off the ground, the heat was rising as DJ Ansh played his thumping mixes into the chilly night air. The crowd surged in excitement as he cued, "IISc, Make some noise!" The boom of energy, fuelled by the latest Bollywood music with synth and strobe, reached heights as the beats rose and fell.

He chugged on with a number of international EDM hits like Hardwell's Apollo and a remix of Martin Garrix's Animals. By then the crowd was in a condition of ecstasy. The 'state of trance', as it is referred to in the language of EDM, had already embraced the gathering. The enthusiasm was never let to drop, even as the bass did. The excitement was further boosted as the DJ threw Pravega t-shirts to the audience.

Just as people thought that their evening was drawing to a close, the realization drew upon them that the party was just getting started. As the famous DJ NYK entered the stage to present his 'The ElectroNYK Show', the crowd burst into euphoria. Despite the fact that the visuals could not be displayed, owing to unforeseen technical issues, its absence wasn't felt as NYK dropped a great many Bolly-mixes as well as international tracks like Armin van Buuren's Ping-Pong. The start of the track Ping-Pong was a remarkable sight as the entire crowd waved their hand to the beat in perfect unison, as a feel of unity swept through what was now a colossal dance floor. With phrases like, "Everybody put your hands in the air", it was made sure that the energy never died down.

DJ NYK's electronic extravaganza was a clear sign that he was a master of his art. The transitions were neither mere cross fades nor abrupt switches, but were more like a fine synchronisation of beats and pitch. His skills in judging timing while adjusting the filters and volumes were impressive. Also his choice of use of the filters was remarkable. The ending was also a very creative manipulation of filter and tempo.

Technicalities aside, all the spectators unanimously agreed that the evening was a scintillating experience. It was also marked as an event of significance being the first time a major DJ had performed at IISc. It was a fitting end to an exciting 2nd Day.

Indian Ocean

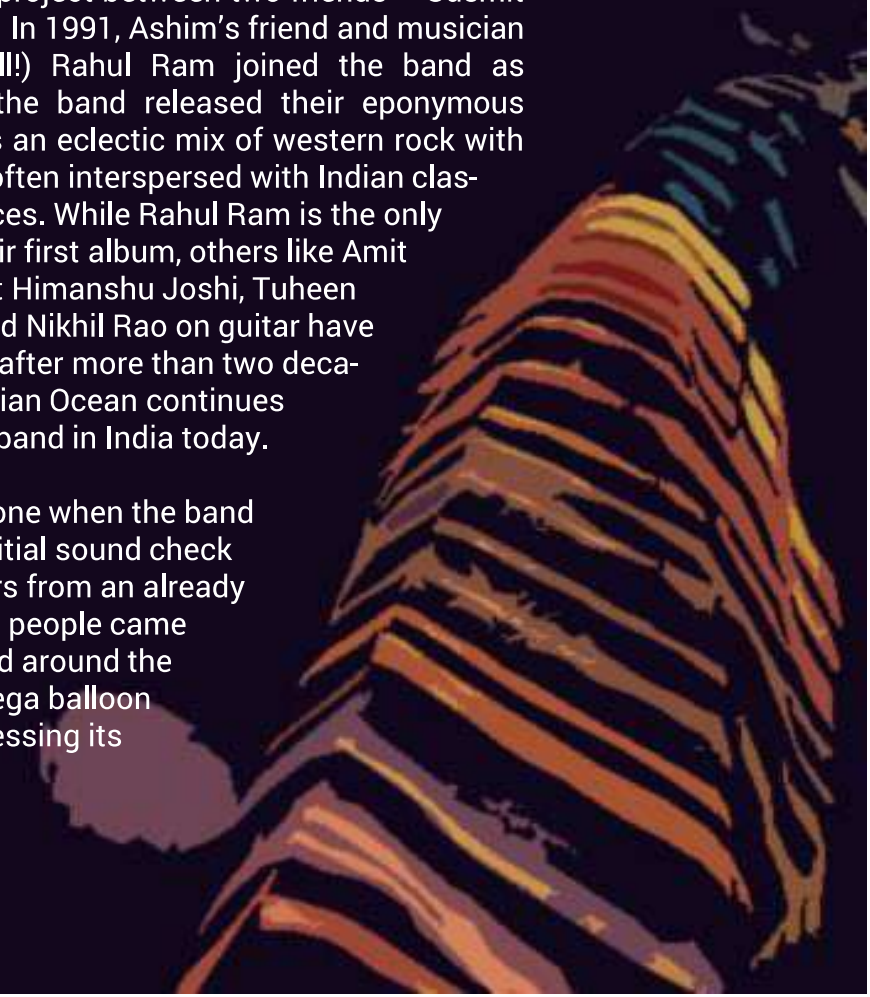
LIVE IN CONCERT

Subhayan Sahu

It is not often that one finds the usually indolent students of IISc fraternity gather in hordes to enter the Gymkhana grounds - after all, research is hard work and not many find the prospect of hitting the ground exciting. But boy, did they hit the ground running to catch the third pro-night of Pravega live! Quite understandably so; it was Indian Ocean performing at IISc for the closing event of the 3 day extravaganza that was Pravega 2015.

Even a neophyte will agree that Indian Ocean is one of the biggest things that has happened on the scene of Indian Music in the last three decades. As a band, Indian Ocean was born in 1990 in Delhi as an experimental project between two friends – Susmit Sen and Ashim Chakravarty. In 1991, Ashim's friend and musician (cum chemist from Cornell!) Rahul Ram joined the band as bassist and vocalist and the band released their eponymous debut album. Their sound is an eclectic mix of western rock with strong Indian folk element, often interspersed with Indian classical, jazz and other influences. While Rahul Ram is the only remaining member from their first album, others like Amit Kilam on the drums, vocalist Himanshu Joshi, Tuheen Chakravarty on the Tabla and Nikhil Rao on guitar have joined the band since. Even after more than two decades from their inception, Indian Ocean continues to be an extremely relevant band in India today.

Hence it didn't surprise anyone when the band got on stage at 7 for their initial sound check and immediately drew cheers from an already 3000 strong audience. More people came trickling in till 8 and gathered around the centre stage, with the Pravega balloon swinging wildly above, expressing its approval.



Rahul Ram, always the showman with his jovial nature and characteristic beard and headband, took no time in creating a rapport with the crowd. Even the sound check was a treat for the audience, with Ram quipping in with occasional wise - cracks. While the musicians got off stage for their final dress up (Rahul Ram was kind enough to take permission from the crowd), Coke studio, the official sponsor of the event, kept the crowd occupied with their videos on the background. Their Make a Wish campaign struck a chord among the audience, as they were more than willing to write their wishes on stickers and stick them on the balloons for the company.

Once all the preparations were done, and the musicians were on stage once again, a characteristic hush fell upon the audience, eagerly waiting to be served a memorable night of music.

Their first number, Behne Do, was a song from their latest collaborative album – Tandanu. The soothing opening guitar and tabla jugalbandi with bold bass play swept the crowd off their feet. While Himanshu's masterly classical singing created the perfect setting, the bold chorus was what really got the crowd going. Perfectly complementing Rahul, Amit and Himanshu's soulful singing were Tuheen on the tabla and Nikhil on the guitars. The atmosphere was electric to say the least, with the crowd jumping with the beat and crooning along with the musicians.

Rahul Ram addressed the crowd atop the loud cheer that followed the first song. He said how Indian Institute of Science was always a special venue to perform at. He fondly remembered the beautiful campus from the last time he performed in the campus more than a decade ago. He also spoke of his friend from the IISc community – Professor Rudra Pratap – a friend from their Cornell days, and was pleasantly surprised to find the Professor himself in the crowd! He also mentioned that he heard that mess food in IISc was much better than in his alma mater IIT Kanpur, to which the crowd had a mixed response, many not sure whether to agree or not.

Adding that the band had been performing for seven weeks straight across the country, Ram said that they were planning to perform more off beat songs for the IISc crowd. Next in their list was Kya Maloom, a rock anthem with heart touching folk sounds. Originally a traditional hindi song, it was given an Indian Ocean treatment in their cult album Kandisa. The crowd loved every moment of it, as evident by their spontaneous participation in the chorus sounds. Following that was a 500 year old Kabir Doha – Jhini Re Jhini, which received a lot of crowd adulation as well.

As the song ended, a lone voice from the crowd came up with a request – Bande! As many others joined in, Ram, who is a half Bengali, acquiesced with a 'hobey, hobey' in his characteristic voice, much to the excitement of the Bengali folks from IISc. What followed was a magical performance of Bande, arguably their most famous number, with Rahul Ram unleashing himself on the stage with his vocals and bass guitar. Now, for a person who hasn't experienced Indian Ocean performing Bande live, it is difficult to imagine its pure magic. Rahul's intent voice breaking into 'Arre ruk Ja re..' sent shivers down the spines of everyone present. The following moments were shot in Technicolor, with blurry scenes of people jumping on their feet, cameras clicking and the lights dimming and coming alive with the haunting ballad in the foreground. Nikhil's strong guitar riffs, Amit Kilam's drums, Tuheen's tabla, Himanshu's soulful voice and a possessed Rahul Ram – a recipe for the best 7 minutes in one's life.

After the intense Bande, they followed it up with an instrumental piece from Kandisa – a recital named 'Leaving Home'. The music left the audience drugged and craving for more. They moved on to a very different song next - Tandanu Ta Nanu, a song from their latest album. A traditional Kannada folk song, it was retouched in collaboration with another musical genius – Shankar Mahadevan. Performing it for the first time without Shankar, Himanshu and co. did a beautiful job indeed. The language of music transcended the barrier of language as everyone lent their voice to the wonderful song.

It was a night to remember and the excitement and the energy in the audience knew no bounds. The most exhilarated were the volunteers, who had worked very hard indeed to walk Pravega past its second year and in the process helping it create a niche in the fest circuit of the country. Adding to their entertainment were Rahul Ram's frequent quips – ranging from Bangalore's by two coffee to PhDs going to music – with Nikhil and himself as partners in crime.

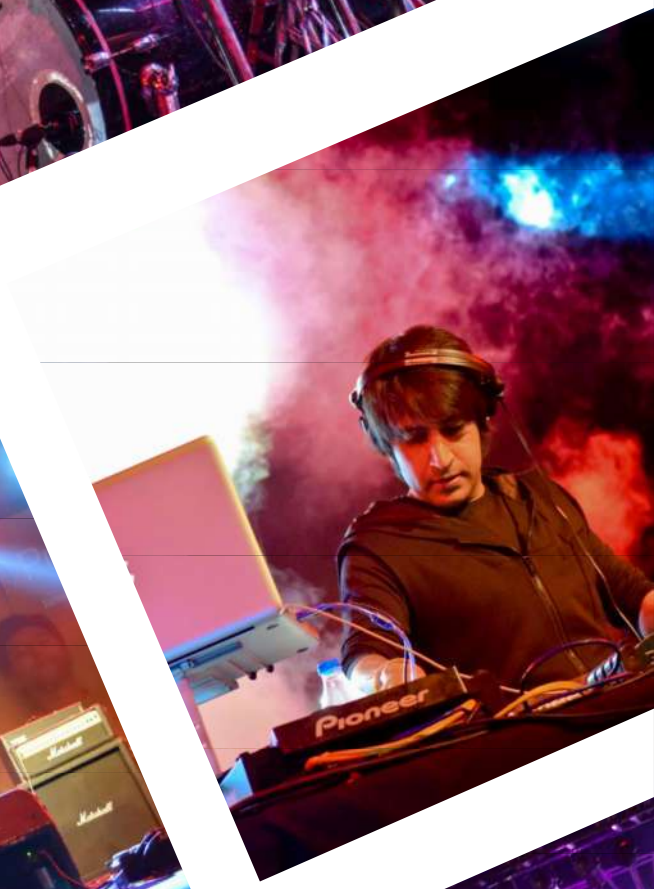
Next in line: Hille le. The peppy Bihari number was an instant hit with the crowd. Even better was when Ram broke into a Hille Le IISc! But the highlight of the show was yet to come. Ma Rewa – a beautiful folk song and a concert regular for Indian Ocean – came next. The band decided to give some singing practice to the crowd present and was in for a surprise! With the crowd matching the band note by note and beat by beat, Amit and Rahul finally said that that was one of the best musical crowds that they had had in all their 877 concerts till then!

With shouts of encore from the audience, the band took a break and vowed to come back for their last song after a brief video by Coke Studio. The disappointment among the crowd was evident from the drop in noise, but it picked up right away when the video started playing. It was a video on the three days of Pravega, set to the tune of 'Sunshine Waali Aasha' jingle from the Coca Cola ad campaign. With volunteers craning their necks to see if they featured in the video and everyone enjoying the memories of the last three days – it was a fitting farewell to the fest. This was followed by the band members releasing the bunch of balloons for the Make A Wish campaign.

It was time for the band to belt out their last song of the night as the clock was ticking to almost 10. They chose Kandisa, a beautiful original composition based on an Aramaic-Syric prayer song. Another concert regular, it was the right mix of energetic rock sound and soulful chanting. The crowd crooned along with the singers, wishing for the concert to go on and on.

That marked an end of Pravega 2015. It was an evening to remember – an evening when soul-churning music created many nuggets of wonderful memories.

Glimpses of PRO-NIGHTS


Pioneer

ACCELERATING WHAT?
A CRITIQUE ON PRAVEGA

Abhishek Kumar Mehta

The year before and this year, with great pomp and show, Pravega - the festival (or fest, for short) of the IISc Undergraduates took place. It was (as advertised) “the annual science, technology and cultural festival” of IISc, Bangalore. Pravega describes itself as a blend of science, technology and culture packaged in three days.

Just how scientific, technical and cultural was this fest over all?

The Scientific “Pravegan”?

Unfortunately, the organizers of Pravega (or “Pravegans”) failed to understand (or perhaps, look up) the definition of a science festival. There is even a Wikipedia article on Science Festival. A science festival, in essence, must propagate the philosophy of science or in some sense be able to demonstrate the scientific method to the general public. In short, a science festival is the celebration of scientific understanding of the world over any other methods or kinds of understanding.

Science is the poetry of reality, so says renowned Evolutionary Biologist Richard Dawkins. Just like poetry, science is moving, inspiring and beautiful. A science festival must reflect all what science stands for and stands on. We live in a society where pseudo-science, superstition and belief take precedence over science, logic and reason in all walks of life of an average person.

Shouldn't this be one of the strategic aims of, especially, an IISc Science fest, for IISc is what represents all the good science happening in the country?

IISc must have a science fest which represents what IISc stands for and what its foundations are. IISc stands for the principles of Science and on the philosophies of Science. This must be honestly represented by any fest which is ever conducted by the students of IISc. We must make a cultural as well as a political statement about the importance of Science through the science fest (which both the fests failed to make) and not just random noise (which is the prime motivation of the fest).

The fests we had were failures as science fest, according to me. Questioning everything, being curious, looking for reasonable and logical explanations, thinking about everything etc. are some of the fundamental ways in which science is done and scientific discovery and advancement owes itself to these. These fundamentals are very easy to implement for a scientist because it is his/her career. But a person involved in a non-science career may never get the opportunity to employ the scientific method or think about the things which might stop an average scientist on his/her trail so that he/she can give it a moment to think about it.

A science festival by definition must provide a platform for common people to implement the scientific principles and methods for at least one day in his/her life to look for answers to questions for which s/he may have had only his childhood days to wonder about. A science fest must create an atmosphere where scientific aptitude can thrive and flourish for as long as the fest lasts.

This can be done by organizing lectures on scientific phenomena in local languages for local people and teachers and students of state-government run schools.

This way we are not only doing the social service of making the scientific concept clearer and more available for the epistemologically less privileged", but we are also inspiring a whole new generation of scientists and engineers. Why did the Pravegans fail to implement or think about that?

"The University of Pittsburgh is ranked second overall, and the top public university in the US, as a "Best Neighbor" for positive impact on its urban community, including both commercial and residential activities such as revitalization, cultural renewal, economics, and community service and development according to the "Saviors of Our Cities" ranking."

Then why should we lag behind? Why not have a fest that results in a positive impact on its urban community, if not commercially, but at least culturally. For any civilization to be successful, the culture must be science-driven or science-inspired. A science-driven or science-inspired culture ensures constant supply of leaders for the coming generations, makes the society think clearly and rationally about a given problem hence ensuring safety, security and happiness for all.

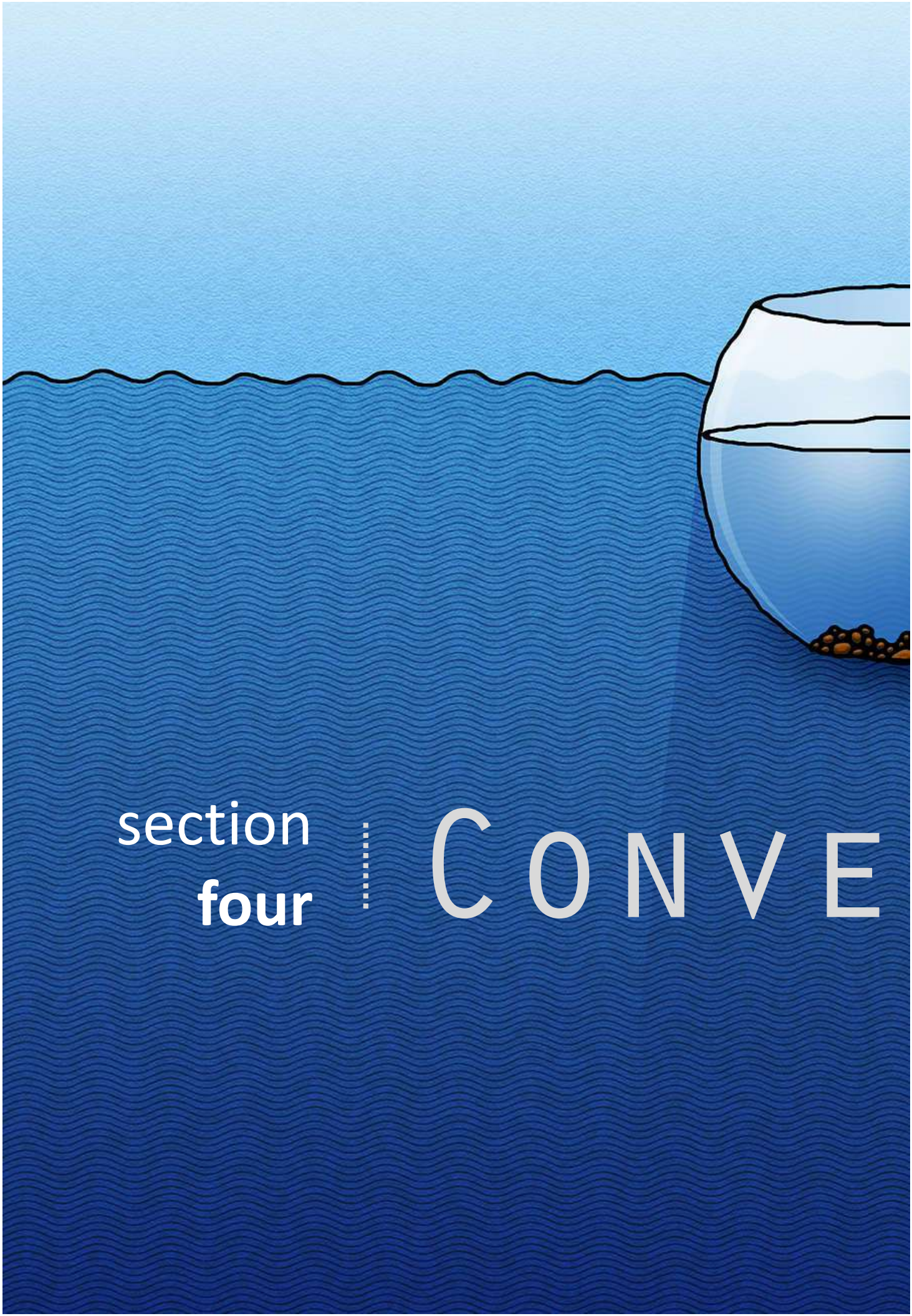
A science fest is started by keeping the aforementioned things in mind and not the popularity of the institute or the Undergraduates of IISc in mind. Popularity is the byproduct of any initiative with novel strategies. Pravega has failed to do any of it, let alone try it.

Fest for a fest sake?

The failure of Pravega can be attributed to its very motivation, which is to have a fest just for the sake of a fest, we are trying to ape the "fest culture" prevalent among many institutes in India. Most of the fests only have relevance to the extent that it makes the institute popular. The fests in India take place with the institute concerned in mind and not the general public or the attendees of the fest. People generally attend fests to observe or look for things which they do not normally see or experience. Does that ring any bells? Have we done something during this fest which they have normally seen or experienced before? Exams, Olympiads, quizzes, puzzles, treasure hunts? Have the attendees of these fests never experienced these before?

What are the things an average attendee has never experienced and perhaps will never experience henceforth? The frontiers of scientific research. The general public is oblivious to the frontiers of scientific research; is it not within our capabilities to bring it to them in a demonstrable and interesting way?

The only event in IISc which comes as close to a science fest as possible is the IISc open day. Although, I feel that not enough is being done because it is just a one-day affair. Pravega should set a gold-standard for fests across India by representing what IISc does best, science that is.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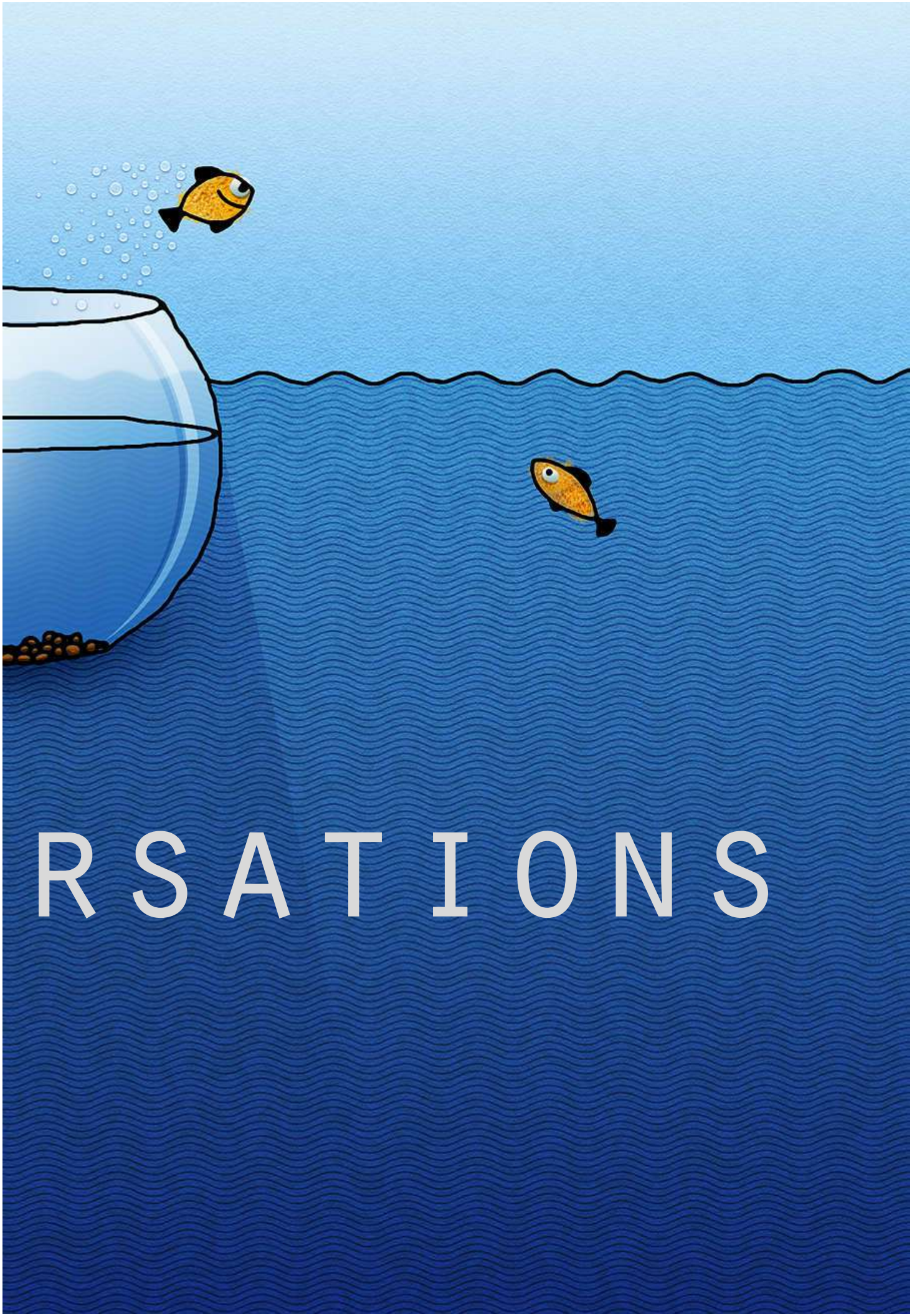
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CONVERSATIONS

IN THIS SECTION:

From the Knight's Mouth:

Life and Science of Sir Mike Pepper

NAREN MANJUNATH

Sir Michael Pepper *(1942- present) is a world renowned British semi-conductor physicist who, in a glittering career spanning decades, has pioneered semi-conductor research in the UK in his time at the Cavendish laboratory at the University of Cambridge (1973 – 2009) and subsequently at University College, London. His research activity includes a range of topics in condensed matter physics, and he has co-authored the paper announcing the discovery of the quantum Hall effect that brought a Nobel prize to Klaus von Klitzing in 1985. Here, the Quarks team (QT) catches up with him on a variety of issues, including his work, his long affiliation to the industry and on student life.*

QT: How did you get interested in physics, and in particular semiconductor physics?
MP: I was actually going to do mathematics at university- but then I asked the careers master at school, 'what could you do in mathematics?' and in those days there wasn't very much. So I decided to do physics.

QT: <nervous grin>
MP: I followed, actually, in very good footsteps- because Chadwick, who discovered the neutron, enrolled in Manchester in - I don't know, 1912-1913 - and he was going to do mathematics. In those days you got admitted to university with just a general admission. You entered a great hall of desks where people enrolled in each course, and the mathematics queue was very long. <Laughter> And right there was physics, so he said, 'I'm going to do physics', and that was it. So I thought that was a good act to follow!

QT: The field of semiconductor physics was practically nonexistent at the time that you started working in it. What was it like in those days?
MP: There was actually a lot of semiconductor work in those days- it was devoted to new ICs. I was quite interested in the concept of the MOS transistor- I'd read an article on it- and the fact that you could change the carrier concentration of the gate made it quite interesting. So I got a job in a company, but went back into research, and then moved into applied semiconductor research. Those days, there was me in the UK, and in the States there was IBM, and in Germany there were two groups, and that was it.

QT: What is it like to build a lab of this size from scratch and convert it into a world- leading centre?
MP: You need to write a lot of grant applications. <Laughter.> There's no fixed budget. There are some institutions today that do have budgets allocated to them, but they are in a fortunate position.

QT: What were your PhD days like? Did you decide for yourself what you would work on, or was it handed to you?
MP: Well initially, I worked with Neville Mott, and we had a well- defined group to use the inversion layer on a silicon device to simulate a disordered system in a material. That's where we started, and from there on I developed the program myself.

QT: What was it like working with someone like Sir Neville Mott and (Philip) Anderson?
MP: Yes, Anderson was there for six months and was a really frequent visitor. You had to make sure that you understood everything- there was a lot of catching up to do!

QT: Can you tell us about the discovery of the Quantum Hall effect?
MP: That was just an accident. Basically I gave my samples to von Klitzing - they were oxide samples of different thicknesses and we had the samples all mixed up. I suggested that we measure the Hall effect to get the thicknesses. He was interested in the Hall Effect as well, for another reason. I had another interest in the Hall effect: in the work on disordered systems, there was a problem and I wanted to see what would happen if you looked at the localised Landau levels- we had measured this but we never got around to measuring the Hall effect. In fact, IBM had discovered the use of the inversion layer in 1963- 64, but they didn't measure the Hall effect either. So they could have measured the quantum Hall effect long ago. It just popped up, really.

QT: Speaking of IBM, you have yourself been associated with industry a lot over the years, first with Toshiba and later through your own company. How is it different working in an industry, and how important is it for scientists to be this way?
MP: Well basically the criteria are quite different. It's not often that you get basic research- it has to be a very large company with sufficient money to spend on that kind of thing and it generally doesn't last. Bell Labs did it for some considerable time, and IBM had a physical sciences division, which is now gone. You can't actually do it for curiosity's sake, unless the research is associated with your product. So it calls for a very different attitude to basic research, though it can be very stimulating…

QT: Did it help in your case?
MP: It did, actually, because we had a very efficient arrangement whereby the company could spend some money on the department and in return could use the cleanroom and the other facilities as if for research, provided there was no competition between what the company and the university were doing. The key to it is ensuring that the two aspects of work were complimentary with one supporting the other. Once you introduce competition the system is doomed. If in fact you help each other, you can go from strength to strength.

QT: What are the things that currently excite you in this field?
MP: What we're looking for now are many body effects in which the situation is dominated by the strength of the electrical interaction. Also, now that technology has given us the ability to make samples whose size is less than the coherence length, there are many new electronic properties that we can study and exploit.

QT: Is there anything you have taken from your undergraduate education that has served you well over the years?
MP: Oh, it's just the foundations, really- if you don't know the foundations it's very difficult.

QT: In your talk yesterday you mentioned about a new programme of study at the London Centre for Nanotechnology called the 'Quantum Technologist' . . .
MP: It's an initiative which is predicated on the view that future industries may very well be built up on the basis of quantum technologies. And if that is the case, then skilled training will be required. It's a good foundation for a PhD, actually- it involves different aspects, such as an understanding of the basic quantum mechanics, the basic instrumentation, and if you're interested in quantum computation or quantum cryptography, then there's a lot of software knowledge and computer science involved. So it spreads across different disciplines.

QT: How much competition do you face in getting to results before someone else does?
MP: Yeah, you should always try to do that. <Titters.> You shouldn't be put off, actually- the problem with the literature now is that there are so many claims, and even if they don't say that they are claiming something they are often quoted as if they are. That's one of the problems in science these days- the sheer proliferation of data.

21 QUESTIONS WITH CDG

As Dean of the Undergraduate Programme for the four years since its inception, Prof. Chandan Dasgupta has been the guiding hand behind all the activities of the youngest members of IISc. In this interview, he talks candidly about his eventful student life, his career in research, teaching and administration, and also his hopes for the UG programme going forward.

QT: How did you first decide to pursue science?
CD: That goes back a long time! When we were coming out of school, engineering was not much of an option. Medical studies were an option, and I did indeed take biology in school, but I was not interested in that kind of work. I was from a small town, and I did not know a great deal about studying this and that, but I knew from reading the newspapers that most of the students who did well in the school leaving exam went to study physics. In fact, out of the top ten students in that year, seven of us opted for physics.

QT: How was your experience as an undergraduate?
CD: That's a long story- I did a BSc at Presidency College from '67, and at that time Kolkata was in the middle of the Naxalite movements. My hostel was in some sense the headquarters of one of these agitations, and there were a lot of disturbances- to complete our BSc degree which was of three years, we were forced to stay for four years because exams were not held on time, and so on. Apart from this, the whole atmosphere at Kolkata was very tense with a lot of violence, even within the college. However, I really liked the college- the students were all very good, and it was remarkable in the sense that out of the 35 or so students in the course, about 15 of us continue to do research in physics today. I learnt a great deal from them.

QT: Did you have to get involved in anything political during this time?
CD: You had to do some things being in that hostel- sometimes the seniors would tell you to take part in some procession or other. Actively, I was not involved
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QT: How did the situation change when you went to do your PhD?
CD: First, I did an MSc at Delhi University. About 15 of us went there from Kolkata because it was very difficult to continue studying there. At Delhi, it was nice- the physics department in those times was very competent, with several good teachers and courses. There was another experience with the war in '71, with restrictions on having lights in the evenings because Delhi was a good target for aerial attacks. But this was not a big distraction.

QT: How is doing a PhD in the US different from doing it in India?
CD: I see the process followed to assign students to faculty members in India, and I think the process is on the whole better in the US. There, students have a big say in the matter and can take their whole first year or even till later to decide upon their guides, but here the allotment is done typically within a month. So students do not have so much freedom.

QT: Did you always feel you had to return to India after your studies?
CD: I spent a lot of time even after my PhD doing postdocs and taking a faculty position. It is true that I always wanted to come back. But at what point one does this is determined very much by circumstances.

QT: Over the years, you have been a researcher, teacher and an administrator. Do you find yourself equally at home in these various roles?
CD: I have had fun being all three. I have been teaching from the very beginning, first in the US where it is compulsory, and then at IISc. Here, people sometimes feel that research is their main aim and that teaching is a secondary job. I didn't dislike teaching at all- I think I learnt a lot from it. Administrative work I never liked - I was the department Chairman, and I didn't like it but everyone has to do it. Then Prof. Balaram asked me if I would like to take up the management of the UG programme. I thought that would be different from routine administration, and it worked out better than being the department Chairman - there was the excitement of being part of something new.

QT: Do you think teaching should be made compulsory here as well?
CD: In my view, yes. Teaching is not simply a duty- people sometimes feel that it prevents them from doing research, and of course you do need to spend some time if you are teaching a course seriously, but there are a lot of benefits as well, and in the end I think it helps.

QT: There must have been many ideas initially on how the UG programme should be structured. How was a consensus finally arrived at?
CD: I only became the dean at the end of 2010, once it was announced that the programme would start the next year. The question of having a UG programme was around for at least five years before that. There was a lot of discussion, first of all on whether IISc should have a UG programme. There the faculty were not unanimous, and in fact many people said we do not need to do this. The idea was originally that both science and engineering should be taught, but the engineering departments said that they were not interested.

QT: What were the specific things you tried to do in order to make the programme different?
CD: Again, there was a lot of discussion on this. People had been concerned for some time that good students were not coming to science and all were taking up engineering. One of the important things done was to set up a committee to get opinions from various quarters on how to improve the quality of science education. The committee was set up under Prof Mukunda, and it did a very thorough job of analysing the situation. The recommendation was then that the science curriculum should be structured so as to make the students ready for a PhD in four years.

QT: Did you have to make any changes to the manner in which you taught undergraduates as opposed to PhD students?
CD: Very much so. That was in fact one of the objections that the faculty had initially, to setting up this programme. Personally, teaching undergraduates is more difficult, because in graduate courses you have students who have already converged in their interests. At the UG level, there are big classes and it is not clear that everybody is interested.

QT: After four years, what would the same people say about the programme?
CD: I think most of those who were ambivalent then would now think that it was a good thing we started this.

QT: Do you feel the introduction of the UG programme has changed the environment of the institute as a whole?
CD: There are a lot of new activities in the campus now.

QT: Did you have to spend a lot of time on administrative work when you were the Dean?
CD: There were a lot of papers to sign, e-mails to reply to,etc. In fact I had told Prof. Balaram that I would be the Dean for a maximum of two years. But in general, the fact that I was dealing with good students who were enthusiastic about a lot of things made this a little different from other administrative work. So I was not- well, very unhappy - to have stayed on!

QT: Tell us some of the most memorable things that have happened over the last four years . . .
CD: The first thing that comes to mind is of course the UGC problem. (Laughter.) There I was very happy with the very mature way in which the students behaved. When the institute said that it would take care of the students, they believed us and there was no demonstration or any such protest. In the end, as you know, it has worked out reasonably well. But going back to my own student years, if something like that had happened in college there would have been a big problem.
Then there were cases where some students had a lot of difficulty, and we were able to help them in such a way that they finally did well. Those are some of the things I remember.

QT: What are the ways in which the programme can do better?
CD: Although we are getting very good students, in order to get 120 students we have to make at least 600 offers each year. This is not something that is discussed very much. So only a small number of the eligible students actually end up coming here, and this should be looked into. As far as the structure of the programme and the teaching is concerned, I am happy with the way things are going.

QT: How prepared do you think we are for research compared to students with a similar degree from other parts of the world? Are we on a level playing field?
CD: I think we do give students good exposure to research- the opportunities are better here than elsewhere. A four year course will not give you all the exposure you need in a particular research field- you will be taking courses in the first year of graduate studies. In order to prepare students better, we have the option of extra year. But this can be done somewhere else as well.

QT: Do you feel students completing their fourth year should try to go out, or is it a better idea to stay on?
CD: My advice would be to try to go if one gets a good placement. (The matter of placements) is actually one of the issues that I am concerned about, and we will try to deal with it. So far we have been talking only about research and PhDs, and there I am happy with how things have been working out. But there is the issue that some of the students who are doing very well in the JEE and so on are not coming into the programme. That is, I think, partly due to the perception that students will basically be prepared for research alone, and so those who want to keep their options open are still not convinced about joining. In programmes at the IITs, for example, students feel there are a wider variety of jobs available. Our aim would be to get such students, and if we do a good job, to make them want to do research.

QT: Tell us some things from your own experience that would help us on the road to becoming researchers . . .
CD: One thing that I found very useful was to have a good peer group. I learnt much more from the discussions I had with my fellow students than from courses.

QT: Are there any books that have influenced you in your career?
CD: In the very beginning, we used to read various books by George Gamow. Those are actually very easy to read. But we read a lot of things, and I cannot think of something in particular.

QT: Do you have any message for the students of IISc, in particular the undergraduates?
CD: One thing students sometimes do not realise is that they get into a programme without thinking about whether it is what they actually want to do. Even among some of the graduate students here,a problem is given to them and they are quite capable of making progress, but they don't seem to be interested. So while joining a programme, you need to think about whether you really want to do it. If after one year, one finds that one is not interested, then I think it is better to change.

Naren Manjunath

#conversation

Subhayan Sahu

Terribly Tiny Tales is an online tweet-sized storytelling forum which has captured the imagination of millions around the world. Quarks Team got the opportunity to interview its founder – Anuj Gosalia, who had come to the campus to deliver a Terribly Tiny Tutorial as cultural partners of Pravega 2015.

Terribly Tiny Tales (TTT), attempts to bring together diverse motley of writers and artists to create stories to cater to the needs of the intelligent reader. It has now started another venture – Terribly Tiny Talkies, which produces short films with a strong storytelling component. Anuj is a cofounder and a contributing writer of TTT and also runs an ad agency called Not Like That.

Q: How did TTT begin its journey? And, what inspired you to start a micro-content generating forum rather than a more conventional form of fifth estate writing, like a blog or some other online writing forum?

A: It started as a rebellion – not even a rebellion – it was basically a hack to the fact that no one cared so much about fifth estate writing. I did own a blog myself; but the readership was woefully limited. It was popular to the extent that friends and a few other prolific bloggers back then read and commented and shared. But clearly the larger population was interested in something that was more photo or video led, and long-form content, as has been proven time and again in recent times, is dwindling. That's why we are looking at things like Scoop Whoop, Buzzfeed and Lists – which are all ways of condensing content for the reader to consume.

I tried keeping up with what the world was consuming then - tried creating memes, drew cartoon strips and wrote on Facebook. But the world was busy with cat photos and selfies. A time came when even my parents were on the WhatsApp for two hours in the morning and were happily sending religious and inspirational messages to me. It was then when I decided to do something for the writers like me, something that is both intelligent and consumable. That was the motivation, inspiration if you like, behind starting this forum for storytelling.

Q: What were you doing when you started this forum? Were you pursuing a different career back then?

A: I am a Gujarati settled in Mumbai. I had a commerce degree and I started working on a media technology startup for some time. Then I started a startup which was lecherously called 'Bechain Nagari'. It was a community of artists and we sold beautifully designed sketchbooks and notebooks. But it didn't come innately to me - I was not directly involved in the creation of the products. While I wanted to make it the biggest merchandise brand in the country, my partner was keener on creating a niche curated studio for supporting fantastic artwork. So it didn't work out and I parted ways. For some time I joined a 9-6 job. But I was hell-bent against a conventional and secure career! I started writing content for a variety of purposes - from companies to thank you notes for friends. The quintessential Gujarati in me led me to found a company, Not Like That, which was meant for such content generation. However, I was more inclined to do or start something for the writing population and looking at the internet at that point of time, in the summer of 2013, I realised that there is an opportunity for such a venture, which can cater to the needs of many.

Q: So what is your current 'job' status?

A: We still run the ad agency - Not Like That. It earns the bread and butter, so to speak. TTT is something we are increasingly giving more time and attention to because I think it is an important product - only because so many people connect with it. If we can smartly monetise it, there is an opportunity there.

Q: You said that it was a rebellion against people's reluctance to read long-form content. Did you start because you were passionate about flash fiction or were you interested more in creating a product that will cater to the need of readers?
A: It wasn't a rebellion really; I was just solving my own problem. Everyone wants their content to be acknowledged and appreciated by readers and doesn't want it to go into a black-hole. So in a way this was a way to fuel our own ego. I wanted to package intelligent content in a way that can be easily consumed.
Coming to the second part of the question, I must say that I wasn't extremely passionate about flash fiction, it's not that I wrote a lot. But I realised that it is an interesting way to tell a story; so I wanted to try my hand at it. At the same time it can reach a wider audience easily. So it was a combination of both.

Q: Each TTT story has a very important design element associated with it - with its characteristic font and colour scheme ...
A: Correct. Reality is that people are reluctant to read long form content on the net and the posts were becoming more photo and video led. It was a disturbing but hard truth and we had to participate in it. Hence it was a conscious decision to attach a photographic quality to the content. This was to ensure that the story can't be ignored once it is on your timeline - you wouldn't have to click on the picture to read it. So the font had to be of the correct size and the post had to be catchy.

Q: A lot of thought must have gone into the packaging?
A: We put in a lot of thought for the product to get out quickly. In that it helped that I spent a lot of time on the internet, studying what works and what doesn't. So finally implementing that vision didn't take a long time.

Q: It was quite exciting to hear you speak about this literary venture as a startup! When did you realise that this can be monetised?
A: Like many other startups, it didn't start as a 'startup'. Now it is a very cool thing to say that one is working on a startup. Take even Google for example – it didn't start as a startup. It was a research problem that was being solved. Similarly, we started TTT because we enjoyed writing and delivering stories in 140 characters.
But it doesn't make sense to put so much effort into something and not make money out of it. It just seems wrong at so many levels! That might just be the part - Commerce, part - Gujarati mentality at work here. (chuckles)

Q: So how does that work? When we look at pages like yours, or say Humans of New York, we can't help wonder - how do these pages make money!
A: Our current model is putting up content on the net, increasing the brand value of the venture and selling merchandises. We are also doing brand collaborations, which is another revenue model.
Humans of New York has generated a lot of money with their book - it has been a NY Times best seller for over six months now. We hope to come up with a book soon and that will be a significant revenue generator. But you don't build a business around a successful book. There should be multiple avenues - and there are - with merchandises and brand collaborations and a potential book ...

Q: Tell us something about the TTT team. How did you get them all together?
A: Once I had the idea that we should start an online twitter-style forum for storytelling, I told my friends about it. Many of them came on board as we shared the common love of writing. We now have 18 authors in our team - from all part of the country. Some of them are friends; some of them are friends of friends! Once you collaborate with a creative person you also learn to trust them in a joint creative venture.

Q: Did all of you share the same vision of Terribly Tiny stories?
A: The vision was, and still is, to create a really good story every day. Nothing has changed in that respect really. We still don't have a 'business plan' and words like numbers, growth, and profit don't play too important a role in this journey. It's as if we are on a bus and we are all travelling to a fun place. We have started launching films now! Terribly Tiny Talkies is a project to create short films and share them with the world. Let's see how that pans out.

Q: No scientist in your team?
A: No (laughs). Not yet. But the position is open!

Q: A lot of your followers are also treading the same path as you and creating stories of their own. There are many other similar pages which are also coming up. Do you see yourself as an internet super-group now (grins)?

A: We want to be that. We want to enable micro-content of all kinds - not just in writing. We are looking at films now; even considering graphics related content. Anything that is not too long and verbose - we are willing to try our hands in them.

Q When you look at your facebook posts, there are a lot of comments with people sharing their own stories and coming up with various interpretations. Many a time it is like the blue curtain situation -
A: Yeah, that story where a teacher tries to explain why the writer chose blue as the colour of the curtain and comes up with all themes like death and despair and all that, right? And the writer says, damn, I just chose the colour blue because I liked it! Yeah, that happens often, especially with the more abstract stories.

Q: So how do you deal with that? Don't you get frustrated?
A: We don't really mind interpretations as sometimes one can really be amazed at how simple descriptions can evoke such deep meanings! Also, by design, a terribly tiny tale tends to be simple and open ended, leaving enough room for the reader's imagination.
That said, I get frustrated when sometimes the comments are completely disconnected from the content and also when some people use the thread as a way to promote their other stories. Because, in a way, that is disrespectful towards the author.

Q: In some of your tales, there is often a strong influence of poetry...
A: There is. TTT will admit to the fact that although we strive to keep the tales 'apoetic', so to speak, inadvertantly or advertantly, some poetic influences are there in the stories. However, we try to ensure that there is a story in every tale, regardless of the form.

Q: What is the method behind this madness that is TTT?
A: I think the only philosophy behind TTT is - respect attention. In today's world we have the freedom to be disengaged. If you are not interested in a lecture you have the liberty to check your phone for whatsapp notifications. Of course there is a larger theory of how the internet is screwing up our lives. But without getting into that, the philosophy behind our venture was to demand readership by capturing the attention and imagination of people. And that is true for any other micro-content related venture that we have taken.

Q: As an aside, purely out of curiosity, how old are you?
A: How old am I? 28.

Q: No interview ends without the question - what you would want to tell the UGs of our institute? But I assure you that I won't end the interview on this note!
A: Oh I hate that question. The only thing that would be useful from what I have experienced till now is - do whatever you feel like doing!

Q: Is there any amazing experience you had with TTT that you would like to share with us?
A: There have been a few instances when a particular story has affected a reader so much that s/he has gone ahead to take difficult decisions - like changing careers even. See, as writers, we often do not understand the importance and impact of these words floating on the internet. This, precisely is the beauty of the internet, it can leave a beautiful impression on its users. In many ways, it is like a collective consciousness.

Q: Are you an avid reader yourself? What are you reading now?
A: I am reading 'The Unaccustomed Earth' by Jhumpa Lahiri presently. And no, I don't read a lot. Lately I have been forcing myself to read books and novels as I am slowly realising that my brain is getting wired to avoid the long-form. I think this is a problem that a lot of people in our generation and the next are facing. As entrepreneurs we attempt to fix that by catering to their needs, but that's not necessarily always the best thing. I, for one thing, would definitely want long-form content to survive. It is beautiful.

Q: Coming back to micro-content, one word for Pravega and the IISc UGs?
A: I told others already, I would say its 'growth'. You are young, our venture is young. We are all growing.

Q: Thanks a lot for the wonderful interview!
A: Thanks to you!

Confessions of a CRYSTALLOGRAPHER

(Conversation with Prof M R N Murthy)

Prof. M R N Murthy (Mattur Ramabhadrashastry Narasimha Murthy) is a very familiar face to most of the biology majors and others who have taken his courses. A renowned crystallographer from the Molecular Biophysics Unit (MBU), IISc, Prof. Murthy is a recipient of many awards and accolades. He did his Bachelors from Central College, Bangalore and his Masters from IIT-Madras. Then he joined the Organic Chemistry Department of IISc for his doctoral studies under the guidance of Prof. K. Venkatesan, a well-known crystallographer. Then began his life-long fascination with the field of crystallography - a fascination that would soon write itself into the annals of Indian science history, and which would prove to be immensely beneficial to science as a whole. An inspiring teacher, an avid conversationalist and a great human being, Prof Murthy, who is retiring this summer, very obligingly sat down with us and shared his memories, views and thoughts on anything and everything ranging from his student day recollections to the present state of education in India.

Q: You have been a student at the Institute, and then have returned as a Professor. Your association with the institute is undoubtedly long and deep. If you can mention something about the Institute which has not changed over the years?

M: Forty-Two years, you see. I think it is the liveliness of students and the pleasure of interacting with them, that hasn't changed at all. And except for the academics, students are still as stupid then as they are now. In the sense they are still ignorant of the history of science, historical perspectives like epics, ancient Indian Math; many haven't heard or seen an ancient textbook like Leelavathy by Bhaskara. I am not saying that we should take excessive pride in our country but we need to know what it was, how it was. This reading of extra things outside the curriculum is missing. Thoughts on why is it that India is so poor, what would make it richer. Actually the society has developed a greater disparity from the time I was a student. The middle class has sprung up and life for them has improved. In fact we professors belong to that class. Our lives have improved. Like, when I was a student, Professors didn't have a car - they couldn't have a car! But every Professor now in the institute has a car sometimes even before they have joined the job. Life has become more comfortable to some at the cost of a huge number which suffer. That is a big change for the whole society, not for the campus alone.

Q: So what has changed a lot about the campus?

M: I will tell you. You had to go to the library, you see, every week to read. Nowadays with the advent of the internet, our huge library building is essentially empty. That is a big change! This change has many facets. Library was a very nice place for students to congregate. We met students from the other departments and always exchanged something with them-Science, Philosophy or something, it was an interaction. So I know many people who were students with me at the Institute and have gone on to become faculty here. I know them now. But if you are a student today and there is some other student in some other department and after thirty years you both go on to become faculty at the Institute, it is very likely that you don't know anything about each other, or of your student days. That is one big change.

The other big change is the computer centre. At nine o' clock in the early morning a whole lot of computer users used to stand in a queue to submit card decks. There were no terminals and there was no storage device at that point of time. The computer reads the card, executes your program and vomits the output, no storage, nothing. So every day you had to go submit the card deck, so a whole lot of users used to come to the computer center at nine o'clock and stand. And that was a fun thing, you know! Now suppose, someone had a problem with their code, say it wasn't working. Of course, we didn't know the field but we knew the language, so we used to debug each other's program, on the spot. It was fantastic fun! And the debugging exercise was different from what it is today. We only used to get a code for the error like 'yi2171', 'yi21751', unlike the explicit error messages today.

The error codes, even now I remember, yi2171 is a data error. Anyway, debugging was a big thing! and people used to help each other and some of us really enjoyed doing this debugging operation with others, for other people's program. And also because you get to submit your deck and the output was got in the afternoon, and if you made a mistake you would have to submit the next day, it would be a huge waste of time. So when you wrote a program you had to absolutely make sure there was no mistake and you had a lot of card punching machines in every department, we don't see that now! So there is this huge change in technology - one such instance is that if I had to go to my hometown, I had to get a bonafide letter from the registrar, stand in a long queue at the railway station and reserve train tickets, and now you can do it on a computer. Like that everything has become automated you see. You have mobile phones and talk to your parents, life on the campus has changed enormously!

Q: Any favourite spots on the campus?
M: Oh! I think every spot in the campus is my favorite spot. I think our campus is beautiful. It's a blessing for us. Actually, when I was the Dean (of Sciences), every time I would come out of the Dean's office in the Main building, without exception for all the two years, and stand on the corridor for a minute or so, just taking in the beauty of scene before me. The greenery you see in most places in the campus...I think ours is one of the most beautiful campuses in the world.

Q: Any humorous anecdotes from your campus life?
M: Many, many of them. I don't think your magazine can take all of it! Well, there is this: During my student days, I had a colleague of mine, who had a soft corner for a girl, and he didn't want to say that to her himself, (in those days it was much more of a rigid society).So he asked me to propose for him. So I went, bent on my knees and proposed. She laughed and said no! It was the only time I ever proposed to a girl and I was rejected! There are many other incidents like that.

Q: When did you first start teaching? What inspired you to be a teacher and such a great one too? Any favorite teacher of yours? Do you have any role models?
M: I actually started to teach because I had to support my family. My scholarship was not enough. I first taught students who had failed their plus two :that is what started off my teaching career.
I don't have any role model but I do have a favourite teacher. I didn't have any in my primary school because of the corporal punishment they used to give us. Those were the demonic days at school! But now the society has changed a lot. Only in my MSc(in IIT Madras) did I have a favourite teacher - Prof. R. Srinivasan (an experimental condensed matter physicist and a pioneer in low temperature expt. Physics).He was great, really great. The one teacher I would say who was inspiring in his teaching.

Q: A clichéd question maybe, but still: Which role do you enjoy more? The role of a teacher or researcher?
M: I enjoy many things. You gave me just two options. Of course these two are very dear to my heart. Research is my lifeblood. But philosophy, classical studies, art literature, archeology, anthropology; I am interested in many things! And each one is so attractive that sometimes I feel I have chosen the wrong profession. I could have easily been a professor of philosophy, philosophy of science for example and moral philosophy - what is the basis of human morality - is it religion or is it something else? These are something which have become critical nowadays like some moral aspects of doing science. Earlier in order to copy someone else's work meant going to the library, finding the right book, sentences, writing it in your notebook and bringing it, but now you can cut and paste. Now while writing your thesis, you can take figures from the web and incorporate into your thesis without citing it, plagiarism is so easy now but that is very immoral. These are things which are never told to students, there is no class for it. But I do believe students should be taught to value and practice ethics in science.

Q: You worked under Prof. Michael Rossman, the world renowned macromolecular crystallographer. Could you share some of your experience of working with him?
M: Oh Prof. Rossman! He is actually a very unique person. Professors like him are absolutely rare. He is a ball of fire! And so full of energy, it is so amazing! He is now 85 years old but he can still walk faster than a 25 year old. And also his mind works faster than a 25 year old. Of course I had a very good time in his lab because it was a very international lab, it was a real mixture of many people around the world. When we would sit for lunch, I would open my rice, sambhar; someone else would open something else, and we all would have different types of food.

It was very nice! Except that Michael would put million pounds pressure on you to do the right research. And if you do it you would have all his love and he would embrace you but if you don't do it, he would give you a mouthful. So you had to face it! But even now, Michael is very dear to me, he has even come to my village. And he wanted to come now, because I am retiring, I had to persuade him not to come. I didn't want a retirement function. Anyway, it was a nice experience. Purdue was a wonderful place!

Q: Your retirement function?
M: Yes, I did not want one, but my students, they said they wanted to do something for me. They themselves decided that they would go to our village where there is a government school, dilapidated, in which I had studied. They decided to rebuild that school; so they all pooled in and there is enough now to construct the school. So for the inauguration, Michael Rossman wanted to come to our village. He has already come there and really enjoyed the way farmers work in the village.

Q: You really liked Purdue, but you decided to return to India, after your postdoc. What was the motivation?
M: I had to feed my parents, you see! Simple; I had a lot of family obligations. And we have a big family and I am a nut and bolt of this big wheel. And of course, I love my country, I am very fond of India, and I love Indians in general. Culturally, I think I feel one with India. I loved America, I had many friends there, and our friendship is still going strong! However, my heart and soul is in India, and I want to work for the poor people of the country. That has always been my goal. Even as a student I was teaching failed PUC students and I will continue to work for them in some form or the other by being in education. Education excites me: I have taught in rural areas, madrasas, and many places in the country.

Q: Sir, do you have any post-retirement plans? Any long-time muse you would like to take up now?
M: Education. I would like to be involved in education in one form or the other.

Q: You have had the experience of teaching many batches of students, recently you have taught undergrads also. How would you compare between the present set of students to their predecessors?
M: You see, times are changing. Crystallography used to be a branch of physics. Today, it has become a branch of biology and chemistry. Even in the institute, the crystallography unit of the Physics department is going to be shut down I guess. So, earlier on, we used to get students who were trained in physics and who had solid math training but knew no biology whatsoever.
But now, we mostly get biology students, some of whom have had maths only till their tenth standard (which is rather a pity, I must say.) Other departments, like theoretical physics for instance, has not changed over the years in this regard: they've always gotten the same kind of students. But for us, it has been a big change.

Q: And with respect to the students' commitment, passion towards science..
M: Oh, let me tell you. If I get four students, one of them knows exactly what s/he wants to do. S/he is clear, and needs no effort from my part. Two students, I'll have to help a bit. And finally, there will the one student with so much inertia that it's painful to push and prod them towards their goal! This has not changed all through the years- this was the case in 1980s, this is the case today. But it is heartening to see the students scale heights afterwards. Very few get lost: most manage to do well in their lives, which is a very satisfying thing.

Q: Can you elaborate on your love for crystallography?
M: Crystallography is my heart, soul, life, everything! I named my daughter Rashmi, after X-rays. (Rashmi means 'rays')

Q: When did you fall in love with it? When were you introduced to it?
M: Oh, I fell in love with it right from the beginning! I was introduced to crystallography in my MSc, as a part of physics. And then I joined Prof. Venkateshan's lab in Organic Chemistry Department in IISc. And that was a fantastic experience. I had very bright colleagues, we learnt from each other very well. Also, that was a very interesting period of time. Our Professor KV was a pre-computer person, while we were all enthusiastic computer geeks! The Guru was less trained in computers than his students. But now, I feel the situation has changed again. Today's students are all expert at handling 'canned' programs, but not many actually code programs on their own!

Q: How would you describe the condition of crystallography studies in India?
M: Crystallography has always been an extremely strong field in India. For some reasons some fields are good in India, while some others aren't. Raman, though he was given the Nobel Prize for Raman effect, was really a crystallographer. And his students, like GN Ramachandran, were world famous. And then we had Vishvamitra, Vijayan…

Q: So is their legacy continuing today?
M: Oh yes! I'm not too aware of small molecular crystallography, but as far as protein work is concerned, we're doing quite well. Of course I feel we can take up more challenging problems, now that we also have a synchrotron at Indore… But that dissatisfaction should always be there. On the whole the output is reasonably good.

Q: Do you see the Indian science scene changing for the better when the current set of undergraduates from IISc and IISERs pass out and take the mantle?
M: I'm very sure that IISc, IISER undergrads will do far better science than their counterparts from elsewhere in the country. The simple reason being they get better teachers, a great environment for learning and are trained better.

Q: What do you think about the condition of science education in India?
M: Science education in India? I cry. Every time I think of it I cry. I pity those who are condemned to study science in colleges across the country where the teachers don't know the ABC of science. I've seen many PUC toppers who, though able to answer questions and score marks in exams, do not understand even the basics of science. For instance, after studying Newton's laws, one should be able to realize that the Newtonian model predicts a clockwork model of the Universe. Such nuances are lost in today's education system. It is not that the students are not bright, but the system is so hopelessly bad.
I feel our system is fundamentally flawed. Here, we pressurize students in school, make them work very hard in plus 2 and get them admitted to an engineering college. Once that is done, you are guaranteed to come out with a degree. It is so easy to become an engineer! This situation should actually be reversed. When you are a child, you should be taught something, but you should also be allowed to explore other avenues like music, art etc. As you age, you'll be put into a grinding mill- your responsibilities and pressure is bound to increase. Hence, college students should be made to work really hard. But today, the situation is such that by the time a student finishes plus 2, s/he is exhausted! This is particularly true of IIT aspirants. Many of them are even disgusted of studies due to all the pressure! You see, when I say I love crystallography, you do realize that at the end of your life, whatever field you may have chosen, it is still as fresh to you as it was the day you started. If that is not the case, then somewhere down the line you have failed the subject and the subject has failed you.
Of course, this (passion for a subject) is possible only if you don't have pressure to pass the exams. I believe that the one-to-one learning is the best. I would say the Gurukula system was a great model! However, that is not possible today. However, the present state of education is definitely a cause of worry. But I think the government can definitely take up the challenge of improving our schools more seriously.

Q: So do you think setting up more institutes like IISERs will help in improving the quality of science education in the country?
M: No, not at all! We don't need more IISERs; we should aim at making every college equal to an IISER. I think this is just a lopsided, stupid solution like the RTE act, wherein the private schools are forced to admit a certain number of students without fees. But why that? Why can't we improve the quality of our Government schools so that students need not go to the private schools? I think we should address the problem at its root.
Today, sadly, we are still following the old caste system with a new name: that is 'class'. We have 'international' schools which charge exorbitant fees, followed by public schools, and so on. This is indeed a sad state of affairs, which need to be addressed and it is high time our Government stepped up and did something about this…

Q: Finally, what would you like to say to the undergrads of the institute?
M: Ha! Firstly, you are lucky that you're going to be scientists, and even more lucky that you're studying science at the Indian Institute of Science. I would say, make the best use of your time here, then go abroad, get into the best labs across the world and work there.

But eventually, come back, for it is the poor man's money in India which got us educated in the first place, and we're really lucky, and we need to give it back in some form or the other. I think that's the real message I would like to convey. Do think of the less privileged of the society. That is the charity, that all religious texts preach, though I'm not a religious man..

Q: But you do quote a lot of religious texts…
M: Of course! I'm interested in all the religions and I'm interested in literature on religions. I feel one should have a broad range of interests,, that would make our lives much richer, and all of this should always be mixed with some amount of humanity, you know, love for the human race as a whole, love for your fellow beings. If you don't have that, then I feel something is terribly missing in your life.

Q: Thank you Sir, it was a pleasure talking with you!
M: (with his characteristic wide smile) All the very best!

Subbulakshmi S & Alistair Lewis

Conversations with A Gay Friend

It was an idyllic afternoon and we were sitting in an empty and unnaturally silent Gymcafe. Me, and my friend who had very recently 'come out' to me. I had the idea of getting her interview for the magazine and she agreed to an anonymous interview. So there we were, sipping into the imaginary cup of coffee in front of us, and discussed queer, life and much more.

There isn't a lot of awareness regarding alternate sexuality in most of us. Because of the socially prevailing norms, it is 'obvious' for the so called 'straight' ones to identify themselves in terms of their sexuality. So many a time, terms like sexuality, orientation, sex, gender are used interchangeably. Could you define these terms for us?

I won't claim that I understand all the terms properly myself. However I'll answer according to the most widely accepted definitions. Sex is a biological term – which arises from your genetic identity. Orientation refers to the sex of the sexual partner of your choice. Gender, well gender is the most complicated of it all! Gender can only be defined over a spectrum – it's what you associate yourself with. For example, consider a young boy who has grown up associating attributes of a boy with himself – most importantly, the mental framework of a 'boy' as imparted by the society. While for a girl, her mental image of herself is very different. And this image can be extremely diverse; so gender can at best be defined over a scale.

How do you identify yourself using these terms?

Sex female. Orientation, well mostly gay! Mind you, orientation is fluid. So, as of now I am more inclined to call myself lesbian. And gender… I don't know! The definition is quite vague, and I don't think I understand the definition properly either.
However, regarding the question of identifying yourself, I don't think it is always necessary to consider these three coordinates to be well defined or invariant. See these terms are majority terms. Like, it is not really required for us to label ourselves as female, male, gay or straight – we might as well be somewhere in between. Take for example, the famous filmmaker Rituparno Ghosh. He started his life as a gay male but later he said that he is transgender. Basically he changed his gender identity. So, the labeling doesn't matter.

We generally start identifying ourselves sexually at a certain age – most commonly between the ages 12-17. When did you first identify your orientation? Was it a realization that took time to materialize?

I think girls generally attain puberty at 12-13, not much later than this age. For me, it was, like, class 6 or 7, I think. To be very frank, at that age when sex drive develops, one knows what one is thinking about! But of course, I didn't know the terms orientation, gender and all that. What I understood, however, was that my feelings were not something many people relate to. I didn't know anyone else who was like me.

Were you comfortable sharing your identity with your friends? Or parents? Or was it something that you kept to yourself?

I kept it to myself. I knew that I had to share this with someone at some point of time; but when I was in my hometown, before coming to Bangalore, I never gave it much of a thought.

What kept you from expressing yourself to your parents?

I didn't want them to judge me. All of us have a default image, and in terms of sexuality, that image is that of a straight person. And also, homosexuality is often wrongly associated with other traits. All in all, I didn't want to tarnish my image in the eyes of my parents for something that I don't need to share with everyone.
In the general Indian social setting, it is quite difficult for anyone to share his or her own sexuality without being judged. It was true even for me – there were a lot of things that I wanted to discuss or clarify as an adolescent, but which I ultimately couldn't. Hence, there is a lot of repressed sexual tension in an average Indian adolescent kid.

How difficult was it for you to overcome that mental turmoil, with the knowledge that your sexuality is probably not something that you can discuss with most of your peers freely?

I was never uncomfortable about my orientation. I don't know how I developed this upbeat attitude, but the thought whether I was socially acceptable or not, never bothered me too much. I was confident that I knew what was right and what was wrong. And the fact that my orientation was not 'immoral' or wrong was something I came to terms with very early. Like I said, I was confident enough to not let that bother me too much.
But you know, it's like growing up - you change with time. You can't imagine how suffocating it is to not share something you know about yourself with even your close friends, let alone family. It can drive you mad at times.
And these feelings are so natural, so basic, that they are not generally considered important, either. Suppose two friends are chatting on how attractive X is - this is very natural isn't it? But to fake this even with your close knit of friends is a very debilitating idea.
Secondly, many LGBT people I know of now, have suffered from depression at some point in their lives, including me. During those times, you really crave for support.

When you came to Bangalore, did the situation change in any way? Was the idea of you being away from home and familial pressures a liberating thought?

There were various phases. Like I said I was confident enough to not let depression get the better of me. However, there were also times when I had wrong notions. Initially I wanted to keep my image intact in front of everyone. But with time I developed an indifferent attitude to what other people thought about me.
See, there are people who do take care of me - my parents, my sibling, my close friends. It's their views that matter to me. At the same time discussing alternate sexuality with family is awkward to say the least.
I did have bouts of depression when I got frustrated at not getting to express myself to my parents, family and friends. But they weren't too horrible. With time I have shared it with my sibling and a few friends. The change in attitude took months. And internet played a huge role in my case.

That would be my next question. Tell us more about how internet shaped your ideas. Did you join any online forum?

I think internet is a big boon, especially relevant in an Indian context where there is not much communication about your sexuality as such. Person A is queer and so is person B, but they cross each other every day never knowing what the other person is! So it is very natural to feel lonely.
So internet is where I opened up to the world, in the sense that the world opened up to me! I came to know of the terms and I realised that it is not something unnatural. It also helped me let go of a common misconception that homosexuality is uncommon. Actually it is not that rare. There are many people who wish to stay in the closet. The idea that there are other people like me was very liberating. I needed only that assurance, I think, because I never judged myself.
I have met people on the internet who are in depression because they constantly judge themselves. I have talked with them and tried to help them and some of them have really recovered. So that's something.

That is really great!

Yes, you make new friends there and you get to know of the world! You come across information that the media won't cover. For example, one can't even imagine the number of hate crimes which are happening against transgenders, hijras, maybe even homosexuals, in India, every single day. In some countries the situation is even worse. You come to know of these things and you feel the need to protest.

And thus your confidence increases.

Yeah.

Did you find any difference in people's attitude towards the 'queer' in your hometown and Bangalore?

I don't have much idea about the condition in the city where I come from; although I have come to know from internet that it is one of the safer places to be queer in the country.
From what I know about the LGBT community in Bangalore, it seems to be a place where there is a higher level of acceptance among people. I know of people who proudly exhibit their homosexuality without fearing societal retribution.

There is a general idea, probably a misconception, that homosexuals can express themselves freely only in an urban cosmopolitan environment. On the other hand homosexuality either doesn't have a place or is more liable to persecution in a rural uneducated society. Your comments?

I can see where that idea is stemming from. See, in a metropolitan city hardly anyone cares about what another person does. We build invisible walls around us and prefer to stay behind them. In a rural setting, there is more interpersonal interaction, dependence and hence more cases where a misplaced sense of responsibility results in hate crime.
That said, in practice it is probably easier to practice homosexuality in a clandestine manner than lead a heterosexual life! An average Indian will not mind two girls sharing a room as much as they will mind a boy and a girl doing the same. However the society has a long way to go before it accepts homosexuality in a free and open manner.
However, it should be remembered that there is ample evidencs that the concept of gender being fluidic existed in ancient India. I think the kind of execration that homosexuals face in India today is due to the trickling in of the Victorian mentality as well as widespread ignorance and misinformation among people. We fear whatever we don't know. People start demonizing this practice and associate homosexuality with causing harm to children and other malpractices, purely because of their ignorance.

Do you think that we have failed as a society in accepting alternate sexuality as just another way of life? I can't think of any religion offhand that has recognized homosexuality as 'normal'.

Incidentally only today the Presbyterian Church of USA announced that they will recognise same-sex marriage!

Oh! I didn't know that!
Anyway, going back to the question, it is especially unfortunate in a country like India which has had a rich culture of sexual freedom in the past. What do you think has changed in today's world as opposed to the past?

(After thinking for a while) I really don't know the answer to this question. Ignorance, definitely, plays a role. But I have thought about this question long and hard and I still don't have a clear answer in my mind.

What is your opinion on the way alternate sexuality is represented in popular culture?

You mean the stereotypical way in which homosexuality is portrayed in some Bollywood movies? (titters)

Yes. Does that affect you? Also, do you feel that it is insensitive when in normal, daily conversations untoward remarks are made towards 'gay' behaviour, among other things?

Is it always derogatory? I don't think so. When my friends and I are discussing something and someone makes a humorous but stereotypical comment, I don't think they had an intention to hurt a community. I take it in good spirit! (laughs)
As far as movies go, I haven't really watched many such movies that you are talking about. There are some nice movies on the topic as well.

Can you share the names of some movies or books which inspired you?

Like I said, my sexuality is just who I am. I don't need an inspiration to be me! There are many sensitive movies made on queer topics which are meant mostly to spread awareness among heterosexuals and I don't need to watch them. Rituparno Ghosh's last two movies were such films.
On the other hand, I love movies that take homosexuality as a fact and tell a story. Like…

Brokeback Mountain? You mean you like these movies for their story irrespective of the LGBT component?

Yeah. Brokeback Mountain is a very famous example. There are other lesser known movies which are not meant for spreading awareness or to preach, but they do tell a nice story.
Recently I watched Portuguese movie 'The way he looks'. It's a coming of age story of a gay, blind boy. It was beautiful.

Have you taken part in the pride movement?

No. However I have attended a Diversity Fair here.

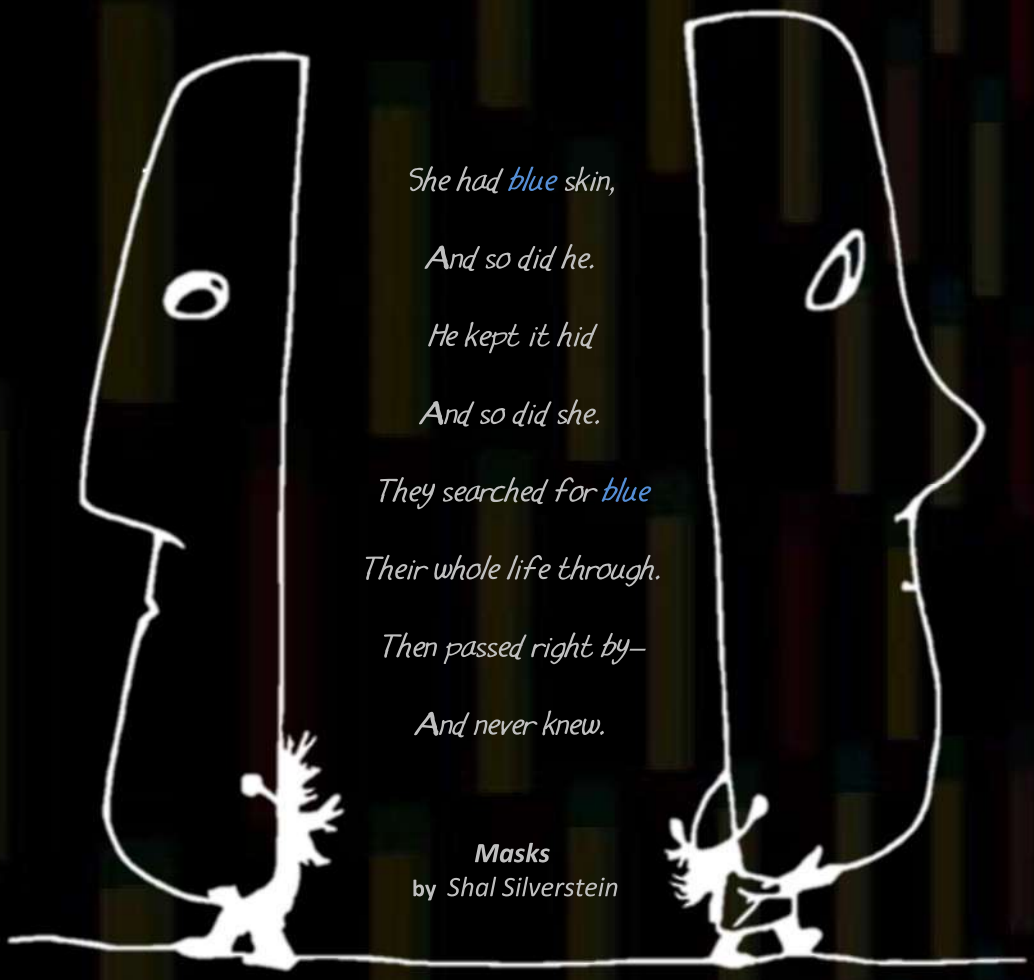
One unfortunate problem that I have come to know of through some blogs is the hierarchy problem in the LGBT community. Are you aware of that?

I don't have first-hand experience, but I am aware of this problem. One thing to remember is that while defining gender, we assign the term queer to everyone who is not straight - and that's pretty much everything! The extent of representation varies a lot as well. I know for a fact that in the queer forums, transgenders are much less represented than homosexuals. The number of crimes against trans people is much, much higher than the same against homosexuals. That might be partially due to the fact that people can physically identify trans people while the same is not true for homosexuals. But another big reason is the fact that they are marginalised even in the queer community! I know of gay people who can't stand transgenders! Imagine the extent of hypocrisy! Similarly, in societies where females are considered inferior to males, it is not surprising that lesbians will be persecuted more than gay men.
Another thing that scares me is the ignorance of people. Recently I came across a question in Quora - 'Why do gays and lesbians go around begging in local trains in India?'! No wonder such mentality has trickled into the LGBT community as well. Actually, if education doesn't seep into the minds of people in the society...
I would like to say one thing, though. Being a queer person has been a blessing to me. While addressing any problem in life, I try to think of the other person's opinion as well before I act on mine. One thing that being lesbian has taught me is that opinion is a very personal thing.

A very personal question – has love come your way yet?

No. (Giggles. Instantly serious, though)
It's difficult. A couple of days ago I read a poem; probably you've also read it. I don't remember it exactly. It goes like this - He had blue skin and she did too, but they...
Wait, I will send the poem to you later. It's difficult when everyone tries to hide their blue skins.

A few days later, I got this message on my Messenger app ….



She had blue skin,

And so did he.

He kept it hid

And so did she.

They searched for blue

Their whole life through.

Then passed right by–

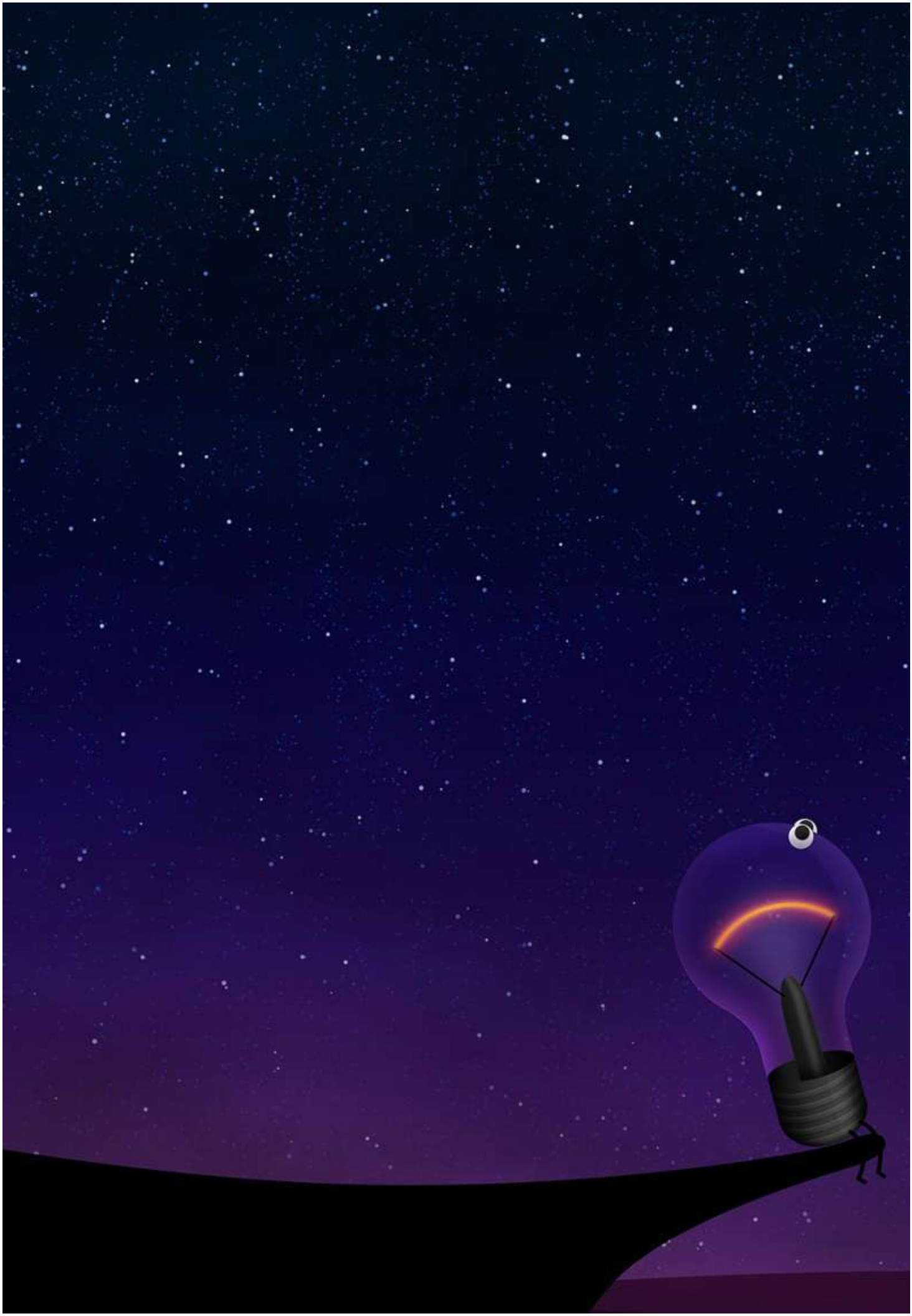
And never knew.

Masks
by Shal Silverstein

Subhayan Sahu

circles of light

Anuva Aishwarya



section **five**

CONSCIENTIOUS CONTEMPLATIONS

THIS SECTION CONTAINS :

SHANKAR N SIVARAJAN

the magic beanstalk

Everyone has heard the English folk-tale of Jack buying some magic beans (bean seeds?) which grow to reach the sky. This can be read as a prescient metaphor for genetically modified crops. The benefit they provide is almost fantastic, with no known intrinsic adverse effects.

We have been modifying the genes of our crops for millennia, through artificial selection. No sane person opposes this process, but there are vociferous objections to streamlining this process, some from otherwise-reasonable people. Their concerns are that we do not know *everything* about the crops we modify, and until we do, we ought not to interfere with the grand design of nature, should not meddle with forces greater than we are, and should not throw wrenches into the clockwork of the ecosystem. (Basically the same argument rephrased multiple times.) While the ideal of preserving the sanctity of the ecosystem is admirable, a cursory glance at *anything* should tell you that ship has sailed.

The most famous examples of genetically modified crops are those created by the Monsanto Company. Their business strategy is to market a herbicide, Roundup, and crops resistant to this herbicide. This ensures that the economic losses due to weeds, which were significant, become negligible. However, in order that this becomes a sustainable business, the seeds are sold on the condition that the seeds harvested will not be replanted the next year, as was customary. This was criticized as “biopiracy”, a threat to the bio-diversity, and an infringement of farmers’ rights.

Monsanto has, understandably, been quite litigious about farmers using second generation seeds harvested from their products without paying them, even if this were to be accidental. There is a development in genetic engineering that, if Monsanto utilizes, they need not worry about this. It is called Genetic Use Restriction Technology, or terminator technology. This process ensures that the second generation seeds are sterile, and it is *this* which worries people the most.

If you meticulously avoid looking at ants or bees, you could argue that the concept of a sterile organism is “unnatural” and that the creation of such should be a line that we, as a species, should not cross. A moratorium was introduced in 2000 by the United Nations Convention on Biological Diversity to prevent the production of terminator seeds and some countries, such as India, have banned the use of this technology. Monsanto itself has pledged not to use terminator seeds, and for now the issue seems to be at rest.

The most potent threat that genetically modified crops pose is that of reducing the bio-diversity of the ecosystem. If they outperform local varieties, farmers will choose to plant only these and other strains will go extinct. However, a concern that most seem to ignore is that of the GM crops accidentally being leaked into ecosystem and acting as an invasive species. There are many instances of invasive species, mostly introduced by humans traipsing across continents, and they have been devastating. It might be worthwhile to introduce a safe-guard against this, and a solution springs readily to mind. We can use the same technology as in Jurassic Park (in a way that works). Unfortunately, there is a moratorium on this technology, introduced in 2000 by the United Nations Convention on Biological Diversity, ironically to prevent the loss of bio-diversity.

We all know of the starvation and malnutrition in sub-Saharan Africa. Genetically engineered crops can cure this scourge once and for all. Golden Rice is a variety of rice that has been engineered to produce beta-carotene, and is a milestone in Genetic Modification Technology as its creators have synthesized a complete biochemical pathway. Golden rice has the potential to cure Vitamin-A Deficiency, which causes irreversible blindness and death in millions of people annually, but is still not being used where it is needed most, despite it having been demonstrated to be safe. Similarly, cassava, one of the most important foods of Africa, has been genetically modified to increase its yield tenfold and is now capable of ending hunger in Africa upon implementation.

During the 2002 drought in Zambia, its president Levy Mwanawasa refused humanitarian aid for his people and chose to let them starve to death rather than allow them to eat genetically modified food. Though it seems tyrannical, and border-line genocidal to us today, one could believe that he thought he was acting in the best interest of his people. To return to our metaphor of the magic beanstalk, we see the goose that lays golden eggs, but do not seize it in fear of an imaginary giant. We see the promised land, where men know no hunger, but we not only choose not to enter it, we prevent others from entering as well. Are we willing to die for our prejudice against GM crops? Perhaps this decision will be easier knowing that it will most likely be someone else who dies for our myopic prejudice.

SHRIYA PAI

GENDER BENDER

Gender is a social concept, much at the mercy of our very own unbalanced psyche. It is often quoted to be an outcome of socialization, the sole entity that distinguishes it from sex, which is biologically determined. The term was appropriated to represent a concept which is more neutral (note the irony), sometime in the 1960s – when people felt the need to procure an accurate representation for those who found themselves trapped in the wrong bodies. Until then, sex and gender were used interchangeably. Gender was meant to capture the amount of masculinity or femininity in an individual, more like a continuous spectrum. But as it might have been easy to guess, conjuring up a term doesn't resolve any social stigma. A more useful question to answer would be – 'What are the social practices that construct gender?' or 'What marks the transition from a female to a woman or from a male to a man?'

I will only try to initiate responses to such questions. To begin with, it might be useful to address how culture has a crucial role to play in moulding the behaviour, emotions, expressions, status and character of an individual. What causes the world to have this notion of the cool, dark yin and the hot, bright yang? Gender only seems to explain, through the word 'socialization', how women are pictured as being docile and emotional and the man, as being aggressive and less emotional. There should be something else, which need not be hackneyed terminology, for the process of unlearning stereotypical social roles. For instance, why is there a difference in the manner in which parents socialize their male and female children, be it in encouraging boys to pursue athletics or in buying dolls for girls and guns and cars for boys? Reversing the process of conventional gender socialization is an uphill task. Why, one may ask. The answer is all around us-in the form of characters in books, in professions, in politics etc. Why, it's there even in the instruments we play - how often do we see a woman playing the tabla?

In an essay, Sigmund Freud writes, "psychoanalysis does not try to describe what a woman is—that would be a task it could scarcely perform—but sets about enquiring how she comes into being, how a woman develops out of a child with a bisexual disposition". The term 'bisexual' is used to represent how the newborn has not psychically matured into a man or a woman. This tells us how our sense of the 'self' is steered by forces we have no control over and that gender is an assigned tag with no natural essence. This defeats the purpose of defining something that is different from sex. Sex is pre-determined, whereas gender should not be. Gender should cease to be the hierarchy that it now is-be it biological or social.

In principle, there is nothing wrong in being sexed a female and gendered a man. At this point, the thought may be socially-revolting. But the anatomical determinism has nothing to do with what one identifies himself/herself to be. There is no need to be conciliatory in our behaviour to fit into society, for this is the society of today and it may very well change in the future. Of course, these things are easier said than done, but as creators and propagators of the current notion of gender (which is subject to only socio-evolutionary forces), we sure have the right to recast it. The only question is, when?

HEERAMAN KASWAN

FIGHT FOR GENDER EQUALITY

Our world is a biased and judgmental place - there is no denying it and historically the scales have never tipped in the favour of women. On 20th September 2014, acclaimed actress from the Harry Potter franchise and UN goodwill ambassador Emma Watson launched the HeForShe campaign in an event in New York. The event gained much publicity on social media and I, a firm believer in equality of the sexes, signed up too. The event was meant as a call for men to take up the issue of gender equality seriously and do something tangible.

This article is an expression of my views on this subject and I don't expect everyone to have similar views. Gender equality, in my belief, is a utopian dream. It is impossible to achieve in all the dimensions; let's face it - men and women are different! However do not misunderstand me and wait for me to explain myself further. I would like to quote Einstein here – "Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid." It can be applied analogously to gender issues. Male and female are physically different and capable of different things and hence cannot be compared. Striving for equality in this direction is a pointless exercise. I am in favour of working towards goals like economic equality and representation in governance. I believe that women should be paid equal wages as men for similar work. I believe that women are responsible for their decisions they make and men do not have any right to judge them based on that.

'My body My Rights' was a campaign started by Amnesty International to battle against sexual exploitation and providing reproductive freedom to women. Women in Africa are dying unnecessarily because they refuse to receive medical care during pregnancy, fearing detection of HIV and the discrimination that follows. From a teenager being denied lifesaving surgery because abortion is illegal in her country to a woman being denied contraception because she doesn't have her husband's permission – these are some of the issues that are plaguing the society at large.

While these issues have been raging for a long time, recent events have brought sexual crimes against women, especially in India, to the forefront of international media. Rising number of cases of rape, molestation and abuse has invoked a campaign to secure the freedom of expression for women, in terms of the clothes they wear and the people they choose to be with, among other things. We are known to teach women how not to get raped, and when someone gets molested judgment is passed on the girl and not to the criminal. These are the issues that need to be tackled and these aren't something that can be solved by creating laws. This is a problem of communal opinion and needs a change in our mindset. Our generation has displayed tremendous positive energy in this direction and the openness for change is visible.

Gender equality is not a gift for men to give to women. It involves responsibilities from both sides. Equality will be achieved when no side feels bound by gender stereotypes, when men do not feel the need to be aggressive, to be 'macho' and women learn to speak up for what is rightfully their. When people can express themselves as who they are, when it is no longer needed to conform to some social baseline, only then can we say that gender equality has been achieved. This fight in all respects is a fight for freedom - the freedom of expression.

REFLECTIONS ON MARITAL RAPE IN INDIA

SRIDEVI V

I could say that it all began in April when Union Minister of State for Home Affairs Haribhai Parathibhai Chaudhary said, “It is considered that the concept of marital rape, as understood internationally, cannot be suitably applied in the Indian context due to various factors, including level of education, illiteracy, poverty, myriad social customs and values, religious beliefs, mindset of the society to treat the marriage as a sacrament,etc,” in response to a question raised by Kanimozhi of the Dravida Munnetra Kazhagam in the House about whether the government would bring in a Bill to amend the Indian Penal Code to remove the exemption of marital rape from the definition of rape.

First let's get this clear, marital rape is not some unrecognized or unheard of phenomenon by the makers of the Indian Penal Code. What we have is not a case that has been overlooked, as if the idea of a husband raping his wife is somehow impossible, but a case which provides deliberate exemption of the husband from the crime of rape; in the words of section 375 of the Indian Penal Code, "Sexual intercourse by a man with his own wife, the wife not being under fifteen years of age, is not rape." The same section also states that a man is accused of rape when he has sexual intercourse with or without the girl's consent when she is under sixteen years of age. The hypocrisy is obvious here. We would call consensual sex between two teenagers, rape. But a husband is fully entitled to his wife's body without being called a rapist. Basically parents are allowed to hand over their daughter's boyfriend to the police and accuse him of rape even if they had consensual sex. But it is okay to marry off young daughters to men who will rape them and not face any consequences. In one case, we refuse to respect the consent given by a woman/girl; and in another, we altogether bypass the issue of consent.

Now the Minister has not said that this is his personal opinion, he has merely stated what is known to him. So blaming him and portraying him as a bad guy isn't really accomplishing anything. But what is shocking is that an esteemed panel of legal experts that has been established by the government seems to share the same view. The Law Commission of India held, in the Review of Rape Laws 2000, that deleting the exemption given to a husband in cases of rape would amount to "excessive interference in the marital relationship". This was in response to the reasoning that, if we make no exemption to the husband in cases of physical abuse, since bodily harm is bodily harm, no matter who the perpetrator, why then do we exempt the husband from accusations of sexual abuse? Apparently the Law Commission did not find it satisfactory and were unable to agree. This was in 2000. Fifteen years later, we still have made no change. The Verma Committee which was appointed in 2013 to review the rape law had also recommended the deletion of the exception. But this recommendation was not included in the amendments to the Criminal Law.

The belief that marriage is a license to sex and that women are meant to be possessions of their husbands is deeply rooted in Indian society, no thanks to certain scriptures. Pre-marital sex is largely looked down upon by the society. Thus with marriage comes the expectation of sex and it is often deemed cruel for the wife to refuse sex to the husband. Marriage is also used as a tool to bring wayward men to heel, or so they say. He's such a wastrel, doesn't work properly, keeps drinking; Get him married, he will settle down, they say. Now I don't know how this makes sense but thereby several women are sentenced to live with violent abusers. There is also this much romanticized image of the wife as devout and utterly faithful to her husband, deemed to follow and adore him no matter what he does, which of course means that divorce or separation from the husband is not very well accepted by society.

Not stopping there, it is also a common practice to marry off the rape victim to the rapist. Recently, in Chennai, Madras High Court Judge P. Devdass ruled in the case of a rapist appealing for bail, that he was to attempt compromise with the victim and mediate. Note that the victim was a minor who gave birth to a child after the rape. It's ironic isn't it, we let husbands rape their wives and we let rapists become the husbands of the victims. Refusal to acknowledge marital rape has not been a problem only in India. Several communities across the world have considered marital 'rape' an absurdity, believing that marriage implies consent to sexual intercourse with the husband always. British laws have also exempted the husband from rape clauses and much of the British Commonwealth too had followed suit. But with the wave of feminism in the 1900s, several countries began to criminalize marital rape as early as the 1930s. But no, not India. We keep coming up with excuses to not do it.

I have heard a lot of arguments from sane, educated people regarding why criminalizing marital rape is not a very good idea and how it won't really help anyone. I'm going to list out some of those arguments in order of somewhat reasonable to most ridiculous and refute them.

I) The predominant view from what I've heard, is that criminalizing marital rape will not really help anyone. There is also a view that marital rape mostly affects rural women. People tend to believe that it is the uneducated and unaware women in rural areas, where child marriage is also predominant, are mainly the victims of marital rape, and since they aren't educated or aware enough to know that marital rape would be a crime, they wouldn't know to approach the police station and get justice. This belief that it is only uneducated, unaware women who are victims of marital rape is not true. Everyone gets married. Anyone can be a victim of sexual assault. A look at the third National Family Health Survey reveals all the information about sexual violence in India. The survey had a section of questions dealing with spousal violence, one of the questions to the married women was whether their husbands had ever forced them to have sexual intercourse with them. The data was categorized based on social status, religion, wealth, education etc. of the women.

The survey revealed, as expected, that spousal violence was the most common form of violence experienced by women. Only 2.3% of the rapes experienced by women were by men other than their husbands. Even in urban areas, 30% of women had experienced spousal physical/ sexual violence. The prevalence of sexual and physical violence perpetrated by husbands was higher amongst employed women (43-44%) than in unemployed women. There was a decline in spousal sexual violence with the education of the women, with 12% of women having twelve years or more of education experiencing spousal sexual violence compared to the 46% of uneducated women who experience sexual violence at the hands of their husbands. But being educated doesn't necessarily eliminate spousal sexual violence as can be seen by the smaller but still significant 12%. A surprisingly high 18% of the women in the highest wealth quintile as categorized by the survey had also experienced spousal sexual violence. This data shows that it doesn't really matter whether women are well educated, wealthy, employed, or live in urban areas, they still get sexually/physically abused by their husbands. But in the end, the survey shows that only 0.6% of all these rapes ever get reported to the police. One may wonder why that is so. Since we have seen that women across all social strata are victims, we cannot say that they all do not know to approach the police or women's organizations for help. There will definitely be some women who are brave enough to escape the clutches of their husbands and seek help. What does happen in the current scenario when a woman seeks police intervention when her husband is sexually abusing her?

Some may argue that the Domestic Violence Act of 2005 will provide protection to the victims of spousal sexual violence. But what that act merely provides for is a court authorized mediation between the victim and her husband and if the victim returns to complain again the husband is issued a court order to conduct himself properly failing which he may be imprisoned for three months if the victim complains. But for a large part, it remains a painfully prolonged matter between the court, the victim and the husband. So currently nothing at all happens when a woman does acquire the courage to go to the police station following sexual abuse by her husband. She will be laughed at, ridiculed and told to go back to her husband. How can we still make a claim that it will not help anyone if do we criminalize marital rape?! Perhaps many women don't report marital rape (less than 0.6% do) because they know nothing will really happen, to help them. When we do criminalize it, we will of course have to sensitize the police officials to the course of action to be taken in such cases. But we cannot be blind to the plights of so many abused women who remain silent or get ridiculed by policemen. We have seen the numbers. There is a very clear need to criminalize marital rape and yes, it will help many women.

II) Another possible reason that I've heard, to not criminalize marital rape, is that it is a very difficult crime to prove. A person may have consensual sex with her husband and always claim later that he raped her. But isn't that true of any rape? A person may always have consensual sex with her partner and later claim it was rape! Also, rape would be accompanied by physical abuse too, which would have signs that doctors can identify. Protocol that is used to prove normal rape may very well be used to confirm marital rape. Let us not kid ourselves that this is the reason why marital rape is not a crime. No, this argument is made mostly in the case of newlyweds. People tell me that when a woman gets married, it is expected that she knows she has to have intercourse with her husband on the wedding night and that if she doesn't want to, why is she agreeing to the marriage in the first place. So the argument is, whether non-consensual sex on the wedding night too will be considered marital rape. Firstly, the woman sometimes does not actually have a say in her own marriage. Secondly, excuse me, but marriage is not a one-way ticket to a man's sexual fantasies. It is not necessary that a woman agrees to have sex on the wedding night, and she need not always say yes whenever the husband is in the mood. I'm not saying that you never need to consummate the marriage, but it takes two people to do it and both of them have to agree when to do it. If a woman accuses her husband of demanding sexual intercourse from her, against her will, then it is rape/sexual abuse if proven, wedding night or not.

I have heard that the Domestic Violence Act of 2005 has been misused often by some women. Now I haven't looked up actual incidences, but isn't it for the Judge of a court to decide whether the women presenting her case is lying or not? I do know of a recent case in New Delhi where Magistrate Shivani Chauhan dismissed the plea of a woman and ruled that she had fabricated evidence, and falsely accused her husband and in-laws of abusing her, in order to extort money from them; and fined her one lakh rupees for doing so. Nobody is a perfect judge of character, there will always be some loophole to a law, but that is a ridiculous excuse for not criminalizing something that is so obviously wrong and affects quite a high number of women. Let us please think of the women who are actually suffering without respite, before cooking up hypothetical scenarios and worrying about those imaginary individuals.

III) The most ridiculous excuse for not criminalizing marital rape is the one given by Minister Haribhai Parathibhai Chaudhary and several legal experts and judges who believe that criminalizing marital rape will lead to collapse of the traditional Indian values of family and the sacred institution of marriage. What familial value is to be learnt from a society where the husband is free to treat his wife as he pleases?

We would rather do nothing to help the huge numbers of women who get raped everyday by their husbands and go far enough to absolve the husbands of this crime, than to "interfere in family matters". Let's just let things be and look like a happy family? I'm not even going to bother explaining why this is not even an argument, let alone a valid one. This is just a whiny pathetic excuse. Many of the countries that have criminalized marital rape too have deep cultural roots and traditions; marriage and family values are not unique to India. Several of our neighboring countries have criminalized marital rape. Marital rape is illegal in Bhutan and Nepal amongst others. Why then do we refuse to change our age old perception of family and marriage. Is our society so deeply patriarchal that we are scared to take away this license to sex that marriage gives men?

So yes, marital rape needs to be criminalized without further delay and excuses. It goes without saying that the problem of how women are treated in India will not be solved by this one move. There are deeper problems in the society with the way we raise our little boys to grow into men who believe they have certain rights and licenses over their wives and are entitled to them, just because they have certain physiological features and women don't. We would have to devise a law that penalizes a husband convicted of marital rape appropriately, depending also on what the wife wants. It could be mediation between the two parties, or financial support for the wife and a restraining order on the husband, or in ultimate cases imprisonment of the husband for sufficient time as the case demands. Someday soon, a woman who has mustered all her courage to escape her physically and sexually abusive husband and file a complaint, will actually get help.

The Fight For

SCHOLARSHIP HIKE

SPANDAN DASH

This is an account of fighting but not violence. This is a saga of the protest for Scholarship Hike for Research Scholars that sprawled over almost two years. It details out how small steps in right directions can contribute to a big cause.

The article is divided into three main sections – The Background, the Problem and the Protest. Like other similar issues in the country, here also the problem can be formulated very easily, but it is the protest for the right that takes the maximum effort and time. A reader initiated to the scenario of Indian Science can go ahead and start reading from the second section, without any loss of continuity.

The Background

What is Research?

Research is one of the most exciting endeavours, but in India it is not a lucrative option. Students enter this field mainly due to their own interest. But nobody can deny the important role of research in the development of our country. Thus it is quite a surprise that more effort does not go in attracting students towards it. This is not a case where the concerned authorities do not appreciate the situation. There already are quite good rules and regulations set up to preserve the interests of researchers, but like all cases in India, this also suffers from the same apathy that has become a trademark for all work done in India.

Let us first define what research oriented courses mean. Primarily these are defined as those courses whose aim is to develop theoretical or practical methods through research which may or may not have a practical application in the time period in which it is completed. Accordingly there are four types of such courses (courtesy: oecd.org) which focus on different facets of research – oriented basic, pure basic, basic and applied research.

Basic research: Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. If it is oriented towards a particular aspect it is termed oriented, otherwise basic.
Applied research: Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Clearly, there are no specific criteria restricting research to any one particular field. Any work undertaken in fields of science and technology, medicine, economics or business administration, which come under any one of the four criteria, is research. Thus any course which strives to make a student possess that level of skill required in undertaking such research is a research oriented course.

So how do Research students sustain themselves?

In general, research oriented courses can be taken at various points of education along a student's career, starting from undergraduate level to doctorate level courses. However, to reach such levels of education requires effort and monetary help, which is offered from a variety of sources, depending on the society, country or region in particular. For India, in general education is heavily dependent on monetary help from parents and on scholarships provided by various government institutions. Parental help has an upper limit depending on the source of income and after some time the retirement pension of one or both parents. On the other hand, scholarships are a constant source of monetary benefit which is intended to let the student concentrate on his/her courses without focusing much on the financial part. One other source of monetary benefit is Student loan or Education loan, which however is not that popular in India compared to a country like U.S.A.

In India

It was mentioned before that scholarships are provided to reduce the financial burden on research scholars. But this is hardly the case. There is a huge gap in communication between multiple regulatory agencies and aforementioned agencies which are responsible for the release of the scholarships/fellowship. Let us enumerate some of the agencies.

In India, regulation and accreditation of all educational courses from the primary education level to the higher education level is done by the Ministry of Human Resource Development (MHRD). For a regulation at the higher education level within the MHRD the Department of Higher Education is in the forefront. In the higher education sector there are also several departments under the Ministry of Science and Technology (DST, DSIR, and DBT), Ministry of Health and Family Welfare (ICMR), Ministry of Agriculture (Department of Agriculture Research and Education), Ministry of Defense (DRDO), various departments under Ministry of Earth Sciences and Atomic Energy Commission (DAE). Now let us look at the types of universities and institutes in India. In general the universities set up in India are classified as Central, State, Deemed and Private Universities. In addition, there are also several autonomous institutes and institutes of national importance set up which include the IITs, IISERs, IISc, SPAs, NITs, IIMs, AIIMs, NLUs, IIITs and several others. Setting up of institutes and universities is done at both the Central and State level and on all Public, Private and Public-Private sectors provided that they are recognized by the University Grant Commission (UGC), which is a regulatory body under the MHRD. Accreditation of higher learning over Universities under the aegis of University Grants Commission is overseen by sixteen autonomous

statutory institutions which include AICTE, DEC, ICAR, BCI, NCTE, RCI and many others.

Clearly, the previous paragraph shows the affinity for the reductionist approach which is a tried and tested way of governance. However, the list of intermediaries required in going up the tiers is huge and often presents problems in proper governance. To combat this, in 2011, a National Council of Higher Education and Research was proposed to be set up by merging UGC, AICTE and several such statutory institutions and breaking up and forming separate bodies for medical and legal matters. This was a huge step in de-cluttering these bodies but was shelved when the Higher Education and Research Bill was opposed by 5 state governments. However, the present situation demands that such a bill is introduced again.

UG, PG and beyond

The higher education sector consists of education at the Undergraduate, Graduate and Post-Graduate levels. In India, research courses are provided at all level and at various institutes and universities. Thus, it is quite difficult to provide parity in regulation of all these courses. While a parity in admission process of such institutes have been somewhat maintained, the situation is quite different when it comes to deciding the fellowships/scholarships at this level. Scholarships at the undergraduate level are generally provided by various programs like KVPY and INSPIRE (which provide Rs. 5000 per month and an annual contingency grant of Rs. 20,000) which are set up under the DAE and are generally focused on courses in Science and Technology only. In comparison, most of the graduate and post-graduate level courses across all disciplines are eligible for at least one scholarship. The students in post-graduate courses are accommodated as Junior Research Fellows (JRFs), Senior Research Fellows (SRFs) or Post-Doctoral Fellows (PDFs) based on the CSIR-NET exams and are eligible to receive fellowships according to these categories. In addition, there is also a provision for Research Associate based scholarship mandated by DST also. Regulation and provision of all such scholarships/fellowships is done by UGC and the required statutory bodies aforementioned.

Clearly, the provision for scholarship for research at the higher education level is greatly simplified but badly managed as the regulation of such scholarships roughly follows an inverted pyramid path. Efforts in change could very well start at a single location but with time and effort on reaching the top of the inverted pyramid, is grouped with a magnitude of other such trivial and serious efforts from various other regulatory bodies. Thus, on including the well known factor of induction of lateness by the government bureaucracy, all such efforts will ultimately be looked upon quite late and hence the change is delayed by a huge amount of time. To cut down the time factor requires effort and hence illegal lobbying (not that common in this case) and subsequent corruption results and is often prosecuted. Thus, it is clear that a proper mandate on regular regulation in research scholarships is very difficult to achieve in a period of say 2-3 years without intervention. This requires the presence of another body which will be set up every 2-3 years to discuss about these fellowships/scholarships.

How important is a research fellowship in India?

The importance of research scholarship/fellowship is quite large in a country like India, where majority of the research scholars have this as the only option for paying their bills. There is also another factor which further complicates matters. In India, marriage is a cultural phenomenon rather than individual. Thus the average age of marriage for males is 26 and for females is 22.2 (Source – Wikipedia). This is lower than many other countries involved in active research like the age of marriage is 28 (both sexes included) in USA, 32.1 in Germany and 31.1 in UK. This might be because of parental expectations and societal pressure. Thus, many research scholars are married quite early on. Thus, in addition to fulfilling the scholar's individual bills, the scholarship/fellowship is expected to fulfill his/her family demands too. Thus a scholarship at the post-graduate level at least has to be fixed at a level which can at minimum fulfill the above requirements. But such a scholarship/fellowship has to be dynamic and also cater to the general increase in price of commodities over a particular period. This makes the case for the aforementioned regulatory body all the more important.

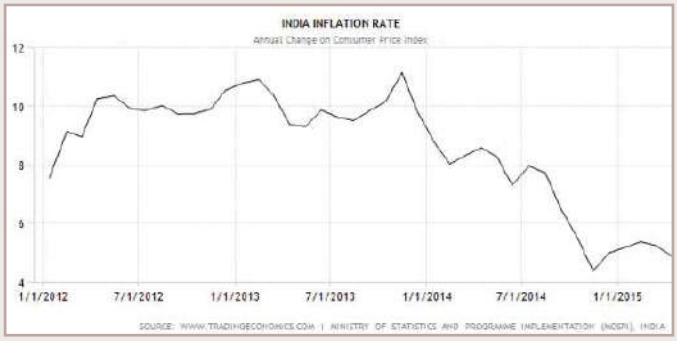
The Problem

The regulation of hikes in scholarships in India is quite poorly done. There is no regulatory board which takes these factors into account on a regular periodic basis and hence the required hike often follows the whims of the administration and in the present case was quite forgotten. An evaluation of hike was last done in 2010 and MHRD, UGC and DST notifications to all departments were issued and the hike was subsequently enforced from 1.4.2010. A previous such evaluation was done in 2007 and hence the gap was 3 years. But then till 2015, there were no more evaluations, for a period of almost 5 years. What had happened? Was the second evaluation too soon or was the recent non-evaluation period too late? An answer may come from discussion about Inflation rate.

The economics of life

Inflation is defined as a sustained increase in the general price level of goods and services in an economy over a period of time. A more visual way of representing the increase is to measure the Inflation rate which is defined as the percent

increase in Wholesale Price Index (WDI) or Consumer Price Index (CPI) over a period of time. India relied on WPI for the calculations till 2013 after which it shifted to CPI. The charts for inflation rate for some years are given beside.



The rapid increase of inflation rate from 2008 to 2010 is attributed to the Great Recession at that time which affected multiple countries. Thus in 2010, it would have been quite difficult for research scholars to survive on a scholarship which would have been hiked even 3 years before. That was a time when great measures were taken to reduce the burden on the public and the scholarship hike might have been a result of that. The inflation rate has subsequently come down from thereon but it is still positive. Although it is not good to compare the increase in inflation directly based on 2010 and 2015 figures as they are based on two different indices, it is still perfectly logical to see that over a period of 5 years the effect will still be similar or worse. Another factor is the decreasing standard of rupee against the dollar. Many of the institutes and universities are situated near cities and hence the selection and availability of items for a research scholar at that location will be more diverse along with a subsequent rise in prices. Thus a research scholar in a city like Bangalore will find it very difficult to meet his day to day needs compared to a scholar in a place like Agartala.

The Protest

The beginning of the protest

All these facts show that the outcry that began from the research scholars beginning from early 2014 was highly justified. Had this happened before? Most certainly, but a widespread movement was never conceived previously due to communication gaps among scholars from different parts of India. This time it was different. There was one factor which turned the tide in favour of the scholars. It was the large scale reach of Social Media platforms.

It all started with the release of an online petition on change.org by an IISc alumnus, Sreevalsa Kolathayar in November 2013. It was a simple two line petition, "Research students need your care, Increase the scholarship amount of Research Scholars." This petition had come up two days after the awarding of Bharat Ratna to Prof. CNR Rao who had also expressed his desire for greater funding in research, and hence received widespread support. Within 48 hours, the petition was signed by more than 4,500 students from various parts of the country as well as Indian scientists from US, UK, Germany, Canada, Singapore, Taiwan, Nepal, Australia, Finland, Switzerland, Paraguay and Japan. Professors and faculty members of various institutes also signed the petition and expressed their support. But like many other starts, this also started to fizzle out. It was election season and while the whole country was engrossed in the cause for electing a good government, this petition was soon forgotten. However, the dice had been rolled.

First steps

As is often the case in many situations, the main cause often does not get too much attention. But after many other different causes get attached to the main cause, however subsidiary they may be, people start to take notice. Fellowship hike for researchers as an issue did not get attention, but when the cause of deliberate neglect of research by the government in Indian institutions was attached to the reasoning for fellowship hike, people from all over India and some other countries who were either alumni from Indian institutions or simply had a soft spot for research as a career, also started lending their support. Comparisons started to be made with other countries, plight of students and researchers with inadequate support for research both financially and structurally came to the forefront. In the meantime in January 2014, the Times of India published an article about an open letter to the then Prime Minister Manmohan Singh from Pankaj Jain, a research scholar from IISc.

Give more stipend: IISc student to PM

In A Letter To Singh, Researcher Says The Amount Has Been Stagnant For 4 Years

Sunitha Rao R | TNN

Bangalore: What has the PM's talk on inflation got to do with stipend for young researchers in the 104-year-old Indian Institute of Science in Bangalore?

On Friday, soon after Prime Minister Manmohan Singh spoke on inflation, one of the most disappointed people was a research scholar from IISc who penned a letter to the PM immediately.

"The worry about inflation is legitimate but we should also recognize that incomes for most people have increased faster than inflation," wrote Pankaj Jain (26), a researcher in molecular biophysics, to the PM.

"I am sorry, but as a PhD student, our stipends have been stagnant for the past four years, while the rates of everything have been almost doubled.... In fact this is also driving many bright students away from research in India to find greener pastures either somewhere abroad or in the industries. Right from school education to higher education, India is way behind in terms of its reach and quality. The progress of science and technology is no better. How do you expect the country to excel without educated individuals and growth in science and technology?" asked Jain.

SCIENCE WOES: Low stipends are driving bright students away from research, rues PhD student Pankaj Jain of IISc

Unless the government supports students pursuing pure and classic science, we are going to pay a high price in future. What is worrying is that we might not get science teachers to teach in schools in the next five years, as the enrolment of science graduates to B Ed courses is declining every year. Adequate support and importance must be given to students pursuing science and research

V P Niranjan Aradhya | RESEARCHER, NLSIU

The crux: The last stipend hike for graduate students was in 2010 and for the past over three years the stipend for graduate students remains the same. A junior research fellow draws Rs 16,000 per month and a senior research fellow Rs 18,000. Inflation has been consistently high. Prices of all commodities have risen by 50-100%. In this scenario it is high time for a next stipend hike, Jain wrote.

Four months ago, an online petition created a buzz on social networks. The two-liner, written in change.org by Sreevalsa Kolathayar, assistant professor, Indian School of Mines, said: "Research students need your care, increase the scholarship amount of research scholars."

This article also caused some stir. But, still no response was obtained. By and large, the elections were still going strong as a topic of discussion. Thus, the only option was to

wait. But, the impetus had been given. As Pankaj states in his e-mail to the editors, "We started building a national team in January 2014 when people started approaching us after an open letter to the then PM. By June 2014, we were connected with many major Institutes (including many IITs) of this country, with IISc being the focal point." So, by the time the new government took shape, the marshals had been assembled.

The Social Media Revolution

On June 29 2014, the Hike Research Scholarship page on Facebook was created. Its intentions were clear.

"Now since the elections are over, the push to increase the Research Scholar stipend on account of changes in inflation and cost of living has resumed from where it it had stopped earlier. A pan-India coordinated effort transcending departments like MHRD (including institutes like IITs, IISERs IISc), all-CSIR, ICMR, DAE, DST sponsored labs, Universities, etc. is being planned with on the ground action teams in each of the institute. As a part of that strategy, this page has been created to promote this cause on the social media..."

At around the same time the Hike Fellowship page on Twitter was also created. Together both platforms could be used to ensure that the scholars' claims and opinions were heard. Within a short period of time students and scholars from all over India started following the Facebook page and re-tweeting the twitter handle's tweets. But, there were no indications of any mass movement or protests at this stage. Surveys were taken and the team in focus decided that the following points will be submitted for referral to the government:

1. Increase in amount of scholarship: This was in effect decided to be 75% of the original amount and was to be implemented from April 1 2014.
2. Annual increment in fellowship
3. Granting of fellowship on a monthly basis
4. Provision of annual contingency for all research scholars

In a short period of time, posts on the page started achieving views from over 1 lakh people due to active sharing. The movement was further boosted when newspapers also started taking up the issue.

The first response

By July 26, the movement had gathered enough steam and the government officials had begun to take note. This was further aided by sporadic protests of students of various universities throughout India. Confirmation that the government was taking note came from Prof. K VijayRaghavan, Secretary of DBT and DST, who assured that their demands were being looked into by a separate committee and there would very soon be a favourable response.

> @NatureInd
>
> #India's research scholars say #HikeFellowship bit.ly/1rmrVGy

In the meantime, the twitter handle had gone viral and several scientific and non-scientific organizations came up to support the cause of fellowship

On July 29, representatives of scholars aided by Prof. VijayRaghavan met with the Minister of Science and Technology, Jitendra Kumar and were told that their demands would be taken forward and they will get back to them in two weeks time. But, there was still no response from the MHRD. Thus, many other institutes from all over India (non-autonomous, central, private and deemed) also took to protests and joined the movement. Pressure started mounting on the MHRD to act and for the minister at the helm, Smt. Smriti Zubin Irani, to respond.

Finally, the meeting with Smriti Irani was arranged on August 13 and representatives from across all research branches converged to convey their demands and grievances. They were assured that their demands will be looked into quite soon (This was at the time when the IISc UG program was in danger of being scrapped.).This being done, the movement went into a hiatus.

Dreary desert sand of dead habit…

To expedite the process of taking a decision, a postcard and online spamming campaign was also set up and mails were sent to the PMO and MHRD offices.

But clearly the inverted pyramid approach was taking its toll. Nothing concrete came up till September (well past the set deadline of 2 weeks). There was only an assurance that their demands were legitimate and the fellowship hike was certain.

Seeing no further response, a nationwide protest was decided to be held on September 24. However it was deferred when the minister of Science and Technology Jitendra Kumar assured the scholars that their hike is only a "few signatures" away from being implemented and would most probably be implemented in a week or so.

The Battle won?

The movement received a very good boost when the ISRO Mars Orbital Mission was successfully placed in Martian orbit on September 23. The general public (high on a tinge of patriotism and success) came aboard to the cause for the research scholars, who began to be witnessed as true patriots who in spite of working in unsatisfactory conditions and on low pay still managed to put a satellite into orbit at the first try. Encouraged by the positive response, with no positive outcome in sight, a nationwide strike was decided to be held on October 19. The onus was on the government to act up and like a broken down old scooter they did. A formal notification from the DST came up on October 20 (which was celebrated as a Dhanteras gift for the students) announcing a 55% (instead of 75%) hike with effect from October 1 2014 (instead of April 1).

But this notification caused more chaos. There was a dramatic clubbing of various eligibility criteria into a single criterion for JRF (and thus an unequal percentage of hike) with no mention about the fate of non-NET candidates and in addition there was no further notification of meeting the other 3 demands. However, Minister of Science and Technology Jitendra Singh responded that a mechanism to set up such a committee for assessment was directed to be put into place soon. Part of the matter was cleared up when the INSPIRE scholarships were also hiked.
These events only covered up the demands of only a minuscule population of scholars. There was no news of hike in graduate level courses and post-graduate courses of other institutes. Thus, a flood of RTI requests were initiated to look into the working of MHRD and UGC in this matter. The result was that it was clear that both were proceeding at an exceedingly slow pace. The rattle of the bearings of an over-centralized higher education sector were clear. Frustrations were running high. On November 17, a direct tweet from Smriti Irani was received which assured that a notification will be out in a week and parity in hike and date of implementation with the DST will be maintained.

Subject: Revision of emoluments and guidelines on service conditions for research personnel employed in R& D programme of the Central Government Departments/Agencies

Attention is invited to the Office Memorandum (O.M.) No. A-20020/11/97-IFD dated 31.03.2010 issued by the Department of Science and Technology, Government of India on the above subject. The matter has been further considered by the Government and the following revised emoluments have been approved. The O.M. is applicable to the research personnel working on R&D programmes funded by the Central Government Department/Agencies.

1) Emoluments:

A. Junior Research Fellow (JRF) / Senior Research Fellow (SRF)

Sl. No.	Designation & Qualification	Revised Emoluments per month
I	**Junior Research Fellow (JRF)** Post Graduate Degree in Basic Science with NET qualification or Graduate Degree in Professional Course with NET qualification or Post Graduate Degree in Professional Course	Rs.25,000/-
II	**Senior Research Fellow (SRF)** Qualification prescribed for JRF with two years of research experience	Rs.28,000/-

The local institution shall review the performance of JRF after two years through an appropriate Review Committee constituted by the Head of the Institution. The fellow may be awarded SRF after successful assessment by the Review Committee.

B. Research Associate

Sl. No.	Category	Revised Emoluments per month
I	Research Associate –I	Rs.36,000/-
II	Research Associate –II	Rs.38,000/-
III	Research Associate –III	Rs.40,000/-

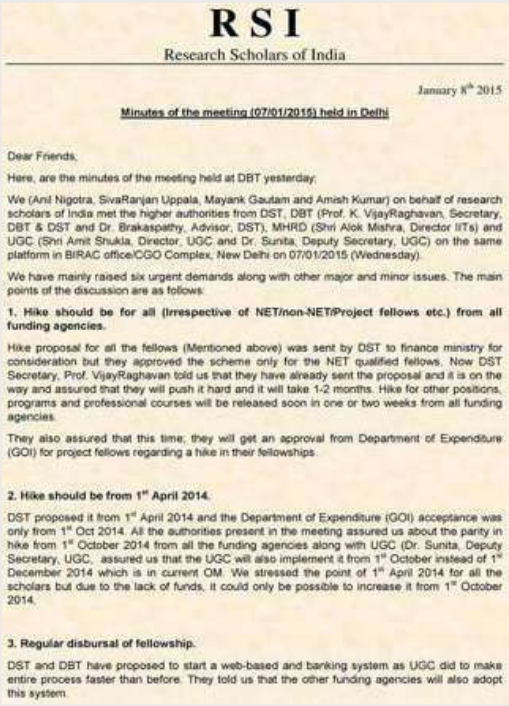
Finally, the UGC came out with the notification of hike on December 1. MHRD then came out with a notification of implementation from January 1 2015!

However the date of implementation was from December 1, not October 1. This was not expected as the minister in charge had already stated that there will be parity. Immediate chaos reigned with accusations of 'cheating' flying thick and fast and a massive protest planned. At the same time, the Prime Minister Narendra Modi addressed the 102nd session of the Indian Science Congress and in his speech mentioned that he wanted "our scientists and researchers to explore the mysteries of science and not of government procedures". In response a letter to the PM was sent from the focus group at IISc mentioning the issue and saying that "This has unfortunately forced us to explore the mysteries of government procedures, rather than exploring the mysteries of science." and "We, the research scholars of this country, feel highly disappointed by such an attitude of the government, forcing us to contemplate for a nationwide protest in the coming days. Such a sad state of affairs is one of the major causes of large out-flux of talented minds from the country leading to brain-drain." Nothing happened. The parliament session was also over and the researchers were left high and dry.

Breaking some walls

Seeing that many of the politicians were active on twitter, scholars took to a 'twitter battle' with #Parity4Researchers doing the rounds. ShivaRanjan Uppala, a research scholar from IISER Mohali started a Walk-Alone March on December 25 from Mohali to Delhi in chilling weather conditions to make the concerned authorities see the plight of researchers.
In the meantime scholarships for the SC/ST students under MANF and RGNF were also hiked. Information obtained from Dr. Brakaspathy, Advisor, DST stated that instead of an annual increment in scholarship, authorities had decided a 3 year revision (with the next revision in 2014). However for the other demands, scholars had to take them up repeatedly with the concerned authorities. Was this compatible with the PM's speech?

Everyone was geared up for a large scale protest. Seeing the general discontent a meeting between research scholars and representations from all concerned departments was held on January 7. Its results are indicated in the images provided.



RSI

Research Scholars of India

January 8th 2015

Minutes of the meeting (07/01/2015) held in Delhi

Dear Friends,

Here, are the minutes of the meeting held at DBT yesterday:

We (Anil Nigotra, SivaRanjan Uppala, Mayank Gautam and Amish Kumar) on behalf of research scholars of India met the higher authorities from DST, DBT (Prof. K. VijayRaghavan, Secretary, DBT & DST and Dr. Brakaspathy, Advisor, DST), MHRD (Shri Alok Mishra, Director IITs) and UGC (Shri Amit Shukla, Director, UGC and Dr. Sunita, Deputy Secretary, UGC) on the same platform in BIRAC office/CGO Complex, New Delhi on 07/01/2015 (Wednesday).

We have mainly raised six urgent demands along with other major and minor issues. The main points of the discussion are as follows:

1. Hike should be for all (Irrespective of NET/non-NET/Project fellows etc.) from all funding agencies.

Hike proposal for all the fellows (Mentioned above) was sent by DST to finance ministry for consideration but they approved the scheme only for the NET qualified fellows. Now DST Secretary, Prof. VijayRaghavan told us that they have already sent the proposal and it is on the way and assured that they will push it hard and it will take 1-2 months. Hike for other positions, programs and professional courses will be released soon in one or two weeks from all funding agencies.

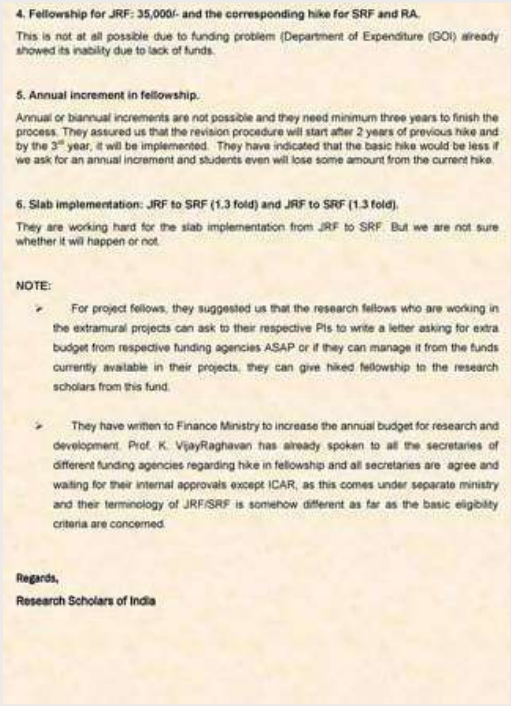
They also assured that this time, they will get an approval from Department of Expenditure (GOI) for project fellows regarding a hike in their fellowships.

2. Hike should be from 1st April 2014.

DST proposed it from 1st April 2014 and the Department of Expenditure (GOI) acceptance was only from 1st Oct 2014. All the authorities present in the meeting assured us about the parity in hike from 1st October 2014 from all the funding agencies along with UGC (Dr. Sunita, Deputy Secretary, UGC, assured us that the UGC will also implement it from 1st October instead of 1st December 2014 which is in current OM. We stressed the point of 1st April 2014 for all the scholars but due to the lack of funds, it could only be possible to increase it from 1st October 2014.

3. Regular disbursal of fellowship.

DST and DBT have proposed to start a web-based and banking system as UGC did to make entire process faster than before. They told us that the other funding agencies will also adopt this system.



4. Fellowship for JRF: 35,000/- and the corresponding hike for SRF and RA.

This is not at all possible due to funding problem (Department of Expenditure (GOI) already showed its inability due to lack of funds.

5. Annual increment in fellowship.

Annual or biannual increments are not possible and they need minimum three years to finish the process. They assured us that the revision procedure will start after 2 years of previous hike and by the 3rd year, it will be implemented. They have indicated that the basic hike would be less if we ask for an annual increment and students even will lose some amount from the current hike.

6. Slab implementation: JRF to SRF (1.3 fold) and JRF to SRF (1.3 fold).

They are working hard for the slab implementation from JRF to SRF. But we are not sure whether it will happen or not.

NOTE:

- For project fellows, they suggested us that the research fellows who are working in the extramural projects can ask to their respective PIs to write a letter asking for extra budget from respective funding agencies ASAP or if they can manage it from the funds currently available in their projects, they can give hiked fellowship to the research scholars from this fund.
- They have written to Finance Ministry to increase the annual budget for research and development. Prof. K. VijayRaghavan has already spoken to all the secretaries of different funding agencies regarding hike in fellowship and all secretaries are agree and waiting for their internal approvals except ICAR, as this comes under separate ministry and their terminology of JRF/SRF is somehow different as far as the basic eligibility criteria are concerned.

Regards,

Research Scholars of India

The bubbling discontent

With this the issues of parity and regular increment every 3 years were resolved. However one surprising aspect was the lack of funds to carry out a full-fledged 75% hike and the subsequent inability of the Department of Expenditure (Ministry of Finance) to implement the hike from April 1 2014. Thus, it was only verbally decided to request for an increase in budget allocation for research. This shows the lax attitude of the Indian government towards research in general. Not being able to gauge the changing demands of the research sector not only places the government in poor light but also shows how neglected research in India is in general. But not all blame can go to the government. What about the common people? Thus research in India is struck in a vicious circle of government apathy and public neglect, none of which can be done to be the main cause at this point of time.

But this was not the most shocking point. News came soon after that even after such assurances, the respective divisions had still not decided upon October 1 to be the implementation date. At that time, for regular disbursement of fellowships UGC had initiated the direct transfer benefit to transfer funds directly to student's account, rather than the respective institutes giving it out of their funds (which certainly would reduce time). But this was not expanded for all students. There was confusion all around. Finally, the frustration level turned critical. A nationwide hunger strike was announced on February 18-19. The main focus was a protest in New Delhi in front of the MHRD.

Final protest

The MHRD played the devil's advocate here. On the date of the strike they issued another notification. But this notification lacked both clarity and parity. It made only a general distinction between different criteria for JRF and SRF, increased the graduate scholarships as a whole and made the implementation date 1st February 2015. This was clearly a half-hearted attempt which failed miserably. On the same date, protesting scholars in front of MHRD, New Delhi were moved to Jantar Mantar. Students at IISc protesting during Prime Minister Narendra Modi's visit were also kept away. This caused general

discord among all. Thereon, an indefinite hunger strike and a complete research shutdown started.

At the same time, #respectresearcher also started trending on twitter.

Vehement protests soon followed. Hunger strikes, dramas, human chains, everything were organized. It was as if the entire student community had decided that enough was enough.

On February 20, a meeting with Smriti Irani resulted in setting the implementation date to October 1 2014 and a letter in this regard was sent to the Finance Minister Arun Jaitley marked "Highly Recommended". Thereafter the onus turned to the Finance Ministry to release the funds. In the meantime, the protests and twitter wars continued to expedite the process.

On February 28, very ironically also celebrated the Science Day, Arun Jaitly presented his maiden budget and contrary to expectations, there was no increase in budget allocation for research. At around the same time, MHRD came out with another notification defining the eligibility of JRF and SRF better and moving back the date of implementation to October 1. It seemed the war had been won, but the research had lost.

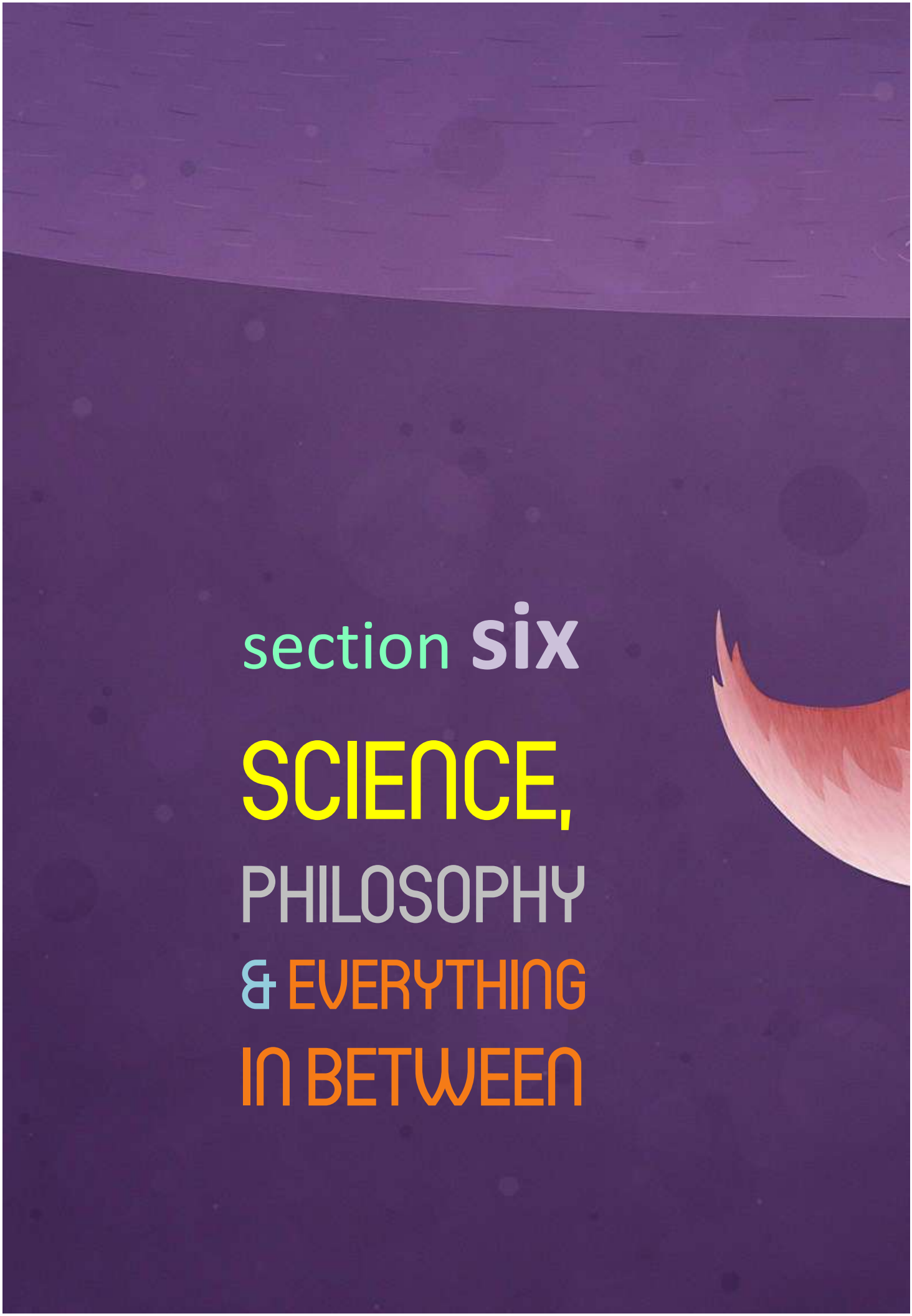
The End?

The researchers were tired and cracks began to appear in the movement. People turned on each other, citing the use of non-violent protests as a failure and soon the movement lost its steam. In the meantime, CSIR and DAE issued separate notifications implementing the hikes. Some irregularities in distribution of fellowships came out into the open with students turning up citing that they had not received scholarship for as much as 43 months! There were sporadic protests. Letters from former HRD minister Shashi Tharoor were also sent to the PMO supporting the student's cause. RTI appeals seeking information of the committee meetings which took the decision of hike were sent but came out rejected. More meetings were organized, but the result was the same set of replies every time. It was as if the research scholars had run up against an immovable wall of bureaucracy. The high handedness of the government to the issue has prevailed till date. Scholaships/Fellowships have still not been released in case of many institutes and the research scholars have been relegated to the same treatment they had abhorred.

In many ways, the movement exposed the misdemeanors of the Indian government. But, it still was simply not enough to completely satisfy all issues. It is quite unfortunate that people in high positions of the government still continue to show a blind eye to the very people who help the country move forward. It seems the old bureaucracy has won for now, but at what cost?

love's in the air

Utkarsh Vijay


section six
SCIENCE,
PHILOSOPHY
& EVERYTHING
IN BETWEEN

This **Section** contains the following articles:

SENSATIONALISM OF SCIENTIFIC STUDIES IN POPULAR MEDIA:

Is it doing harm to the cause of science?

PRANANDITA BISWAS

I wish to emphasize that efforts at propagation of proper science to the general public, subject to maintenance of high journalistic ethics, is one of the prime means that can be adopted in this day and age to keep the population mentally healthy through the dispelling of many a myth.

At the outset, let it be made absolutely clear as to what the arguments here pertain to. By science, I mean science as it stands today; i.e involving, but not limited to, the human endeavour to discover some "truths" of nature through hypothesisation, and thorough experimentation, analysis of data, with conclusions subject to rigorous scrutiny before they attain the status of "theory"; and our view of the world resulting as a consequence of this endeavour. Especially, any such aforesaid theory and fact brought to humanity's notice since the last few decades of the 19th century, if not earlier, shall here not be regarded as science unless it be fruit of some degree of laboratory and computational labour, manifest as reasonably substantiated conclusions stated in a peer-reviewed journal; and anything implied by such conclusions. In this article, "science" will also refer to the international human machienery of scientific knowledge production, and the people involved with the same. Of course, the methodology of science as understood here, then, is of a very young age. Indeed, the scientific method, in a form vaguely resembling how it stands today, can earliest be traced to medieval European and Islamic philosophers, and was the subject of much interest among western European "scientists" (I may now safely call them so) of the Renaissance, the likes of Bacon, Descartes and Newton, the first serious experimentalists. From the 19th century onwards, modern science began to take root in other parts of the world due to a number of often contradictory factors, to the interest of conflicting parties. In "enlightened" Europe and its disillusioned colonies, science came to be seen in a new light, as a propellant of technology, economic progress and national advancement and security (particularly interesting is the case of Japan). Such political endorsement became particularly strong during the World Wars and the Cold War, and continues to be important in public nationalistic mobilisation in many countries.

Since the early days of science in Europe, the words of people involved in it have always been held up to a jury largely ignorant of the technicalities of scientific practice, namely religious clerics and administrators almost invariably allied to them, for sanction for public acceptance. From the Inquisition to the Evolution controversy, perhaps the only thing that changed till Victorian times is the proportion of lay-people on either side of the debates. At the same time, 19th century Europe and North America took immense pride in the technological and scientific achievement of its culture : the administration would variably endorse science, pseudoscience and anti-science to its advantage (has it changed much today, we wonder). The independent media, now in a stage of considerable maturity in these countries, turned science into a minting-machine. This was perhaps the turning point in modern science “sensationalism”. There were scientists themselves who took great effort at public communication, their methods ranging from Aldini's over-the-top public demonstrations of dead animals being "brought to life" through electric stimulation, to Faraday's Christmas Lectures targeted at children. In Asia, equally interesting measures were being taken. Closer home, the very earliest of Indian reformists looked upon science as the epitome of Western progress, and summoned it mainly as a weapon for eradication of superstition.

The first half of the 20th century was a turbulent time for science and humanity. Quantum mechanics brought to end determinism of all kinds, including scientific determinism. The world saw a growing nationalism in colonised countries, feminists had more support than ever before, international wars of unprecedented scale were fought, and the press grew fearless and vitriolic. During the World Wars, the media and political propagandists portrayed physicists and engineers as heroes, fighting the enemy with radars instead of tanks. The military science mania reached its crescendo during the Cold War, when staying ahead in not just the Arms Race, but also the Space Race, were treated indicators of power. In many of the newly freed former colonies, science and technology were, at least initially, given great importance on the national progress roadmaps. What all this implied was a phenomenal jump in interest in scientific advancements among the general public, and the emergence of agencies to satiate that demand. There was an apparent "popular science boom" in the USA of the 80's, when a large number of popular science magazines were printed and numerous TV shows were aired. With the spread of television and, later, the internet, public perception of science is now shaped by a variety of agents.

The definition of science may or may not get clearer in due course. It is important, though, to make certain very rather unsubtle distinctions here. In particular, passing off of dubious claims in the name of science, a practice rampant among certain sections of society, including (not an exhaustive list) politicians, self-proclaimed spiritualists, sellers of baby foods and desperate journalists, is not science but pseudo-science. And claims made of the existence of flying machines in ancient India are, well, pure nonsense.

I wish to emphasize that efforts at propagation of proper science to the general public, subject to maintenance of high journalistic ethics, is one of the prime means that can be adopted in this day and age to keep the population mentally healthy through the dispelling of many a myth. Some scientists are not comfortable with the way science is portrayed in even credible, non-“charlatanic” popular media, which focuses on the often attractive conclusions obtained by researchers, while downplaying the rigours of the methodology involved. This sort of reporting does paint quite a fairytale picture of "doing science", which is far from reality. Also disliked is the high degree of simplification required to make science accessible to the general public. However, to a vast majority of their target audience, who shall all their lives remain laypeople with respect to science, the rigour is hardly relevant. It is rather like saying someone should not be allowed to enjoy a classical music composition unless they understand every meter. Also, just a positive public attitude towards science, can, as we shall see, be a net good thing for both society and science.

It is incorrect to think of the entire body of popular science as a load of half-truth spread by people who have little technical understanding of science, and even less desire to understand it. A look at Carl Sagan's hugely popular television series *Cosmos : A Personal Voyage*, should convince one of the same. Sagan would definitely be guilty of some extent of "sensationalisation". Measures were taken to make every episode a grand spectacle. The series employed what were, in 1980 at the time of its first run, ground-breaking special effects for television. The very episode titles : *Harmony of the Worlds*, *Heaven and Hell*, suggest a highly populist production strategy. In the charismatic manner of a storyteller, Sagan narrated a very abridged and selective history of the universe, our understanding of the "cosmos" and of humanity, with topics ranging from supernovae to DNA mutations. Indeed, there was no effort to portray science as it is "done", no reference to the numerous setbacks, budget constraints and technical difficulties suffered by scientists building space probes. *Cosmos* would magically transport viewers to distant worlds in an instant, speak of probabilistic estimates of extraterrestrial civilisations and discourse on Ancient Greek philosophy. In defence of its tendency to exaggerate attractive facts to incite broad interest, keep in mind that *Cosmos* was meant to be a philosophical amalgamation of humanity's knowledge rather than technical instruction on physical cosmology.

In all this grandiose presentation and over-simplification of concepts, one essential thing that *Cosmos* maintained always was to ensure that the audience would think and question, not just be passive consumers. This reflected Sagan's general philosophy as a teacher and in life. As an example, though actively engaged in debunking UFO-myths in the 60s and 70s, he had helped organise a dedicated UFO seminar for the public in 1969, so that people could be presented with the flaws in the logic they would themselves work out.

The key point to note here is that the creator of the series was a scientist himself, active in research and teaching, and a renowned one at that. As long as science comes from credible and respectable sources, its watering down for popular appeal will not understate its gravity.

David Attenborough's wildlife documentaries, collectively referred to as the *Life* series, are another example of very high quality material that can be developed out of popular science. Although not a researcher, Attenborough has a degree in natural sciences. His team would conduct thorough background research for the content of the episodes. This won them the approval of scientists engaged in the field, providing the crew privileged access to protected wildlife ranges. Again, Attenborough was a sensationalist in his excessive embellishment of the documentaries. Elaborate music scores were the norm. The social lives of animals and plants were dramatically narrated, and one ground for criticism for the series was its excessive "humanising" of subjects, attributing emotions to them, which is not scientifically correct. Such digressions, however, were not intended by the makers to be taken literally.

Life has to be understood and appreciated as a work of art, not judged purely on the basis of its science content. As something that strove to, and quite succeeded in, creating a philosophical appreciation of the natural world, and also create genuine concern for nature conservation among its audience, *Life* has furthered the cause of science, not gone against it.

Let us now come to mainstream media sensationalism of news from the science world. Much as one may be critical of the media's hyping of events, it cannot be denied that they exist to serve a purpose in modern democratic societies. By providing independent third-party insights on activities of various institutions to the general public, they play a crucial role in keeping these institutions accountable. Take the case of Rosalind Franklin. A half-hour search on the internet would spew up innumerable conspiracy theories as to why she never received a Nobel Prize, by people who are not even vaguely involved with science, except maybe for their apparent interest in it. Franklin would be a lone female scientist in all her labs in a highly patriarchal and misogynistic England of the 1940's and 50's, the science community all the more so. It is not surprising that she would often get into tiffs with her colleagues, and was quite unpopular for the most of her career. Particularly interesting was her relationship with Maurice Wilkins, who headed another lab in King's College when Franklin was also there. It is known that Wilkins had revealed an X-ray crystallograph of DNA produced by Franklin's lab, the iconic photograph 51, to James Watson without her consent. The photograph provided crucial insight into the structure of the DNA, and in fact Watson and Crick even mentioned having "been stimulated by the knowledge of the general nature of the unpublished ideas" of Wilkins and Franklin in their historic 1953 Nature paper that elucidated the double-helix structure of DNA. Franklin's dramatic life has been, after her death at the age of 37, the subject of numerous books, and a stage play. The "sensationalism" here is evident: there is unending speculation about and interest in aspects of Franklin's life and career, about which reliable evidence may never be found. Her death in 1958 notwithstanding, many still believe that she had been "cheated out of" the 1962 Nobel Prize shared by Watson, Crick and Wilkins (the Nobel Prize is not awarded posthumously). While Franklin was disliked for her temper, one cannot be sure how much her male colleagues treated her as the "hysterical woman", and often depictions of the same are coloured by the depicter's imagination. Obviously, the public and the media has a much greater interest in “gossip” rather than the actual science done by the central figure, how much her actual contribution was, whether she could have cracked the structure independently or not. In short, as with anything that is "hyped", the public urge to actually know the "truth" of the matter is much less than their tendency to consume anything easily available in newspapers, that may be subject to significant bias.

Nevertheless, bringing the story of Franklin's life to public light is a good thing that reveals the sexism that even today persists in the hallowed corridors of science. Note the peculiar problem we have at hand: the populism that some would accuse of depicting an unrealistically flowery picture of the research world, is also responsible for exaggerating its darker side. This is precisely how popular media comes to play an important balancing role in modern society : free thought and speech promote dialogue between holders of different views. Human tendency may lead to exaggeration from all sides. As for science, between these two extremes of depiction, the public develops a sufficiently balanced, albeit inaccurate, perception of the research world. Public concern is definitely useful for countering injustice everywhere, including in science.

Finally, apart from the "dignified" sensationalism, and the human side of research discussed so far, often in our highly non-ideal world where policy decisions are largely taken by people with least technical understanding of whatever it is that the decisions are concerned with, a tactful employment of gross, “cheap" sensationalism is simply necessary. This is sad, but true : as true of science as of any other field.

The important thing to be kept in mind here is that this "sensationalism" ought to be carried out by either actual scientists who know what they speak about, or at least, by people who trust scientists more than their instincts, and quacks, when it comes to science. The very fact that pseudoscience is popularised more than real science is an indicator of the sorry state of public science communication by the professionals. Just how dangerous this can be shall become evident if we take the climate-change denial example. With some perspective, this denial phenomenon becomes a very interesting, and rather incredible thing to watch. In a number of countries, particularly the US, there exist a huge number people who, against a million indications to the contrary, hold either of the following beliefs (a) that global warming is not taking place, or (b) that global warming is taking place, but it is not due to anthropogenic action. In the US, climate change denial has become phenomenal and acquired strong political connotations. Whether one “believes” in human-caused climate change or not is associated with their political affiliations. How is it that such a vast number of people with basic education, who are socially and politically conscious, can doubt the validity of something on which there is almost complete consensus among scientists? This example shows us just how powerful the right PR tactics can be. In the late 80s and early 90s, fossil fuels lobbies backed by some of the richest and most influential industrialists in the world, began using their political clout to counter legislatures aimed at cutting carbon-dioxide emissions. Over the following years, these industry big-shots, along with political outfits and other powerful stakeholders with vested interests, including religious groups, evolved an elaborate “denial machinery”, of which PR is one of the most powerful tools. Their traditional approach was to create doubt among people regarding the validity of scientific claims regarding global warming. They started by saying that there is no consensus among scientists regarding global warming and its causes, later going on to develop conspiracy theories, accusing scientists of falsifying data and what not. This was outright propagation of false information. Later, they also took to propagating myths based on deliberate misinterpretation of scientific facts. For instance, a favourite is this: “Carbon-dioxide is essential for survival of plants, therefore fossil fuel emissions are not a problem.” The “climate issue” becomes a deciding factor in US elections at many levels. Where public opinion can influence an issue of such importance, it becomes essential that the public is at least on the right side of the dichotomy, their ideas on the intricacies of the issue become secondary. Vigorously promoting science, even slightly exaggerated truth, is necessary to counter the sensationalism of pseudoscience.

The promotion of science and research with excessive nationalist fervour in many countries is another cause of displeasure for many scientists who believe that it takes away objectivity. It cannot be helped that people are impassioned through patriotism. Instead, this tendency needs to be harnessed. China's aggressive, winning-oriented state policy has led them to become the world's third largest producer of scientific research papers in a matter of years(1). Though ideally it is desirable that scientists look at their work in the most objective fashion possible - free from very human issues like nationalistic divides, do bear in mind that most of them are very human, and, like common humans, are motivated by various incentives. Competition is a powerful one. In the real research world, the major ill-effect of competition, viz. tendency to take to cheating, will be felt decidedly less than in regular competition-driven fields (say business or sports) as honesty is given great importance, plagiarism and data manipulation are sins. The very culture of peer-review will keep quality from getting sacrificed at the cost of success.

"Service to the nation" may not be directly obvious in certain cases, for instance in theory-driven fields. In such cases, national pride may be summoned, with good intentions. If knowledge of Ashoke Sen's winning the Fundamental Physics Prize convinces a school-child that a future in theoretical physics in their country is not hopeless, then why not popularize the news, even with the knowledge that probably any simple description of his work will veer into sensationalism of scientific facts? Soon enough they will have learnt about the real nature of scientific work. The rather hard-to-fulfil demands of a career in science ensure that all but the most dedicated ones are weeded out of the system at some stage. As such the quality of research cannot get worse. Given the huge shortage of researchers in basic sciences in our country and many others, getting energetic young people interested can only be a good thing.

Science cannot contain itself to scientists and prospective scientists. That's how we come to the perhaps most important reason why science cannot do without a little "sensationalism". Unless research is understood to do its beneficiary some good, it would get very difficult to get grants approved. For this one has to resort to populist strategies in the best interests. These strategies would cover everything mentioned above and more. Without the excitement of the "God-particle", national governments would see no reason to invest hundreds of million dollars in conducting high-energy experiments that have no relevance to citizens' lives. If it was emphasized that regenerative medicine and stem cell therapies are not as promising many believe they are, governments, corporations and philanthropists would lose interest and money put into cancer research would drastically drop. Meting out modified truths may seem a cheap tactic, but often it is just inevitable.

In *The Double Helix,* James Watson writes ".....science seldom proceeds in the straightforward logical manner imagined by outsiders. Instead, its steps forward (and sometimes backward) are often very human events in which personalities and cultural traditions play major roles." Science is not is not built on an isolated island world removed from society. It has always had a give-take relationship with the rest of humanity, and shall continue to be so in the foreseeable future. If monitored sensationalism be the only way to counter pseudoscience and sustain research, it has to be done, whether one likes it or not.

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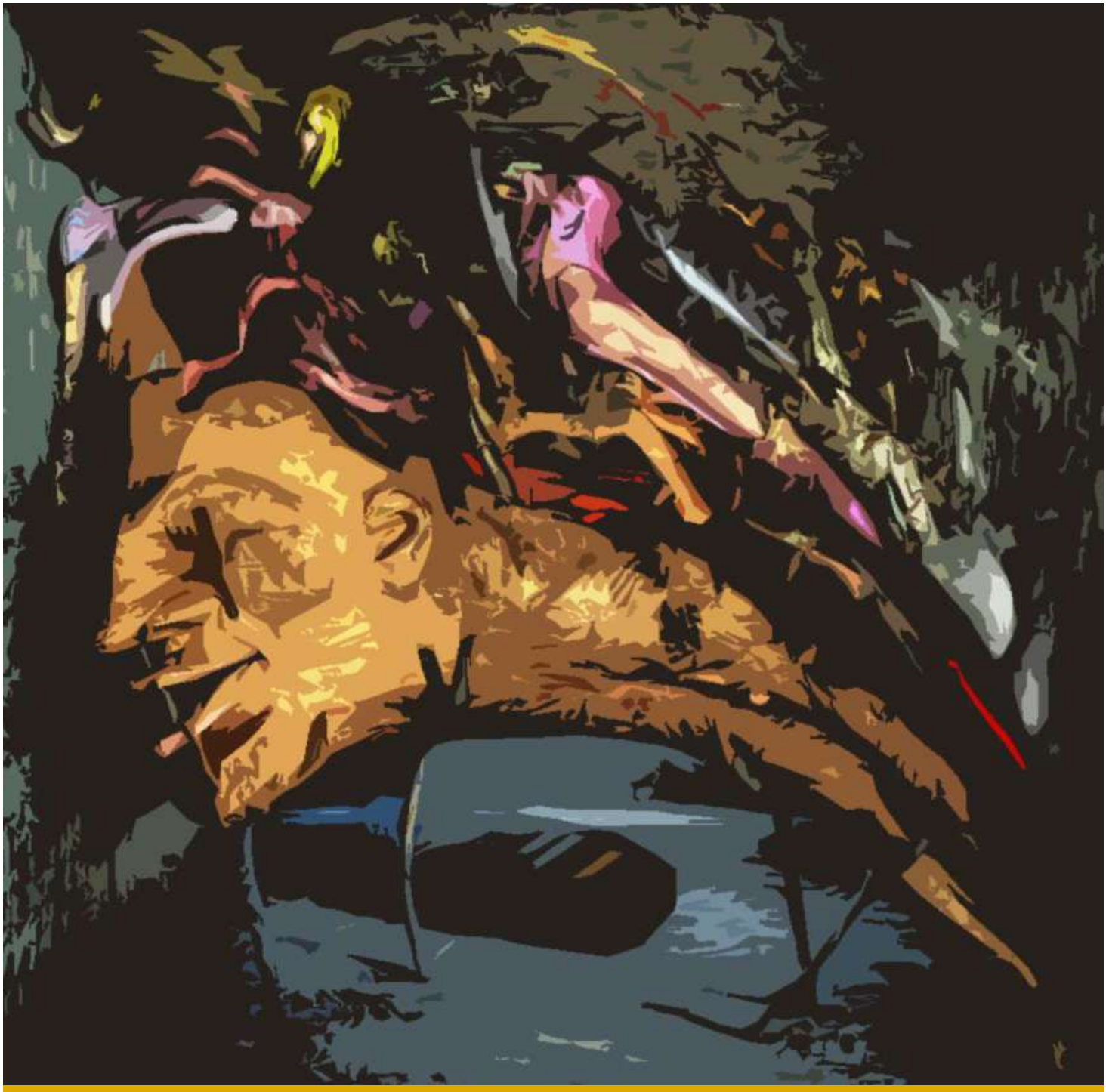


THE SLEEP OF REASON

On Philosophers for Public Misunderstanding of Science

KARTIK WAGHMARE

The sleep of reason brings forth monsters…
El sueño de la razón produce monstruos…
Francisco Goya

Disputes between science and the humanities are not news to anyone. Ever since there has been a distinction between the two, people of these two disciplines have often looked down upon each other, as in Goethe's rant against Newton's physics or be it, Hilbert's immortal taunt "Good, he did not have enough imagination to become a mathematician" upon hearing that one of his students had dropped out to study poetry. Roughly speaking, humanists have always, more or less, maintained that science doesn't contribute towards meaning, beauty or human emotion and instead destroys it; while scientists have called the arts useless, for not adding anything to human empirical knowledge as they know it. But in spite of these minor disagreements or misunderstandings, both of these disciplines have benefitted immensely from each other. Philosophers like Popper have made vital contributions to scientific theory, while Archeology, once an exotic branch of Art History, has become an entirely separate and sophisticated subject in itself, due to inputs from technology. The relations between these two "cultures" as they were called by the late C. P. Snow, have always been somewhere between mutually respectful and cooperative.

At present, however, as noted by Cognitive Scientist Steven Pinker, "Though science is beneficially embedded in our material, moral, and intellectual lives, many of our cultural institutions, including the liberal arts programs of many universities, cultivate a philistine indifference to science that shades into contempt". This disregard for science has manifested in one form as the intolerance in social science community towards naturalistic explanations and scientific techniques which shows up in their wrong-hearted criticism of Evolutionary Psychology; and in another form as the most vicious and hostile criticism of science, in general, and of the most unproductive and dubious kind. The latter is one of the themes we will pursue in this account.

Now, it turns out that an influential section of the humanities community has been in its works routinely misappropriating scientific concepts and terminology, sometimes as metaphors (still wrongly), in order to advance its own silly and unfounded conclusions, in a way which amounts to a really serious misrepresentation of those concepts, and in some instances encroaching upon what is science's rightful territory. In its criticism of science it has been attempting to undermine science's position and discredit it of its achievements; and worse, frame science in crimes it didn't commit. Left to itself it can cause lasting damage to public understanding of science as well as the present social order. It is this part of the humanities community that is the subject of this enquiry.

Most of these nasty trends in criticism and abuse of science are derived from a tradition in literary criticism and philosophy called "the postmodern", which started in the late 1960s France. This was a time when revolutionary struggles in many parts of Europe were fizzling out. And so it is said that this tradition rose to prominence and became the ruling academic culture, mainly because it allowed professors and their students, who then largely identified with the leftist cause, to distance themselves from communism's failure in the West, and disassociate from the evil and ugly face of the Soviet Union –the supposed people's utopia, that had began to emerge; and in addition gave them ready-made answers for their defeat in bringing about a radical transformation of society. Thus postmodernism filled the vacuum that was left by Marxism and Communisms. Among other reasons for its rise, which are not any less insulting, are the alluring complexity of its theories and the possibility of extreme specialization which gave a false sense of sophistication. At its heart it holds the belief, that one can, using certain literary techniques, can get access to profound insights into the inner workings and motivations of a community by applying these techniques to its texts, doesn't matter what community it is be it the inhabitants of a city, uncontacted peoples of New Guinea or in this case, scientists. One could say that postmodernism allows humanists to "be Nietzsche": train in one small obscure esoteric discipline and yet be able to make grandiose pronouncements on every aspect of human existence.

Understanding postmodernism as a philosophy or a methodology is a quiet complicated task. It evades all attempts at definition. A brief survey of its works would paint the picture that it is cumbersome collection of complex and often inconsistent social theories. It appears in various subjects ranging from literary criticism to philosophy of science, in form of ideas such as deconstruction, new historicism, postmodern philosophy, feminist theory and deep ecology, with innumerable references to names such as Foucault, Derrida, Lacan, Irigaray and Latour. But there are two features (though not mutually exclusive) almost omnipresent in all of postmodern literature –epistemic relativism and cultural constructivism. Relativism is the idea that there is no universal knowledge. All supposed explanations are just opinions or "perspectives" of individuals, true only "locally" in their own minds. There is no single reality or truth, but instead the world exists only in fragments of individual imagination. Contrast this with realism which holds that there is one single reality to which we all are witnesses and which we can influence in our own personal capacity. Cultural constructivism states that all ideas, opinions and even observations of people are in effect created by them and these are undeniably and invariably a product of the culture they live in without any basis in reality. Everything, even logical statements like 2 + 2 = 4 are thus "culturally situated" and don't mean anything outside it. Apart from these "tenets", there is little that can be said about postmodernism's foundations. Another way one can make sense of it is, as the term itself would suggest, as a rejection or rather, negation of the "Modern". It rejects all intellectual progress made by (and since) the Enlightenment (the intellectual grandfather of science and much of present human knowledge), and dismisses it as just a product of the white European male culture. Think of the modern and its intellectual predecessor "the Enlightenment" as one project which aims to discover, understand and explain the world around us, in form of one unified theory. The "Postmodern" will then say that such a project is inherently futile because there is no such thing as universal knowledge. All knowledge is "local" and relative. Explanations are just opinions, and since there is no one true reality, questions like "How true is an opinion?" do not make sense, so there is no such thing as truth.

According to Gross and Levitt; postmodernism is more easily identified by its ruling attitudes rather than its content. The rejection of Enlightenment comes at its own price like obscure and poetic writing and vaguely defined concepts. Appeals to facts are despised, and causal and natural explanations, similar to those made in science, are dismissed as deterministic and reductionist or at best, are regarded as naive. Relativism, as stated before, is universal. Reasoning consists of sloppy and incoherent "logic", or rather rhetoric, carefully polished to appeal to the tastes of a special audience. Philosophizing, moralizing and sermonizing are the norms.

Let us take a look at some instances of the widespread abuse of scientific terminology and concepts.

"If you'll permit me to use one of those formulas which come to me as I write my notes, human life could be defined as a calculus in which zero was irrational. This formula is just an image, a mathematical metaphor. When I say 'irrational,' I'm referring not to some unfathomable emotional state but precisely to what is called an imaginary number. The square root of minus one doesn't correspond to anything that is subject to our intuition, anything real – in the mathematical sense of the term – and yet, it must be conserved, along with its full function." (Lacan, 1977)

"What is most extraordinary is that the two hypotheses, the apocalypse of real time and pure war along with the triumph of the virtual over the real, are realised at the same time, in the same space-time, each in implacable pursuit of the other. It is a sign that the space of the event has become a hyperspace with multiple refractivity, and that the space of war has become definitively non-Euclidean."

(Baudrillard, 1995)

The first of these quotes, on a sympathetic reading gives the impression that the writer, Lacan is trying to employ mathematical concepts as metaphors to "define human life". Not only is he confusing imaginary and irrational numbers, in the process displaying what is at best, a vague understanding of these concepts; he doesn't even give his audience, be it here or anywhere else in his extremely overrated work in psychoanalysis, any good justification for using these foreign concepts. Terms like "irrational" or "imaginary numbers" mean nothing outside mathematics. In fact much of his work is riddled with statements like "This torus really exists and it is exactly the structure of the neurotic" (Lacan, 1970) which involve unfamiliar mathematical terms, make grandiose conclusions and are not justified at all. Baudrillard quote falls for the same trap. He seems to be hinting at some deep connection between the Iraq war and geometry. If anything, these are shameless tricks for impressing an unsophisticated reader. As Sokal and Bricmont write in their book *Fashionable Nonsense*, "Some of these authors exhibit a veritable intoxication with words, combined with a superb indifference to their meaning."

Another myth that has been advanced by postmodernists is that of "Postmodern Science" –the idea that recent advances in fields like quantum mechanics and chaos theory, and results like Gödel's incompleteness theorem and Heisenberg's uncertainty relations have somehow presented serious challenges to science, realism, naturalism and empiricism and have thus brought about profound philosophical and epistemological shifts. Now these advances have indeed changed the ways we look at the universe in several important ways, but nothing of the kind what these people have deceived themselves into thinking. Gödel's incompleteness theorem is a rather specialized result in logic, and it does not mean that language is fundamentally impotent in doing the job it is required for as Derrida and his friends have been thinking. Heisenberg's uncertainty relations do not pose a challenge to determinism in the sense that science has failed to extract reliable information about the Universe (actually, there is no more information to be extracted). But these people keep writing trendy books speculating in a grand and pompous fashion about the future of science, technology and human life, talking in technical terms they manifestly lack the adequate understanding of:

The conclusion we can draw from this research (and much more not mentioned here) is that the continuous differentiable function is losing its preeminence as a paradigm of knowledge and prediction. Postmodern science – by concerning itself with such things as undecidables, the limits of precise control, conflicts characterized by incomplete information, 'fracta,' catastrophes, and pragmatic paradoxes – is theorizing its own evolution as discontinuous, catastrophic, non-rectifiable, and paradoxical. It is changing the meaning of the word knowledge, while expressing how such a change can take place. It is producing not the known, but the unknown. And it suggests a model of legitimation that has nothing to do with maximized performance, but has as its basis difference understood as paralogy.

(Lyotard, 1984)

Criticisms of science generally range from complaints of providing insufficient evidence for holding the philosophical positions it does; to, serious accusations like "a faith as fanatical as any in history" by Historian Jacques Barzun. In the case of postmodern critiques, they come from a variety of perspectives, often in combinations of various versions of "epistemic anarchism", Marxism, Feminism, Multiculturalism and Radical Environmentalism. As mentioned earlier, they all espouse their own versions of relativism and cultural constructivism. They have come largely from humanists who have no background in science, whatsoever, who instead rely on a "semiotic" reading of what they themselves consider important scientific works. The worst part is that they don't feel the need for any such background.

"This book is dedicated to all of the science teachers I never had. It could only have been written without them."

(Ross, 1991)

Bruno Latour is a much celebrated example of this kind of critique. In his writings, he has endorsed rather extreme forms of cultural constructivist and relativist dogma. His works in the ethnographic tradition of science studies –he studies real scientists as they work in the lab. But like most of his fellow postmodernist friends his books do not reflect even a high-school understanding of the technical subjects he talks about.

On studying Einstein's semi-popular book *Relativity: the Special and the General Theory,* he writes of the supposed genius's obsession:

"obsession with transporting information through transformations without deformation; his passion for the precise superimposition of readings; his panic at the idea that observers sent away might betray, might retain privileges, and send reports that could not be used to expand our knowledge; his desire to discipline the delegated observers and to turn them into dependent pieces of apparatus that do nothing but watch the coincidence of hands and notches ...".

(Latour, 1988)

Notice, how spectacularly he confuses the mathematical concept of "Observer" with real living people. His reply to scientists who have objected to such usage of these concepts is:

First, the opinions of scientists about science studies are not of much importance. Scientists are the informants for our investigations of science, not our judges. The vision we develop of science does not have to resemble what scientists think about science ...

(Latour, 1995)

Moreover, he also reflects the self-congratulatory tone typical of this type of critiques:

Did we teach Einstein anything? ... My claim would be that, without the enunciator's position (hidden in Einstein's account), and without the notion of centres of calculation, Einstein's own technical argument is ununderstandable...

(Latour, 1988)

Latour considers himself the first modern thinker of science who found out what scientists actually did, instead of what they say they did. According to him scientific theories are not accepted because they are confirmed by experiments or contradict more established theories, but rather because they confirm to scientific orthodoxy or ideology. For example, in his book, *The Pasteurization of France* he examines the life and career of pioneering biologist Louise Pasteur, and provides explicitly ideological reasons why Pasteur's theories were accepted. A similar book has been written by Historian Gerald L. Geison, *the Private Science of Louise Pasteur.* Both of these books try very hard to overstate the few known instances of Pasteur's intellectual dishonesty which were not hidden from the scientific community. In fact they have been well documented in timeless classic *Microbe Hunters,* a book published back in 1926. Another problem with these approaches is that the writers already believe that science is a matter of ideology rather than experiment –all they have to do is cherry pick favorable evidence and construct a self-serving story; which makes it rather unsurprising that these accounts are often factually inaccurate. Aronowitz thinks Newton was a member of the "high-aristocracy". He was son of a farmer.

The point is that neither logic nor mathematics escapes the contamination of the social.

(Stanley Aronowitz, Science as Power)

Stanley Aronowitz is a well-known example. According to him, the special theory of Relativity was not a result of Einstein's singular genius. That's an idle legend, an anecdote scientists tell each other, to conceal the capitalist and imperialist forces of that time which gave birth to the theory now famously associated with Einstein (after all, who, in those days, didn't think about mirrors travelling at the speed of light!). And the same applies to Newton. And to all of science, including logic. Science is just a social construct, manipulated by the rich and the powerful, in order to control the poor and the weak. Now, someone making such a sweeping assertion better not rank low on reason. And yet, he never makes clear how this mysterious process is supposed to have happened, or care to present any plausible evidence. Instead, he relies on appealing to the reader's unconstrained leftist visions and a common victimhood, and continuously keeps flirting with the romantic notions of radical change. The dubiousness of his proposition does not seem bother many humanists, who meanwhile, keep singing on the same song.

Recent developments in the history and philosophy of science have led to a re-evaluation that acknowledges that the goals, methods, theories, and even the actual data of the natural sciences are not written in nature; all are subject to the play of social forces … Social, psychological, and political norms are inescapable, and they too influence the questions we ask, the methods we choose, the explanations we find satisfying, and even the data we deem worthy of recording. (Emphasis added.)

- Evelyn Fox Keller

"Many scientists believe that science is very objective and factual, it's a wonderful aspiration, but it's actually not true."

- Janet Hyde

Scientists are first people to admit that science is a human attempt. But to say that all science is a social convention, because it is practiced by humans and involves the use of language, is tautological. The right question to ask is to what extent is science, in theory and practice, affected by social conventions and if it is as arbitrary as described.

There are certain sophisticated and precise versions of this story which are much more agreeable, but to say that empirical statements (along with theoretical explanations) are merely social conventions, flies right in the face of common sense.

By the way, anyone who believes that the laws of physics are mere social conventions is invited to try transgressing those conventions from the windows of my apartment. I live on the twenty-first floor.

(Sokal & Bricmont, Intellectual Impostures)

Feminist critiques too use the same emotional tactics, but evidently, their criticism tends to be much more obnoxious than others. To them the present science is "masculine" and "andro-centric", and it has to be reformed by feminists through the applications of powerful postmodern-feminist techniques. Mainstream science ignores women and the issues which concern them, and is just one of the many other "patriarchal" institutions which have been used to enslave and subjugate women throughout history like religion and culture. It relies too heavily on "masculine ways of knowing" like reason and logic, and does not give the "feminine ways of knowing" like intuition, the respect they deserve. Women are and must be, by default, as good as men in these disciplines. Departments like mathematics and theoretical physics do not contain as many women as they do men, imply that these places are hotbeds of discrimination and misogyny. It simply couldn't be that women are naturally inclined away from some of these technical disciplines towards more social ones (where they are a majority in many cases). Nope. That's one of the many misogynous myths perpetrated by scientists, which are also very old-fashioned. Evolution works only on animals. It has not affected humans. Males and females differ only in certain characteristics like sexual organs and hair-patterns, but their brains are exactly the same.

"Is E = Mc^2 a sexed equation? Perhaps it is. Let us make the hypothesis that it is insofar as it privileges the speed of light over other speeds that are vitally necessary to us. What seems to me to indicate the possibly sexed nature of the equation is not directly its uses by nuclear weapons, rather it is having privileged what goes the fastest ..."

(Irigaray, 1987)

"Isaac Newton's Principia Mathematica is a 'rape manual' because 'science is a male rape of female nature'."

(Harding, 1986)

To be fair, Harding has indeed expressed regret over writing this.

One the most pathetic attempts at reforming "masculine" science, is *"Towards of Feminist Algebra"* by M. Campbell and R. K. Campbell-Wright which was presented at a meeting of the Mathematical Association of America.

It may seem to innocent readers, if any such remain, that we are putting words in the authors' mouths; but no: they disapprove of a particular problem in which a girl and her boyfriend run toward each other (even though the girl's slower speed is carefully explained by the fact that she is carrying luggage) because it portrays a heterosexual involvement. They object to a problem about a contractor and the contractor's workers (sex undeclared), because they assume that the student will envision the workers as male. On the other hand, they offer for our approval a problem about Sue and Debbie, "a couple financing their $70,000 home." Their general maxims call for problems "presenting female heroes and breaking gender stereotypes" and "analyzing sex similarities and differences intentionally" and "affirming women's experiences." All this, mind, is to be done in an algebra class.

(from Gross and Levitt's *Higher Superstition*)

And they think they are supposedly talking about "college algebra". Further objections are raised:

"Mathematics is portrayed as a woman whose nature desires to be conquered" (Campbell and Campbell-Wright)

The paper also draws your attention to the kind of "violent, aggressive, and sexist" slang used in these books, like "brute force", "exploit (a formula)", "manipulate (an expression)" and "attack (a problem)". It reflects the usual puerile and hopeless nature of these kinds of critiques. We move on with one final quote by Katherine Hayles summarizing an argument by Irigaray and another by Jean Bricmont:

The privileging of solid over fluid mechanics, and indeed the inability of science to deal with turbulent flow at all, she attributes to the association of fluidity with femininity. Whereas men have sex organs that protrude and become rigid, women have openings that leak menstrual blood and vaginal fluids. Although men, too, flow on occasion -- when semen is emitted, for example -- this aspect of their sexuality is not emphasized. It is the rigidity of the male organ that counts, not its complicity in fluid flow. These idealizations are reinscribed in mathematics, which conceives of fluids as laminated planes and other modified solid forms. In the same way that women are erased within masculinist theories and language, existing only as not-men, so fluids have been erased from science, existing only as not-solids. From this perspective it is no wonder that science has not been able to arrive at a successful model for turbulence. The problem of turbulent flow cannot be solved because the conceptions of fluids (and of women) have been formulated so as necessarily to leave unarticulated remainders.

(Hayles, 1992)

With friends like these, the feminist cause hardly needs enemies. (Jean Bricmont)

Now, some of these quotes are known to be extreme, though I fear they still find acceptance in surprisingly huge sections of the social science and humanities community. None of the authors (except for Harding) quoted here, have gone on record showing remorse. And it is also not the case that these are views of a fringe group of activist professors –they are representative of large sections of this discipline. Irigaray is held as one of the greatest of all French feminists.

Latour is reportedly one of the most frequently cited authors. But he is an elusive chap. It appears that he has used many of the same objections on his competitors like Aronowitz that can be raised against his own work. All this gives the impression that these postmodern scholars don't care about internal logical consistency anymore, and have abandoned the use of elementary logic long ago.

Quiet recently a paper titled *"Who are the "Clever Sillies"? The intelligence, personality, and motives of clever silly originators and those who follow them"* by E. Dutton and D. van der Linden, published in the journal *Intelligence*, seemed to support this view. It says that postmodernists among many other "clever sillies" are actually highly intelligent people, who endorse "obviously logically flawed" ideas such as postmodernism in order to display their high intelligence which aids the kind of "intellectual gymnastics" required to defend these ideas.

Adopting a highly complex idea, even if it is wrong, showcases the intelligence necessary to adopt such an idea at all in a way that espousing a simpler (though correct) idea does not.
(E. Dutton and D. van der Linden)

The paper suggests that all this is done, ultimately, in order to attract mates. Well, I hope you see the irony of daring to propose an adaptationist explanation to describe the behavior of people who are most hostile to the very idea of these kinds of explanations.

A range of objections, both philosophical and empirical have been raised against postmodernism, many by eminent humanists themselves.

Analytic Philosopher and Linguist, Noam Chomsky, writes on the irrelevance of postmodernism to human empirical or analytical knowledge:
"what are the principles of their theories, on what evidence are they based, what do they explain that wasn't already obvious, etc.?...If [these requests] can't be met, then I'd suggest recourse to Hume's advice in similar circumstances: 'to the flames'."
Biologist Richard Dawkins writes about obscurity:
"Suppose you are an intellectual impostor with nothing to say, but with strong ambitions to succeed in academic life, collect a coterie of reverent disciples and have students around the world anoint your pages with respectful yellow highlighter. What kind of literary style would you cultivate? Not a lucid one, surely, for clarity would expose your lack of content."

Epistemic relativism, at least in the strict forms one encounters in certain works, as in "Everything is relative", can't possibly be true, because then it will contradict itself (as in the statement "Every statement is false"). In order to be true enough, such a statement has to make an exception for itself. This is called special-pleading, and it is omnipresent in most postmodern works. This can be done easily on paper, but how can one then make a factual claim like "science is relative, like everything else"? If everything is relative, how come postmodernist techniques and methodologies produce genuine non-relative knowledge about science? How come a discipline which is every bit as relative, if not more, as science produce this kind of knowledge about science. Postmodernists should abandon the metaphysical claim that the language games they play with their literary techniques can somehow reveal to them the deep secrets about humans or nature.

"This is, of course, the usual problem, for relativists, of truth (a problem because they would be out of a job if they allowed not only—as they always do—that there is no necessary truth in what others say, but also in what they say)."

Gross and Levitt, *Higher Superstition*

"Postmodernism, the school of 'thought' that proclaimed 'There are no truths, only interpretations' has largely played itself out in absurdity, but it has left behind a generation of academics in the humanities disabled by their distrust of the very idea of truth and their disrespect for evidence, settling for 'conversations' in which nobody is wrong and nothing can be confirmed, only asserted with whatever style you can muster."

-Daniel Dennett

The point is, of course, not that the whole of postmodernist literature is nonsense. There are in fact beautiful works, which you might have come across, by some like Foucault, which are not so much factual, yet still provide beautiful insights into human culture. After all, if knowledge makes this life possible, beauty is what makes it worth living.

Our misfortune is that too many people from this school of thought have gone completely overboard with their opinions and have completely lost track of reality, resulting in serious damage to the humanities and the social sciences, not to speak of the generations of idiots trained in these departments which we will have to deal with. Such nonsense along with the blessings of few leading universities and their academic presses does serious damage to public understanding and trust of science in its pursuit for petty ideological gains. It should be noted that all of this literally exceptional scholarship went on for more than two decades (and still continues) until the scientific community took note when the book *Higher Superstition* was published. This was followed by the famous Sokal affair and then the book *Fashionable Nonsense*. But still we don't see many signs of humanities growing out of this fad; instead their attitudes and language have seeped into the media and even some softer areas of science. Incidents like #gamergate and Daniel Sarewitz's absolutely moronic proposal on CRISPR policy (published recently in *Nature*) adequately demonstrate this.

If science is indeed so cultural determined, as they think, how could it produce such strong results? How come, more often than not, scientific discussions are so far removed from ordinary human experience (forget about trivial political matters)? The least we expect from them is some humility and a willingness to understand science as scientists themselves do.

SHRIYA
PAI

saffronisation of science

There is a strong notion among the 'more aware' that the Indian cultural and scientific history is largely concocted by those who strongly advocate saffronisation (of education mainly). With the Right attributing several important discoveries to Indian origins, the pursuit seems endless. So is there any hope for creating an honest, scientifically rigorous narrative of Indian history? We could begin by first locating our goalpost-which is probably to refrain from politicizing history and to make it a sound analysis and assimilation of intellectual honesty instead.

The dire consequence of taking saffronisation of education to a new level of neologism is not limited to a fall of reputation of the factions involved. It affects, in every way, the kind of picture that will be drawn in young minds, by plaguing them with narrow-minded views on science, religion, society and politics. On the other hand, it is incorrect to force stop everyone who shows Indian scientific history in good light. If for instance, people make a claim that the Pythagoras theorem had been looked at by Indians as early as 800-600 BC, there is no need to shoot them down. There is enough evidence that it was also given by the *Sulbhasutras,* in connection with the construction of their religious altars.

It is for groups like the RSS to play their cards right. Their standard justification for *Indianising* the school curriculum is to inculcate the feelings of patriotism and Hindu spiritualism in children. The 'Shiksha Bachao Andolan' for instance, sought to ban all anti-Hindu books. Even if political ideology creeps into our textbooks, a sound mind can be expected to see through the jargon. Consider an example from almost 15 years ago: 'Minority communities' were quoted as a major problem for the country, followed by corruption, bribery, caste-based reservation, drugs etc.! In fact, the lesson even went on to refer to the Christians and Muslims living in our country as foreigners. We can only hope that we have come a long way since this time. The point that I wish to drive home is that glorified tradition and culture cannot be used to justify propaganda.

Claims about planes facilitating interplanetary travel in the Vedic times were made recently at the Indian Science Congress. What's more, apparently the invention of the television dates back to Indian *rishis* who were attaining *divya drishti.* What *is* this? A revolt against western hegemony? Several institutions are founded with the objective of training children to emerge as the protectors of a Hindu nation. Saffronisation of education is part of a far-reaching agenda to reverse such historic trends as the Constitution broadly favouring tolerant humanism. And it actually harks back to the period of turmoil to which the secularism of the Constitution had been an answer. The upsurge in nationalist tendencies is more like an exercise in rewriting history. What *is* the obsession with making such spineless statements? Why waste time making them at all, for this is not the impetus we need. Even if we are to accept that these claims do not truly reflect the government's ideas, the hassle is just not worth the effort. It is as if the road not taken now faces the nation at a point to which it has returned after all its wanderings.

Whether it is about test tube babies in ancient India or about aeroplanes fuelled by elephant and cow urine, through the creation of unnecessary hierarchies, saffronisation of science is en route to becoming a form of intellectual terrorism. Young minds should not be allowed to be laboratories for the experimentation of political ideology. There is no room for half-baked truths, no ownership of a distorted history and no pride in obtaining extremist education. Propagation of mythological stories as facts is not even what is *claimed* to be Indian modernism. This is not what any generation would want.

We still face quite some trouble in accepting certain incidents in history. This is perhaps due to colonialism continuing to influence our conscience. Ours is indeed a cruel dilemma-neither can we snap out of our mental association with colonial ideas, nor can we resolve the confusion regarding our own tradition. Making our history sound like a fairy-tale does not entail an advance into anything. There is a sinister constraint of working in the limelight of the media, and in all probability, statements can be blown up and/or misquoted. So how does one pass on political history? Intellectual honesty seems like a reasonable guess.

The makers of a history cannot be predetermined. However, it is well within our reach to create (only out of will) *good* academic historians. There is no dearth of the interested and this will at minimum, keep non-practitioners from narrating our history, especially of the Indian contribution to Mathematics, Science and Art. This could be the storm that uproots the trees of self-proclamation and sows the seeds of meaningful pursuit.

The Trolley Problem

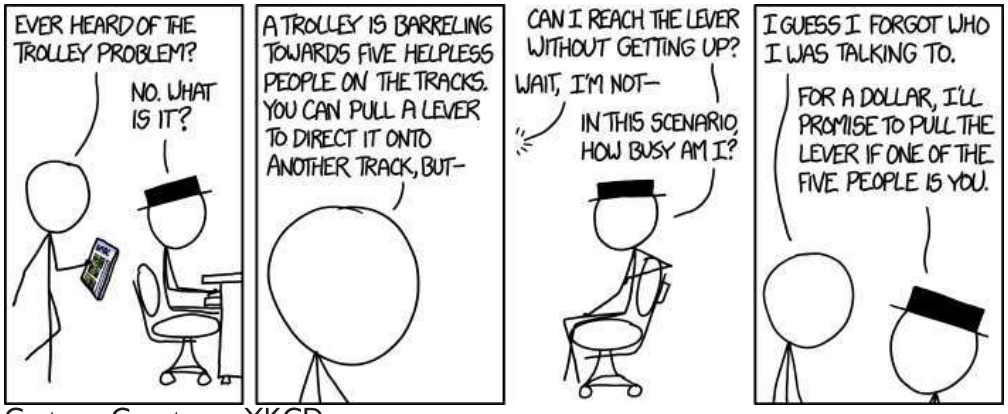
Shankar Sivarajan

If I were to ask you about the "trolley problem", your response reveals a lot about your manner of thought. If you are a physicist, you might have thought about a frictionless cart rolling along an inclined plane with springs and pulleys and other diabolical contraptions generally seen only in Rube Goldberg machines. (For the modern non-physicist, pulleys were wheels with grooves around the rim, and used in Ancient Greece to lift weights and move ships around.) If you wondered if there was a shortage of shopping-carts at the local supermarket, well, you probably aren't a philosopher (or, if you are, you are a particularly ignorant one).

"The Trolley Problem" is a classic in philosophy, and consequently in ethics. The traditional form of the problem is as follows: You're standing at a railway switch and there is an out-of-control trolley hurtling inexorably down the tracks towards a group of five people. If you pull a lever to divert the train, it switches to a new set of tracks where there is a single person. Now, the question is "Is it morally permissible to pull the lever and kill one person to save five others?" Further, if it is permissible, is it *obligatory*?

Now, I will not tell you my own response to the problem as it will strike you as either obvious or atrocious, but I *will* propose certain variants, which are also famous. The Fat Man: As before, a trolley is hurtling towards five people. You are on a bridge under which it will pass, and you can stop it by placing something heavy in its path. There is a fat man next to you and your only way to stop the trolley is to push him onto the tracks, killing him to save five. Now this, for some reason strikes most people as more sinister and considerably less "moral". To simplify the problem, suppose the fat guy was the villain responsible for putting the five people on the tracks in the first place. Then, the answer is considerably simpler and pushing the man over is not just permissible, but imperative.

Now, there are a couple of other variants, one of which involves a surgeon deliberating on whether to harvest a single healthy person's organs to transplant into five dying ones, but I shall discuss, *ad absurdum*, more variants and also explain why we need to worry about these. Clearly, if the one person to be brutally murdered (or sacrificed "for the greater Good") is a relative, or a romantic partner, your decision would be influenced. What about really distant relatives? So distant, in fact, that the only thing you have in common is that you are of the same race? Are you a racist for preferring to save your relative, who is coincidentally of the same race as you, over five others, who just happen to be of a different race?



Cartoon Courtesy - XKCD

Suppose now that your choice was between the life of one person and provisions being sent to a poverty-stricken area where it would save, you guessed it, five lives. It should seem monstrous to let a living, breathing, human die just to save some "stuff", but a strictly utilitarian view mandates that it be done.

Now, neglecting ridiculous examples involving Siamese twins (or conjoined twins? Whichever is currently politically correct) and whether they ought to count double, the last major question is involving yourself. Would you sacrifice your own life to save others? This is where most people would abandon the entire line of thought and try to forget they ever heard about the damn trolleys in the first place, but I have one phrase for you which might keep you interested: Autonomous Cars. They are almost here, and as anyone with experience in programming can tell you, computers need to consider every case, no matter how unlikely it may seem to you, or you risk stack overflows, segmentation faults and other exotic errors.

Suppose you are driving on a narrow road, just turning round a sharp bend, and you suddenly see five people on the road in front of you. There's no way to stop in time, and your only option is to swerve of the road and down a bottomless ravine/abyss (surely they exist?). Whether or not you could bring yourself to do that is not the relevant question. The question is whether you would buy a car which would do that automatically. Perhaps there would be many models in different price-tiers with different moral outlooks, similar to how they vary today in security features, protecting you at the expense of others, and you could choose the behavior of your vehicle.

Far be it for me to judge you for your choices, or to address the nuances of these questions. I only state that these issues exist and a decision must be made. Or maybe we can just let Google decide how they want to make their self-driving cars. It is often easier just to avoid addressing ethical conundrums at all, and just wait for them to be answered on our behalf.

Up and down the evolutionary highway

Narmada Khare

Prof. Eric Lander, when he came to give a public lecture in Bangalore in February 2015, was asked if the process of evolution can move backward. The gist of his answer was: As a scrambled egg can't go back to being a functional egg, so can evolution not go backward to a precise previous stage. Do you all agree with this?

When I was in 7th or 8th grade, there was a rumor about a boy in the neighborhood that he was born with a tail. Naturally we all found it deliciously disgusting, but were quite disappointed when his sister, who was also the source of the rumor, told us that it was removed immediately after he was born. The unfortunate boy with an over-talkative sister must have had a truly horrible childhood. We asked our elders if such a thing was even possible, and most of us were summarily banished. My father however, an avid reader of all things biology, solemnly told me, "It is rare, but only as rare as a hen with teeth", and promptly handed me an essay to read. The essay by Stephen Jay Gould was called "Hen's Teeth and Horse's Toes" (1). And yes, in those days we were allowed to read material that didn't necessarily result in increased test scores.

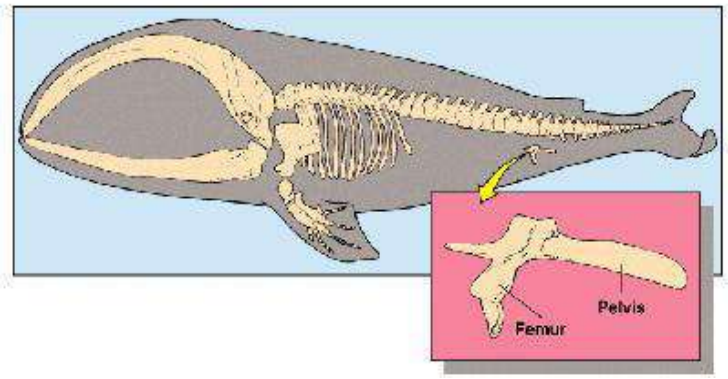
Is it true then that evolution is a one-way journey? It is generally believed that there aren't many universal laws in biology. One comes up with a rule, and Nature presents an apparent exception. True, one can't go back to a whole egg once it is scrambled, but every now and then don't we hear of a person with her whole face covered in hair, or a newborn baby with a tail? Aren't these examples of once-lost traits returning?

Traits are lost as well as gained over the course of evolution. Structures that are developmentally costly to make, energy intensive to maintain are probably the first to go when their need is over or compensated. The reason for their loss may not be a mutation causing a defective protein necessary for, say, tail formation; but turning off of a genomic switch: a switch that regulates the developmental process to create a tail. Imagine a bulb going off not because the tungsten filament burnt up, but because somebody turned off the switch. If a switch can be turned off, it should be easy to turn it on again.

Gould's essay talks of an idea called "Atavism", from "atavus", Latin for great-great-grandfather. Atavism describes going back to one's ancestral form. Every so often an individual is born with a trait similar to the one its species left behind during evolution, e.g. a hen with teeth or a horse with cleft hooves, or a snake with legs. Such individuals were often considered mere freaks of nature, curiosities and nothing more. They were even looked at with a bit of embarrassment, as reminders of an imperfect past. In his essay, Gould suggests that these may be glimpses into the fantastic hidden potential for diversity that our genomes still retain. It is as if the record of our evolutionary past has been archived in the library of our genome.

It is important to remember that evolution is often not one single mutation that leads to a new form. From a variety of choices, the form that is advantageous to the organism in surviving in its surrounding becomes more and more frequent in the population. The new form is not 'created' with any particular intentional. It may be a result of many genetic / molecular changes, a combination of many chance events. Also, one individual sprouting a tail does not put the whole human population on the return journey to a previous evolutionary stop. A useful structure gives that individual a reproductive and survival advantage, and over generations, it becomes more frequent in the population. If the human tail ever becomes common, it will only be because it gives us a significant advantage for our survival.

Many ideas regarding the speed and direction of evolution have been beautifully examined by researchers. Let's look at two such experiments.



1.
A cock with teeth

2.
Whale skeleton which shows the leg bones

A structure may be lost during evolution but the machinery required to make it may still be present in our genomes. In the oral cavity of 'toothed' organisms the outermost layer of cells (the epidermis) works together with the layer below (the mesenchyme) to form a tooth. The epidermis 'induces' the mesenchyme to generate the bone and dentin that underlie a tooth. The dentin, once made, induces the epidermis to produce the enamel that covers a tooth. Birds are not 'toothed'. Though fossil record shows that early birds had teeth, no known modern bird species produces them.

In 1980, Kollar and Fisher asked, if provided with correct conditions, would the epidermis of a hen participate in producing a tooth (2)? They took the chicken epidermis, laid it over the mouse mesenchyme and grew them together. Out of 55 such grafts, 10 produced dentin! What's more, in 4 the tooth development was complete, enamel and all. This showed that the modern bird cells, which have not produced a tooth for the last 70 million years, have nonetheless retained the ability to do so. Not just could the chicken epidermal cells induce a responsive mesenchyme to create a functional dentin, they could also differentiate in response to the signals coming from that dentin to give rise to an honest-to-goodness tooth.

Now the question was, how do we know it was a bird tooth and not a mammalian tooth? After all, the mesenchyme came from a mouse. In 2006, Matthew Harris found that a chicken mutant he was working with grew teeth very similar to those of reptiles, all by itself, without any mammalian help (3). This was the first glimpse at a "bird tooth". What happened in this mutant? Harris and colleagues showed that the mutation had caused some molecules that normally expressed on the sides of the gum area to change their location. Now, these molecules started appearing in the middle of the gum as they did 70 million years ago, in the animal's tooth-making days! So, no complicated surgery was needed, and a single mutation could return the trait to its ancestral form.

So, did a similar change in the reverse direction result in the modern birds losing their teeth? Isn't evolution supposed to be a combination of many small changes and chance events? The Darwinian view of evolution is that it is a smooth, gradual, incremental change in form. One form gradually changes to become another, better-suited form. Although the fossil record is not overflowing with evidence for such a gradual change in form, Darwin argued that this could be because the fossil record is imperfect. "Gradualism" makes little sense when considering the evolution of certain structures, but may have takers in some others. Let's compare evolution of an eye and a wing. Imagine these structures going from very basic, rudimentary stages to more complex, highly specialized organs. While one can imagine a rudimentary eye being useful in sensing the environment to some extent, what could be the use of a rudimentary wing that provides no lift to a body? Did wing also had to evolve gradually? One school of thought says that the wing may have had a completely different function to start with and 'flying' came as a happy perk (4).

Do remember, Darwin did not know about the "gene: trait" correlation. He had not read the works of Mendel (nor had Mendel read his), though they were contemporaries. Today we know that seemingly insignificant changes in our DNA can start a chain reaction that can have a drastic impact on the way we are. Genes are arranged on the chromosome in a specific manner, and regulation of one may seriously affect the regulation of the others. There are master switches, controllers, regulators in our DNA that when turned on or off can affect functions of large sets of genes. Here is an example of a simple genetic change resulting in a drastic structural change: The thorax of the fruit fly Drosophila has three segments. Normally, only the 2nd thoracic segment gives rise to a pair of wings. A mutation in a single gene can cause the 3rd segment to look like the 2nd, sprouting an extra pair of wings, and now we have a four-winged fly.

Then, is evolution a gradual process or a jerky one, punctuated with change? Why is it considered irreversible? Around 1890, paleontologist Louis Dollo proposed that once a structure is lost due to evolution, it cannot reappear in the organism. This is why legs have not reappeared in the whale population nor have teeth in the chicken population (5). Since there may be many a stop

in the journey from an ancestral to a modern form, and since there may be many ways to reach the given destination, it seems impossible to retrace the path.

Mutant 4-winged Drosophila

Thornton: The chances of reversibility ever happening are vanishingly small: There are examples of organisms losing a trait over evolution and then regaining it (6). However, it isn't clear if reappearance of the trait is due to a precise reversal of a change that caused its loss in the first place, or because of some other mutation resulting in a similar trait. Stick insects are known to have lost and regained their wings. Did they reacquire the same exact kind of wings they had lost? Biologically, biochemically, energetically the same exact wings?

Thornton and colleagues study how protein molecules change their shapes over millions of years to evolve new functions. Using new techniques, they determine the structures and functions of ancestral genes, and then biochemically synthesize them for further studies (7). They have identified the ancestral (A)and the modern (M) forms of the protein "glucocorticoid receptor". This is a transcription factor in the nucleus. The shape of the modern protein changed from that of the ancestral one over the last 40 million years, also modifying the function. In going from A to M, its ability to bind to cortisol increased and the ability to bind to other hormones went down. The two proteins differ in 37 amino acids. Since both forms of protein are available, this is an excellent starting point to study forward and backward evolution. Two steps were planned: 1. In A make the known changes and observe its conversion to M, and 2. reversing the known changes from M to convert it back to A.

The researchers categorized the 37 mutations in groups W, X, Y, Z etc. based on their positions and degrees of conservation. E.g. X contains changes that are highly conserved and are in the area of protein involved in binding to cortisol; Y group contains mutations involved in binding to other hormones, and so on. First, they introduced subsets of mutations into A to learn how its function became modified. They found something very interesting: After making a total of only 7 changes (groups X, Y and Z) in the ancestral protein, it became functionally identical to M. There were 30 other mutations that were apparently unnecessary for the functional evolution from A to M.

Does this imply that reversing these 7 key sites from M would result in its reverse evolution to A? The experiment was performed, and to their surprise, returning only those 7 sites in M to their A form resulted in a functionally completely inactive protein: a "dead receptor". This constraint on reversal must be the result of the 30 other changes that occurred during those 40 million years. Those differences now make it impossible for the protein to revert to its original shape in spite of the 7 key reversals. Thornton and colleagues call this a "ratchet", a device that prevents backward motion, created by changes in unrelated genes. We don't know the sequence in which mutation events took place. We don't know if some mutations got reversed over time, and how that may have affected the molecule. This is where the gradual changes and the chance events have resulted in evolution from A to M form of the protein. And this is where it becomes mindboggling to imagine that a precise reversal of evolution could occur.

The observations made by these researchers clarify some aspects of the evolution of the developmental process: It is possible to see a drastic change in form even when the genetic change is minor. Such a change is often a consequence of turning on or off a regulatory switch in the genome. Over the millennia the genome accumulates changes. The more the number of changes, the harder it is to reverse them. The chances of reversing 1 mutation are higher than reversing 37. A change will stay in the population only if it gives a survival advantage to the organism, taking the next step in evolution. Not all changes are functionally relevant, however they will affect the shape of the molecule in ways that are not obvious when looking at the final form. These changes and the sequence in which they may have occurred make returning to the original form hard if not impossible.

So there…Though I wish otherwise, it doesn't look like the tail will come to stay in the human population.

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mother's lap

Anshuman Swain

In Verse

poetry, life.

Women poets of yore - from Greece, Japan and India

Anish Mokashi

Love poems of three women poets from three very different historical periods and geographic locations are presented here, which though written in different languages, seem to have much in common.

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Sappho was a Greek lyric poet from the 7th century BC, belonging to a cult of Aphrodite. Her vivid and sensual poems are like a celebration of life. The fact that her poetry has survived two thousand six hundred years itself makes its beauty truly timeless! What makes her poems even more interesting is the fact that she used to sing them with her own music that she played on the lyre. Sappho also wrote poems of love directed towards women which suggests that ancient cultures were probably very tolerant. In fact, the word lesbian comes from Lesbos, the place Sappho belonged to. Her name is also the origin of the 19th century word, sapphic to refer to lesbian relationships. These poems are from the book *Sappho* by Mary Bernard.

With his venom
irresistible
and bittersweet

that loosener
of limbs, Love

reptile-like
strikes me down

When they were
tired
Night rained her
thick dark sleep
upon their eyes

Pain penetrates me
drop
by
drop

At noon time
when the earth is
bright with flaming
heat falling straight
down,

the cricket sets
up a high-pitched
singing in his wings

Love has shook
my senses
like wind crashing
on
mountain oaks

You may forget but
Let me tell you
this:

someone in
some future time
will think of us

Izumi Shikibu, a Japanese poet from the 10th century AD, was a member of the royal court of Kyoto and practised Buddhism. She is one of the Thirty Six Immortals of Poetry of medieval Japan. She is famous for her diary about her affair with the Emperor's son, prince Hatsumichi. These poems are messages that she sent to her lover through servants and they are from the book, *The Ink Dark Moon* by Jane Hirshfield.

愛は
受け取る力があってこそ
与えられるもんだ

This heart is not
a summer field,
and yet...
how dense love's foliage
has grown

What colour is
this blowing autumn wind,
that it can stain
my body
with its touch

Watching the moon
at midnight...
I wonder
whose village
he watches it from

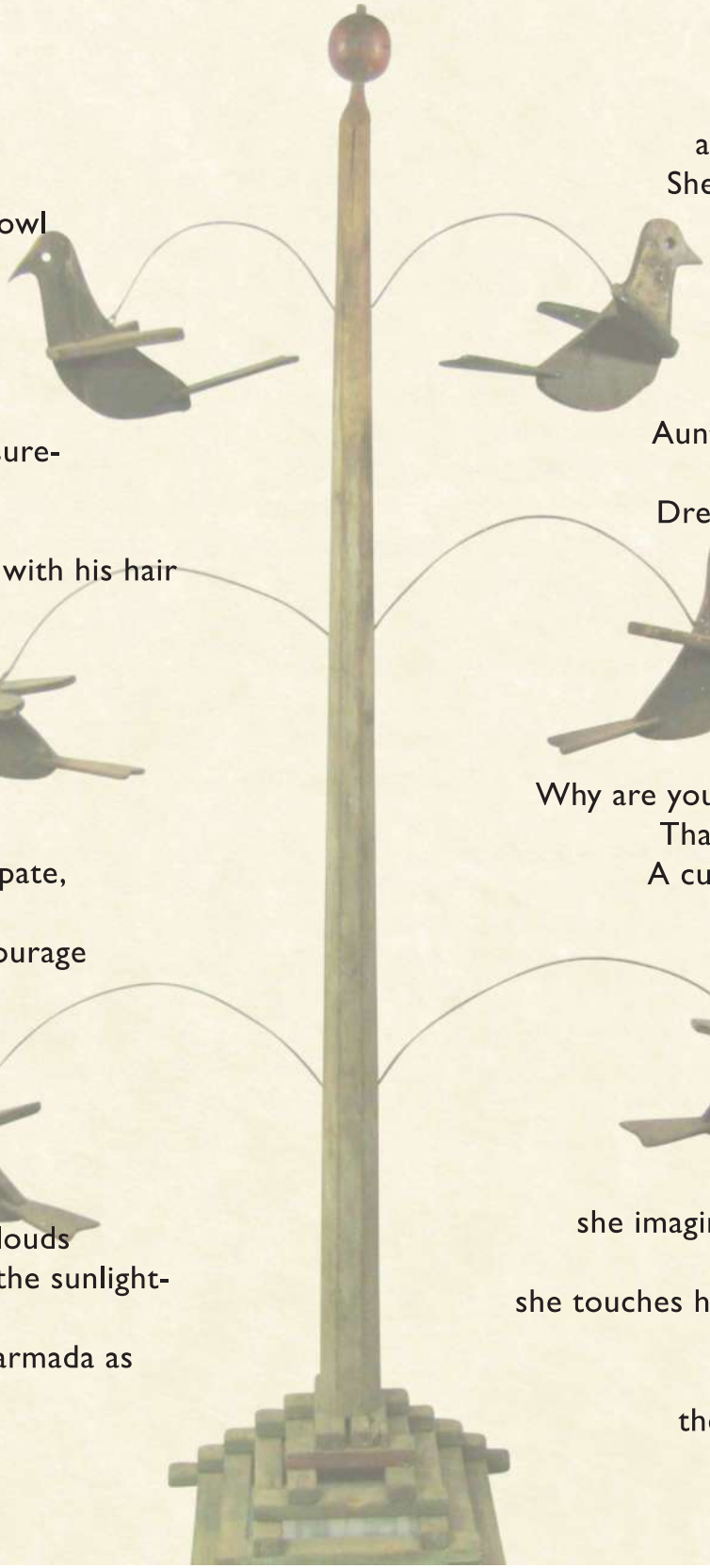
One by one,
at day's end,
the birds take flight
in all directions-
which could lead me to you?

If you had
only stayed away
when I first missed you,
I might have forgotten
by now

Although the wind
blows terribly here,
the moonlight also leaks
between the roof planks
of this ruined house

This heart,
longing for you,
breaks
to a thousand pieces-
I wouldn't lose one

Gāthā-Saptaśati (Seven hundred poems in 'gāthā' form) is a collection of Prakrit love poems compiled by the 2nd century Sātavāhana king Hāla - from the dynasty that made the mural paintings of Ajanta. Amarushataka is an 8th century collection of Sanskrit love poetry selected by king Amaru of Kashmir. These poems were mostly written by women - prominent among them were Vidya, Shilabhattarika and Vikatanitamba. The poems are bold, humourous and full of natural imagery, about trysts between lovers and have an honestly sensual voice. The following poems are from *The Cane Groves of Narmada River* by Andrew Schelling and *The Absent Traveller* by Arvind Krishna Mehrotra.



While the bhikshu
views her navel
and she
his handsome face,
crows lick clean
both ladle and alms bowl

I remember this pleasure-
he sat at my feet
without speaking
and my big toe toyed with his hair

Ask the nights of rain
and the Godavari in spate,
how fortunate he is
and unwomanly my courage

Cool thickets
leaves the colour of clouds
cane groves breaking the sunlight-
but you've forgotten-
forgotten the river Narmada as
well
how we washed
in it afterwards

O Mahua
blossomed
on Godavari's
arboured banks.
Shed your flowers
one
after
one

Aunt, can a glimpse
Fulfil?
Dreaming of water
Slake thirst?

Why are you crying, friend?
That's how love is.
A cucumber tendril
Its emblem.

Eyes closed
she imagines leading him
into her bed
she touches her own breasts
adoringly
on her arms
the loose bangles

Whispers, deep kisses,
bodies perfumed with slippery
oils,
betel nut cooling the mouth.
To make unhurried love
the whole night before you.
Ah! But a hundred,
a thousand times sweeter the
quick and forbidden-
done in a moment
gone like a thief.

Where to
girl with bright thighs?
There's no moon tonight

'Out to my lover'

Not afraid, young in the darkness
to travel alone?

'Can't you see - at my side
with lethal arrows
the love god?'

Not knowing me,
Vidya,
dark as a blue lotus petal,
the critic Dandin
declared our goddess of verse-
craft
and learning, entirely white

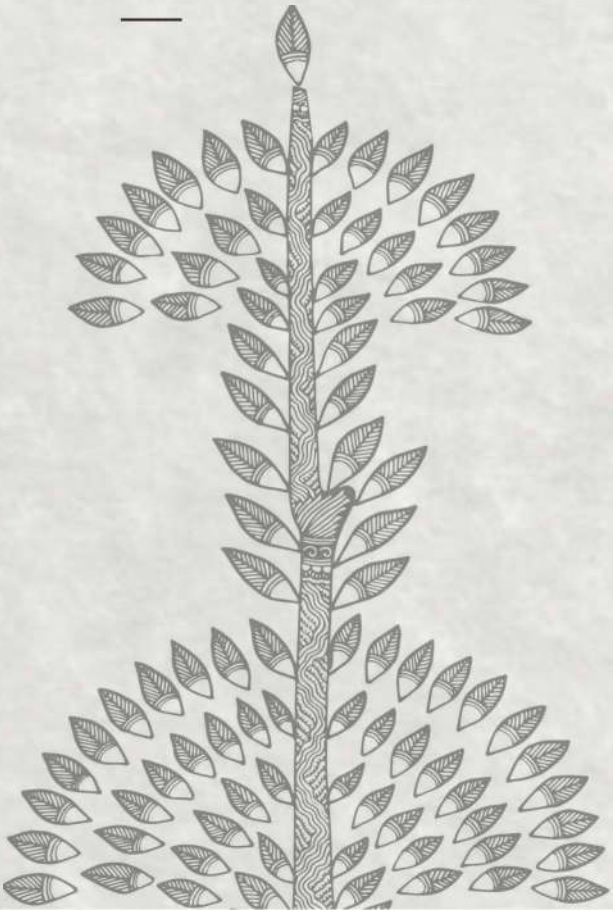
She conceals herself
where the forest is thickest
and waits for the sound-
dry leaves of
autumn
someone approaches

Talking's no use
all that's written sounds trivial
do we alone
know how it hurts
to be separate?

To keep from spiteful tongues
Her love for you,
She looks at everyone
With equal affection.

Please mother
get the cage out of our wedding hut
this parrot has taught the whole village
to mimic our
love cries

As the traveller, eyes raised,
cupped hands filled with water, spreads
his fingers and lets it run through,
she pouring it reduces the trickle

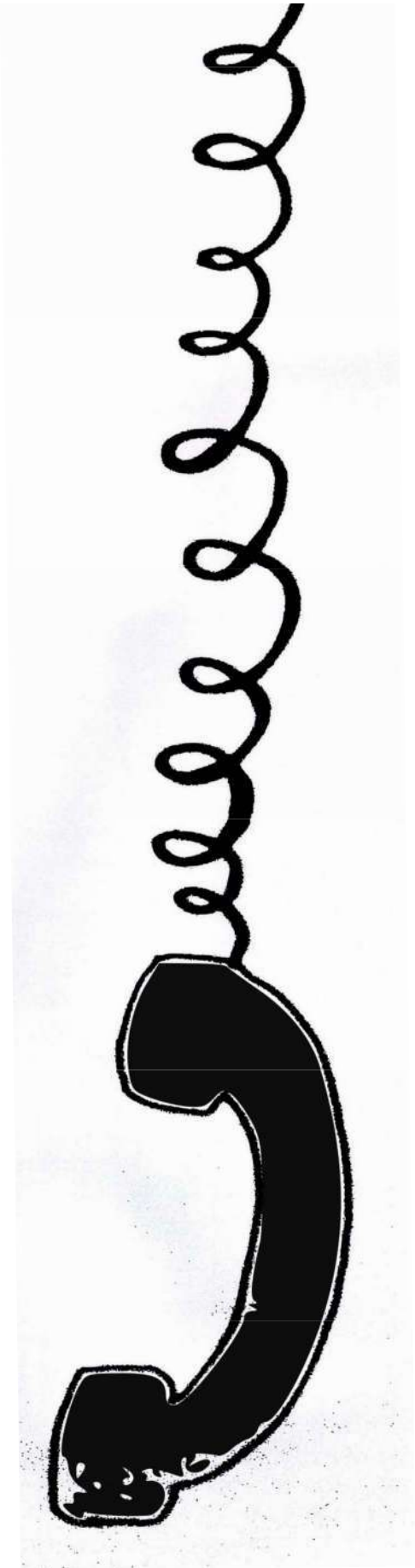


Indolence

Rohit Chatterjee

I sense everything
The hint of jasmine in the air
The mellow heat on my palm
From a patch of sunlight
A newspaper within sight
But out of reach
Beyond my comatose limbs
As I now desperately beseech
With parched tongue
The alarm clock not to resume intonation
While my ears pick out
The ever melancholy Mukesh in the next room
Serenading a coy country lass
- And it seems this lethargy won't pass
But hold me locked in its soporific embrace
Be that as it may; I'm not prepared to face
The lesser concerns of everyday existence
I wish a few more moments of this delicious druggedness
And force my now palpitating sense of duty into defeat
As my foot unmindfully reaches out
And forges another cranny
Into the tortuitously contorted bedsheet

What do you want to know?
Things are as bad as they will always be
I'm not getting better; I passed that point
Right when I crossed over into despondence
When you passed me by
I craft my days in ignominy
Now in the twilight of faltering years
And forgotten faces
The memories are stagnant now;
There are weevils among the dandelions
In the fields where we snuggled
And whispered sweet nothings
When the fluttering winds carried silly lullabies
We used to have tunes for them
Used to have each other
For warmth; of nights when we would
Pelt the dark lake with smooth stones
It's surface glistening like quicksilver
The lake is dry now; the nights are cold
We drew breath as one; singular,
Yet singularity is now my curse
I tell myself it is unbearable
Yet I bear it everyday; living, yet living
But no life is this - dank and bleak
I fritter away time drunk in desolation
Too broken to act -
On impulse, on sentiment
I used to be frantic, yes
When your loss was still so fresh
I could smell its vapid humours
I used to grieve, wallow and flail
Cover up your loss with mental remains
Songs and pretty pictures
Of a utopia so complete even in absence
But odes and sonnets would no more bring you back
Than take me away
To the place where you must be
Swimming among the fragrant fields of summer
While the sparrows take no prisoners
As you feed them crumbs of light
So stop visiting me in my dreams
Throwing open suspicions in my waking moments
An overturned book, a little note, a flower vase
And full blooded phantasms hovering in the shadows
They all take your form
Or what I remember is your form
I cannot be certain anymore
And I'm not sure I want to be



Retrospect

Rohit Chatterjee

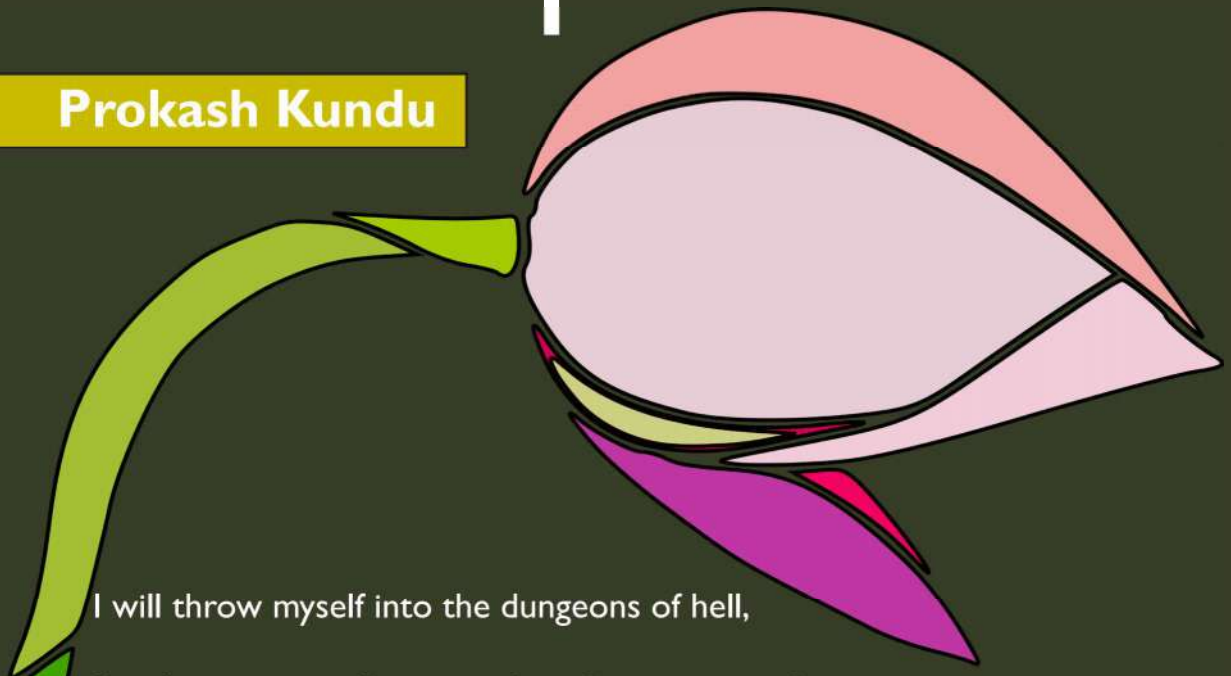
Run along, little kitten, run along
over the musty bookshelves lined with tomes
Fain would you care
About the foreboding mountains of knowledge
that pass unheeded beneath your paws
As Grandpa pores over on his desk
Over sheaves of important looking pages
And you search for your morning mouse
I am the only one left purposeless
As i fidget between my ruler and my exercise book
seeking to escape the monotonous drudgery
of inconsequential word problems
Hurry now, little kitten, hurry up now
I won't tell Grandma you're about to raid the larder
It won't do to dither wide-eyed
While she's busy grinding the poppy
On the ominously black grinding stone
The lentils are boiling on the stove
The coriander finely chopped, ready to garnish
The divine, mustard-laden preparation of afternoon fish
I am the only one left purposeless
Caught between the lemon pickle
Whose tangy goodness brings tears to the eyes
And the amber, liquefied golden
unworldliness of the mango chutney
Scurry along, little kitten, scurry along
The flowerbeds are no place to rest
My little cousin, the devil incarnate
Has espied you from his perch in the banyan shade
He is armed with his toy sword and his plastic car
And means business, face flushed inside the monkey cap
He is excited, as you no doubt are at the sight
Of the squiggly evening rat, nosing about lazily in the bushes
I am the only one left purposeless
Caught between the spectacle and my moth eaten novel
As the winter sun shines weak on my sweater clad back
My mother humming her songs as she preens my hair
On the fold-up cot we have put up in the garden
Dart away, little kitten, dart away
The halogens on the verandah will reveal you
To the boisterous crowd gathered at the television
The adults have their stupid soaps
But we are playing at cards
Peering at each other through slightly bleary eyes
The fault of incense and Mortein smoke.
This is no time to look for your nightly dose of milk
I have it waiting for you near the shade of the stairwell
Where we will meet to trade nourishment for nuzzles
I will tell you my stories of the day
But it is all for naught
If you manage to get yourself caught
Go on, dart back into the shadows

Kitten

Rohit Chatterjee

Emancipation

Prokash Kundu



I will throw myself into the dungeons of hell,
For the corpses of my own thoughts, my own ideas,
That surround me in all derogation and stench;
The weary frustration and the hatred and the lust,
That are creeping into my skin,
Are by no means better.

I will burn myself down
in the eternal fire of hell,
and free myself of all desires,
All sins.

And I shall be free.

And then I will soar;
High above the fire,
Above the ashes,
High into the heaven of salvation and emancipation.
And I will recreate myself.
With light and purity,
With love and modesty,
With patience and perseverance,
With efforts and with energy,
And with honesty and strength.

I AM CHARLIE

In a meeting I was when I first heard;
An editorial meeting, making people laugh
Our only agenda. Humour invites happiness,
But not that day.
All my friends were there –
There was Charb, one of my old friends
Calm and fearless;
Charb who once said, " One has to disarm
Them (extremists) with humor, not with riot cops."
Too Bad "they" never understood what it meant.
There was Cabu, Oh! How long have I known him
Our leader, Our legend;
And there was Honore, always in black and white
We all had a good laugh seeing what he drew a few days back
On ISIS; but some were not pleased.
There was Tignous, with his dark humour, and
There was Wolinsky and his satires,
And there were many more
Sitting and having a good time.
We first thought it was a cracker,
Maybe someone was feeling too joyful,
But then faces turned grim – it was not a joke it seemed -
And as the door opened, we saw Rey,
Her face revealed everything, followed
By two agents of death;
Charb's name they called,
Charb stood up, calm as always,
Looking fearlessly at death –
He fell the next second.
And then bullets past me flew,
And I saw, as one by one, all my friends fell
Cabu, Honore, Tignous and Wolinsky,
And others; The agents left shouting "Allahu Akbar"
I wonder if He was pleased.

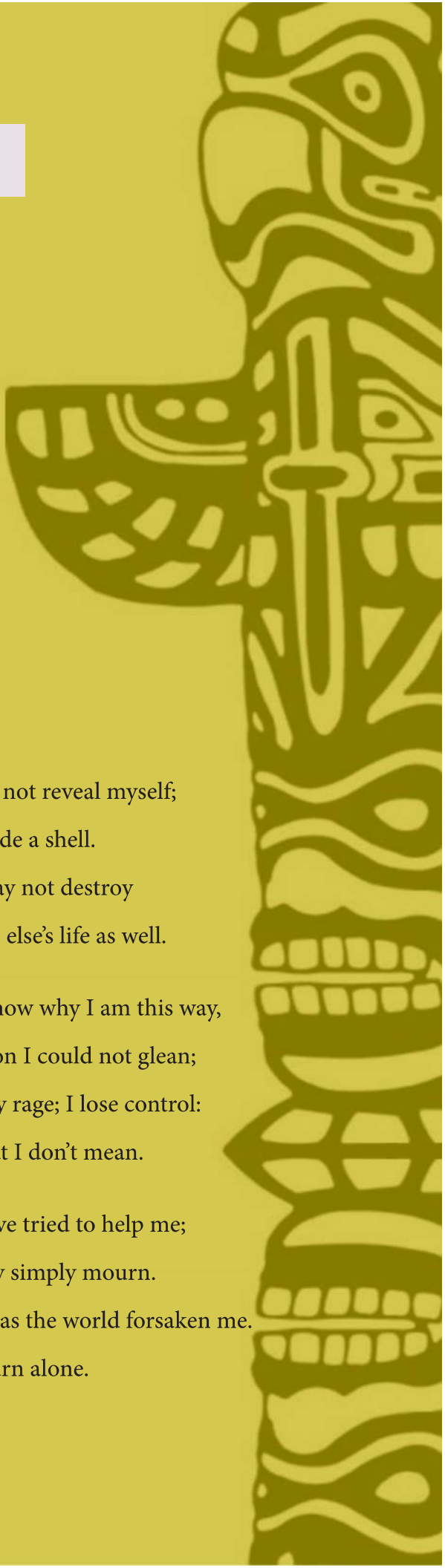
10 cartoonists didn't die that day;
Freedom died, freedom to express
And all reasons to make people smile.

And I was left wounded, bereft
Of people I loved and with a tear in my eye.

Agniva Dasgupta

Anger

Ishan Agarwal



It could just be a mocking jest,
A few words spoken in vain,
Or simply having to wait awhile;
Or even a child's simple mocking smile.

No reasons more than these,
And all Reason fades away;
Every colour I see before me,
I want to burn into ashes grey.

My world is a tinderbox:
Into flames, explode it must.
Everything I can create, converts
Into an inferno; flames and dust.

I look into the future,
And see fire all around;
Why with tender care to nurture,
Though now all is safe and sound.

I have known myself, not to trust myself;
Anything can be the spark,
That sets the raging flames of anger,
Burning me into despair dark.

So I dare not reveal myself;
I live inside a shell.
That I may not destroy
Someone else's life as well.

I don't know why I am this way,
The reason I could not glean;
But in my rage; I lose control:
I say what I don't mean.

Many have tried to help me;
Now they simply mourn.
Rightly has the world forsaken me.
Now I burn alone.

THE CITY GIRL

Through her crowded roads and endless turns
Moves the overflowing transports, like fatigued blood cells
Through clogged capillary passage.There are the cuts and burns
And there is the glamour, of hastily mixed-up tales.
The often unwanted taste of artificiality, lacking the taste of mud.
The overwhelming cluelessness, the undeniable pest
Of not knowing, how heart feels, or about its warm thud.
But the intense desire of being felt, patted - desire to rest.

Then there are the violent, cold, but passionate string d'or,
And the royal burning taste of royal barreled liquor
And the weak but hopeful, loving look, filled with inherent grandeur.
The unbearable pain - the untouched palms, searching for
Alive, wet skin to hold on to. She resembles a common, undiscovered city.
You fall for her, to reincarnate her, live her, and to taste eternity.

Prabaha Gangopadhyay

Liberation

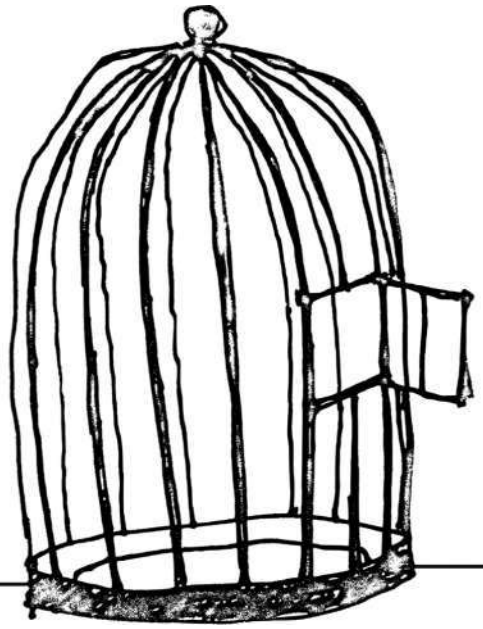
Pranandita Biswas

Today I have left the monsters behind.
Today no more
can the disgraceful
hurt and maim my fingers that painted dreams,
I shall not let them
break my spirit
as they have broken
the delicate threads of trust spun with honest belief and a diligent labour of the heart,
Not so much through their neglect thereof,
as through their general apathy for nobility,
and the shameless liberties they felt not wrong to take
with their standards of honour, so lofty -
Their pretenses disgusted me.

So I refused to mend the yarns
Or build new ones to fresh folk.
The needle of trust I stowed away
and receded into my little armoured citadel,
built strong on firm foundations of fear
of human greed and human vengeance;
but today, once more
has the sun come in,
and its soft gold
touched and healed my wounds of long ago;
and the fragrant mirth of the evening drizzle
has washed away the bitterness from my soul.

Today I have let the sun and the rain take effect,
for the other morning
a sweet spirit, like a butterfly
had chanced into my presence,
Whose innocent belief and good gratitude
opened my secluded bastion
to the warmth of daylight.

In solitude
I had lost and found myself again and again.
In new-found company
I hope to hold fast
to my discoveries.
I value my solitude.
Human alone can be inhuman,
Yet I thank my new friend for bringing back
the gift I had lost -
Trust.



ਖੂਹਾਂ ਨੂੰ ਭਰ ਭਰ ਲਹੂ ਦੇ ਨਾਲ
ਕੋਈ ਕਿਹੜੀ ਪੂੰਜੀ ਦੇ ਘੜੇ ਕਮਾਵੇ
ਤਾਂ ਫ਼ਿਰ ਕਿਉਂ ਜਗ ਵੇਖਣੋ
ਪਹਿਲਾਂ ਹੀ ਮੇਰੇ ਸਾਹ ਗਏ ਮੁਕਾਏ
ਭੋਰਾ ਤਰਸ ਨਾ ਆਏ ਨੀ ਮਾਏ
ਭੋਰਾ ਤਰਸ ਨਾ ਆਏ

ਕੌਣ ਫੂਕ ਕੇ ਮਾਏ ਗੁੱਡੀਆਂ
ਹੁਣ ਮੀਂਹ ਦੀ ਅਰਦਾਸ ਕਰਾਏ
ਕੌਣ ਬਨੇ ਵੀਰੇ ਨੂੰ ਰਖੜੀ
ਵਿਆਉਣ ਚਲੇ ਨੂੰ ਕੌਣ ਘੋੜੀ ਗਾਵੇ
ਭੋਰਾ ਤਰਸ ਨਾ ਆਏ ਨੀ ਮਾਏ
ਭੋਰਾ ਤਰਸ ਨਾ ਆਏ

ਬੇਭਾਗੀ ਜੇ ਮੈਂ ਕਿਤੇ ਜਮ ਵੀ ਗਈ
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ਮੈਨੂੰ ਜਿਉਂਦੀ ਨੂੰ ਅੱਗ ਲਾਵੇ
ਭੋਰਾ ਤਰਸ ਨਾ ਆਏ ਨੀ ਮਾਏ
ਭੋਰਾ ਤਰਸ ਨਾ ਆਏ

ਕੁਖ ਚ ਪਲਦੀ ਜਿੰਦ ਦੇ ਹਥੀਂ
ਹੁਣ ਰਬ ਕੀ ਕੀ ਲਕੀਰਾਂ ਪਾਵੇ
ਕੀ ਨਰਕਾਂ ਦੇ ਜ਼ੁਲਮ ਭੋਗੇ ਉਹ
ਜਾਂ ਸਵਰਗਾਂ ਨੂੰ ਹੀ ਮੁੜ ਜਾਵੇ
ਕਿਉਂ ਭੋਰਾ ਵੀ ਤਰਸ ਨਾ ਆਏ ਨੀ ਮਾਏ
ਕਿਉਂ ਭੋਰਾ ਵੀ ਤਰਸ ਨਾ ਆਏ

ਭੋਰਾ ਤਰਸ

Bhora Taras - Diksha Rehal

Punjabi

BS से BSc का सफर

आग लगीं दिल्ली में
लपटें फैली
हर कोने में||

UGC ने फरमान भिजवाया
Course वहीं, जो मैंने बतलाया।
सबों के माथे-बल आया
आनन-फानन में मीटिंग बुलाया।
खूब अपनी माथा-पच्ची करवाया
पर समझ में कुछ न आया ||

ना जाने,
किसने यह राह सुझाया
BS को BSc करवाया।
लगे हाथों.... प्रेस में,
घोषणा करवा लाया,
"अच्छे दिन" ....मैं ले आया,
मैं ले आया||

खूब हुए बच्चे नाराज
होगीं लड़ाई तुमसे आज
बगैर सहमति मेरी,
कैसे किए
तुमने ये काज?

हों न भविष्य अंधकारमय
तेरा चाहे मंगलमय।
काट लें कुछ और समय
फिर से होगे तुम
B.S.मय,B.S.मय!!

गौतम कुमार सुमन

रे मन

रे मन, कभी तो ठहर।
रे मन, कभी तो ठहर।
सपनों की जहाँ में दौड़ लगाना छोड़,
ख्वाबों की आसमाँ में उड़ान भरना छोड़||
आ, आकर सच्चाई की धरातल पर,
चुनौतियों की चट्टानों को फोड़,
दुश्वारियों की बंधनों को तोड़,
जीवन की सच्चाई से, तू मुँह न मोड़||
ऐसा न हो,
तेरी चाह को चुराने, आ जाए कोई चोर
होने ना दे, तेरे सपनों का भोर||
रे मन, अब तो हकीकत से नाता जोड़
.....नाता जोड़।
लगा दे अपना सर्वस्व,
अपनी मंजिल की ओर।
तभी गूँजेगी चर्तुदिशा में,
तेरी सफलता की शोर,
तेरी सफलता की शोर||

Hindi

Gautam Kumar Suman

ऐ बहारे चमन तू ख़फा क्यूँ है?

ऐ बहारे चमन तू ख़फा क्यूँ है?
ये बता तो सही मेरी ख़ता क्या है?

तेरी उम्मीद के दिये दिल में हर दिन जलाया,
तेरी आमद के खातिर इस गुलिस्ताँ को सजाया,
किया चारो पहर इस चमन की रखवाली,
इसकी शोखियों में मैंने खुद को भुलाया |
फिर भी रही कसर जो हमें नहीं बताया,

ख़ामोश रह गये पर कभी नहीं जताया
ऐ बहारे चमन तू ख़फा क्यूँ है?
ये बता तो सही मेरी ख़ता क्या है?
इन मुरझाते फूलों को मैंने अक्सर समझाया,
मायूस तितलियों को उड़ने का हौसला दिलाया,
इन सूखते पत्तों की हालत से वाक़िफ़,
दरख्तों को मैंने तेरा नग़मा सुनाया |

कितने अरसे से है इनको तेरी उम्मीद में बहलाया,
अब तो इस झूठ की बदौलत मेरा ईमान भी शरमाया
ऐ बहारे चमन तू ख़फा क्यूँ है?
ये बता तो सही मेरी ख़ता क्या है?
आज पूछती है शबा वो शबनम कहाँ है?
पूछते हैं ये भौरें फूलों की फ़ितरत कहाँ है?
प्यास की शिद्दत से अब हो कर के आजीज़,
पूछते हैं ये परिंदे बारिश की बूँदें कहाँ है?

मेरी बेबसी को छोड़ इन का तो लिहाज़ कर,
ये हर वक़्त पूछते है तेरी रहमत कहाँ है?
ऐ बहारे चमन तू ख़फा क्यूँ है?
ये बता तो सही मेरी ख़ता क्या है?

चमन=garden, ख़फा=angry, ख़ता=mistake, आमद=visit, शोखियों=beauty, वाक़िफ़=aware, दरख्तो=trees, नग़मा=song/melody, शबा=morning air, शबनम=dew, फ़ितरत=nature, शिद्दत=intensity, रहमत=kindness

ৰংমন

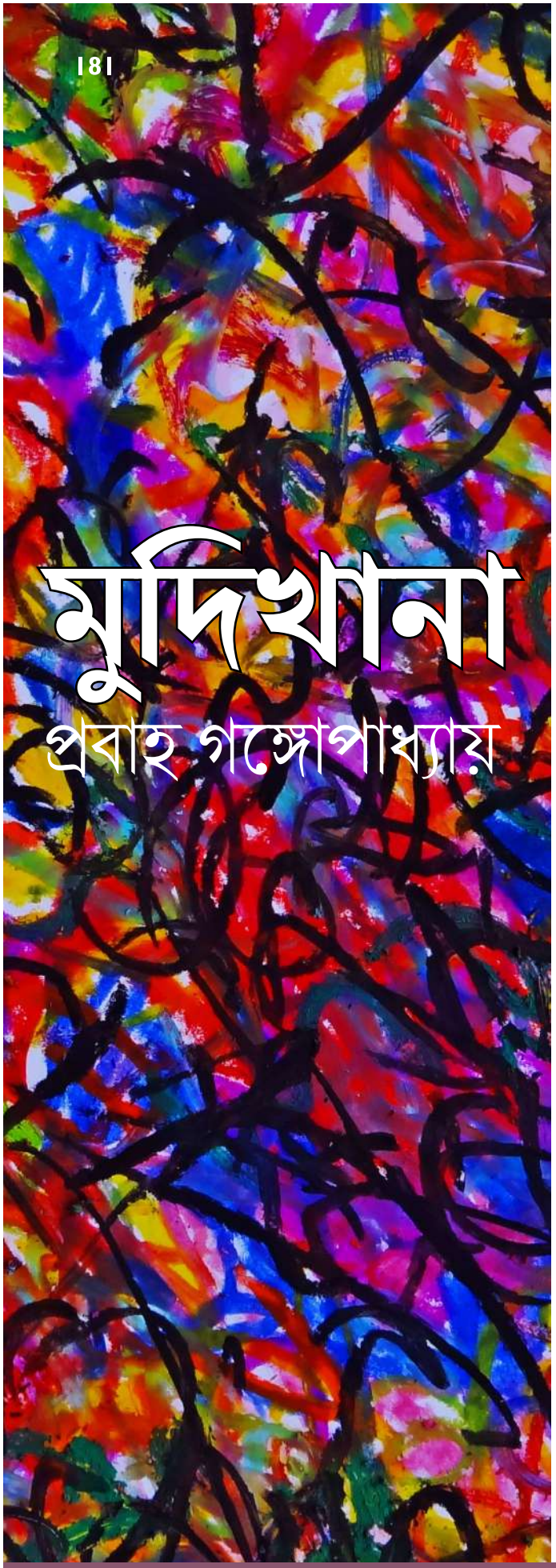
কৌশিক বৰা

মনত পৰেনে কাজিৰঙাৰ
খেলি থকা ৰংমন
আপোন পাহৰা হৈ দলনিৰ আঁৰত ;
দেখোন পিছে আজি
ৰংমনৰ দুখ দেখি
কহুঁৰাৰ বিননি শুনো লুইতৰ পাৰত।

আছেনে মনত তোমাৰ
ভূপেনমামাৰ কথাশাৰী
অৰণ্যতকৈও ভয়াবহ জন অৰণ্য ;
জীৱশ্ৰেষ্ঠ মানবৰ
বিবেকহীন কৰ্মৰে
বধ্যভূমিত পৰিণত অভয়াৰণ্য।

প্ৰকৃতিৰ ৰং ৰূপ
নেদেখে যিজনে
কেনেকৈ কৰিব তেওঁ সৃষ্টিৰ অনুভৱ ;
জীৱমাত্ৰেই একে আত্মা
নাভাবে যিজনে
তেওঁৰ বাবে মূল্যবোধ কিদৰে সম্ভৱ ?

বনমন্ত্ৰীৰ আঁচনি
পৰি ৰ'ল কাগজতে
চৰকাৰী বিভাগৰো নপৰিল দৃষ্টি ;
ওলাই আহা ডেকা সৰে
ধৰো সৰে হাতে কামে
অন্যথা লুপ্ত হ'ব প্ৰকৃতিৰ অনুপম সৃষ্টি।



মুদিখানা

প্রবাহ গঙ্গোপাধ্যায়

চোখেতে তোমার ঝরছে অশ্রু-ধারা
দুঃখ বেদনা জমে আছে কত বুকে;
জীবনে তোমার সুখ দুখ পরিমাপে
পাল্লার ভার দুঃখের দিকে ঝুঁকে।

তোমার মত দুঃখী কেহই নাই,
জীবন তোমার কূলহীন পারাবার।
অভাগার অভাগা আছে তোমার চেয়ে সুখে
তোমারই শুধু নেই সুখে অধিকার!

সারাদিন তাই ঝরছে তোমার আঁখি
দুঃখভাঁড়ার তোমার বসুন্ধরা!
প্রাণপাখিটির মুক্তির সাধ জাগে
পাঁজরের মাঝে জীবন বন্দি করা!

তোমার মুখেতে নেই এক ফোঁটা হাসি;
জীবনে তোমার নেই কোন উন্নতি।
সমুখে তোমার ছবিটা অন্ধকার
অজানা তোমার জীবনের পরিণতি!

সত্যি, তোমার কষ্টের নাই শেষ
তুমিই সকল দুঃখের অধিকারী।
আজকে, আমি তোমারই পক্ষ নেব
বলব, "তোমার দুঃখের বলিহারি"!

তোমার দুঃখে আমারও খারাপ লাগে
ভাবি, "এর কি কোন সমাধান আছে?"
(তবে) সুখদুঃখের মানেটা বুঝিনা আমি,
আমার তো দাড়িপাল্লাই ভেঙে গেছে!

প্রবাহ গঙ্গোপাধ্যায়

তোমার জন্য তাজ গড়ব আমি,
গড়ব আমি তোমার জন্য তাজ।
চুন-সুরকি, শ্বেত-পাথরের স্তূপে
তোমাকে আমি শুইয়ে যাব আজ।

থাকবে তুমি চোখটি বুজে শুয়ে
তুষারধবল স্তম্ভ-গর্ভ মাঝে;
থাকবে হয়ে অচল অশরীরী
গ্রীষ্ম-বর্ষা, সকাল এবং সাঁঝে।

তোমার বুকে হৃৎপিণ্ড খানি
স্পন্দনহীন, নেইকো তাতে আলো;
কোন কালে জীবন ছিল তাতে
আজকে শুধু নিথর এবং কালো।

মৃত্যুর এই দৃঢ় আলিঙ্গনের
বাহুডোরেই বদ্ধ আছো তুমি।
স্পর্শের সেই মাদকতায় মেতে
আছো তুমি, তারই ওষ্ঠ চুমি।

তোমায় আমায় প্রেম হয়নি কভু
তবু, মনে শূন্যতা মোর জাগে!
জীবনে মোর তোমার উপস্থিতি
ভরিয়ে দিতো কোন করুণ রাগে।

তাই, আমি তাজটা গড়ে যাব
তোমার আমার বিদায় অবকাশে;
অশ্রুজল নাইবা ঝরুক মোর
বেদনা খানি থাকবে সদা পাশে।

জীবনের এই বদ্ধ কারাগারে
প্রতিদিনই বসে জানলা পাশে,
দু'চোখ ভরে তাজ দেখব আমি
যতক্ষণ না সন্ধ্যা নেমে আসে ।।

ಬೆಂಗಳೂರಿನ ನೆನಪು

ಪ್ರಣವ್ ಗುಪ್ತ "ಮೂಕ ಪ್ರೇಕ್ಷಕ"

ಮಂದಿರದ ಘಂಟೆಗಳ ಝೇಂಕಾರ,
ಶ್ರೀಮಂತರ ಠೇಂಕಾರ,

ಆಕಾಶಕ್ಕೆ ಹೋಗುತ್ತೆ ಬೆಲೆ,
ಊಟಕ್ಕೆ ಸಿಗುತ್ತೆ ಎಲೆ,

ಠಕ್ಕಿನ ರಿಕ್ಷಾಚಾಲಕರು,
ಜಾಣ ಬಸ್ಸ್ - ನಿರ್ವಾಹಕರು,

ಮೊಸರನ್ನ, ಚಿತ್ರಾನ್ನ ಉಪ್ಪಿಟ್ಟು ಮತ್ತು ಶಾವಿಗೆ,
ಕೇಸರಿಬಾತ್, ಗೋಬಿ ಮಂಚೂರಿಯನ್ ಮತ್ತು ಮುದ್ದೆ,

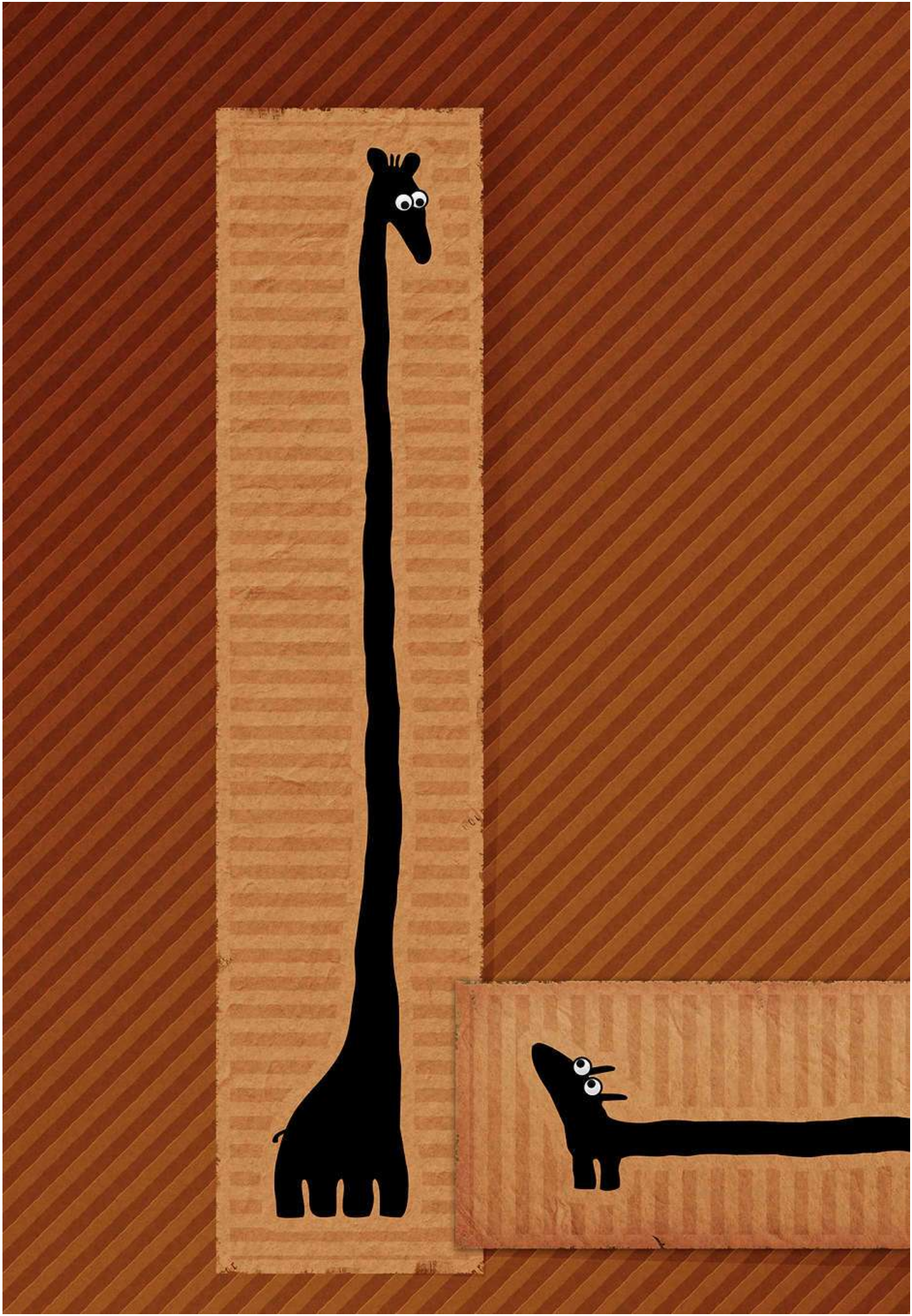
ವಸ್ತುಗಳು ಬೇಕೆಂದರೆ "KR ಮಾರ್ಕೆಟ್ಟು" ,
ದಾರಿ ಮರೆತು ಹೋದರೆ "ಮೆಜೆಸ್ಟಿಕ್ಕು",

ತಬ್ಬಿಬ್ಬು ಮಾಡುವ ಲೇಔಟ್,ಹಳ್ಳಿ, ಪಾಳ್ಯ,
ನಿಜವಾಗಿಯೂ ಬೆಂಗಳೂರು ಒಂದು ನಗರ ಅನನ್ಯ!

ಬರುತ್ತದೆ ಇಂದು ನೆನಪುಗಳಿಂದ ಲವಲವಿಕೆ,
ಬೆಂಗಳೂರಿಗೆ ಅರ್ಪಿಸುವೆ ಈ ಸಣ್ಣ ಕವಿತೆ!

a bug's life

Tanmoy Pal



NOT IN VERSE

section eight

THIS SECTION CONTAINS :

A Rebirth

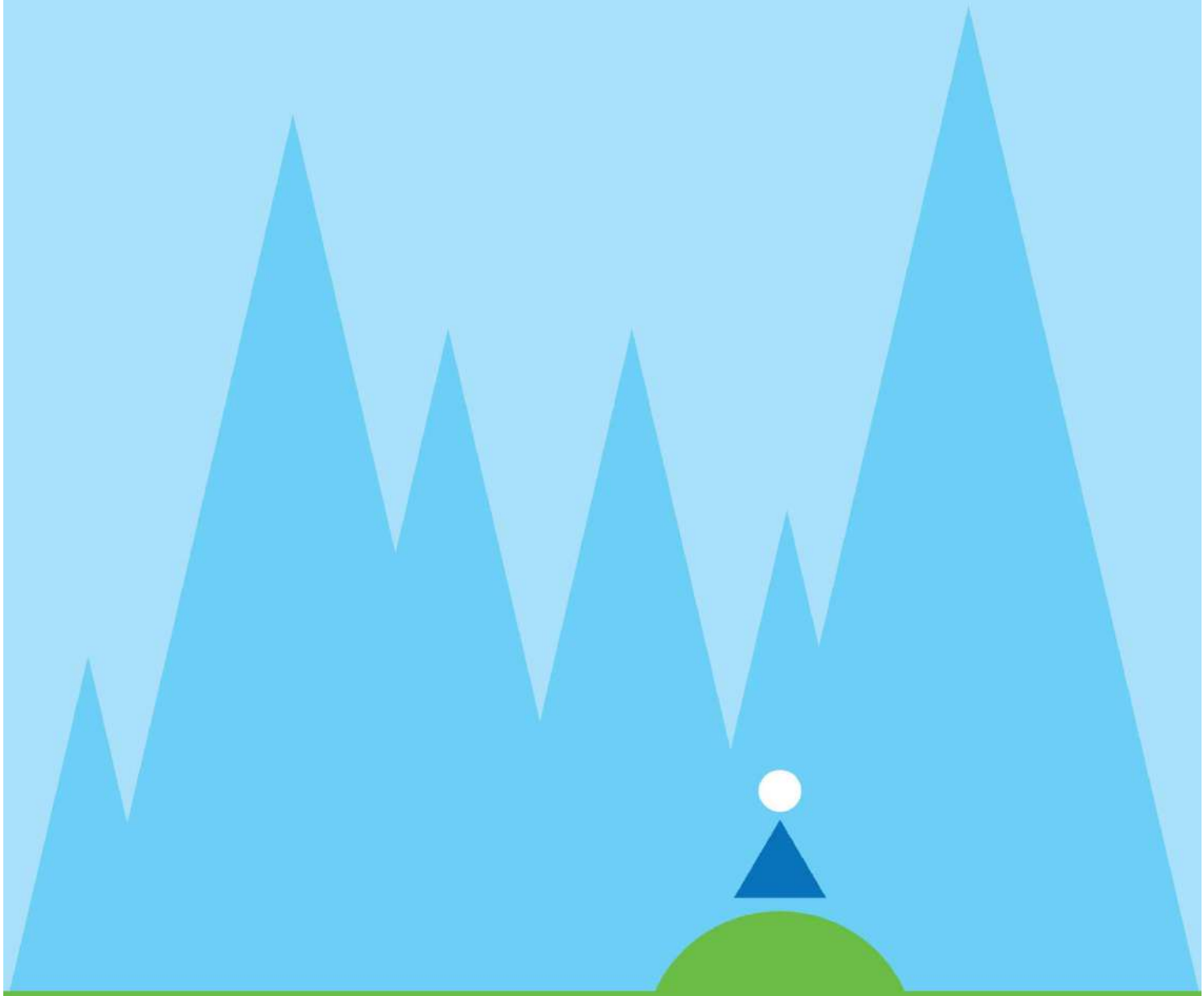
Nandini S

The other day, I happened to come across a few '*appupanthadis*', ('*appupan*' means grandfather, while '*thadi*' means beard', as they are commonly called in Malayalam; they are pappus flowers which are light, white and feathery) lying on the ground near the juice center in our campus. The flowers, bearing the seeds, detach from their fruits and fly with the wind until they fall somewhere on the ground. Though left unnoticed by many walking on the road, the sight of it took me back to a childhood memory which I wish to cherish throughout my life.

I was only three or four years old when my parents used to leave me with my grandparents for their work. The first sight of my day would be seeing my grandpa sit in his old armchair with a glass of black coffee beside him, reading the 'Malayala Manorama', the Malayalam daily. An old man of about seventy, he was as energetic as he was in his younger days. He was a tall, dark man and used to wear 'kurta' and 'dhoti' made of 'khadi'. He wore big spectacles and had a serene look. My grandpa was my best companion. He used to take me for long walks along the fields, rivers, tell me stories, take me to the temple festivals; the very first person to teach me and inspire me. Those days we lived in our ancestral house in Kerala which had a big courtyard. The courtyard housed some huge trees which made the place rather cool and shady. One of my leisure activities was picking up '*appupanthadis*' that came flying across to our place. There weren't any trees that bore them anywhere nearby. So they appeared quite mysterious to me. My grandpa who knew from where exactly they came, never answered me when I asked him. He used to say "Go on! Look out for the mother tree!" He used to tell me that these *'appupanthadis*' are like the human life. They are born, they thrive in their homes till they ripen and then detach from there. Then they fly across lands, explore and finally when they lose their strength, they fall to the ground. The seeds then grow into new *'appupanthad*i' saplings. Even though the thought of detaching away from home and leaving him scared me, he used to say something which I still remember, "One day we will all fall to the ground, not to be lost into the dreary layers of the soil, but to be born again as fresh new saplings, bearing the sparkle and zest for a new start!".

His death was sudden. He had passed away in his sleep, leaving quite a few questions unanswered; answers which he knew but didn't tell me, instead wanting me to quest for myself. On the day he died, while the house was flooded with people mourning his death, the death did not bring me any real grief then; however his presence around the house was greatly missed. Because I believed that he was never going to die, at least that was what my grandpa told me; no one dies, it's a new life they get, a new beginning. While I still didn't know where the flowers came from, there were a few more mysterious *'appupanthadis'* in the courtyard. Not left out to die, but to be born again.

Alistair Lewis



Homesick

"Bye Thempu, see you after three months!" shouted Jish as he furiously waved Thempu goodbye from the train. "Good bye to you too, Jish" shouted back Thempu, trying to raise his voice above the cacophony at Darjeeling station and the ear-piercing horn of the diesel engine of the Himalayan Rail. The melancholy in his voice could not be missed even in that cacophony. With that the train pulled out of the station and Thempu slowly trudged back to St. Josephs' boarding school, his second home.

It was early December and the winter chill had set in Darjeeling, the quilts were out and so were the 'European gowns' as the boarders called them; hot 'thukpa' was the order of the day and so was the evergreen Maggi .The school had just closed for the winter vacation for three months when Darjeeling faced the full wrath of the harsh winter (especially for someone who hadn't been exposed to that kind of cold before); temperatures plummeted and an eternal gloom was cast over the sky with the sun peeking out only occasionally. The resonance of the weather with Thempu's state of mind was unmistakeable.

As he entered the hallowed portals of St. Josephs' he ran across some more of his hostel mates, making their way to the station for the next train. He waved at them, trying to put up a face which masked the storm in his mind. "Bye, Thempu." They said. "See ya," Thempu replied. Everyone seemed to be leaving home - everyone except Thempu. He hadn't even booked his tickets, but that was only the tip of the iceberg, the problem was much more deep-seated.

Right through the last Term, he used to get calls from his parents time and again to come home as soon as he got any holidays. "I'll see; depends on whether I want to learn something new in the vacation" was his usual reply. "Can't you manage some time at home?" was his Mother's constant question. "Have your studies become more important than your family?" Silence usually prevailed after that question was asked; he never seemed to have an answer to it.

Truth was that he had become so used to the life in the boarding school that he didn't want to go home. In fact, he loved the time that he was spending there. He enjoyed the camaraderie of his hostel mates and loved the time he spent with his 'hang out group' - from the small dinners in the local restaurants to the excursions to the nearby towns like Gangtok and even that time when they hurled snowballs at each other in Nathu-La. This life at the boarding had become so dear to him that he had forgotten how it felt to be with his family - after all it was eight months since he had last spent time with them. But something in his mind kept nagging him to go back home even if it was for a couple of days. This invisible force though was a weak one, one that was almost always overpowered by his attachment to his friends.

Strangely though, this was not the case with his friends - even the closest friend he had - Jish. They seemed to long to go home, wanting to be with their family. They seemed to be so attached to their family. There always used to be a joy which could be perceived when they spoke to their family over phone. Thempu never seemed to come to terms with this. "How do they manage to keep their ties so strong while mine are so weak? How do they remain so happy while talking to their family?" was a constant question that kept nagging him all the time.

Thempu had now reached his room. He switched on the lights but they seemed to create such a gloom that he switched them off, again. It was not like he didn't miss his family. He was always grateful that his parents had given him such a good education and had sacrificed so much for him. Everything in his room seemed to remind him of them.

From the quilt –a ‘razai’ that his father had bought for him from Jaipur, the statues of Mother Mary and Jesus which reminded him of the times when they used to pray together as a family to the family photo; still he didn’t feel like going home. It was a strange feeling, something he had not encountered before. He didn’t know what to do. He did have lots of things planned for the winter but going home didn’t seem to figure on that list. Confused and tired, he just lay down on his bed and fell asleep very soon.

He woke up late next morning and after freshening up, checked his messages as usual. He came across a message from Jish. “Strange," he said. “Jish is normally the last person to use whatsapp," he thought to himself. He opened the message and what he saw surprised him. Jish had sent him some photos of himself with his family. There was a message at the end which read, “ A wise man once said, ‘A person makes about ten lifelong relationships in his life’ - I have already made three #Dad, #Mom, #Sis, #I’m back home.” That message triggered a chain reaction within him. He just lay still in his bed staring at the message. Looking at Jish’s mother feeding him a piece of roti suddenly brought memories of the numerous delicacies that his Mom used to prepare at home; a picture of Jish hugging his Dad brought back memories of Thempu hugging his Dad after missing him only for three days after an NCC camp. There was an avalanche of emotions passing through his mind. Every picture of Jish seem to trigger a new one. It was too much to handle and Thempu started sobbing uncontrollably. “How could I have forgotten all these small memories? How could I even think of not going home? How could I not miss my family?” were the common refrains that Thempu kept reiterating in this state of grief. It seemed as if he had forgotten the small joys of the family life and Jish had just managed to refresh all of them.

After about half an hour, Thempu returned to a sane state of mind. He immediately went to the travel agency in the shopping complex of his school and booked his tickets for the first train next morning.

Three days later, Jish got a message from Thempu. It read, “Thanks Jish, you made me feel the warmth of my family’s love," with pictures attached. Jish was ecstatic. He knew that Thempu only too well and was sure that he was always attached to his family, even though he never expressed it; he had just needed a trigger and was glad that he provided one. He replied, “Welcome, my friend; Glad your back home; what are friends there for anyways?” When Thempu looked at the message, his joy knew no bounds. Why hadn’t he talked to Jish about this before? What was he doing all this time when he had such people to help him out? As he muttered these things to himself he noticed the sun setting from his balcony. He quickly typed another thank you message to Jish which read, “Let the sun never set in our friendship. Thanks again, my best friend, #my lifelong relationship no.3, #Jish.’” and looked at the reddish-cantaloupe hue laden sky, thanking God silently for the awesome friends and family He had blessed him with.

Through The Forests Of

RANTHAMBORE

ROHIN BISWAS

On a hot, sunny and dusty summer noon, our jeep stopped at the main entrance of the RTDC hotel, some 15 kilometres away from the Sawai Madhopur railway station in the state of Rajasthan. The attendants were moving the luggage from the car to the rooms when I came out of the jeep and took a look at the horizon in front of me. Rugged mountains with thick vegetation - the trees had lost their greenish appearance and had turned brownish. I had a mixed feeling thinking about the experience that was in store for me next morning in the safari! We were called for lunch and after that I went for a stroll on the roof of the hotel. The view that opened up to my eyes was enthralling - a vast stretch of vegetation in the hills and nothing else, with occasional shouts of deer or caws of peacocks. But surely there was a lot more on offer for which we had to wait till the next morning.

It was 5 am in the morning when we were called for morning tea. After tea, the jeep for the safari was made ready and we started off. After travelling some 5 kilometres we came near the main entrance gate of Ranthambore. A security check followed and then we were allowed to enter the sanctuary. The car was in full throttle through the empty pitched road. Obviously it was empty that early in the morning - we were the one of the first to enter the park. The road then diverged. The unpaved one entered the woods, the other one which was pitched went ahead. We took the unpaved one and entered the deep jungle. Soon, we came to the main checkpoint from where various safari jeeps take various directions to enter the forest ranges. We were allotted Zone 4. As soon as we entered the range, an Amaltaash tree with all its bright yellow flowers offered a beautiful contrasting view to the surrounding grey. Suddenly, the jeep stopped hard and we saw a few cars in front, all halted. The monkeys on the trees were behaving unusually, screaming and climbing high up on the trees. None of them were on the ground. A herd of deer nearby were alert on their toes with their tails pointing straight up. They were ready to jump. My cousin whispered in my ear, “The monkeys are giving a call.” I said, “Call for what?” She replied, “Tiger, obviously!” Suddenly my head pointed upwards. Our jeep was standing in between two elevated portions of the land. I looked up and couldn’t turn my eyes away. It was a leopard. By the time I tried to fix my gaze on it, it was gone. That was my first encounter with a big cat in the open jungle. The jeep progressed more into the woods.

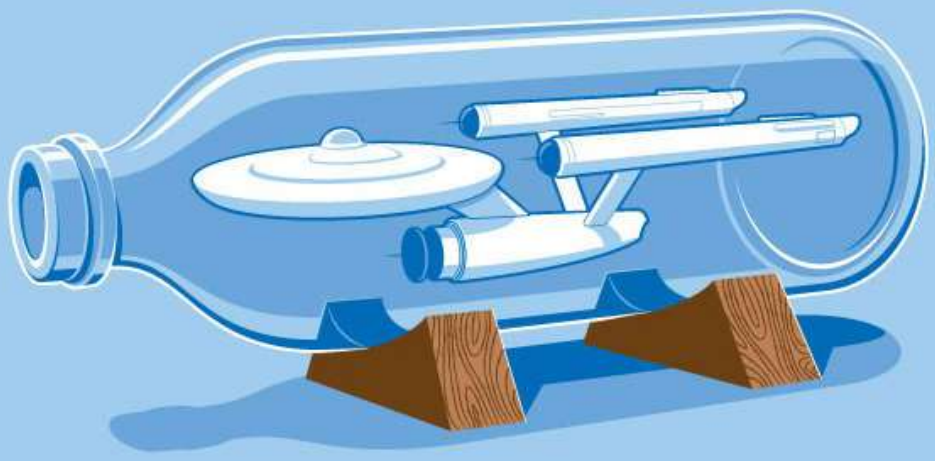
But our luck was not good for the next few days. We only heard from other tourists about their experiences of encountering a tiger; we didn’t spot one. We were waiting for our day. On those four days we spotted some lovely birds, though. Those views were also very soothing. Falcons, kingfishers, flycatchers and the most beautiful of them all, peacocks. One day while in the safari, we spotted a crocodile. Our driver explained that there used to be another one in that pond but the king of that jungle, a Royal Bengal named “Machhli” fought it and ate it up. The tiger was now old and was nearing its death. It could be spotted nearby, he said. We were keeping our hopes high but neither did we encounter Machhli nor any other members of her family. We returned frustrated from the evening safari on the fourth day.

The next day we were supposed to leave for Jaipur. And we hadn't spotted any tiger yet, the sole reason for which we came to visit Ranthambore. We decided to book a ticket for the next morning safari and request the authorities for zone 5 where tigers were being frequently spotted.

Next morning, we started for the safari very early in the morning so that we waste no opportunity. We entered zone 5 with a herd of jeeps behind us. Suddenly, our driver started speeding because he had heard a call. We noticed that the other jeeps which were behind us were not there. We brought this to the notice of our driver. He stopped the car in the middle of the jungle. For the very first time, I could feel the silence of the woods. It was an ethereal experience.

Suddenly, our driver said he had heard something and turned our car and headed fast in the opposite direction. To our great surprise we could see the other jeeps waiting at a corner of the road and everyone in the jeeps was photographing something. As we started going near, a very different smell came to my nose – something that I had never smelled before in my life. As we went near, to our excitement, we could spot a tiger sitting beneath a tree in the shade! An experience of lifetime it was. The beast was sitting there in all its glory. The sun's rays fell on its beautiful golden-yellow skin with those beautifully decorated black and white lines. Our driver identified the tiger as Machhli who had fought the crocodile years back and was now nearing its death. We kept looking at it as if no time had elapsed. The tiger was just resting there and everyone took that opportunity to photograph it. No one could tell that this creature can be a beast when it spots a prey. Soon, we realized that it was time for us to leave the sanctuary. The driver started the jeep and blew off the dust nearby and headed towards the main gate with the beast disappearing slowly from our sight…

INTERVIEW



Sagnik Dasgupta

I checked if I had all I needed - my recorder, my ID chip, the gift. I reassured myself, “Now I’m ready. Let’s do this.” I looked at my wrist, “Crap! 10:01AM.” I rushed to the door of the Director’s office and knocked.

“Come in,” replied the calm but firm voice of the director, a voice that was nothing like that of a 100 year old. I entered.

“You’re late," said the voice on the other side of the chair.

“Forgive me Sir, but the teleporter was malfunctioning.”

“Ahh, teleporters these days. You never know if you’ll end up in my office or in Mars.” He chuckled. His smile was magical, one couldn’t help but smile back. “Back in my days, we used to get from A to B by things with wheels. Now we don’t even use the word vehicles anymore.”

That word, of course, was phased out when mankind’s erstwhile greatest invention, the wheel, became obsolete in front of the new disappear-reappear technology.

“Sir, I can’t describe what an honour it is to meet you. On behalf of Reuters India, I would like to convey my best wishes on your 100th birthday.” I revealed the gift.

“Oh, you can put that with the others. Care for a cup of tea?”

I politely refused.

“Sir, would you have anything to say about your seventh Nobel Prize?”

Yes, seven Nobel Prizes he had. So respected he was in the scientific community, that if he decided to say that Newton’s Laws were nonsense, everyone would believe it. But, of course, he’d never say that.

“About the Nobel, it is really my students whom I’d dedicate it to since they worked very hard to realise our dream of realistic 3d holograms.”

“What are you currently working on?” I asked.

“I am working on a time machine.”

“Time machine?” I didn’t see that coming.

“It’s nearly ready, I’ll show you.” He pressed a few buttons on the table and the whole room started sliding vertically down like a giant elevator. Soon I could see around me a giant lab.
“Welcome to my lab. No space on the surface so had to shift underground," he said, “Go on. Check it out.”

He didn’t care to get off the chair. I crossed what used to be the boundaries of the office and made my way towards the time machine. It looked like a big box of steel, almost as big as a small room.

“Titanium, in case you were wondering," he shouted. Who knows maybe he was also working on telepathy.

I approached the box, the door was open. I walked a bit faster. The next thing I remember is that I lay face down on the floor of the machine. I must have failed to notice the step that led to the raised platform of the machine. A bunch of buttons above me were glowing. Red, blue, green, I had no idea what they stood for.

With an obvious fear I opened the door. My fear turned out to be right. All there was to see was rock, completely covering the door. I must have come to the past, before the time the lab was built. Now I had to figure out how to get back.

Right then, a loud beeping started. I looked around and noticed the screen saying “Alert! Oxygen level dropping! Time till hypoxia: 15 min : 30 s.” I panicked, I had 15 minutes to get out of there. As my breathing grew heavier I saw the time drop to 13 minutes. I had no choice but to remain calm.

I looked around and found a crowbar but it was no good in front of that wall of rock. 7 minutes left. I looked at the control console. It seemed all gibberish to me except for one line which showed “13 Jan,2017.” I tried sliding my fingers over the numbers and it worked.

So, I set the date to “16, May, 2096.” In a few seconds, I heard a small thud. I opened the door and there he was the smiling director, still in his chair.

“How was your trip?”

“I ended up inside an underground rock. Sir, not that I’m not happy to be alive but shouldn’t I have been crushed?”

He laughed, “When this machine travels time, it displaces whatever is in its path. Meaning it must have been you who caused the 2017 earthquake and created the hill on which this building is built.”

I was stunned. It wasn’t easy to digest that.

I took a seat in the chair in his office and said, “Maybe now I’ll take that cup of tea that you offered me.” He chuckled and had one of his robots give me a cup of tea.

“Thank you for your interview," I told him as I reached to shake his hand. Alas, my hand just passed through his. As I retreated in shock and utter dismay, the hologram laughed heartily at me.

THE NIGHT BEFORE THE DUEL

SAYANTAN KHAN

Évariste was restless. He had the whole night ahead of him, but he feared those hours would not suffice for what he had to do. He shook his head, and ran down his fingers through his usually well combed, though now unkempt hair. He recalled the moments when Stéphanie had run down her long graceful fingers through the same locks. He sighed - equal parts resignation and melancholy.

“All this for a woman," he said to himself. But he knew he couldn't help it. His fiery passion, the passion he'd got from his father, would not let him rest unless he settled the matter with that blackguard d'Herbinville. With a sense of satisfaction, it dawned upon him that things would settle, one way or the other, the next day.

With that thought guiding him, he set down to writing all he knew, collating the essence of his manuscripts written over the years, both published and unpublished work. He might not have a chance again, as M. Chevalier had hinted more than once. Apparently, Évariste's reputation for being a firebrand revolutionary preceded his mathematical reputation, thought Évariste with a grin on his face.

The hours went by as Évariste poured his soul out on paper. All the work he'd done over the years, the culmination of all the effort, he embodied in ink, on the sheets that kept flying under his sloppy, untidy penmanship.

Évariste knew his work was one of the best and he openly admitted it. He was not one for false modesty. The world, he had learned, had enough people who would downplay your work, even without you helping them. But his pride still rankled at the old academicians, those myopic stagnant minds, rotting away in their secluded towers of ivory. His temper flared when he recalled how they'd made little of his work, calling it unclear and underdeveloped. But he also had had his fair share of supporters. M. Fourier and Mlle. Germain being the foremost of them. But even with their support, recognition was hard to come upon in the mathematical world. The world of political revolution had been more welcoming, however. Évariste was a born revolutionary, ready to rebel against injustice, a quality no doubt he'd inherited from his parents. He'd been to prison more than once, though never for long. That, however, was the least of the consequences of his rebellious behaviour. Évariste had also managed to get himself expelled from École Normale, for writing a scathing but true article about the head of the institution, describing him as a stooge of the crown. That memory brought another smile to Évariste's visage. He'd never liked École Normale. Had he gotten his way, he'd rather have gone elsewhere. But that thought turned Évariste sour again. For he knew very well that elsewhere would have been no place other than École Polytechnique. He'd tried getting in there twice, and failed. Not failed, rejected, he corrected himself. For he knew, he was more than capable of getting in there, just that he'd been several times smarter than his examiners, and as a result, his examiners had been incapable of comprehending his solutions. He wondered if things would have turned out differently had he joined the Polytechnique. Maybe he never would have met Stéphanie and none of this would be happening. Suddenly, with a shudder, he realized he did not want to live in a world in which he'd not known Stéphanie. Maybe it was all for the best, even if he did die the next day. He would die happy, with the thoughts of Stéphanie in his head.

And so the hours passed by. As the first rays of sunlight came creeping up through his window, he realized how long it had been. He was out of time. He knew he hadn't written down everything, but there was no time. Someone else would have to fill in the details. He was satisfied with what he had done, but he wondered, was that enough? Had he made a mark upon the world, something the world would remember him by, even long after he was dead? Now, he wasn't so sure that he had done enough. Tears welled up Évariste's eyes. At this moment, he could not help but let his emotions show.

But never a one to lose control to his emotions, he held the tears back, went to his cabinet and took his pistol out. He was about to leave, when he remembered something and went back to his manuscript. With a sense of finality, he wrote something on the margin, and giving one last satisfied look at the manuscript, he left his room. The manuscript still lay there, in the light of the rising sun, that one last word written by Évariste illuminated by the golden rays. It read, "*Stéphanie*".

A MIDSUMMER FRIGHT

ALISTAIR LEWIS

“Good night, Mai” I said wishing my grandma for the night. “Good night, son and try and wake up early tomorrow, we have lots of work to do.” I simply shrugged my shoulders and went to sleep. I very well knew the work she was referring to - buying groceries, cleaning the house, and the other household chores.

As I lay on the mattress on the floor, I struggled to sleep as had been my wont for the past few days ever since I had come to visit my grandma. My thoughts ran from one topic to another. It was my summer vacations and according to a yearly custom that my mom had induced in me ever since I was young, I came over to my native place to stay with my uncle’s family with whom my grandma also stayed. But this time my uncle had to attend a wedding of his best friend’s daughter, the customs and the traditions of the wedding requiring him and his family to stay overnight at the bride’s place. Hence I was left behind with my grandma in my uncle’s house.

My grandma is a very curious character. Very loving at times, but sometimes she can be very fussy. Extremely fit for someone of her age (the proof being her regular walks to church, about a kilometre away through an uneven terrain, at brisk speed) and usually very calm and docile, she has some fears as a result of old age - one of them being that someone is going to attack her at night. Hence she always needs someone present in her room during her sleep and it is usually her grandchildren who do this job. And as my cousins were also attending the marriage I had to take up the duties. I lay there on the mattress on the floor while my grandma slept soundly on the bed. Eventually sleep overpowered my sensations and I fell asleep.

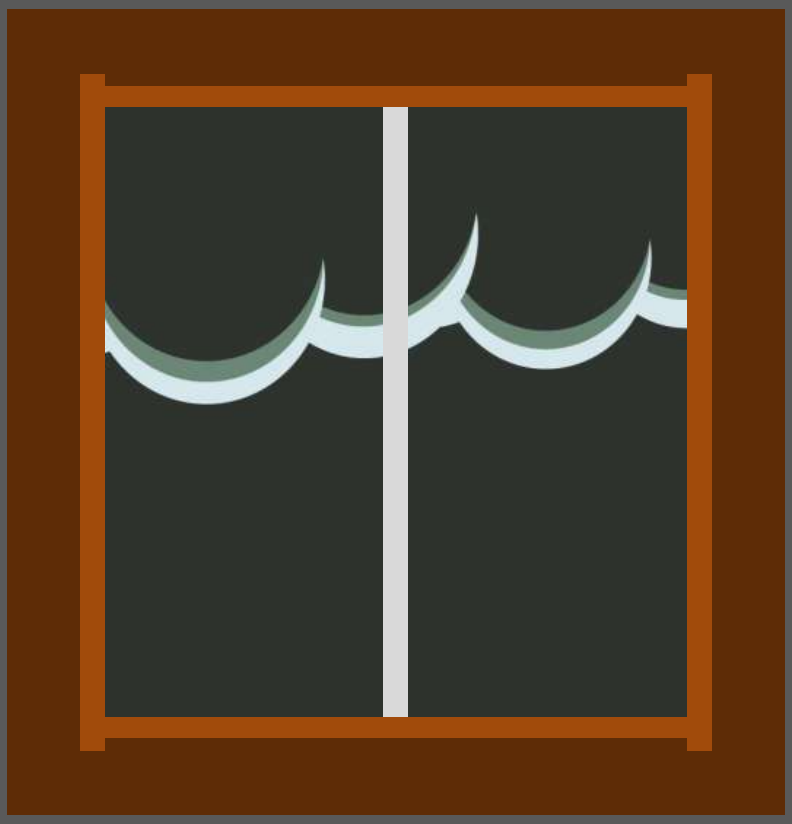
After sometime, I suddenly woke up with a jerk. Some noise had upset my sleep. I checked my phosphorescent wrist watch which indicated it was mid-night. The room was pitch dark. I lay still on the mattress. I heard it again. Someone was trying to open the cupboard in my uncle’s room. I froze stiff. There had been cases of burglary in the nearby houses recently and my grandma’s iteration of the stories had only registered them better in my mind.

As I lay on the floor thinking hard about my next course of action, I heard the heavy trudging of footsteps outside the door of my grandma’s room. Still not knowing what to do, I just waited for them to fade away, grateful that it hadn’t entered our room. Just then a sudden train of thought took charge of my mind. What was I doing? A burglar had entered the house, I had my grandma to protect and all I was doing was lying on the mattress like a coward. I needed to take charge of the situation not only to prevent a robbery of my uncle’s hard earned money but also to protect my grandma. With this I got up and placing my footsteps as gingerly as possible, I grabbed a club near the door and proceeded in the direction of my uncle’s room.

It was still very dark but as I approached the room, I saw a beam of light coming from the washroom. I clearly remember switching off all the lights, then how come this one’s on? Could it be that the burglar’s attending the call of nature? Without any more hesitation I braced the club in my hand and prepared to strike the burglar once the door opened. After a few seconds, the bolt of the door made a creaking sound. I braced myself and with all my muscles in a tensed state prepared for one strong heave.

“Mai, what are you doing here in the middle of the night?” I bellowed at my terrified grandma. “Attending the call of nature, son, doesn’t an old woman have this basic right? And for heaven’s sake what are you doing with the club?” her voice showing all the signs of hysteria, she was panting heavily. Perplexed and embarrassed I went around the house and as expected found no burglar in the house. It was my grandma all this while. I went to her, apologised for my actions and said, “Mai, what was the need for you to open uncle’s cupboard in the middle of the night?” “I was just confirming that it was locked. There are burglars around you know,” she said and for the nth time (I seemed to have lost track of its value) she narrated to me the burglary in the neighbourhood and there I sat in the middle of the night listening to my grandma.

Maybe this was all caused due to her stories which had managed to even penetrate my subconscious mind or maybe it was my innate fears about sounds at night. But whatever be the case, it was surely a midsummer fright for both my grandma and me.



ചില മഴക്കഥകൾ

ABU ANAND

പുറത്ത് ഇപ്പോഴും മഴ ചെറുതായി ചാറുന്നുണ്ട്. തുറന്നിട്ട ജനലിന്റെ അഴികളിൽ തട്ടി അകത്തേക്ക് വീഴുന്ന വെള്ളത്തുള്ളികൾ. മഴ എന്നും എവിടെയും ഉണ്ടായിരുന്ന ഒരു കഥാപാത്രമാണ്. ഈ ഭൂമിയിലേക്ക് ഞാൻ എന്ന മനുഷ്യൻ പിറന്നുവീണപ്പോൾ മഴ പെയ്തിരുന്നു എന്ന് അമ്മ പറയുമായിരുന്നു. വീട്ടിൽ എന്നെ കിടത്തിയിരുന്ന തൊട്ടിലിന് മുകളിൽ ഒരു ഓട് പൊട്ടിയിരുക്കുന്നുണ്ടായിരുന്നു. മഴ പെയ്യുമ്പോൾ തേക്കുകൊണ്ടുണ്ടാക്കിയ കഴുക്കോലിൽ തൂങ്ങിക്കിടന്ന് കൃത്യമായ ഇടവേളകളിൽ താഴേക്ക് വീഴുന്ന വെള്ളത്തുള്ളികളിൽ കൈ നനയ്ക്കുക എന്റെ ഇഷ്ട വിനോദമായിരുന്നത്രേ. ഓർമ്മയിലുള്ള ആദ്യത്തെ മഴക്കാഴ്ച ഒരു കൊയ്ത്തുകാലമാണ്. പണിക്കാർ കൊയ്യുന്നതും നോക്കി അച്ഛനോടൊപ്പം വയൽവരമ്പത്ത് ഇരിക്കുകയായിരുന്നു ഞാൻ. തുറന്നുവിട്ട മടയിലൂടെ കൈത്തോടിലേക്ക് ഒഴുകുന്ന വെള്ളത്തിലെ മാനത്തുകണ്ണികളും പരൽ മീനുകളും എന്നെ നോക്കി ചിരിക്കുന്നുണ്ടായിരുന്നു. വരമ്പിന്റെ ഒരറ്റത്ത് കൊയ്തുകൂട്ടിയ കറ്റകൾ. മാനം ഇരുണ്ടു വരുന്നു. മാനത്തച്ഛൻ തന്റെ കൊട്ടാരത്തിലെ പത്തായത്തിൽ തേങ്ങ പെറുക്കിയിടുന്ന ശബ്ദം കേൾക്കാം (ഇടി വെട്ടുന്നത് എങ്ങനെയാണെന്ന് ചോദിച്ചപ്പോൾ അമ്മമ്മ പറഞ്ഞുതന്നതായിരുന്നു അത്). അന്നത്തെ മഴ മുഴുവൻ വയൽവക്കിലെ ചേമ്പിലയ്ക്കു താഴെ കുറേ കുഞ്ഞിത്തവളകൾക്കൊപ്പം നിന്നു കണ്ടു. പിന്നെയൊരു ജൂൺ മാസത്തിലെ മഴയുള്ള ദിവസമായിരുന്നു ആദ്യമായി സ്കൂളിലേക്ക് പോയത്. തുള്ളിക്കൊരുകുടമെന്നരീതിയിൽ പുറത്തു മഴയുടെ ഇടന്തലപെരുക്കം കേൾക്കുമ്പോൾ എന്റെ കണ്ണിലും തോരാത്ത കണ്ണീർമഴ പെയ്യുന്നുണ്ടായിരുന്നു. കൺപീലിയിൽ തങ്ങി നിന്ന ഒരു കണ്ണുനീർത്തുള്ളിയിൽ വെളിച്ചമടിച്ചപ്പോൾ അതിൽ ഏഴുനിറങ്ങൾ കാണാമായിരുന്നു. പിന്നീടോരോമഴകളും ഓരോ ആഘോഷങ്ങളായിരുന്നു. കണക്കു പീരീഡ് കഴിഞ്ഞുള്ള ഇന്റർവെൽ സമയത്ത് സ്കൂൾവരാന്തയിൽ നിന്ന് നോട്ട്ബുക്കിന്റെ നടുപേജ് കീറി ഉണ്ടാക്കിയ കളിവഞ്ചിയിൽ ക്ലാസ്സ് മുറിയുടെ വാതിൽപ്പടിയിൽ അരിച്ചു കയറുന്ന ചോണനുറുമ്പിനെ കടലുകാണാൻവിട്ടും കുടയിൽ തങ്ങിനിൽക്കുന്ന വെള്ളത്തുള്ളികളെ പരസ്പരം അങ്ങോട്ടുമിങ്ങോട്ടും തെറിപ്പിച്ചും ഓരോ ഇടവപ്പാതികളും നിറമുള്ളതാക്കി. കാലം കടന്നുപോയപ്പോൾ വരാന്തകൾ മാറി, പക്ഷേ മഴ പഴയതുപോലെ ഒരായിരം പൊട്ടിച്ചിരികളായിരുന്നു. അങ്ങനെയുള്ള ഒരു മഴക്കാലത്താണ് ആദ്യമായി ആ നീളൻമുടിക്കാരിയെ കാണുന്നത്. തുളസിക്കതിർ ചൂടിയ കറുത്ത മുടിയിഴകളിൽ മഴത്തുള്ളികൾ തങ്ങിനിൽപ്പുണ്ടായിരുന്നു. അവളുടെ പൊട്ടിച്ചിരികൾ ഒരിക്കലും നിലയ്ക്കാത്ത അടമഴകളായിരുന്നു. ആ മഴകൾ എന്നെ നനയിച്ചുകൊണ്ടേയിരുന്നു. അങ്ങനെയാണ്, അന്ന് ബാഗിൽ കുടയുണ്ടായിട്ടും എടുത്തിട്ടില്ല എന്ന് കള്ളം പറഞ്ഞ് അവളുടെ കുടയിൽ ബസ് സ്റ്റോപ്പ് വരെ പോയത്. പിന്നീട് ആ മറവി പതിവായി, അവളുടെ പൊട്ടിച്ചിരികൾ എന്റേത് കൂടിയായി. പക്ഷേ കാലത്തിന്റെ പെരുമഴയിലുണ്ടായ മലവെള്ളപാച്ചിലിൽ ഞങ്ങൾ രണ്ടു തുരുത്തുകളിലെത്തി. ഒരിക്കലും നീന്തിയെത്താൻ കഴിയാത്തത്ര അകലെയുള്ളവയിൽ.

പുറത്ത് മഴ ഇപ്പോഴും നിന്നിട്ടില്ല. നാട്ടിലത്ര ഭംഗിയില്ല ഈ ഉദ്യാനനഗരിയിലെ മഴയ്ക്ക്. എങ്കിലും ആർദ്രമാണത്. ഓരോ തുള്ളിക്കും ഓരോ കഥ പറയാനുണ്ട്. ചന്നം പിന്നം അക്ഷരങ്ങൾ കൂട്ടിച്ചേർത്ത് അവയത് ഉച്ചത്തിൽ വിളിച്ചുകൂവുന്നു, കാതുള്ളവർ കേൾക്കട്ടെ എന്നു കരുതിക്കൊണ്ട്. ഇനിയുമൊരു മഴയായി മാറാനുള്ള നീണ്ട യാത്രയ്ക്കിടയിൽ അവ എല്ലാത്തിനും സാക്ഷിയാകുന്നു. മഴ പതുക്കെ പെയ്തോട്ടെ, അല്ലേ !

through the lens of a biologist

Srinath Thiruneelakantan

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