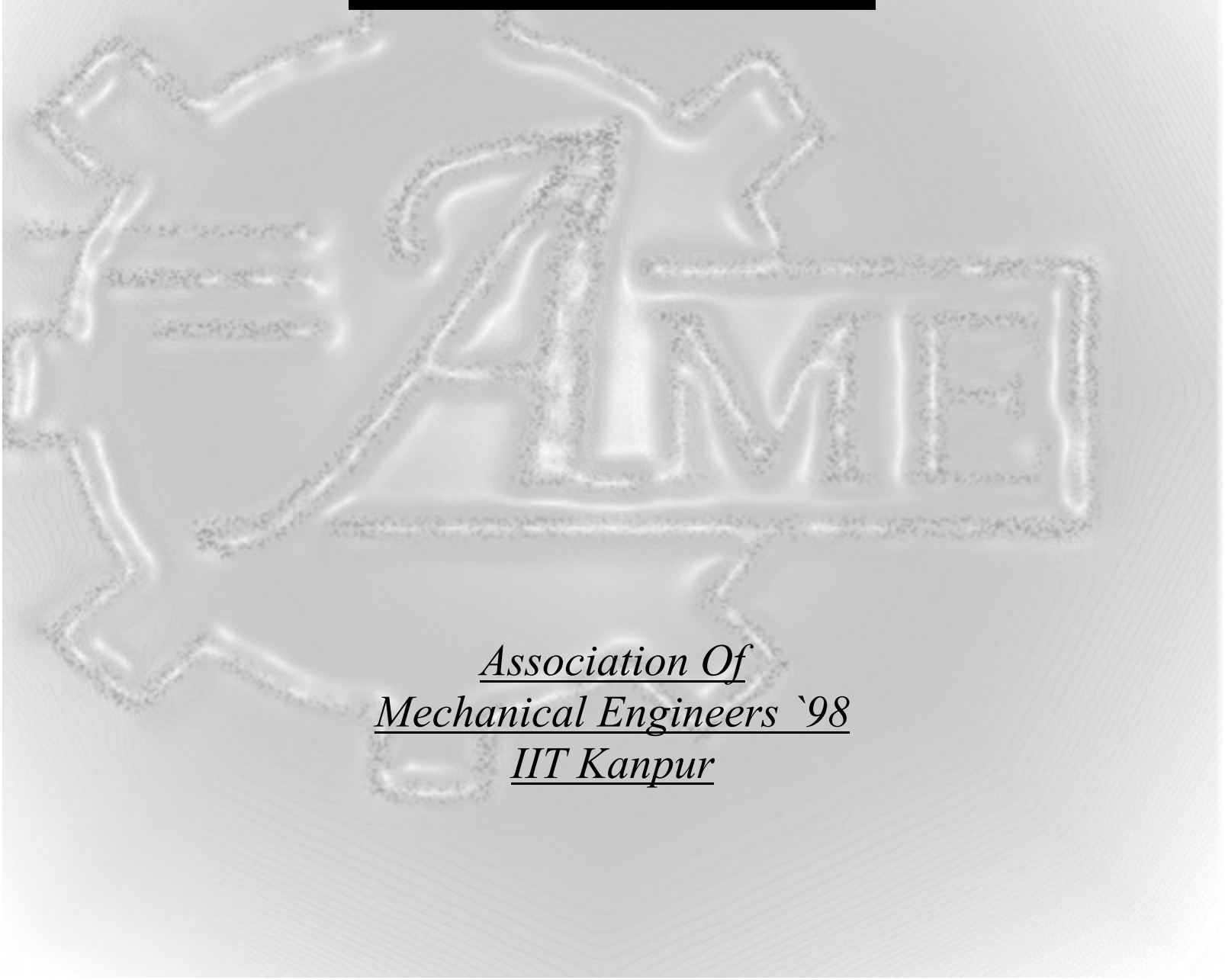
MECHZINE



Association Of
Mechanical Engineers `98
IIT Kanpur

INSIDE

The AME goes active.

After long years of lull, the AME is finally coming out of its hibernation. The release of this AME mouthpiece is only one of the signs of its revival. On the basis of the strength and the vibrancy of the department, one would only have expected it to come a bit sooner, but as it has turned out to be-all what we needed was to get our steps together. Now as we march in unison, no obstacle seems hard enough to surmount.

The AME is now going all out to make up for the lost time. The AME executive council has met and finalised its plans for the coming year. Apart from the publication of the magazine, it also proposes to bring out the departmental T-shirts (which, I guess, will be out very soon). The AME also proposes to conduct an industrial tour for the senior batch students. It will also be our endeavour to help improve the informal relations between the faculty and the students. For this we propose to organise a faculty-students cricket match this semester.

We release this magazine in the beginning of the new millennium , wishing that, as the new millennium has seen the successful culmination of our endeavour, may it also see all your efforts bearing fruits. The dawn of these new times brings hope- hope that one day India will emerge victorious in its crusade against poverty and exploitation of its teeming millions, hope that one day it will occupy its rightful place among the community of nations and that we the IITians will play a substantial role in its attainment

,and the hope that this world in its totality will become a better place to live in.

As we step into the 21st century, we should also ponder over few hard truths and do some introspection. We should ask ourselves what are we doing to convert the dreams we see for India and the world, into reality. Isn't it true that with each passing day, we are becoming more self centered and less considerate towards the nation and the society we live in. Or else what was the point in India hosting one of the biggest millennium parties of the world in Goa when one of its states Orrisa has suffered one of the biggest natural calamity of all times only about a month back.

To me it certainly doesn't make sense. Does it to you?

NANDEESH SHUKLA

The AME Council

Dr. Subrata Sarkar	**Faculty Advisor**
Ashish Awasthi	**President**
Kailash Mittal	**Convener**
Aviral Khandelwal	**Treasurer**

Executive Council members

Tushar Thaker	Saurabh Bhatnagar
Abhisheik Choudhary	Rohit Mathur
Udit Kulmi	Piyush Agarwal

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Phir Bhi dil hai Hindustani

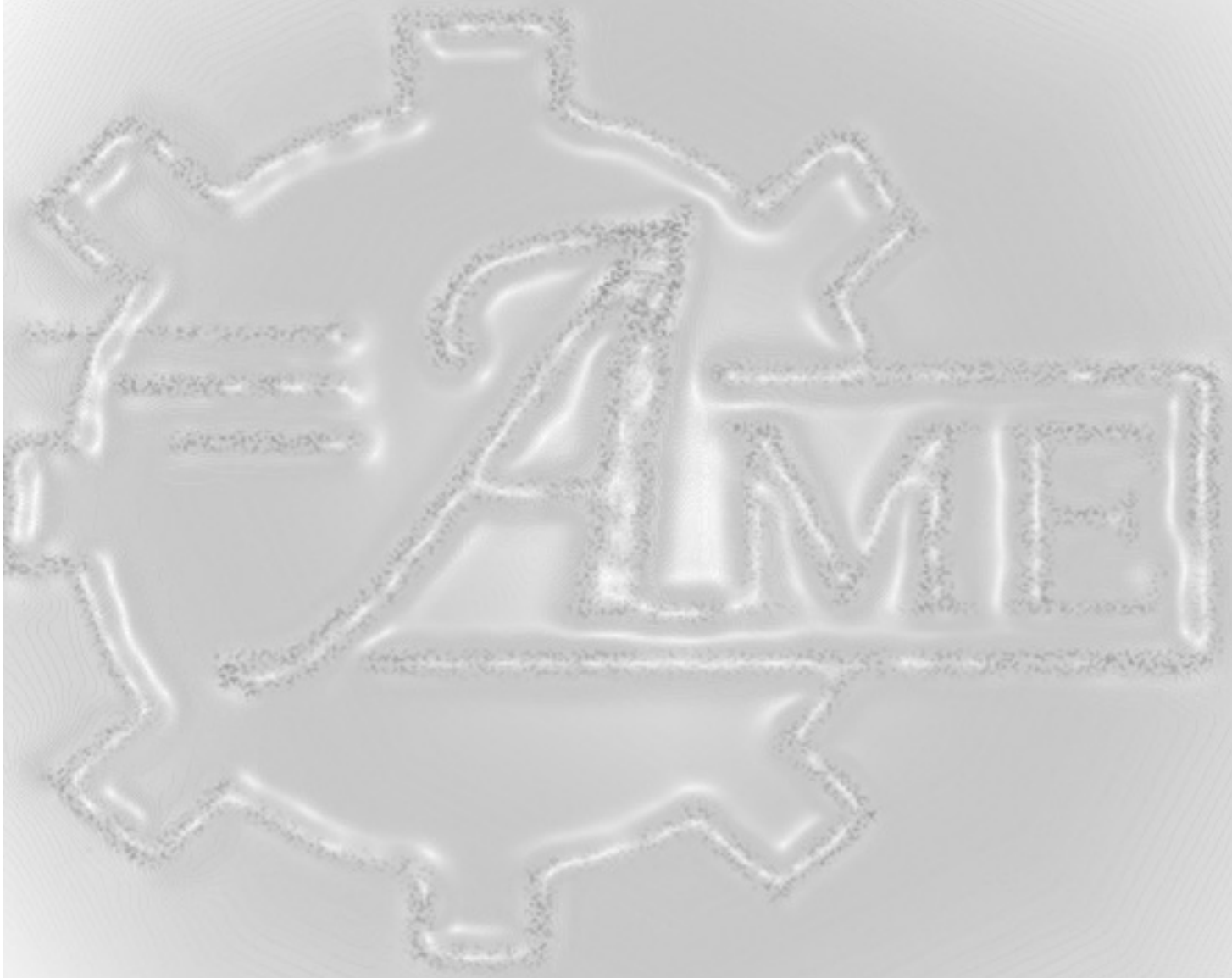
The good news : we Indians are tolerant. The real news: this tolerance is mostly towards mediocrity, shoddiness and the other undesirables. 'Chalta *hai'* has come to epitomize the great Indian mindset so well that we wonder how can we change , if ever. Evolutionary attitudes have allowed us to cope with problems that should have overwhelmed us. I-care-two-hoots approach makes the Indians stand apart and makes us fortified against any –ism or –ization.

Such is our apathy (or our philosophy perhaps!) that we like to believe that that's the way to go……slower and lower. We may love watches but certainly disregard what they show- Einstein never saw our great life style or else he would have postulated that to achieve time dilation, one does not necessarily have to move with high speeds, rather the cheaper way would be to come to India where time almost never moves. (Perhaps that is natural for a country whose national language has the same word for yesterday and tomorrow). Why it should move after all, Indians argue, when *Samaya* is *shaswath* nd *anant* and *shaswath* entities are always *sthir.* A true Indian believes that he is the son of the cosmos and has all the time in this world for his earthly sojourn. What is fated to happen at the "appointed hour" WILL happen so who are we to rush around and be sticklers to time when the coordinate of the fourth dimension only demonstrates the inevitability of fate and cannot change it.

Our Philosophy does not limit itself to time only but even dictates our hygiene and living habits. Why to care for our environment and nature and…whatever you say, when all this is *Maya* And will be destroyed when *Pralay* comes. Why not use them to show to the world that India is one country where human independence is cherished and one is allowed to live as he desires – whether he wishes to use them or misuse them or buy them or steal them depends on his own sweet wish. So we are comfortable when walking on Kanpur pavements actually mean walking on dirt, we are comfortable when a large percentage of electric supply is simply stolen, we are comfortable when municipality doesn't care to supply water for days at a stretch - we may actually feel uncomfortable without them all.

All this comes naturally to us- hypocrisy is in our blood. We do things with which we are not really comfortable, which we don't really believe in. Our beauty queens make televised pledges to save the starving, our politicians crusade against immoral western values and we show patriotism by being glued to Kargil news during the commercial breaks in a cricket match. We are smug about our "virtuousness" but lap up porn whatever be may its source. We call women *devis* and cows *mata* but we quite willingly send the latter to be slaughtered and as for the former- we proceed to rape and burn them. We pride ourselves on our *guru shisya parampara* but we pay our teachers peanuts.(of course we make up by celebrating a Teachers day). We have a Children's day too- so what if children of this great nation languish in sub- human conditions. We may organize *Satyanarayan Katha* frequently in our homes, yet we are unequivocally dishonest.

Above all , we are determined not to allow western culture to swamp our noble one . We shall not go the way of the immoral west. We shall defend with our last drop of our blood….



Reminiscence of a lifetime

Gafur woke up with a startle. Slowly as he came to his senses, his eyes caught a glimpse of the date on the digital clock beside his bed. It read 2nd March 2094. Suddenly he realized that someone was standing beside his bed. With difficulty he tried to focus his eyes. At an age of 111, he found it increasingly difficult to drag himself through the last remaining strides of his life."Grandpa, are you awake ?" Gafur smiled as his eyes met that of his grandson, Ali. At 21 he was brimming with energy and liveliness of youth. It made Gafur's mind race back to the days of IIT Kanpur. Back to those days when he was still doing his B.tech .

He would never forget those days. How could he? But the world was quite different now . A lot of things have changed. The world itself has changed. The only reminders of the long gone era are grand old people like Gafur, in whose memories places like IITK, as it was in 2000 live on. It all started with the professionalist revolution in the thirties. It arose from a mad man's ideas or genius as some may call it. The exact identity of this person is not known to the world. But rumor has it that it was some professor in IITK. The idea was that, everything if it is done, has to be done perfectly. The idea became so popular and strong that governments all over the world redefined their stand. They realized that fighting and tension among themselves can only hamper their progress. It is from this concept that the inter-state corporation establishment, a company owned by people throughout the world was born. It was indeed a historic moment which saw the merger of science, commerce and politics all towards one goal - better quality of life for each human being.

Ever since ICE came into existence, things have been different. There was only this simple thumb rule - do your bit and do it properly. Although simple the impact was great. The period after 2030 saw a dramatic fall in poverty and a giant leap in science and technology. The "thunderbolt" a spacecraft which could reach the speed of 0.5 c , the first independent android, the huge underwater settlements initiated by ICE in its drive to provide home for all. The invention of an energetically feasible method to obtain Iron and Oxygen from Ferrous Oxide found in plenty. The list goes on and on..... perhaps the most dramatic of all was the concept of psi-alterations invented by the scientists of IIT-k and MIT in the biggest joint venture ever to be commissioned. They were able to alter the quantum mechanical states or so to say the wave functions of different atoms permanently. This meant that information could now be stored at the level of atoms- opening up the idea of infinite storage space. This storage space allowed doctors to store the complete genetic database of humans and all other species. They were able to duplicate the genes at will, solving the problem of extinction of species. As Gafur woke from the past he felt a surge of pride for the institution he had studied in. So much was contributed by IITK that it was placed in the elite alpha-category of research institutes by the ICE. More than an institution IIT was a movement in Humanity. A rich tradition it still carries.

" You seem to be in a pensive mood grandpa." Gafur suddenly came out of the torrent of thoughts flowing through his mind. " I have kept breakfast ready for you. Please hurry up, its already time for me to leave." Ali slowly helped Gafur into his interactive wheel chair which on verbal command brought him to the dining table. Ali switched on the immersive

television set, illuminating the entire room with 3-D Holograms. Suddenly something caught Gafur's attention. Gafur realized that IIT K's Techkriti was being covered live. From the commentary he understood that a payload deployment race was taking place. Each team was trying to offload a dummy satellite into a geo-stationary orbit, with the launch vehicles they had devised. The team clocking the best time would win. Gafur smiled as they showed one of the teams setting up their equipment on the IITK launch-pad. He was thinking about the boat race, he had taken part in during techkriti.He had cut thermo-col to resemble a boat, fixed a motor and a paddle. Gafur laughed out aloud when the memory of his sinking boat came back to him. Gafur Mohammed sat back and closed his eyes. He was back in the good old days. Those days when he used to hang out with his friends in MT. Was it NT or was it MT. He couldn't remember. But he remembered his friends crystal clear. He remembered that final year when he took his first interview. Those long walks he took with Nadia. The fun they all had when he stood for Cultural Secretary. Students today are so caught up in their work that they don't have time for these little things. Things that make life worth living.

Are these so called achievements of mankind holding us prisoners in our own world, dictating our lives to us? Gafur didn't know the answer. He slid back into his dreams and took a walk with Nadia.

Excuse me, You are naked

- Said a small boy to the king in a classic fable when he appeared before the public stark naked thinking, probably under the influence of his courtiers, that he was wearing something very special and nobody present dared to tell him the truth. It is amazing how somesituations never change though the characters involved do- and the simple lessons that these fables offer continue to hold.

India may have come a long way on the path of democracy and kings and queens may be a thing of the past but the inability to call a spade a spade still persists in us. We refuse to face or say the truth as if we are almost afraid of it. "*Dekhna,* by the next 25 years, our country will be a superpower," proclaim our *neta*" We are going to develop missiles which will be able to destroy Beijing, Islamabad and what not"." India has the bomb – so be careful world," thunders another of them. Every body celebrates – we have the bomb and the missiles so we are powerful. Though everybody is also aware that the power shedding has increased to six hours a day, the water supply was a bit blackish today and that the old woman living in a close by slum died (probably she starved). Every body knows the 'king is naked' but how can they say this- so nobody does.

The old wise heads of FICCI meet in the conference room of Hotel Taj in Mumbai and happily announce that liberalization has put a new life in the Indian economy, the sensex is zooming up and the

coffers are full of foreign exchange. The finance minister says, " India is becoming increasingly more prosperous. Look at the increasing purchasing power of the people- look at the automobile industry, look at the electronics industry" he quotes the figures. " India is the place to be in the future. Look at the market potential" agree foreign investors. Lesser men hear to this all. They are perhaps going without food, clothing and shelter. They know that the king is naked but he is happy- he has been told by his courtiers that he is exquisitely dressed and they have no business telling him the truth.

One character is missing- that small boy. We need someone to tell our kings today that they are deceiving themselves. We need someone to tell them that beyond the hitech and modern India, which is the cynosure of their eyes because only that interests the foreign investors and the MNCs, there exists a neglected and deprived 'Bharat' which requires their immediate attention- a 'bharat' without which India cannot really prosper. Someone is needed to tell them that wearing clothes is more important than wearing jewellery

Someone is needed to tell them that they are naked

Nandeesh Shukla

I didn't drink, mom ...

I didn't drink, mom
I didn't drink and drive, mom
Even though they told me I should
I didn't drink, mom
I didn't drink and drive, mom
Even though I easily could.

It made me feel nice inside, mom
Like you told it would.
You told me that I could enjoy
Just as much without a drink.
You were right mom, I enjoyed
More than I ever could,
Just as you told me I would.

The party is over now,
Everyone is learning. As I pull
Out of my car, the other guy doesn't.
See me, mom
I am lying on the floor, mom
I am lying here all alone, mom
You told me I will be safe, mom;
I thought I could see you again, mom
You told me, that I never would.

I am lying here, dying mom
Tell me why, tell me why, mom
There is blood all around me, mom
I can feel more leave my head, mom.
I am feeling fait, mom
I can't see, mom
I am alone, mom
Lying all alone, mom
Help me, mom.

I hear the Policeman say,
That no one can help me.
Oh, why mom! Why me mom.
Before I go, mom
I have to tell you, mom
I didn't drink and drive, mom I
I didn't drink and drive.

Sandeep Urankar

It was the Night before Exams

Twas the night before finals
And all through the college,
The students were praying
For last minute knowledge.
Most were quite sleepy,
But none touched their beds,
While visions of essays
danced in their heads.
Out in the taverns,
A few were still drinking,
And hoping that liquor
would loosen up their thinking.
In my own apartment,
I had been pacing,
And dreading exams
I soon would be facing.
My roommate was speechless,
His nose in his books,
And my comments to him
Drew unfriendly looks.
I drained all the coffee,
And brewed a new pot,
No longer caring

That my nerves were shot.
I stared at my notes,
But my thoughts were muddy,
My eyes went ablur,
I just couldn't study.
"Some pizza might help,"
I said with a shiver,
But each place I called
Refused to deliver.
I'd nearly concluded
That life was too cruel,
With futures depending
On grades had in school.
When all of a sudden,
Our door opened wide,
And Patron Saint Put It Off
Ambled inside.
Her spirit was careless,
Her manner was mellow,
She started to bellow:
"What kind of student
Would make such a fuss,
To toss back at teachers
What they tossed at us?"
"On Cliff Notes! On Crib Notes!
On Last Year's Exams!
On Wingit and Slingit,

And Last Minute Crams!"

Her message delivered,

She vanished from sight,

But we heard her laughing

Outside in the night.

"Your teachers have pegged you,

So just do your best.

Happy Finals to All,

And to All, a good test."

Life is worth living…

Actually what life is ! It is very difficult to define life accurately because life is viewed by different Personalities in a various fields.

Life is a poem for a poet, worship for a saint, battle for a warrior, research for a scientist, nature for a philosopher etc. Thus life sprawls around man next. Step is triumph or a defeat as the two sides of the same coin have equal probability to appear upside or down when tossed.

According to Anatole France: -*" The truth is that life is delicious, horrible, charming, frightful, sweet, bitter and that is everything. "*

It is only upto man to make life worth living. Life is worth living if one ignores materialistic pleasure and opts for spiritual triumph because it is everlasting and brings true happiness. It can be achieved by preventing over attachments to material comforts and by preserving moral integrity and by fostering the tranquillity of mind through wisdom. To achieve this is a very difficult task, yet nothing is impossible. One can make his life worth living, charming and precious by making the best of his work, by being persevering, optimistic with firm determination and word power.

As the blind man in "Paradise lost" remarks "The mind in its own place and in itself can make a heaven out of hell, a hell out of heaven. "

The life that is lived heroically will be the life that is beneficial for others. It will never be tiered when the day becomes hectic when days become busy. Rather it finds happiness in all its ups and downs. But one

must be cautious to choose good from evil. So one should always discern the good in vast stretches of triumph from the pebbles of defeat and always be like a flower that perfumes those hands that crush it.

On concluding the whole-" *Life is worth living if human is loyal to God.*"

Prasoon Diwakar

C programming with a difference

```
Struct female_professionals
{
        double styles;
        short skirts;
        long time_to_understand_problems;
        float mind;
        void knowledge;
        char non_co-operative;
}

struct married_females
{
        double weight;
        short tempered;
        long gossip;
        float hopes;
        void word;
        char unstable;
}
```

```
struct engaged_females
{
        double time_on_phone;
        short attention_on_work;
        long boast;
        float on_cloud_nine;
        void understanding;
        char edgy;
}

struct newly_married_females
{
        double dinner_invitation;
        short time_at_work;
        long lunch_break;
        void bank_balance;
        char hen_pecked;
}

struct husband_wife_professionals
{
        double income;
        short tempered;
        long time_no_see_each_other;
        void love_life;
        char money_making;
```

```
}

struct beautiful_city_girl
{
        double boyfriends;
        short affairs;
        long stories;
        void greymatter;
        char flirt;
}

struct old_lady
{
        double chin ;
        short memory;
        long sighs ;
        void attention_from_men;
        char chatterbox;
}
```

Pieces of Poetry

A poem begins with a lump in the throat.

--Robert Frost

These are bits and pieces of our favorite poems, accumulated through the years. In the case of some shorter works, the entire poem is included.

All that is gold does not glitter,
Not all those who wander are lost
The old that is strong does not wither,
Deep roots are not reached by frost.

- - - -J. R. R. Tolkien "Lord of the Rings"

And with tears of blood he cleansed the hand,
The hand that held the steel:
For only blood can wipe out blood,
And only tears can heal.

- - - -Oscar Wilde "The Ballad of Reading Gaol"

Beauty never slumbers;
All is in her name;
But the rose remembers
The dust from which it came.

- - - -Edna St. Vincent Millay

Before the beginning of years
There came to the making of man
Time, with a gift of tears;
Grief, with a glass that ran;
Pleasure, with pain for leaven;
Summer, with flowers that fell;
Remembrance, fallen from heaven,
And madness risen from hell;
Strength without hands to smite;
Love that endures for a breath;
Night, the shadow of light,
And Life, the shadow of death.

- - - -Algernon Charles Swinburne "Atalanta in Calydon"

(1865)
Every Night and every Morn
Some to Misery are born.
Every Morn and every Night

Some are born to Sweet Delight,
Some are born to Endless Night.

- - -William Blake "Auguries of Innocence"

For the crown of our life as it closes
Is darkness, the fruit there of dust;
No thorns go as deep as the rose's,
And love is more cruel than lust.
Time turns the old days to derision,
Our loves into corpses or wives;
And marriage and death and division
Make barren our lives.

- - -Algernon Charles Swinburne "Dolores" (1866)

I loved you in the morning, our kisses deep and warm,
your hair upon the pillow like a sleepy, golden storm,
yes many loved before us, I know we are not new,
in city and in forest they smiled like me and you,
but now it's come to distances and both of us must try,
your eyes are soft with sorrow,
Hey, that's no way to say goodbye.

- - - Leonard Cohen "Hey That's No Way to Say Good-bye"

I shall go the way of the open sea,
To the lands I knew before you came,
And the cool ocean breezes shall blow from me
The memory of your name.

- - -Laurence Hope

I walked beside the evening sea
And dreamed a dream that could not be;
The waves that plunged along the shore
Said only: "Dreamer, dream no more!"

- - -George William Curtis

If i could catch your sorrows
I would toss them into the sea,
But all these things I'm finding
Are impossible for me.
I cannot build a mountain
Or catch a rainbow fair,
But let me be what I know best,
A friend that is always there.

- - -Khahlil Gibran "A True Friend"

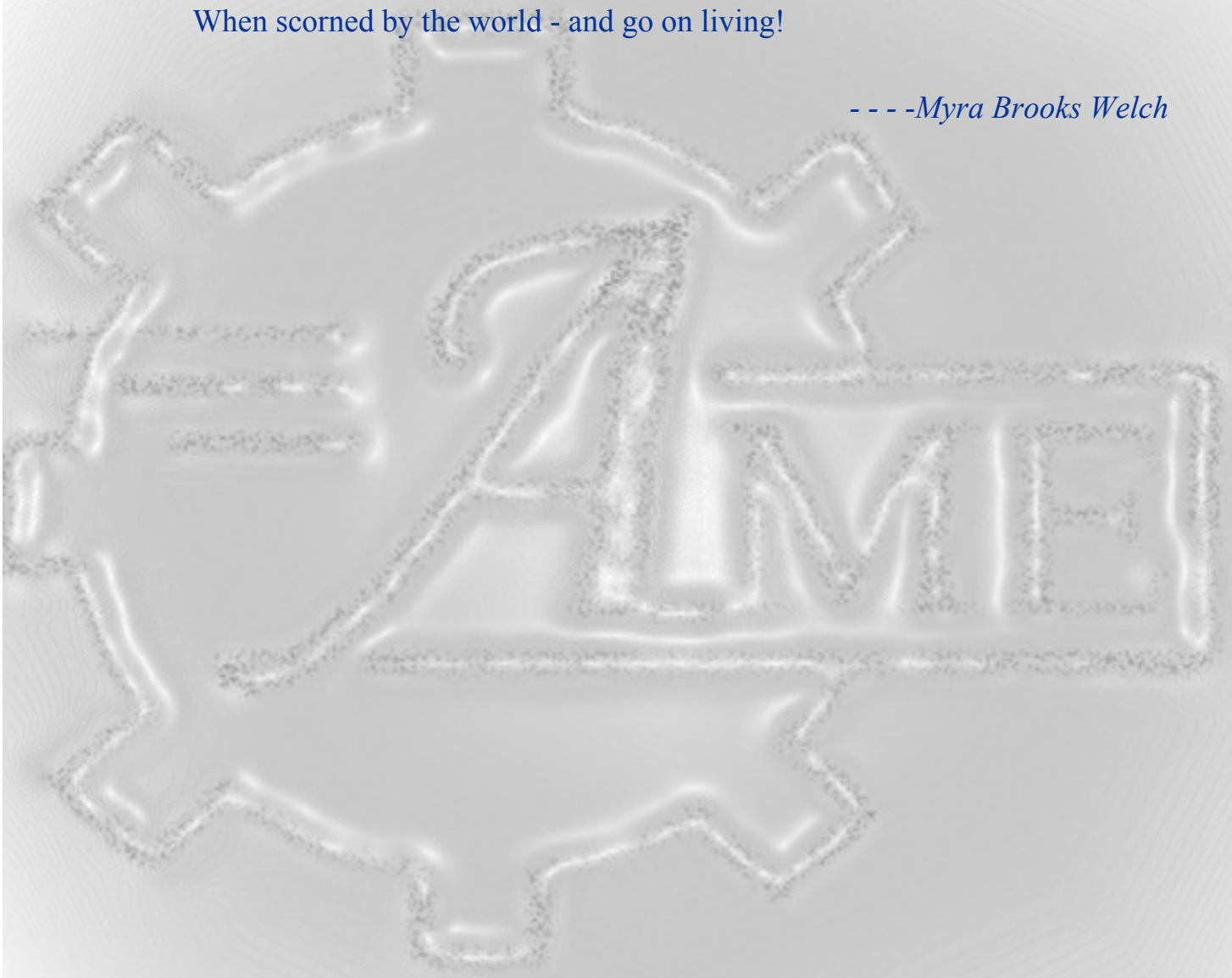
It's easy, perhaps to die for a dream

With banners unfurled - and be forgiving!

It's the hardest part to follow the gleam

When scorned by the world - and go on living!

- - - -Myra Brooks Welch



Give this tongue-twister a try!

Mr. See and Mr. Soar were old friends.
See owned a saw and Soar owned a seesaw.
Now See's saw sawed Soar's seesaw
before Soar saw See, which made Soar sore.
Had Soar seen See's saw before See saw Soar's seesaw,
then See's saw would not have sawed Soar's seesaw.
But See saw Soar and Soar's seesaw before Soar saw See's saw,
It was a shame to let See see Soar so sore just because See's saw sawed
Soar's seesaw.

Source: Annonymous

Saviour Faire

- *Industrial Tour*

  an Experience — *Dr. S.K. Chowdary*

- *Industrial Training ,*

  The HLL Experience — *Bhawik Gupta*

- *Memories that Linger*

  The Farewell of the `95 Batch — *Aviral Khandelwal*

Industrial tour: An experience

Come September and you would invariably meet a group of Mechanical third yearites roaming around the corridor with very worried faces.

"Something wrong boys?"

"Sir, would you accompany us to the Industrial Tour?" would be the very standard reply to your query.

Well, this is how it begins with the search for a Faculty Member willing to accompany the students to the Industrial Tour which normally starts off immediately after the end semester examinations, i.e., from 2nd or 3rd of December. Home work for this professional cum pleasure trip is enormous contact factories which will be willing to allow a bunch of IIT'ans (running away from their shop floors after a year of joining), getting their I-cards (if not lost altogether) renewed from the DOSA office (in case the responsible person is not on leave) for the purpose of railway concession, making several trips to Kanpur railway station for purchasing the round trip group ticket and making reservations for the break journeys, arranging accomodations in various cities etc. etc.

In case everything goes all right (with no F's for anybody), a bus leaves from somewhere between Hall II and Hall III with the boys (rarely girls!)

from both the hostels peacefully co-existing. Normally it is "Prayag Raj" or "Unchahar" that we board at Kanpur to reach New Delhi early in the morning, change the platform and board the Bombay-bound train. Accomodation in Bombay is normally available at IIT Bombay hostels (without any beddings) without much problem. In Bombay usually 3 to 4 factories are visited. Larsen & Toubro, Crompton Grieves, Ceat Tyres, Hindustan Lever, Mahindra and Mahindra, Godrej are some of the Bombay-based industries we get permission to visit. Fun trip in Bombay includes Elephanta, Gateway of India, shopping at VT and of course an unique experience of travelling by Bombay Rail.

From Bombay the tour continues to Pune by double decker express. In case the ABC Ball Bearing factory in Lonawala permits the visit, (lately, however, they are reluctant for some reason) the journey is broken in between Bombay and Pune just for the factory visit in Lonawala. In Pune suddenly it becomes much cooler than in Bombay. Accomodation here is normally made in relatively cheaper hotels, popular one being hotel "Deluxe" on Tadiwala Road, very close to the Railway Station. TELCO Pune, Bajaj Auto, Premier Machine Tools, Sandwik Asia are some of the industries worth visiting here. Institute of Cinematography and some co-education colleges at Pune are very popular places for the students to visit in off time.

From Pune the students continue the journey with a jovial mood the next destination is Goa the land of beaches. Of course there are two places to visit : Juari Agro Chemical and the Institute of Oceanography. If the students are lucky, the accomodation is made available right on the Colba beach with the Goa Tourism for which you have to write to them at least three months

in advance. After very intensive factory visits in Bombay and Pune, students get relaxed here for two days to continue again.

Next destination is Bangalore where we spend roughly four days to visit four factories like Hindustan Machine Tools (HMT), Bharat Earth Movers Ltd. (BEML), Hindustan Aeronautics Ltd. (HAL), MICO, Lipton Tea etc. Bangalore YMCA at Nrapathunga road provides excellent accomodation at a very reasonable price. A Sunday here is normally used by the students for a day's trip to Mysore. Some students, however, venture for Uti from here. From Bangalore the group comes back to IIT Kanpur through Jhansi after a very exhaustive two days travel by Karnataka Express.

Although Industrial Tour is not compulsory for all the Mechanical Engineering students, I feel that no one should miss this unique opportunity. Apart from getting acquainted with the real life industrial environment, many of the mechanical engineering concepts, particularly in design and manufacturing, get clarified during the tour. Students get the opportunity to see various machines and equipment in operation about which they were only told in the classrooms. Finally it is a lot of fun to travel together. The route described above has been selected keeping in mind the industrial belt of Bombay and Pune. However, we can also consider the industrial belt around Delhi and Jamshedpur for the Industrial Tour.

Dr. S.K.Choudhary
Deptt. of Mechanical Engineering

The experience of summer internship at HLL

It hadn't been long after we returned to the grind at IIT Kanpur after a long and refreshing summer of 99. HLL arrived. After a long, jovial but important discussion at home, I had decided to apply to the company that did not really specialize in design (I'm in Mechanical Engineering) but a company that made soap, shampoo, toothpaste..... !! All of you who are trying to make sense of this dissertation must by now be familiar with the exhaustive application form, the ménage the GD is and the interview that is so technically technical! But with lady luck on my side, I managed to just scrape through.

The semester passed as I waited for some written conformation from their side, but in vain. A new year's card eased me, but only the form asking for my choice of project relieved me fully. I asked for a project involving cycle time optimization, and very soon received a letter informing me of a software-based project related to management of research organizations at Bangalore! I soon found out that my letter had been exchanged with the CSE student who had also been selected. That was sorted out and here I was to report to Factory Manager, Tundla factory on the eighth of May for the project "Reviewing of Material Handling Systems for Original, Processed and Packed Tea". And within no time, I found myself on the flight to Delhi, on route to Tundla.

The day began with me reaching the factory only to find that the Factory Manager had to leave for a few days. I was introduced to all the managers at the factory, and yes a voice within me said, "Welcome to big time Bhavik, here you're looking at serious stuff."

Very quickly I was made to realize that the project I was to work on was to be implemented by the end of this year. It was also made very clear to me that the company was not interested in simply a theoretical analysis of the problem. They expected me to generate options and discuss it with manufacturers of equipment to obtain proposals and finally do a cost benefit analysis to determine the feasibility and internal rate of return of the project. Well obviously, this wasn't spelled out on the first day, but the drive to deliver had already burgeoned.

The first week passed in orientation, as I was allowed to go around the factory and get familiarized with various processes in the plant and also start interacting with the personnel there. Accommodation, I could only get at Firozabad, which was just half an hour away by bus. But for the first day I was accommodated at the company guesthouse.

Once settled and oriented, I began work with full vigor. Having seen the plant up close, having been acquainted with each process related to material handling, which was really the mainstay of the plant as the operation performed was only blending and packaging, I began drawing up plans and ideas. I worked on a green field exercise and then took care of the constraints in the existing plant to generate options. Naturally, I hadn't done any course on material handling, and hence I had to do a lot of study as well.

And of course the help every engineer and every manager was willing to give, cannot be overestimated.

Life at Summer Training had now become routine. A look at my typical day makes me really laugh today! And in fact, if you are reading seriously, you might even skip this paragraph! The day began at seven, with me cursing the alarm clock before coming to my senses! Often it was during my bath that power was lost, and the bathroom became pitch dark.... I would fumble for my clothes and go out to have the generator put on. Breakfast would be a choice of chocolate cream biscuits, orange cream or the plain ones! If I was late, I took them on the bus. The day at the factory was busy most of the time but lunch was very good. On my return, which was usually around five (sometimes seven!) I was caught between the horns of leaving early and letting the loo be the air conditioner, or wait till a little after five and end up standing on the bus! Not to mention the four litres of water I carried back with me everyday, to take care of filtered water! Evenings passed at the home of a distant relative whose kindnes s cannot be expressed. And then dinner!! Please forgive me I don't even want to discuss it! But yes, one day after being fed up with the tasteless vegetables, I tried another place. The food turned out to be exactly as before. I later found out that the men who owned the places were brothers!! Returning to a room with no light or an effective-less fan or cooler, owing to low voltage certainly didn't brighten things up! And the days so rolled...

The next phase began, and theory seemed only such a supporting facet when implementation became the concern. So many ideas which looked splendid on paper, suddenly had to be rejected, but others were improved as well. New ideas were also generated. But the real substance that was added

was that the ideas now did not just satisfy a Mechanical Engineer, they had been assigned an approximate value and even an accountant could be satisfied. At a personal level I was able to grow. I was given independent charge to contact manufacturers all over the country by phone, fax and mail. This gave me a sense of responsibility and confidence to interact at a professional level.

It was time for the long promised Orientation program in Mumbai, where all Trainees would be brought together for a better insight into the company's businesses. I took the morning train to Delhi and flew to Mumbai in the evening. The next day began with discussions with high level managers on the areas of Technical, Sales and Marketing, Commercial and HR. The post lunch session was so engrossing that time seemed to have flown by, with discursions on the Millennium Project and a true story of how a product was launched, how one by one the competitors were crushed and how the brand has become a household name. (Check if your home uses Vim bar for utensils!). While the lectures were great, the arrangements and treatment was nothing short of five-star.... We were already feeling like high-flying executives! The day ended with another fabulous meal and cocktails. Most of us took the morning flights on the next day to our respective sites.

Things were moving on. The plans had been finalized. I was ready with the layout drawings, the new equipment that would be required and issues like power consumption and the civil work required. I also visited Agra a couple of times to get estimates of the civil work that would be required. The stage was set for a cost benefit analysis. The proposal was divided into three independent parts and IRR calculated for each of them. Only two turned out

to be feasible. The report was prepared, and my presentation lasted a little under three hours! The training had come to an end.

I was later called to Mumbai for final interview, the arrangements made in a decent hotel and all flights paid for. I have now been offered a job - a truly fitting and consummating end to a useful and productive summer training.

I could very well describe it as the experience of my life, a great and exhilarating experience or a complete professional experience. But I would always be vague and incomplete unless I called it THE HLL EXPERIENCE.

Bhavik Gupta

Farewell to the '95 batch

The farewell function to the 95' batch was memorable in more ways than one. Not only did it provide a glorious ending to the fruitful stay of the 95' batch in IIT Kanpur, it also displayed how our department is like a close knit family where each one cares for others from the depths of his heart. Perhaps that's what led to the revival of the AME. Another striking feature of this function was that even more than the participating students it were the faculty members who stole the show. We're sure that the 95' batch must have passed out with the realization that strict discipline in the classroom and tough grading notwithstanding, the love and affection of the faculty towards them was second to none.

The function took place on the lawns of the visitors; hostel on a fine Sunday evening. It was well attended, along with the 95'batch and the junior ug students, by many faculty members and their wives. The compere of the show was Anshu Vaish, the present AME president. Among the presentations, the monoacting display by Dr. S. G. Dhande and some jokes and words of encouragement by Dr. B Sahay and Dr. Prashant Kumar deserve special mention. Manish Dwivedi (ug 98 batch) entertained the audience with his mimicry performance. Every member of the passing out batch was presented with a title on the basis of his impression he has left on his juniors alongwith an informal photograph of the batch taken a couple of days ago. The faculty wives, not to be left behind, elected "Mr. fundoo" from the passing out batch while the winner of another special title-" Mr.

Mechanical" was chosen by the students. Mr. Mahendra K Yadav and Mr. Subir Kohli won these titles respectively. Then the mike was handed over to the outgoing students and they kept up the liveliness of the show. The whole show was followed by snacks.

That evening ended on an emotional note. Everyone's eyes were brimming with tears - tears of love and remembrance. They have now left the comfort of IIT Kanpur and have gone out in the Big Bad World. But on the basis of the training they received in IIT Kanpur, everybody is sure that they will be successful.

AME wishes them all the best.

Aviral Khandelwal

Technical Stuff

- *Dream Cars in your Driveway* — Nandeesh Shukla
- *How to drill Polygon Holes* — Shikhar Maini
- *Special Effects*
  Behind the Scenes — Jacob Jhon
- *The Birth of Boing 777* — Dr. D.P. Mishra
- *May the Force be with you* — Sandeep Urankar
- *Terra Formation on Mars* — Raman Chaddha

Dream Cars in your Driveway

Cruise control set at 65 m.p.h., you're driving down the highway, listening to Mozart. The kids are in the back seatwatching "Rugrats" on the built-in television. Then you glance at the screen of your personal computer, docked in the dashboard. You say "map," and a detailed route to your destination flashes on-screen. Then you say "traffic," and you see a live video of the traffic flow two miles ahead. If it looked congested, you'd say "re-route" and the computer would offer several alternatives. There's no need to reroute today, but as you listen to your Voice-synthesized email, you're distracted from the tractor-trailer that pulls into your lane ahead. Your car senses it, and the cruise control automatically decelerates to maintain proper highway space between you and the truck.

Fantasy? All the technology described above could become available in cars of every price range in the next few years. America's love affair with the car is car makers can deliver more quickly on what the consumer wants - from better cup holders to concert-quality sound systems to vastly improved child seats. It used to take up to six years to bring a car from concept to reality. But dramatic computer-aided design and manufacture mean that consumer feedback can be translated into steel, glass and plastic in little more than two years! These days many automobile companies sponsor focus groups and styling clinics, where potential customers are asked what they think of new ideas. And engineers and Designers and engineers at some

companies have been combined into "platform teams," working hand-in-glove with lifestyle and product specialists who try to discern the elusive Only! Combination of metal and mystique that strikes fire in the hearts of drivers. The result: ideas that were once only wild-eyed dreams find their way to America's roadways. Mix and Match. Chances are pretty good that even now one of the cars in your driveway isn't a car at all; minivans, sport-utility vehicles and pickup trucks account for about half of today's new-car market. But feedback from their drivers has resulted in the birth of a new beast -Lincoln Blackwood - half pickup truck/halfsport-utility vehicle - caused a huge buzz when displayed in the big auto shows. The rush is on to get them into showrooms. This spring, DaimlerChrysler will begin selling the PT Cruiser, which is a vehicle that almost defies description. It has the styling of a late 1930s Ford sedan, but the seats remove easily like those of a minivan. This "car" joins a host of other so-called segment-busters like the BMW X5, Lexus RX 300 and Isuzu VehiCROSS, which looks kind of like a fancy running shoe on wheels.

"The trend is to mix and match different concepts," explains Bernard Robertson, senior vice president of engineering technology at DaimlerChrysler. Everybody is looking for a niche. Technology is making driving easier in other ways. Cadillac has a sophisticated night-vision system, which uses heat sensors and projects onto the windshield an infrared image of objects - pedestrians, animals, other vehicles - that may lie beyond the range of headlights Cruise-control systems are being upgraded dramatically. Mercedes-Benz and Lexus have both developed systems that send out radar beams to detect the car in front The next step is to install collision-avoidance radart that will judge closing speed and automatically

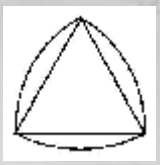
apply the brakes when necessary. These systems will work in fog or heavy snow, helping to prevent accidents. Additional computerized systems are also under development to help the driver maintain control. "Consider dynamic steering correction," says Jim Hall, of AutoPacific, an automotive think tank. "If your car starts to sway too much, the computer will take control and steer you back to safety."

Thanks to the technology revolution that is sweeping through the American economy, new types of vehicles, radical power systems and features unimaginable just ten years ago are now coming to you soon. Cars in the near future will be economical and safer. But most of all, they'll be fun.

Nandeesh Shukla

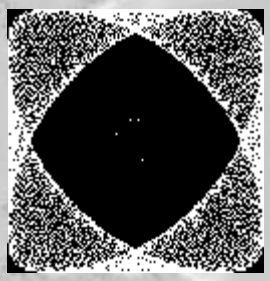
How to drill polygonal holes?

Why is the cover of a manhole round? The usual answer is that a circular lid, unlike a square or hexagonal cover, won't fall through the opening. There's no way of orienting a round lid so that it fits through a hole of the same geometry but slightly smaller size. The circle works because it has a constant width. This width is defined as the distance between a pair of parallel lines touching the curve on opposite sides. For a circle, the width is simply the circle's diameter. That's why wheels and cylindrical rollers produce a smooth ride on a flat surface. Unlike a circle, an ellipse doesn't have the same width in all directions. So an elliptical lid could easily fall through an elliptical hole, and an object riding on elliptical rather than cylindrical rollers would jiggle up and down. However, the circle isn't the only curve of constant width. There is actually an infinite number of such curves, any one of which could form a manhole lid or the cross section of a roller that gives as smooth a ride as a cylinder.



The simplest such curve is known as the REULEAUX TRIANGLE, named after engineer Franz Reuleaux. One simple way to generate this figure is to start with an equilateral triangle, then draw three arcs of circles,

with each arc having as its center one of the triangle's corners and as its endpoints the other two corners. The resulting "curved triangle," as Reuleaux termed it, has a constant width equal to the length of the interior triangle's side. Like a circle, a Reuleaux triangle fits snugly inside a square having sides equal to the curve's width no matter which way the triangle is turned. Indeed, the rounded triangle can rotate freely inside the square without ever having any room to spare. .



Interestingly, as it rotates, the curved figure traces a path that eventually covers just about every part of the square (except for a little rounding at the corners). This property can be seen in the figure above and is the basis for an ingenious rotary drill that, constrained by a special guide plate (which has the same structure as the polygon to be drilled), bores square holes. It's possible to construct a curve of constant width not only from an equilateral triangle but also from any polygon with an odd number of sides. Thus, one can readily obtain a curved pentagon, heptagon, and so on. Some coins have a rounded heptagonal shape that allows their use in slot machines designed for ordinary coins. Drills shaped like curved heptagons produce hexagonal holes. The Reuleaux curves described so far have corners -- points where two sides meet at an angle. However, curves of constant width having rounded corners can be readily constructed from the angular forms. Moreover, a curve of constant width need not be symmetrical or even consist

of circular arcs. So there's an unlimited number of curves of constant width, and the Reuleaux triangle happens to be the family member of least are Why can't Reuleaux polygons be used in place of wheels? The trouble is that these polygons don't have a fixed center of rotation. The hub of a circular wheel, for example, stays a fixed height above the ground, allowing smooth, horizontal motion. In contrast, the center of, say, a Reuleaux triangle wobbles as the curve rotates. That doesn't matter for rollers laid down on a surface to ease the passage of a heavy load, but it does matter if the roller or wheel has a fixed axis. That's also why the drill for cutting square holes requires a special "floating" chuck to hold the drill.

Shikhar Maini

Special Effects: Behind the Scenes

"How do they do that !"- This is the big question in the minds of awestruck movie audiences worldwide watching a well-made special effects movie. Humans fly, prehistoric dinosaurs come back to life, spaceships engage in dogflights, volcanoes erupt inside cities... Is there a limit to what effects guys can achieve on screen ?! According to Mat Beck who did the special effects for X-Files, "Start assuming we can do anything. We'll always find one way or the other. Man's reach must be higher than his grasp or what are virtual effects for?"

Whatever the situation may be, the basic aim of a special effects expert is to fool people. And getting the better of the human intuition of reality is not an easy job. This can be understood from the great lengths these people go to get the effect they want. A special effects expert's interests span from modelling and animation to subjects as diverse as psychology , biology and mathematics. Take the case when an explosion of enormous magnitude is produced from a miniature one. A model built at 1/16 scale would be shot 4 times (ie square root of the reciprocal of 1/16) faster than normal that is 4 x 24 =96 frames per second, in effect fooling our persistance of vision. Often the element that gives the thrill is how we combine man's fantasy with reality. For example in Titanic when the ship cracks in half and it's doing this pretty heavy pitch up, there's a small portion that was filmed as live action 60-70 feet up on a hydraulic rig. And anything attaching to the rest of

the ship is all done with a computer set extension. Anybody physically falling off and into the water is done with what they call digital stunt people. They use a model of a real stunt person falling into a bag, motion capture them, and then create every large stunt fall that you see in the movie.

Another area which is becoming popular by the day is animations. First, the art department and director design the models, first on paper, then in the computer--think of them as being puppets in the computer. You can look at this character from any viewpoint. There's sort of a virtual camera that lives in the computer, and you can position that anywhere around the character and look at it from any point in space. One of the first things done by animators is test these models to make sure that they have the flexibility to make them act.

The next stage now for an animator is to make the model move as in the real world. For instance Woody [from "Toy Story"] has over 200 articulated facial muscles in his face alone. He's got over 700 different controls in his body that let you rotate his arm at the elbow or the wrist, bend and rotate his hat and so forth. We use those animation controls to set poses at different frames. It's called key-frame animation. Twenty-four frames make up one second of film. So if you wanted to have Woody do a double take and look over at somebody, you could set a pose like this at say Frame 10 and set a pose like this at Frame 50. And what the computer would do with a lot of coaxing from an animator is give you all of the in-betweens. And where the animator really comes in is not only creating those poses, but also manipulating the timing. In animation films what the animators get is only the dialogue. They have to use someone else's line, but what the body does, how the character moves during that line, how many gestures, what the

facial expression is, is entirely up to the animator. Aside from their own explorations, they also videotape the actors as they read the lines, so that when Kevin Spacey is delivering his line as Harper, the main bad guy in "A Bug's Life", the animator Glenn McQueen carefully studied what choices he made. What are his eyebrows doing? What's he doing with his hands? Is he moving his head a lot? All these are very important to get the final outcome we enjoy!

The latest obsession that is catching on with the bigshots in the special effects industry is virtual humans. After millions of years of natural selection, humans beings have some serious competition for their lofty perch on the evolutionary ladder--and the challenge has only been evolving for less than a decade. Some computer artists contend that anything we can do, "virtual humans" can do better, and they're poised to revolutionize movie-making with a new species that doesn't require an astronomical salary, works around the clock without complaint, and lives quietly on a hard drive between death-defying stunts. A generation of computer-generated (CG) characters, called "synthespians" or "vactors," are attracting notice in Hollywood. Some insiders envision a future when digital stars compete for roles with the flesh and blood variety. While a photoreal digital actor has yet to carry a major motion picture, synthespians have captured supporting roles for some time now, whenever the going gets too tough or too expensive. Synthespians serve as doubles for breathtaking stunts too dangerous for mortal stars: a girl leaping from a skyscraper in "The Fifth Element," Sylvester Stallone chasing through the skies on an airborne motorcycle in "Judge Dredd," and a luckless attorney becoming tyrannosaur fodder in "Jurassic Park."

And producers cut costs on the "cast of thousands" by using digital extras to stand in for the legions of troops in "Hamlet," mobs of Washington demonstrators in "Forrest Gump," and passengers aboard the doomed Titanic. The leap from extra to starring role for synthespians is a big one, since it invites heightened scrutiny from the viewer. Human beings have a finely tuned ability to recognize their kind, an ability that is thought to be both innate and learned, and that ups the ante for filmmakers seeking to fool them with a synthetic stand-in. Creating convincing movement is particularly difficult. Animators can take the perceptual challenge head-on and painstakingly create movement for their characters frame by frame from scratch, or they can use the real thing. A technique called motion capture allows actual movement to be recorded and applied to digital characters. An actor wears reflective markers at key body joints, and surrounding cameras record the motion of reflected infrared light in the computer. Later, this motion data is transferred to the digital character.

The human face presents an even more daunting challenge. Ed Catmull, a computer graphics pioneer since the late 1970s and a founder of Pixar ("Toy Story," "A Bug's Life"), regards it as a central issue in character animation. "The human face is a unique problem," he says. "We are genetically programmed to recognize human faces. We're so good that most people aren't even aware of it while they think about it. It turns out, for instance, that if we make a perfectly symmetrical face, we see it as being wrong. So we want things to be not quite perfect, have a lot of subtlety, but if they're too imperfect, then we think that they're strange." For Scott Ross, President of Digital Domain, the problem is more intangible: "One of the things that I'm mostly concerned about in terms of virtual actors is that

there's been millions of years of experience in our genetic code. And I'm concerned that when you create a close-up of a virtual actor and look into its eyes, that it will take real skill to be able to give that virtual actor soul. And I've not yet seen that."

Whatever the facts, one thing is certain. The future of Film-making is going to be one which is dominated by special effects. With the ever falling prices of computers , the future indeed looks bright. That day is not far when you look at the TV screen and say "Hey, I can do that on my PC !!".

Jacob Jhon

The birth of Boeing777

The birth of Boeing 777, " the last long range transport of 20th century" was celebrated in the sprawling mammoth Everett factory, the largest building in the world by volume (approximately 8 million cubic meter) way back in April 1994. The official debut of the Boeing 777 was attended by a select of approximately 100,000 invited guests. Unfortunately, these guests could not be accommodated at one time, even in the massive building of Everett factory, where the production of seven Boeing 777 per month can be carried out without any problem. As a result, the guests were scheduled in the shifts of about 7000 each between 6 a.m to 9 p.m for viewing the multimedia ceremonies oh the birth of Boeing 777. The astounding task of handling the massive invited guests was successfully managed with the help of computer flow simulation, in which people were assumed to walk at the rate of 1.0 meter per second, thus the successful completion of unveiling ceremony of Boeing 777 could be possible.

The envisaged objective of this new 777 series transport aircraft was to develop a commercial airplane that would be economical to manufacture and operate. Therefore it would provide an opportunity to replace the fleets of aging jet aircrafts namely the DC-10, L-1011 and other older Boeing 747s. With this in mind, the early version of the Boeing 777 was designed to carry about 300 passengers on flights ranging upto about 7000 kilometer. It is planned that a later version of the Boeing 777 could carry up to 400 passengers with a range of approaching 17,000 kilometers. Although Boeing

has not made the public cost of expenditure for the design and development of the Boeing 777, but approximately $4 billion is believed to be invested to bring the 777 upto rollout stage. Therefore, this project turns out to be the world's largest engineering project, funded by a private corporation.

The 64 meter long air but with two Pratt and Whitney turbofan engines rated at approximately 35,000 kg of thrust could manage to move the aircraft's quarter million take off mass. The early pilot's experience with these engines along with 2.75 meter fans reveal that the present engine could produce sufficient rotary inertia for smooth speed changes and easy taxing under low power conditions. The engines have been under development since 1990, but the conceptual design of this massive engineering project can be traced back to mid 1980s. However the detailed design of 777 can be said to have started in 1990. The whole design was carried out in a new technological environment ,where the computer based engineering design ,analysis, testing and manufacturing were completely integrated through the project. This noble procedure could make it possible to eliminate conventional drawing and resulting mockups through the development process. As a result, the first completely "Paperless" major commercial transport designed plane could be realized within a short span of time. With more than 130,000 unique engineered parts and 3 million individual parts going into each plane, having things to be fitted right for the first time is a manufacturers nightmare. This difficult task has been completed successfully with the help of computer aided engineering systems.

Initially, the airplane was designed with the help of computational fluid mechanics to fly efficiently at Mach 0.84 . The fight test indicated that the Boeing 777 actually operates smoothly at Mach 0.84 which is not really a

bad prediction. The plane is found to be very easy to land with its wing as large as those of a Boeing 747 but closer to the ground thus experiences a strong "ground effect". Besides these, new features, amenities like the selection of programs on passenger's personal video screens, credit card telephone facilities, key board for playing video games for passengers has been made possible by incorporation of fiber-optic cable technology. The 777 is Boeing's first fully "fly by wire" commercial airplanes. This mean that the controls in the cockpit are connected electronically through intermediary computers by wire to the system they operate in stead of being connected physically by levers, pulleys, steel cables and hydraulic lines. As a result, hundreds of kilos of airplane weight was reduced there by saving the cost of the fuel. The future can only judge whether this technologically advanced airplanes will survive in the present rapidly changing market for adequate time.

Dr. D.P Misra
Deptt. of Aerospace Engg.

May the Force be with you

The room is dark. As your eyes begin to focus, you realize that it's huge. You don't know where you are. You feel a slight loss of weight, as though you were in space. As you are considering this possibility, you see a portal in one of the walls. You strain your eyes, and a sudden chill runs down your spine. You can see little dots in the portal, you realize they are stars, thousand of them. You heart is beating harder now, pumping blood, pumping it so hard that you can hear the veins in your head, pounding. Now you know. You know where you are. You are aboard the space station in Star wars. The space station is as big as the moon, a symbol of the Power, the Dark side possesses. This is where Luke has to take on Dark Vader. This is where Luke has to kill his own father. A drop of sweat trickles down your face. You hear a loud thunderbolt. You turn around. There you see Luke take out a small object from his robe, before you know it, a long beam of light emerges from it. You gasp at the shear brilliance of the wand. You are awestruck, because you know that not only is it beautiful, it is also deadly. Dark Vader takes out his own lightsaber. Yes that's what it is, the Lightsaber. The deadly wand that gives a Jedi his power, his honour.

The tension is scintillating as the fight is about to begin. You wonder who is going to take the first shot. You think to yourself, " It wont be Luke, he is trying to keep anger out of his mind." At that very moment, you see a bright spark and moments later you hear the crackling bolt. The fight has begun. Dark Vader takes another shot. Luke defends. A quick succession of strikes follow. The two men don't show any emotions on their faces, neither

is willing to give him-self away, but their eyes are telling you of the shear tension they are in. Luke takes a swing at his opponent , he misses. His light saber touches an iron pillar. What do you see? You watch the iron pillar vaporize before your eyes. Such is the power of the light saber. It vaporizes any object in its way. Both the men are beginning to tire now, but they are still involved in a flawless combat. You wonder what, makes them so good? It dawns on you that it's the force. The Force is with them, the force is their strength. Dark Vader has the dark side with him, while Luke has the Jedi Nights. You want to tell Luke, "May the force be with you", but you dare not speak. You realize that both the men are coming towards you. You want to move away but your feet are stuck. You are paralyzed once again by the deadly beauty of the light saber.

You stand there watching the deadly fight, wanting to get away and stay at the same time. Dark Vader and Luke are just an arms length away. Vader draws his strength from the depths of darkness, and delivers one powerful blow. You anticipate a quick reply from Luke, but to your shock, Luke wasn't read for that one. His Light saber is knocked out of his hand, and he stands there in horror awaiting the final blow. You have a sudden surge of courage. You obstruct Vader's light saber with your hand. A sudden torrent of heat passes through your body as your arm vaporizes. You too are left in horror, waiting for the death to come... and that's when you wake up.

What a dream! I know all of you star wars fans have these dreams and so do I ...

The interesting fact is that I am always awestruck by the power of the light saber, every time single time. So lets just step out of our dreams, and see

what a light saber really is. Does it really exist? Has George Lucas locked it in some vault? Can I possess it? Can I buy it, steal it? Whatever...

One fine morning, I sent an email to George Lucas, I was planning my grand Theft. I decided it would be beneficial to get some information about the saber. So here's what I asked him.....

Dear Mr. George Lucas,

I am a fan of Star Wars and I would like to know about your light sabers. Please tell me," how do they work in the Star Wars movies?" "Are they real? If so, where do you keep them? If not why do they look so real?" To this I got the following reply,

Dear Fan,

Unfortunately light sabers are not real. Like so many other things in the movie, light sabers are special effects that look so real that you actually believe that they exist. The technique used here is pretty straight forward but tedious. The actors use aluminum replicas. After the shooting, the film is developed normally. In this film the actors look as if they are fighting with painted broomsticks. A special effect artist now has a job of making these broom sticks look like real light sabers. The artist looks at the film frame by frame and projects each frame that contains a light saber on to a clear piece of plastic (animation cell). The artist draws the outline of each light saber in the frame onto the cell, then for each cartoon color. Eventually the artist has a stack of these cels. The cels are clear everywhere the light saber blade is seen.

Now a new piece of movie film is shot. On this film each animation cell is placed over a black background and shot with a light diffuser over the

lens, this diffuser gives the saber its glow. The movie is double exposed onto the same film. The effects are amazing, the sabers look bright and real.

Digital effects are so real now a days that, it even gets a person like me to dream of Light Sabers instead of Cindy Crawford. Oh, well now that my plans of grand Theft have been foiled, I think I am going back to Cindy. Sweet dreams everyone...

Sandeep Urankar

Terra Formation on Mars

Mission ‘Terra formation of mars’ i.e. converting mars into the second earth, has to be the most challenging task ever faced by human mind.

The whole mission will extend over a century from 2015-2175 and will be six leveled.

LEVEL 1: (2015-2030 A.D): After three months journey through the space, a group of scientists and technicians land on mars to study them atmosphere and probe an area of 5000 miles for life signs by 2030,it will be known whether mars is inhabitable or not.

PROJECTED COST: 300 MILLION DOLLARS.

LEVEL 2: (2030-2080) To bring down the average temperature of mars from -76F to -40F,the following proposals are made.

2a) Chemical factories to be set up liberating gases such as carbon dioxide and sulfur dioxide by means of small nuclear reactors ‘imported ‘ from earth. The gases produced will help trap heat energy.

2b) A black powder of specially prepared bacteria will be sprinkled over mountains covered with ice to prevent heat loss by radiation. These bacteria will grow rapidly in the ice.

2c)’Miler’ mirrors of large area will be hung above the polar orbit of mars. These would reflect sunlight on the ice caps.

As the atmosphere turns denser, the temperature will increase but still the planet surface would be left exposed to the ultraviolet rays.

PROJECTED COST: 1500 CRORE RUPEES PER YEAR.

LEVEL 3: (2080-2115) Temperature reaches 5F and the atmosphere gets denser. Thick white clouds (due to low pollution levels) start appearing and sky changes from pink to blue .Air pressure increases reaching half of that of earth. Population increases due to increased immigration.

LEVEL 4: (2115-2130) Temperature increases from 5F to 32F. During this period small seas, lakes and rivers start appearing. Hard trees such as 'sadabahar' will be grown and a thin layer of organic soil will start forming. Population reaches to 250000 and half of them will be born on mass thanks to specially designed space suits allowing 'second time breathing' i.e. the exhaled air is reinhaled.

LEVEL 5: (2130-2150) Temperature rises to 40F. Cottage industry flourishes and cars start running on metallic roads resulting in the first 'traffic' jam.
Mars experiences continuous rainfall. Due to long summers many crops will be grown in one year. Population crosses the 1 million mark. Mars will now be in a position to pay back to earth for its imported goods.

LEVEL 6: (2150-2175) With the help of sufficient factories people will be able to abandon rebreathers.
Mars changes into The second play ground of our solar system. It will enjoy the status of 'Silicon Valley' of the interplanetary era.

Raman Chaddha

Roll No.	Name	Placement: SPO Outside
96001	Abhay Kumar Singh	VERITAS
96007	Abhishek Goel	GSSL / McKENSEY
96009	Abhishek Singh	WIPRO
96023	Amit Gupta	ADITI
96026	Amit Kumar	HLL
96034	Amit Kumar Trivedi	IOCL
96035	Amit Kumar Yadav	CTS
96043	Anil Kumar Yadav	INFOSYS
96050	Anshu Vaish	CTS, INTERRA, AFS INDIA
96057	Anurag Kumar Gupta	WIPRO
96065	Arul Mehra	DENEB
96067	Arunab	JINDAL
96068	Ashish Jaiswal	GSSL
96071	Aswini Kumar	BAJAJ
95074	Dharmendra Rohit	DENEB
95100	Dinesh Kumar Singh	CTS, AFS INDIA
96092	Gagandeep Arora	CTS
96095	Haritesh Gulshan	TELCO
96101	Jagdish Kumar	BEML
96118	Kuldeep Narayan	GSSL

96122	Kumar Rishabh Ranjan	INFOSYS
96141	Mayank Agarwal	GSSL
96148	M I Faisal	IOCL
96153	Naveen Agarwal	SYNTEL
96155	Naveen D.	INFOSYS, ADITI
96157	Naveen Tewari	McKENSEY
96161	Nikhil Kumar Gupta	MATRIX
96184	Om Kumar	BEML
93172	Praveen Rajouria	GM
96179	Pankaj Vohra	INFOSYS
96182	Prabhat Kumar Sinha	MARUTI
96186	Pankaj Rawat	BEML / BHEL
96190	Prashant Vijay	MARUTI
95230	Rajneesh Kumar Pankaj	BEML
96201	Raghavendra Pokhariyal	COCAL
96222	Ramesh Pandey	SYNTEL
96226	Ravi Prakash Shrivastava	INTERA
96230	Rashabh Bajpayee	WIPRO
96233	Ritesh Bansal	DELSOFT
96234	Ritesh Chandra	WIPRO
94281	Sushil Kumar	SYNTEL / HCL
96245	Sachin Shah	GSSL

96246	Sachin Shrivastav	MARUTI
96250	Samit Panjiar	CTS
96264	Sharad Agarwal	GSSL
96265	Shashank Gupta	DENEB
96273	Shomil Pant	SYNTEL
96282	Sonu Sonkar	SYNTEL
96285	Sridhar Anand	GSSL
96295	Sushant Saurabh	FLUENT
96310	Umesh Joshi	CTS
96314	Vijay Kumar Mishra	CTS
96323	Vinayak	GSSL/ CAPITAL
96325	Vineet Agarwal	ADITI
96330	Vishesh Kumar	MARUTI
96329	Vishal Gupta	WIPRO

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