Alumni Link

Alumni Day
2014
Edition

Organized by

GAABESU

With best compliments from:

I.R. TECHNOLOGY SERVICES PVT. LTD.

ECO SPACE BUSINESS PARK
BLOCK No. 4B, 9TH FLOOR
UNIT No. – ESNT 4B 0903,
NEW TOWN, RAJARHAT
KOLKATA - 700156, INDIA
TEL: (033) 40361800
FAX: 91-33-40361888
E-MAIL: sales_cal@irtech.in
Website: www.irtech.in

OTHER OFFICES AT – MUMBAI : JAMSHEDPUR : BANGALORE : CHENNAI : NOIDA: HYDERABAD : BHUBANESWAR

EXCLUSIVE REPRESENTATIVE OF OVERSEAS MANUFACTURERS FOR ANALYTICAL INSTRUMENTS:

- **RIGAKU CORPORATION, JAPAN** –
  - X-ray Diffraction System (Powder/Single crystal) for Small/Large Molecule
  - Wave Length Dispersive X-Ray Fluorescence Spectrometer (WDXRF),
  - X-Ray Radiography System, X-Ray Residual Stress Analyser, X-Ray Generators.
- **LECO CORPORATION, USA.**
  - ► **Elemental Analyser for Organic/Inorganic Compounds:**
    - Carbon/Sulphur Analyser ● Micro & Macro CHNOS Analyser ● Nitrogen/Food Protein Analyser
  - ►**Elemental Analyser for Metallurgical Samples:**
    - Carbon & Sulphur Analyser ● H, N or O Gas analysers for metals.
  - ► **Physical Testing Instruments:**
    - LECO Hardness Tester (Vickers, Rockwell, Knoop)
  - ► **Special Instruments for various applications:**
    - Proximate / Ultimate Analysis of Coal, Coke & Fuels ● TOF based GC-MS & GCxGC MS System
    - Bomb Calorimeter for Calorific value of fuels.

● Glow Discharge Optical Emission Spectrometer for elemental analysis and Quantitative Depth Profile (QDP) analysis.

- **OLYMPUS CORPORATION, JAPAN** – Metallurgical Microscope with Image analyzer software.
- **HUNTER ASSOCIATES LABORATORIES INC., USA** – Colorimeters, Spectrocolorimeters, Glossmetres for laboratory and on-line color measuring & color matching applications.
- **INNOV-X SYSTEMS EUROPE, BV, U.S.A.** – Portable Handheld X-Ray based Alloy Analyser.
- **MILESTONE S.R.L., ITALY –** Mercury Analyser, Microwave Digestion, Extraction, & Ashing system.
- **O.I. ANALYTICAL, USA** - Total Organic and Inorganic Carbon (TOC & TIC) Analyser.
- **RAPISCAN SYSTEMS OY, FINLAND** - Satmagan Magnetic Balance.
- **ANGSTROM INC., U.S.A**., - Optical Emission Spectrometer PMT based.
- **PEMTRON Corporation, Korea** - Scanning Electron Microscope (SEM).
- **R.B.AUTOMAZIONE s.r.l., Italy** – Plastometer, Dilatometer, CRI-CSR Measurement System.

Keshari Nath Tripathi
GOVERNOR OF WEST BENGAL

RAJ BHAVAN
KOLKATA 700 062

17th December, 2014

Message

I am glad to learn that Global Alumni Association of Indian Institute of Engineering Science and Technology, Shibpur is organising its first Alumni Day on 28th December, 2014.

It is laudable that the Alumni spread over all parts of the world have taken this initiative and are bringing out a Souvenir to commemorate the event.

I wish the Alumni Day and the Publication all success.

Keshari Nath Tripathi

ড. পার্থ চ্যাটার্জী
ভারপ্রাপ্ত মন্ত্রী
উচ্চশিক্ষা বিভাগ, বিদ্যালয় শিক্ষা বিভাগ,
পরিষদীয় বিভাগ
পশ্চিমবঙ্গ সরকার
বিকাশ ভবন, সল্টলেক, কলকাতা-৭০০ ০৯১
দূরভাষ ঃ ২৩৩৪ ৬১৮১/২২৫৬, ২৩৩৭ ৬১৭২
ফ্যাক্স ঃ ২৩৩৭ ৬৭৮৩/২৩৫৮ ৮৮৫৮

Dr. PARTHA CHATTERJEE
Minister-in-Charge
Departments of Higher Education,
School Education, Parliamentary Affairs
GOVERNMENT OF WEST BENGAL
Bikash Bhavan, Salt Lake, Kolkata-700 091
Tele : 2334 6181/2256, 2337 6172
Fax : 2337 6783/2358 8858

MESSAGE

I am delighted to know that **Global Alumni Association of Indian Institute of Engineering Science and Technology** is going to organize **first Alumni Day** on 28th December, 2014.

On this occasion they are going to publish a Souvenir, **Allumni Link** to commemorate the programme.

I extend my greetings and good wishes to every professor student as well as all the member of Publicity and Publication Sub Committee, Alumni Day 2014. I also wish a grand success of this programme.

Minister-in-Charge
Departments of Higher Education,
School Education, Parliamentary Affairs.

Shri Partha Pratim Roy,
Convener
Publicity and Publication Sub Committee, Alumni Day 2014,
Global Alumni Association of IIEST, Shibpur, Howrah.

Prof. Ajoy Kumar Ray
Director

Indian Institute of Engineering Science and Technology, Shibpur
(An Institute of National Importance)
(Formerly, BESU, Shibpur)
P.O. Botanic Garden, Howrah – 711 103, West Bengal, India
Phone : (033) 2668 2674 • Fax : (033) 2668 7575
E-mail : director.iiests@gmail.com • ajoy_ray2004@yahoo.com

Message From the Desk of the Director

Professor Ajoy Kumar Ray

I am ecstatic to learn that GAABESU is going to celebrate 1st ALUMNI DAY on 28th DECEMBER 2014 to commemorate the occasion of the annual coalescence of our very dear alumni/alumna and our present loving students.

The alumni of IIEST (erstwhile BESU, BEC), Shibpur spread across the globe have made their alma mater and our motherland proud through their brilliant contributions and achievements. The 1st Alumni Day meet is an opportune occasion for me to recognise their contribution and support to their alma mater in our journey towards building a model Institution of higher learning. I am sure that this meet shall provide an opportunity for the alumni to once again unite with their friends and connect with the young minds of our Institution. This will also provide a platform for the present generation of students to know more about the past and to receive the guidance of the alumni.

On this great occasion, I recall with gratitude, your contributions in our journey towards achieving excellence. In some of the challenging moments in the past of this Institute, I have received all the support from you that was needed for our academic and developmental programmes.

Needless to say, that with your support, we have excelled in several areas of research and development in this Institute. Our students, teachers and staff members will forever remember the great bond that this Institute has established with its Alumni.

On this great and happy occasion of your get together, I take this opportunity to convey my very best wishes to each one of you and also the members of your family.

Dated, December 17, 2014

(Ajoy Kumar Ray)

In This Issue...

Alumni Link | Editorial Team

Tarun Basu | 67 CE

Indranath Sinha | 82 MIN

Swapan Saha | 88EE

Partha Pratim Roy | 97 CE

Debargha Sengupta | 98 ARCH

Shankha Kar Bhowmik | 97 MIN

EDITORIAL

ALUMNI DAY BY GAABESU AT IIEST SHIBPUR - WHAT AND WHY?

When we started the discussion to form GAABESU a decade ago, the question came up - what is GAABESU and why do we need GAABESU? We believe now we understand what GAABESU is and why we need it. The alums, students, faculty and administration now routinely use the GAABESU platform to network, provide financial help to a community member in medical emergencies, raise funds for new infrastructure projects or upgrade existing ones, celebrate the success of our Alma Mater and achievements of our alums around the world. GAABESU publicizes these activities to the community at large and to the media to showcase how our alums are impacting the lives of the IIEST community members in need and helping to create an inviting environment in the campus. All these activities reflect the mindset of our alums which, in turn, helps to differentiate our Alma Mater from other institutions in India and establish a positive image.

When few of us joined hands with the then BECDU faculty members in our decade long mission to convert our Alma Mater to an IIT/INI (now an IIEST/INI), the same question came up - why do we need to convert our beloved Alma Mater to an IIT/INI? After numerous interactions and clarifications, our Alumni Community realized the need for the conversion, and started asking "why is it taking so much time for the conversion of our Alma Mater to IIEST/INI)"?

Well, the same question was asked when we proposed Alumni Day more than a year ago. The question was - "What is Alumni Day, why do we need

another alumni event when we have REBECAA, batch events and chapter events"?

Let's start with what is Alumni Day for us? Well, it is projected as our first local (at campus) celebration by our global alumni for the conversion of our Alma Mater to IIEST(INI). Alumni Day is envisioned to be a social and family event at our Campus by the alums and for the alums to rekindle bygone days with old friends and to make new friends. It will be a casual, relaxed fun event to spend a day or two with friends and family visiting old departments, hostels and old hang-outs.

Then the obvious question is why do we need Alumni Day when we have 25th /30th /35th /40th/50th anniversary celebrations by different batches and almost all chapter-wide celebrations? Moreover, we have REBECA which is organized by IIEST. However, all those are group-specific events, whereas Alumni Day is intended to be the superset that combines all these events at our campus. Here, not only can you meet your batch-mates, but also can meet your immediate juniors and seniors with whom you spent long hours at hostels, at Lords or Oval. This event is scheduled in such a way (last Sunday of each year) so that our mobile and global alums can plan well in advance to attend. We have many alums settled outside of Kolkata or Bengal e.g. Delhi, Mumbai or Middle-East or in North America. Recent alumni/alumnae are mobile and they may not be attached to any particular city or country. Having a central and permanent location with fixed date will certainly help alums to plan and meet in person. Again, many batches celebrate their re-unions around this time – so, the visiting alums will have a chance to meet others at the same time. As far as REBECA is concerned, its starting day kept changing for the last decade or so – and sometimes at a relatively short notice. This creates a huge problem for our mobile alums and out-of-town alums to plan in advance and attend REBECA. When alums from the older batches meet, there are quite a few who are back to the campus after 25/30/40 years since they left. It is often impossible for them to visit their departments or hostels when they celebrate during the weekend. Often, they don't have a chance to meet students when they are out for winter recess.

Alumni Day addresses these issues by fixing the event date as the last Sunday of each calendar year, keeping it open to all ex-students. Furthermore, GAABESU would work with the IIEST administration to keep departments and hostels open and engage current students to keep them in the campus to meet ex-students. Moreover, involving alums in a social atmosphere may help them realize the extent of GAABESU's involvement in different activities at the campus and persuade them to work with GAABESU to create a better academic/living environment (through various students, alumni and Institute benevolent projects). With the successful celebration of our Alumni Day, GAABESU is expected to raise funds from sponsors that can be used to run its annual operations or even expand its operations to meet growing needs of our Alumni Community. This, in turn, will help us run the projects without drawing from the current funds. It will also provide a social avenue for many alums to join GAABESU and help achieve its mission: reaching, serving and engaging the broader IIEST community of alums, faculty and students fostering a lifelong intellectual and emotional connection between the college and its graduates; and enhance the capability of our Alma Mater.

On behalf of the GAABESU Executive Committee, we welcome you at this inaugural Alumni Day. Enjoy the day and please give us your feed-back as to how we can make it more enjoyable in the coming years. We hope that in a not so distant future, alums will ask each other "are you attending the Alumni Day celebration or see you on Alumni Day at the campus". May God bless our Alma Mater and all her sons and daughters!!

Swapan Saha | 88 EE

My Teacher - Dr. Shantimoy Chakraborty: As I saw him

Kausik Bandopadhyay | 78 CE

Still I remember that pitch dark evening when I desperately treaded the antique wooden staircase of the Professor's Quarters (Downing Hall reconstructed) with my feeble steps to muster the courage to knock at his door.

Let us go a few years back. All the students of our class entered B.E. College (now IIEST, Shibpur) in 1973 in the heyday of the monster "Power Cut", just after turbulent years of the early Seventies. That monster continued to play hide and seek with us for our entire student life in this campus – both U.G. & P.G.

We were fortunate enough to have some legendary teachers in our Civil Engineering Department in those days. They were, to name a few, Prof. S. K. Mukherjee (Lord), Prof. S.K. Bhattacharya, Prof. S.P. Brahma, Prof. S. Dasgupta and others. Each of them was unique by virtue of his own qualities. And, there were some teachers who not only taught us but also took the trouble to take the role of our mentor for inspiring us and grooming us in a proper manner. These teachers never expected or aspired for anything mundane, but widened their wings to protect us from the heat and dust, only out of their strong love and affection for the students.

Among them, most outstanding was Shantida – Dr. Shantimoy Chakraborty. Normally he used to take the classes like "R.C. Design" or "Project Planning & Management." I was fortunate enough to have him as Project Guide for my Dissertation at Post-Graduate level. We came further close during my P.G. classes as well as his taut ledge pertaining to my Project work. Still I remember that in most of the days he taught us in the forenoon and had to go to Calcutta in the afternoon. In those days of early eighties Vidyasagar Setu was under construction. As a result, Shantida used to return to his Quarter exhausted in the evening or late evening. Even at those moments he spared his valuable time to guide us, instruct us.

During a vacation, a student like me reached his residence at Santoshpur for some refinement of my manuscript. Readily Shantida greeted me with two mugs of coffee prepared by him. His reassuring face and aroma of his coffee are still in my memory. Even in his tiring and trying times he was always eager to attend our queries or quest for knowledge.

Again, I go back to my initial lines – desperate attempt on that evening engulfed with darkness, I climbed the staircase amid darkness aiming at the source of a Tanpura tune. When finally the door opened, an enchanting tune of Rabindrasangeet by his daughter soothed our nerves. Then in that candle-lit drawing room amid sweltering heat of summer days, Dr. Chakraborty once again took the trouble to go through my papers instead of asking me to come next day. Another unforgettable incident for me was the scene of visiting him lying in his bed at SSKM Hospital, Kolkata consequent to a fatal stroke. Even in that semi-conscious state of mind his last words were, "Kausik, remember we have to finish the revision of the paper for publication". It is very unfortunate for me that untimely death of so tall a Co-Author like him stood in the way of fulfilling his last wish, partly due to my inadequate experience in this respect at that tender age. Although, subsequently many of my papers were published, that did not compensate in any manner my failure to give shape to his unfulfilled dream.

Dr. Shantimoy Chakraborty was an alumnus of this institute from the class of 1960 and untimely passed away on 11th September1992 while he was still a faculty member. With him we lost a true role model – friend, philosopher and guide for the student community. If his successors try to emulate his ideals and vision as far as possible – that would be the best tribute for him. By paying homage to him through this article, I like to pay my humble homage to all such dedicated teachers whose untiring efforts have made us Engineers.

Transportation System in San Francisco

Barun K Basak | 71 ME

It is in San Francisco, in the state of California in USA that we get to see so many kinds of public transport systems that are hardly seen in other cities around the World. About 35% of commuters in San Francisco are said to use public transport regularly. The Municipal Railway of San Francisco, known universally as "Muni", is one of the oldest and one of the most versatile transport systems in the world, which serves 200 million commuters a year. The Muni fleet is unique in that it includes, other than its own Metro light rail and subway system, other types of much eco-friendly surface transport such as the heritage streetcars, bio-diesel and electric hybrid buses, electric trolley buses, and world-famous cable cars.

After returning from a visit to this city in the month of May 2012, I could not resist myself from writing this article featuring and describing those most useful and technically interesting utility vehicles with a few pictures and some understanding of their working principles.

This Cable Car, the icon of San Francisco, California is said to be the world's last manually operated cable car system. Set up in 1873, the cable cars are the only mobile National Monument in the World. Out of 23 routes of cable cars set up between 1873 and 1890, only three remain operative now. They are more of a tourist attraction now and few daily commuters use this. The only other most significant tourist attractions around here are The Alcatraz Island and The Fisherman's Wharf.

Cable Cars have tracks on the road 3ft 6in apart over which the wheels roll. There is a central trench between the tracks through which the cable moves. The cable 1.25 in. diameter, runs under this central trench at a constant speed of 9.5 mph, driven by 510hp electric motor. Each cable has six steel strands of 19 wires each, wrapped around a sisal rope core and coated with oil.

A Cable Car with track & cable trench

Grip man

Driver of the Cable Car is known as the Grip man or Grip Person. The person has to operate the lever very smoothly to grip or release the cable in the trench. The cable has to be released also to allow for crossing cables, or where cable does not follow the trench. It requires very high skill and strength to operate the grip as well as the brake and an anticipation power to avoid collisions. The records say there have been only two women employed as Grip Person so far. There is also a conductor in cable car who collects fares, manages boarding and dropping of passengers and also applies the rear wheel brakes when the car runs down the hill slopes.

There are single-ended cars which need to be turned on manually-operated turn-tables at the terminus; there are double-ended cars also, which can be operated from either ends. With a total capacity of about 60, there are some 30 seats while standing passengers can also travel. Operating costs and the fare being very high, nowadays only tourists use Cable Cars.

The first car was brought from Hamburg, Germany in 1979. These are pollution-free cars. While taking ride on these streetcars, we did not feel the jerks of the rails at any uneven joints or the screeching sound of wheel collars rubbing against the track, as we experience in Kolkata trams. The first route was Embarcadero or the E-line; this was augmented in subsequent years with the F-line to serve Market Street and then came the N-line.

The heritage streetcars of San Francisco

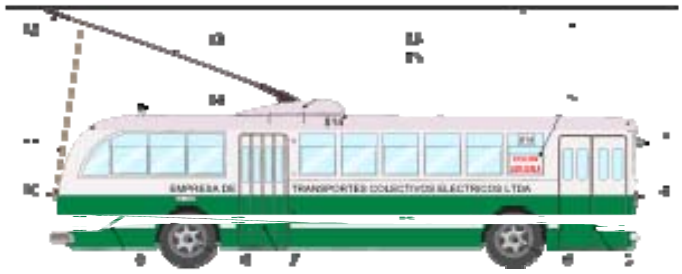
The heritage Streetcar of SFO is like our own tram cars which run on fixed tracks and have electric haulage powered from the overhead cable. They have limited mobility on the road but can indeed run at speeds almost like those running in European cities.

Trolley Buses are rubber-wheeled trackless vehicles with their traction motors powered by electricity from overhead wires. "Trolley" refers to the trolley poles on the roof of the bus that collect and transmit the electric power from overhead pair of cables. Two cables and trolley poles are required to complete the circuit in these electric buses which make it different from tramcars where the steel track is used as the return path and only one cable and pole (pantograph) can do the overhead job. However, trolley buses have much more mobility on the road and manoeuvrability because of no tracks to follow. San Francisco is said to have the largest fleet of trolley buses than any other transport organizations in USA or Canada. These trolley buses are considered almost entirely pollution free, as they are run by hydro-electric power supply source. he problems of ugly sights of the overhead cabling on the roads are overweighed by the quieter and cleaner services provided by Trolley Buses.

Trolley Buses are good on hilly routes, as electric traction motors are more effective in providing high torques at start, as required while climbing slopes. Unlike diesel engines, electric motors draw power from a central plant that can be overloaded temporarily without damaging the plant.

Electric cars (trolley buses or trams) have these advantages in common. However, the advantage of Trolley Buses over Electric Tramcars is in their flexibility on the road. They can be taken to the sides for allowing other cars to pass or can swerve to bypass any stalled vehicle on the road (one trolley bus cannot normally overtake another though). Trolley Buses receive passengers from the curb of the road and won't require a boarding island in the middle of the road. In addition, the rubber tires of Trolley Buses have better adhesion to the road surface during encountering slopes, than steel wheels and tracks.

Thus, San Francisco and Seattle in USA favor Trolley Buses, both being hilly cities. The other reasons are improved acceleration and braking performance. While braking in the 'regenerative process', an electric car generates electricity from the kinetic energy which is saved either in flywheels or in batteries of the power station of the trolley bus.



Typical Trolley Bus Details

The Trolley Bus on Road

1. Electrified line
2. Destination or route sign
3. Rear view mirror
4. Headlights
5. Boarding (entry) doors
6. Direction (turning) wheels
7. Exit doors
8. Traction wheels
9. Decorative elements
10. Retractors/retrievers
11. Pole rope
12. Shoes
13. Trolley pole(s)
14. Pole storage hooks
15. Trolley pole base and fairing/shroud
16. Bus Number

Trolley Buses these days are equipped also with an APU or Auxiliary Power Units – a small diesel unit or a battery pack, which give them limited off-wire capabilities for emergency propelling the vehicle to bypass a route blockage or for operating within a depot.

Entire fleet of about 1500 diesel buses of San Francisco Muni were converted to run on Bio-Diesel fuel in 2006. The Biodiesel B20 is a blend of 20% vegetable (renewable) oil and 80% fossil (non-renewable) fuel. This mixture saves an estimated 1.2 million gallons of diesel fuel every year and thus, cuts down unfavourable diesel burning fumes.

The San Francisco Municipal Transportation Agency (SFMTA) set up their mission of reducing greenhouse gas emissions by the year 2012 to 30% below their level in 1990. With this objective in view, they ordered Daimler-Chrysler Orion VII Diesel-Hybrid buses for their fleet.

Diesel Hybrid Bus

Hybrid Bus on Bio Diesel

The 'Muni' Hybrid buses are actually based on electric traction, the power of which is developed by running a generator from a diesel engine and stored in set of batteries. There is no mechanical connection between the engine and the driving wheels, and this type is called 'series hybrid'. In contrast, the 'parallel hybrid' vehicles like the principle used in passenger car Toyota 'Prius', has a blend of mechanical and electrical power to accelerate. In the Muni 'series' hybrid buses, the engine operates only in its most optimum operating condition, with no fluctuations and with minimum emission levels. All the extra power required during acceleration or for high energy hill climbing, is provided from the stored energy in the battery; the same battery receives and stores extra electrical power when the vehicle decelerates or brakes, through its 'regenerative' actions. This process in turn increases the brake life of the vehicle while it also improves the fuel economy. The 30% anticipated increase of fuel efficiency is estimated to save 20,000 gallons of diesel for Muni in 12 years.

Hydrogen Hybrid Bus

A Solar Powered Bus Stop

Various kinds of Hybrid buses are getting developed in the world or are being updated and modernized using Bio-diesel, CNG, Hydrogen fuel cell types and others. Though hybrid buses cost much more than conventional diesel buses, they pay for themselves by being more economic in operations, using simpler, smaller and cheaper diesel engines, suffering less wear and tear, gaining in reduced cycle times, in extended life of brakes, and in general service life of each vehicle.

For the city, its citizens and commuters, these hybrid vehicles are much less noisy with much smoother operations, much friendly to passengers and finally and importantly, less damaging to the environment.

This road transport system in SFO appeared as a model solution to any city transportation needs.

FUEL CELL - A PROMISING TECHNOLOGY FOR EMISSION FREE POWER GENERATION

Swapan Basu | 79 ETC

1.0 Introduction

Fuel cell (FC) technology is not a new idea (known from nineteenth century). However only after Hydrogen fuel initiative in 2003 in US, its demand for power generation has gained up momentum. After Kyoto protocol, all over the world especially in developing countries like India China, there has been demand for increase in energy conversion and utilization to produce more power with less emission [1]. Other renewable energy sources like Solar PV, Wind power can augment power requirement with lesser emissions but they have seasonal variations. On the contrary, in fuel cell, continuous power is obtainable without interruptions at minimum emission. Fuel cells produce power with > 45% efficiency and when used in conjunction with Combined Heat and Power (CHP) efficiency could be as high as 85%. In this paper basic functions, pros and cons of fuel cell technology has been discussed.

2.0 Fuel Cell Technology

What is Fuel Cell? US Department of Energy definition is that "A Fuel cell uses the chemical energy of hydrogen to cleanly and efficiently produce electricity with water and heat as by product." Here it is better to note that not always (in fact in most of the cases fuels are natural gas and methanol) hydrogen is used as fuel. Six different kinds of fuel cell known in the market are:

- Alkaline Fuel Cell (AFC)
- Direct Methanol Fuel Cell (DMFC)
- Poly Electrolyte Membrane Fuel Cell (PEMFC)
- Phosphoric Acid Fuel Cell (PAFC)
- Solid Oxide Fuel Cell (SOFC)
- Molten Carbonate Fuel Cell (MOFC).

Major Advantages of fuel cell shall include but not limited to the followings [2]:

- High Efficiency (especially with CHP)
- Flexibility in type of fuels
- Clean and low chemical, thermal, acoustic emission
- Modularity
- Low maintenance
- Reliability

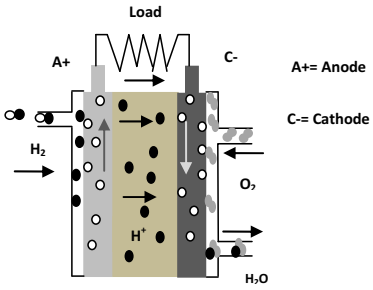


Fig.1 Working principles of PEMFC & PAFC

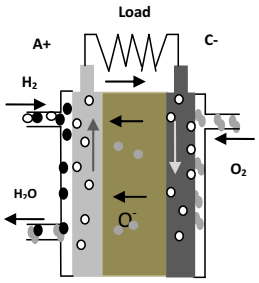


Fig.2 Working principles of SOFC

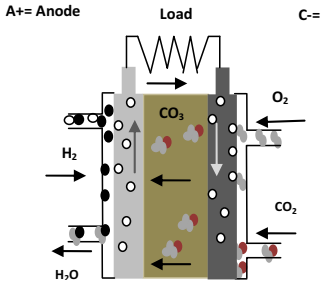


Fig.3 Working principles of MOFC

Out of six types of fuel cells discussed above mainly last four types are primarily used for power generation.

2.1 PEMFC

As shown in Fig. 1, at anode H2 diffuses and come in contact with noble metal (mainly Platinum) and gets dissociated in to H+ ions and electrons. Electrons are not permitted to pass through poly electrolyte membrane (better known as proton exchange membrane), so they have to travel via external circuit to reach cathode. At cathode where air enters the cell, comes in contact with electron from external circuit, gets ionized (O-). H+ ions however, pass through the membrane at cathode, meets O– ions and chemical reaction takes place. So at cathode H2O is formed along with formation of heat. There are two backing layers next to anode and cathode. Backing layer manages water in the cell as applicable so that water is not excess as well as cell is moist. Next to backing layer is bipolar plat whose main function is to five flow path and act as current collector. Not always pure hydrogen is used, many times normal fuel like

natural gas/alcohol may be used. In those cases reformers which extract pure hydrogen from various fuel, are used.

Major components of PEMFC are: 1) Electrodes, 2) Catalyst, 3) Backing layer & bipolar plates, 4) Membrane (Per-fluoro sufonic acid) and 5) Misc. hardware. Characteristic equation and features have been enumerated below: Chemical action & Equation [3]:

$H_2 + \frac{1}{2} O_2 = H_2O$ (Overall equation); $H_2 \rightarrow 2H^+ + 2e^-$ (at anode); ($\frac{1}{2} O_2 + 2e^- \rightarrow O^{2-}$): $\frac{1}{2} O_2 + 2H^+ + 2e^- \rightarrow H_2O$ (at cathode)

- High Power Density(8-10lb/Kw)
- Low Weight an volume
- Low temp operation ~80˚C
- Quick start up (6-8 min)
- Low water
- Better durability
- Noble metal catalyst needed
- Higher cost
- Easy poisoning
- Stack power > 100Kw
- ~60% efficiency
- Stationary & FC Vehicle
- Also use in car

2.2 Phosphoric Fuel Cell (PAFC)

Principle of operation, components & equations of PAFC are similar to PEM fuel cell as shown in Fig no. 1. Phosphoric acid fuel cells use liquid phosphoric acid as an electrolyte - the acid is contained in a Teflon-bonded silicon carbide matrix and porous carbon electrodes containing a platinum catalyst [4]. PAFC characteristics are as follows:

- More vol & wt (pow. den. 25lb/Kw)
- More tolerant to Impurity
- Higher voltage operation
- Requires noble metal(Pt)
- Higher cost
- First used commercially
- More cell life [2]
- Operating temperature:200˚C
- Corrosion to use of acid
- Stack power <10Kw
- Start-up time: 1-4hrs
- Efficiency: 35-40% (~80% with CHP)

2.3 Solid Oxide Fuel Cell (SOFC)

In this cell negative Oxygen ions move from cathode towards anode. At cathode where Oxygen is fed, it absorbs electrons to form negative Oxygen ions. At anode negative Oxygen ions reacts with Hydrogen gas to produce electricity and water as by product. Depending on Fuel there may be CO_2 emissions also but in less quantity. As it operates at higher temperature, SOFCs internally reform various fuels such as natural gas, butane etc. Various Characteristics and chemical reactions are as follows: Chemical reaction/equation [3]:

$H_2 + \frac{1}{2} O_2 = H_2O$ (Overall equation); $H_2 + O^{2-} \rightarrow H_2O + 2e^-$ (at anode); $\frac{1}{2} O_2 + 2e^- \rightarrow O^{2-}$ (at Cathode); other characteristics:

- Power density 40lb/Kw
- High Temperature (1000˚C)
- Internal reforming
- No Noble metal Catalyst
- Carbon coking (C built up at anode)
- Cut in Price
- Sulphur & CO poisoning Resistant
- Higher start up time (5-10hrs)
- Thermal shielding necessary
- Lesser durable
- Power up to 2MW
- ~ 60% efficiency (~85% with CHP)

Major Component: Anode (Ni/YSZ*) Cathode (La, Sr) CoO_3) Electrolyte: YSZ, (Ce, Sm) O_2 [5]. The details furnished are for planer design it could be tubular and for lower temperature operations CGO (in place of YSZ)* can be used. For further details ref. [6]

(* CGO = Cerium gadolinium oxide; YSZ= Yttria stabilized zirconia).

2.4 Molten Carbonate Fuel Cell (MOFC)

Hydrogen in the gas at anode reacts with moving CO_3^{--} from electrolyte to form water, electricity and CO_2. Alike other fuel cells electrons pass through external circuit reaches at cathode. At cathode O_2 from air and recycled CO_2 from anode, meet these electrons which help to form CO_3^{--} which moves towards anode to complete the circuit as shown in Fig. 3. Various Characteristics and chemical reactions are as follows: Chemical reaction/equation [3]:

$H_2 + \frac{1}{2} O_2 = H_2O$ (Overall equation); $H_2 + CO_3^{2-} \rightarrow H_2O + CO_2 + 2e^-$ (at anode); $\frac{1}{2} O_2 + CO_2 + 2e^- \quad CO_3^{2-}$ (at Cathode)

- Pow. Den. 40lb/Kw
- High Temperature (650°C)
- Internal reforming
- No Noble metal Catalyst
- Not prone to Carbon coking/ CO
- Cut in Price
- Sulphur Resistant
- Higher start up time (due to temp)
- Thermal shielding necessary
- Lesser durable
- Pow. Den.40lb/Kw
- Power up to 2MW
- ~ 55% efficiency (~85% with CHP)
- Start-up time >10 hrs

Major Component: This is liquid based electrolyte hence they are available in planer configuration stack. Electrolyte is Li-Na or Li-K based carbonate salt electrolyte. Low Cr anode and stabilized Ni oxide Cathode [7].

2.5 Fuel Cell Discussions

Typical structure of fuel cells has been shown in Fig. 4 below. PEM electrolyte is sandwiched between two electrodes Anode (left) & Cathode (right) followed by backing plate and bipolar plates on either side. Gas path and water path has also been shown. Fig. 5 shows how fuel is processed and how CHP is used in conjunction with fuel cell stack. Major challenges for this technology are economic and durability. The cost of production per unit of power is still much higher than other means of power production. This is due to labor and material cost. Durability and reliability of fuel cell systems are also problems for practical use of the technology. Although there are commercial applications, yet exact life expectancy of various cells are not yet established.

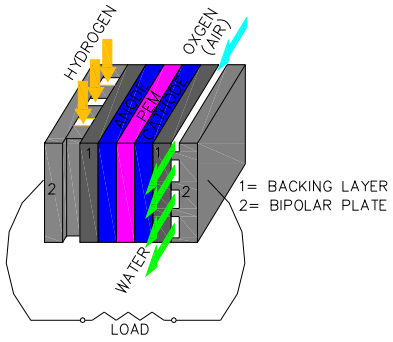


FIG. 4 STRUCTURE OF FUEL CELL

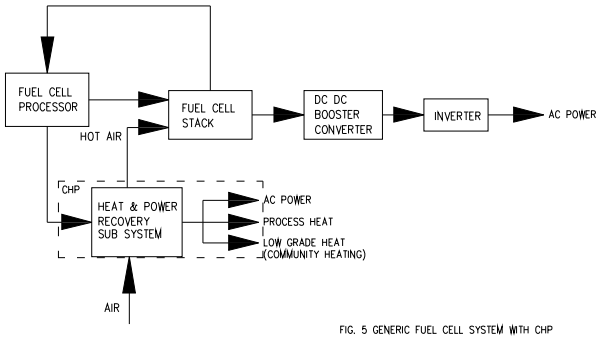


FIG. 5 GENERIC FUEL CELL SYSTEM WITH CHP

3.0 Electrical Characteristics and Connections

As shown in Fig. 5, (based on fig. from Blomen & Mugerwa-193) fuel cells need power conditioning unit (PCU) so that it could be connected to distributed load. Before discussing PCU, note Theoretical maximum voltage from fuel cell is 1.2v at open circuit condition. Polarization caused by chemical and physical factors, reduce the voltage. There are three Polarizations these are:

- Activation Polarization: the energy barrier to be overcome to initiate chemical reaction to take place (Va)
- Ohmic Polarization: This is linear, and occurs due to Ohmic losses in the cell
- Concentration polarization: occurs due to mass transfer effect non-linear.

As is seen from Fig. 6 at low and high current density region voltage changes sharply (non- linearly).

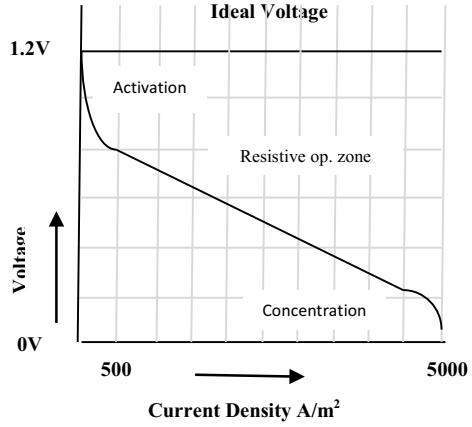


Fig. 6 Voltage characteristics of fuel cell [8]

If E_{nernst} is the thermodynamic potential (average) then voltage at each cell will be given by

$Uo = E_{nernst} – U_A - U_{ohmic} - U_C$

So, it is seen that in operating region Ohmic relation will be predominant. If U_o is open circuit voltage and U_i is operating voltage which is load dependent.

Assuming linear relationship,

$I = U_i / R_{app}$ where R_{app} is internal resistance.

$I = U_o / (R_{app} + R_{ext})$ [3] and

Power $P = U_i^2 * R_{app} / (R_{app} + R_{ext})^2$ [3]

Now when n cells are stacked in series with each unit cell voltage U_i the stack voltage will ne n times U_i. Operating temperature (also Pressue) is also important factor for voltage output. As seen from the curve that with increase of current voltage declines. So efficiency and power from the cell is conflicting in nature and it is the duty of the designer to fix importance for efficiency or power in his system design.

Single fuel cell is not suitable for any practical application so these are combined in series to form a fuel cell stack. For high power application a single module with several cells may be unsuitable. Therefore multi stack is necessary. From the above discussions, it is rather clear that in reality fuel cells are far from their ideal operating point on account of slower dynamics and poor voltage regulation. As voltage varies with load current so load current and problem arises during no load condition when voltage will be high and high rated switches are required [9]. So, for distributed power generation PCUs are compulsory parts.

3.1 Power Conditioning Unit

PCU consisting of switch mode DC-DC booster converter [10] & inverters with necessary controllers (PWM) converts the unregulated DC power from fuel cell (FC) into AC power source suitable for grid connection.

PCU offers high efficiency, low ripple, marginal cost, electrical isolation, high gain to increase overall performance of FC. As shown in Fig. 7 when the switch is on, the diode is reverse biased, thus isolates the output stage, and the input supplies energy to the inductor while the capacitor discharges into the load. When the switch is off, the diode is turning it on and the output stage receives energy from the inductor as well as from the input. Switching ON /OFF timing is regulated by PWM controller to take care of variations at input voltage or output load. For inverter PI controllers are used to control the firing angle for controlling active and reactive power.

Droop controller and advanced Fuzzy logic controllers are also deployed. One of the major drawbacks of fuel cell is that it is not possible to meet the load demand under peak requirement conditions also it has slow transient response [9]. This necessitates use of other electrical storage devices such as battery/capacitor etc. as shown in fig. 8. This is hybrid system.

Energy storage system (ESS) is similar but covers wider range of devices including ultra-capacitor, hydro-system, wind power system etc.

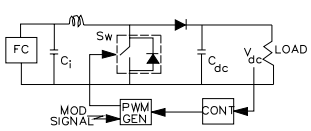


FIG. 7 DC DC BOOSTER COVTER SCHEME

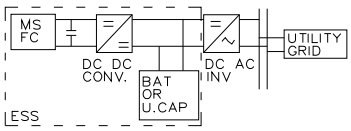


FIG. 8 AC COUPLED ESS/HPS

4.0 Layout Considerations

Normally large fuel cells deployed for stationary DG shall comprise of three major sections:

- The fuel cell module: This is the heart of the system consisting of multiple fuel cells in stacks,. Additionally there will be hydrogen reformation from the fuel source.

- Mechanical balance of plant: Up-stream units are responsible for water, fuel preheating and treatment humidifying, etc. whereas downstream units are responsible for various heat exchanges to extract heat mainly for CHP and co-generation.
- Electrical balance of plant: It is the downstream part of fuel cell, (as discussed in Section 3.0), mainly responsible for generating the required AC voltage at desired level from small DC voltage generated by FC.

5.0 Distributed generations

As of date, most of the electricity produced, are supplied to customers via the grid. Slowly, however, the landscape is changing, because of the distinct advantages of distributed power generation. Commercial businesses and institutions - hotels, hospitals, universities, and government facilities, to name a few - are choosing to become self-reliant in terms of energy needs. What is distributed generation? Distributed generation can be defined as electric power generation within distribution networks or on the customer side of the network [11]. Apart from high quality power with very little emission, distributed generation using FC can offer the following benefits also.

- Little /or no transmission and distribution loss
- Peak Shaving (taking advantage of time of day pricing [2]
- Energy demands can be met incrementally at lower cost [2]
- Growing market especially for developing countries and for meeting exigencies
- Possibility of co-generation

Distributed generations could be stationary as well as moveable like Fuel cell vehicle (FCV) which can be parked at/near the place of use to for "power shaving" for commercial/ big building (residential complex). DG can be connected to grid to augment power in buy back situations, and/or as spinning reserve for grid also. DG can provide grid independent (isolated) power during emergencies such as during typhoon/grid failure etc.

6.0 Conclusion

In conventional fossil fuel power plant energy conversion efficiency to get lower emission is not an easy task. So people are going from sub critical to super/ultra-super critical plant to get little over 45% efficiency (Ref: Power plant Instrumentation and control handbook: Elsevier (www.store.elsevier.com/9780128009406) whereas, FC with CHP can have efficiency up to 85%. Therefore exploring the scope of such energy efficient system is absolutely essential especially for developing countries like ours. I would like to conclude that pioneer institute like ours should lead from the front to explore such possibilities to render services to our country.

7.0 References

[1] T.S.R. Prosada Rao & U Turaga; Opportunities and challenges for fuel cell in India; Am. Chem. Soc. Div Fuel Chem, 2003

[2] Energy center ; Fuel cell for distributed generation report (193-1,) March 2000

[3] Validimir S. Bagotsky; Electrochemistry encyclopedia, Russian Academy of Science Moscow, Aug'2009 (http://knowledge.electrochem.org/encyl/).

[4] (http://energy.gov/eere/fuelcells/fuel-cells); Energy, Gov-office with energy efficiency and renewable energy

[5] F. Tietz, H.P. Buchkreme, D.Stover; Component manufacturing for solid oxide fuel cells; Elsevier - Solidstate Ionics (2002: 373-381)

[6] Springer (https://www.springer.com/978-1-4614-1956-3); Chedong Zuo, Ming Fei Liu & M. Liu ; Solid oxide fuel cell

[7] D.S. Erickson, R. Remick & Z. Ong; Advanced Molten carbonate Fuel cell components; http://web.anl.gov/PCS/acsfuel).

[8] C.K.W.E. Sutantod, Ho, Y. L & Law, K.K.; Exploring the power conditioning system for fuel cell ; IEEE Xplore July 2009

[9] N.A. Zambri & A. Mohamed; "utilization of fuel cell energy source for distributed power generation: theory, modeling and review of research; PREZEGLADELEKTECHNICZNY ISSN 0033-2097, R.90NR 5/2014

[10] Hani Fadali; Fuel Cell Distributed Generation: Power conditioning, control and energy management; Electrical and computing engineering Waterloo, Ontario, Canada, 2008

[11] T. Ackermann, G. Andersson, L. So¨der; Distributed generation: a definition; Electric Power Systems Research 57 (2001) 195–204; Elsevier

Application of Innovative Push Launching Technique for Long Span Steel Truss Bridge Construction, a Case Study

Sanjoy Sanyal | 96 CE

Introduction

Bridges have been constructed using the Incremental Launching Method (ILM) for many years. In this method of construction, the bridge superstructure is assembled on one side of the obstacle to be crossed and then pushed longitudinally (or "launched") into its final position. Application of ILM method to truss spans is very rear; this particular case study describes the lunching technique adopted for India's longest span railway truss bridge in Jammu Udhampur Rail Link Project in J&K, India.

Project Details

Name: Jajjar Khad Bridge, Bridge No. 20, Jammu Udhampur Rai Link Project, Jammu & Kashmir, India

Contractor: Larsen & Toubro Ltd, Client: Indian Railways

Bridge Structural Description

Bridge consists of two 154m span truss girder with 90m high hallow octagonal pier. The pier was having 28m diameter foundation and a cap of 1.5m deep 15m diam. slab. Both ends were having abutments. Steel truss was of 10m wide and 23.5 deep capable of carrying 2 BG railway tracks.

Bridge Launching System

The bridge super structure was fabricated at one end of the abutment and connected with temporary stitch girder and launching with the help of 65m steel nosing attached to its launching direction. During launching, truss was supposed to have a cantilever of 154m resulting 1.5m deflection at tip. It was decided to launch the bridge at 3m up level above bearings to take care of deflection and push from abutment end with 2 - 400tons rollers. After erection, trusses were lowered and permanently placed of bearing.

Design and Planning Considerations

Recognize Critical Restrictions & Reason for launching

As the bridge was located in hilly terrain having 125m gorges and limited access at one end abutment, construction of bridges has been difficult task and posed numerous challenges. Apart from complexity of design and construction of this bridge requires great amount of planning and special techniques. Topography of the terrain results in long girders with large pier height. Geography and terrain was deterrent for any other solutions than incremental push launching.

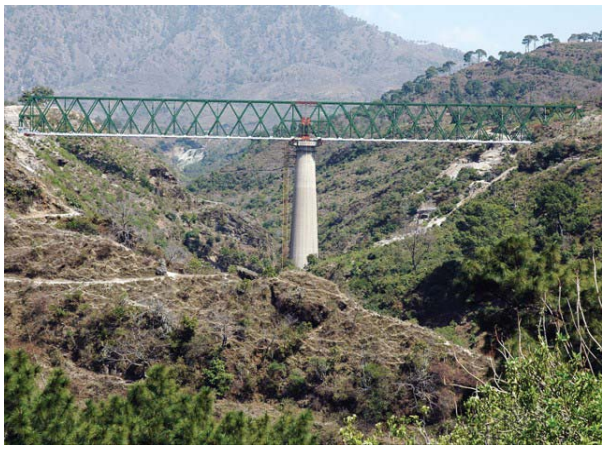


Fig 1: Bridge in final position

Design Phase Considerations

Substructure Effects Caused by Launching Forces

The forces applied to a substructure element due to launching a bridge include three vector components which include the following:

- Vertical loads due to representing the dead load support reaction at the pier
- Longitudinal loads generated by the friction and other resistance forces in the bearings as well as the local grade of the launch surface
- Transverse horizontal component generated by the lateral guide system

Lateral Guidance and Steering Control during Launching

An adequate lateral guidance system must be provided for the superstructure during launching operations. It is well-known that steel girder bridges are subject to sun-induced

curvature prior to placement. However, when this curvature occurs during a launching event, there can be significant problems in maintaining the alignment of the girders and providing a means to keep them tracking along the desired path.

A guidance system was developed which provides lateral resistance of at least 10 percent of the vertical reaction at a given pier during the entire launching process. This lateral resistance also contributes to resist the lateral forces due to wind forces which are applied to the length of the girders and any fabrication and assembly tolerances that may exist.

Wind Forces during Launching

The design and construction team are highly recommended to consider the effects of wind on a potential launched bridge project. The effect of both static and dynamic wind forces during the construction of the bridge using incremental launching must be considered, particularly in the case of a lighter-weight steel superstructure. An analysis of the static wind forces applied to the superstructure at maximum cantilever is not sufficient to include the possible effects of buffeting caused by a blunt body. In some cases for longer spans, the use of wind fairings to help improve the aerodynamic performance of the cantilever span has been used with reasonable success.

In order to eliminate potential problems with wind effects during a launching operation, a clause is suggested to be included in the project special provisions which prohibit launching of the bridge when forecast conditions indicate a likelihood of wind speeds on a given day in excess of a particular threshold of 50KMPH.

Lateral Bracing System for Steel Girder Spans

The modern concept for incremental launching was developed in the 1960s, primarily for use on concrete box girder superstructures. These girders are inherently very stiff and provide considerable resistance against torsional buckling during the launching phase. However, this same resistance is not pertinent for a typical steel girder bridge. The advantage of a steel superstructure is a significant savings in dead load resulting in potentially smaller rollers and bearings, as well as reduced jacking force needed to launch the superstructure. This makes these an attractive alternative for moderate spans.

A system of upper-and-lower lateral bracing was introduced during design of steel girder superstructures in order to provide the necessary torsional stiffness during launching operations. This bracing should be designed as a primary member for calculated loads during the cantilever stage. In particular, the bracing is of critical importance in the leading span which undergoes reverse bending during the cantilever stage of construction. The bracing is likely not needed in the final condition and could be removed following completion of the bridge deck. However, due to the cost and difficulty of this operation, it may be more economical to simply leave the bracing in place for the final condition.

Steel Girder Flange Contact Stresses and Girder Web during Launching

There has been considerable research into the subject of contact stresses on the bottom flange of heavily loaded steel girder bridges. It should be noted that large contact stresses must be considered during design and appropriate consideration must be given to both localized effects on the bottom flange as well as web buckling and crippling concerns.

When launching a bridge superstructure over a series of roller supports which are fixed in position, essentially any point along the length of each girder line serves as a support point at some point during the launching operation for the non-composite steel dead load. It is critical that the girder web be stiffened appropriately to resist this loading without the risk of local web buckling due to the combined flexure/shear acting at this point. A design check was carried out and where required, a thick plate was provided in bottom chord.

Required Jacking Forces to Overcome Friction and Longitudinal Grade

The use of a low friction roller system is recommended for use on all future launched girder bridge projects. These rollers are typically assumed to provide a frictional resistance of 5 percent when rolling across a surface covered with steel plating sufficient to resist deformations due to the heavily concentrated load.

Analysis of Erection Stages

Much has been written about the challenges of analyzing a bridge for incremental launching. Essentially, an envelope

of flexural moment and shear forces must be calculated over an infinite number of support conditions as the superstructure is launched. An envelope of design forces was generated and all the members checked to verify adequacy and structural safety. Substructures were also checked for its stability and adequacy during and after construction.

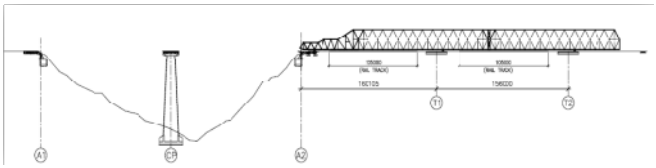


Fig. 2: Schematic launching position

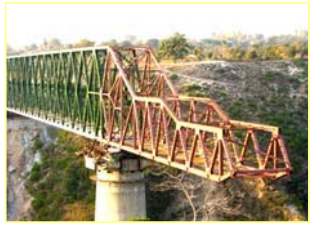
Design of Specialized Bridge Components

Due to the significant number of these projects that have been completed in Europe, there has been an opportunity to develop standard bridge launching equipment which is commonly specified. However, in India, we need to develop and design customized components, which include:

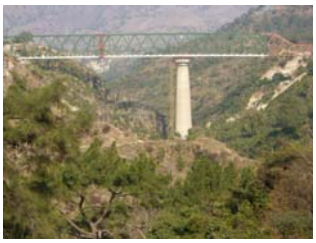
- Design or selection of bearings/rollers. Past projects have typically used proprietary rollers but a few projects were constructed using rollers which were custom-made for the specific application;
- Design of launching nose & stitch girder to join to trusses.
- Design of lateral guides and skid beams
- Design of kingpost and cable-stay system (if required). The need for additional girder stiffeners at the location beneath the kingpost must be considered.

A stage in launching (Nosing marked in red)

Truss supported by nosing at Pier



Supported at Pier launched towards Abutment



Truss reaching abutment at other end

Truss lowered over bearing

Designed Verification before Erection

In order to ensure that the launching operation goes well at site, tests were carried out simulating the launch. Deflections were measured at different simulated launching stages and ensured that test results matches with design values.

Observations and Conclusion

A well planned construction procedure with documented check list and monitoring system is essential for successful erection of this kind of bridges. Except minor yielding of gusset plates, no other damages were observed, which were rectified later. This was the first time in history of Indian railways that Truss Bridge was erected with push launching technique and it is also the largest span (154m) steel truss bridge built by Indian railways to-date.

THUS SPAKE ENGINEERING

Sandeep Chatterjee | 98ME

The American Engineers' Council for Professional Development has defined "engineering" as 'The creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design; or to forecast their behavior under specific operating conditions; all as respects an intended function, economics of operation or safety to life and property'.

Though the sanctity of the definition has remained sacrosanct over the years, the nature of the work has changed considerably over the years. Very few engineering graduates get to the 'creative' part of it; rather it is more of an application of a previously defined set of rules and regulations which need to be followed. While the graduates may be willing to experiment, the constraints of the corporate world act as a deterrent for trying out new things. I do not blame the corporate for this but it is the same as trying to please the shareholders quarter on quarter rather than take a long term view. Of course, there are corporates who are willing to give you a free hand and that has more to do with the risk appetite and DNA of the company.

Leaving aside the debate on 'Jack of all trades and master of none', there was a need for specialized people to pursue specialized fields owing to the complex nature of the discipline. Thus when engineering had its birth, there were people specializing in machines aka mechanical engineers, people specializing in bridges and buildings aka civil engineers and the list goes on. The course curriculum was also designed beautifully to cater to these specialized skills. One good thing which most of the colleges have done is having the first year common (two in case of the IITs) where the students are exposed to basics of physics, chemistry, mathematics, humanities, engineering drawing, strength of materials which cut across all streams. Some disciplines have inter-disciplinary subjects as well which is again a brilliant idea. A mechanical engineer may not be able to trouble-shoot a PLC machine if he has no exposure to electrical engineering. Given the fact that we are in a connected era, it is imperative that we appreciate related disciplines so that we have the ability to look at the bigger picture and not confined to a 'my area' syndrome.

There was an era when the students with higher ranks in their board examinations used to choose the general discipline while others used to go through the engineering/medicine route. This does not imply that there were no toppers in engineering. The trend was that the toppers used to choose the normal graduation courses. This does not necessarily mean that the person with the highest marks was the brightest (I am not trying to ridicule the current examination system but there are cases where a person with a higher IQ loses out on marks due to a variety of reasons). I think this had more to do with awareness rather than the quality of the course being offered.

But thanks to Nehru's concern on 'scientific temper', The Indian Institutes of Technology (IITs) came into existence. It was Nehru, who had mooted the idea of establishing them to provide trained technical personnel of international class who would act as leaders in technology for the newly born independent India. This started attracting the student community and slowly we saw competition building for entry to the engineering discipline. And since the nature of the courses was more of an applied science, there were more jobs in this sector and slowly the general stream started losing out as companies started flocking the campuses of engineering colleges.

As there was more supply than demand for getting into the engineering colleges, the authorities had to design a system of selection to cater to the limited number of seats. So the trend shifted from marks in board examinations to entrance examinations. This had multiple implications. The process seemed fair as it was believed to be a test of intelligence. And as a result, students started neglecting their board examinations (mainly English and the vernacular language).

Specialized coaching institutes started minting money for the coveted seat. There was a prestige associated with 'engineering' which increased the 'marriageability quotient' of the students.

Another trend which picked up was the mushrooming of engineering colleges. While we understand that for a population of this size, we need to have more opportunities, what was disturbing that there was no check on the quality of the engineering colleges. This led to huge mismatch of expectations on Return on Investment (ROI). Private engineering colleges started charging huge sums of money without guaranteeing a placement. Some of the engineering colleges did not have the basic infrastructure like well-equipped laboratories.

Today we have a shortage of faculty in the top engineering colleges. Part of the problem is because of the remuneration paid, lack of consulting opportunities and exponential increase in the intake of students. Also, some of the engineering colleges are in remote locations which do not offer a good social and academic life for the kith and kin. We are not able to attract foreign talent as research is almost non-existent. It is not about the capability or intent but it is the lack of motivation due to umpteen reasons. Add to that the problem of some of the faculty still continuing with their age old notes and have not really upgraded them. As a result students also do not have any incentive to try something new. Not much emphasis is given for publishing research papers as the institutes are turning to be job generating machines and not temples of learning.

The Information Technology boom added more problems. Earlier there were people from the Computer Science Department, Electronics and Electrical department used to sit for the placement interviews in IT and ITES. But the scarcity of manpower compelled companies to look at other streams for their staffing needs. So what the student ends up doing is unlearning four years of engineering and getting into a job which may not offer too many avenues for learning. Some people enjoy it and do well while others are just stuck in the system which they cannot quit because of either money or status. The point is that if we are willing to hire any engineer, then what is the problem with ordinary graduates? The logic which I understand is that the companies have their tasks cut short as they need to select from a creamy layer which has already been screened through the entrance examination process. It is more a matter of minimizing the risks.

Another interesting thing which has been observed over the years is that the top rankers go for Electronics, Computer Science, Mechanical, Electrical Engineering in that order of preference. What puzzles me that what has rank to do with the stream which you choose? After all you need to think irrespective of any discipline. May be it is wrongly assumed that only the brightest (I am assuming that the top rankers are brightest) can do computer science. Why can't we base it on interest? May be it has something to do with the job market and the salaries being offered. Some colleges allow you a progression to other disciplines if you do well but again the trend is same.

Coming to the question on higher studies, I really appreciate if somebody decides to go for a masters' degree. But unfortunately an M.Tech is looked down upon in India with little employability quotient. But the same is considered brilliant if you take GRE and go for an MS. But if we can get some of the students with an MS to teach in India, I feel the purpose is served. And again, MBA is another exit option to escape the engineering studies. What I really do not understand is how does an engineering added with an MBA make him/her a better manager? Again here it is trying to cover up your risk by selecting the creamy from an already creamy layer.

There are also some brilliant students who could not make it due to lack of exposure. Also, is a 3-hour test fair enough to judge somebody's capability? I do agree that we have a social system which does not allow us to take risks and to pursue our interests. But it is imperative that we do justice by making engineering study worthwhile, give a more application orientation to the course, attract good faculty and reward risk taking. India has no dearth of talent and it is imperative that we tap into the potential to make a better India!!!

A Tryst with Planning

Monideep Chattopadhyay | 63 ARCH

That was the time when at B. E. College First Gate, a new land mark celebrating College Centenary (1856-1956) had just been erected to greet us all and lead to newly built imposing College Building. The Building itself was a bold expression of Modern Architecture with geometric blending of blocks and cubes in rhythms. It was also a steel-framed structure very contemporary to first such major construction of New Secretariat Building on Strand Road on the other side of river. Not only it created an elegant façade to commemorate a century old institution but also created behind no less impressive quadrangle, quite in line with the existing buildings of Professors' Quadrangle and Downing Hall, which was again flanked by the original older buildings of Bishop's College built during 1820-24, thereby creating unique blending between past and present. The Chapel of this Gothic architecture was claimed to be first of its kind in India. In fact, B. E. College Campus with its central iconic edifice of Clock Tower in association with Oval, Professors' Quadrangle, Gym (just been then converted to make shift Ladies' Hostel for their maiden entry), Downing Hall, Baby Slater Halls etc., all together resembled very close to any well-known old university campuses in England, as we could realize later.

We all felt elated and privileged to be part of this historic institution set up in such serene surrounding. Moreover, we were also initiated to community living, a first time experience for most of us. To cater for all extra-curricular indoor activities of student community, at large, there was an old fashioned Institute Hall (still standing strong, I guess) just in front of the College Building, on its western corner. That was the place where we witnessed with great expectation students experimenting with TV transmission possibility within limited distance though, from inside of the Hall to outside for standing or passerby viewer. Nevertheless, we were then so excited about this innovative effort, no matter how successful it was in its maiden attempt.

The Institute Hall, indeed catered for multi-various students' needs. In those days, there was only one, so to say, public telephone booth in campus located in the Institute for students making as well receiving calls. There was also one attendant (known as dadu) provided with a cycle, which of course could not be often used for various reasons, to inform students from different hostel whenever calls received for someone from outside. The attendant was quite a busy man, almost like a "Runner" moving from one corner of the campus to the other in search of the called party and informing details of call received. That was also part of our charming past.

The same Institute building also provided a launching pad and also meeting place of newly formed B. E. College Planning Forum, a student and teacher joint body, set up under the patronage of Planning Commission, Government of India, for the purpose of propagation of national development priorities including small savings among students from different colleges so that they could be made aware of and involved in the process, albeit in limited manner. From the beginning, I was attracted to the Planning Forum and got involved as its Student Coordinator under Prof. S. N. Ray of Electrical Engineering Department who was Teacher-in-charge. It was then quite an enthralling and satisfying experience with the thought that we could also, at least, be involved with some kind of "social services" which could even be construed as paying back to the society, of course in a notional manner, from which we derived so much so in so many ways to be part of this great old Institution.

At the end of '50s, Planning Fora from different parts of the country were invited in New Delhi where the First Prime Minister Jawaharlal Nehru addressed the meeting at Vigyan Bhavan. The rare privilege of representing B. E. College at that meeting was bestowed upon Prof. Chiranjib Sarkar of Civil Engineering Department as Teacher and upon me as Student representative, respectively. We both went together to attend the national conference and for me, needless to mention, it was the first such exposure to National Planning process, per se. I was overwhelmed with the exposure to Planning, in general, and unknowingly get initiated to it since then.

Back to B. E. College, we carried out so many programs under aegis of Planning Forum, as part of our extra-curricular activities, which included running of Night School for nearby under privileged children, even for some time a Cheap Store in the same Institute building which was

encouraged by Prof. Sankar Sen of Electrical Department. Apart from that, we used to organize regular film show of patriotic fervor in the Institute with double projectors, taken from Departments, to ensure uninterrupted viewing. We were also toying with the idea of adopting a village near by, particularly across the Drainage Canal. But our limited means prevented us to make any major headway. Nevertheless, we used to explore the possibility of utilizing some of the Student Workshop Projects for the benefit of villagers next door.

Later, under Dr. Dhiresh Bhattacharjee of Economics Department as Teacher Coordinator, we organized one Inter-university Seminar on Planning at our library on the 4th floor where Dr. Triguna Sen, Vice-chancellor of Jadavpur University along with our Principal A. C. Roy enlightened us on the subject.

Thus my initiation to Planning, in general, at B. E. College lead me to focus on Urban and Regional Planning at The University of Wisconsin - Madison, through its Graduate Programme. I continued to be under the spell of Planning ever since, even continued in my career with Calcutta Metropolitan Planning Organization (C.M.P.O.) and later with Calcutta Metropolitan Development Authority (CMDA).

On a hinder sight, I would prefer to presume the seeds sowed in the arena of B. E. College Planning Forum might have been germinated into the publication of "Paschimbanger Parikalpita Nagarayan: Utso O Sandhan" which was released at B. E. College Ex-Students' Club, Bidhannagar in 2013 in the presence of Prof. Ajoy Kumar Ray, Director of the new institution founded upon our beloved B. E. College.

Swami Vivekananda as I see him

Pinaki R. Chakrabarti | 61 CE

It would be a daunting task – if not an outright audacity – to write about Swami Vivekananda within a few pages. But on the eve of his 150th birthday, this is one of ways we can pay our homage to him. I notice - he was not one person – he had the capabilities to assume multitude of personalities. He loved people. At different time he behaved differently with people as the situations warranted. Sometimes, he cried for them, sometimes he laughed with them and sometimes, he chastised them very severely. But, he was really not involved. However,

Vivekananda would not be possible without Sri Ramakrishna. Sri Ramakrishna was the anchor. It is also true that Ramakrishna would not be known to the world so clearly without Vivekananda. In the language of Roma Rolland – "I have chosen two men, who have won my regard because with incomparable charm and power they have realized this splendid symphony of the Universal Soul. They are, if one may say so, its Mozart and its Beethoven – Pater Seraphicus and Jove the Thunderer – Ramakrishna and Vivekananda (1)." Indeed they are inseparable souls.

To understand Swami Vivekananda, one must go through his entire life and then he must notice that Swami Vivekananda lived only 391/2 years. Then one would wonder – how did he do all the work he did? Academic career of Swami Vivekananda was modest. Yet, when we read all the speeches he made in America and Europe and read about his oratory, when we see all the books he has written, when we count the time he spent on the road or on the ship (his trips to America and Europe), when we list the names of famous and ordinary people he met, when we see the countless letters he wrote to various people (from a young girl in America, to all of his disciples and brother monks and even to the Maharajas in India), when we wonder how did he find time to build Ramakrishna Mission and Belur Math and planted the seeds for all its future branches throughout the world and train the young disciples and when we realize that the time was late 1800 when India had no footing anywhere in the world and Indians were the object of ridicule – we simply stop thinking. Mathematically the time does not add up. The

only answer would be – at every moment he was guided by the divine power of Sri Ramakrishna (2). Only other person, who accomplished so much within such a short time, would be Alexander the Great. However, the objectives, methods and purpose were very different.

Early Life - Swami Vivekananda was born on January 12, 1863 as Narendra Nath Dutta in a wealthy family of Calcutta. Although his father was a reputable lawyer, a staunch materialist and agnostic, his grandfather became a hermit and left home at a relatively young age and spent a monastic life (3). He had that ascetic spirit in his blood. Narendra Nath also had an internal struggle even at a young age – he wanted to 'know'. He wanted to know how he could be out casted if he smoked from certain pipes used by so called low cast people – he wanted to know if a snake would really bite even if he prayed intensely to Lord Shiva – he wanted to know and play every sports possible – finally, as he grew up a little, this inquisitive mind wanted to know more -- is there a God? Can we see Him? That is when the drama started. He was a very healthy, strong and bold person. Once a British man got injured and he was bleeding. He tore his shirt and bandaged him – when his other friends fled out of fear. He was a physically active and fun loving person – with lot of sense of humor. Deep down inside him there was a serious person, with a poetic pain and inner joy.

Youth – As he grew older he finished school and entered college. He had a good voice and an intense personality. He started singing in public more often. He liked to mix with people and spend time talking on all kinds of subjects for hours. He was well liked in the gatherings of Brahmo Samaj (believers of form-less Brahman) where young men and women participated, prayed and sang. He knew Keshob Sen - a big name in the "Naba Bidhan"- a new faction of the original Brahmo Samaj (started by Raja Rammohon Roy and then lead by Maharshi Debendra Nath Thakur – father of Rabindra Nath Thakur). At this time Narendra started asking everyone – "Have you seen God". Once he asked that question to Devendranath Thakur. In reply, Devendranath said - "My boy, you have the eyes of a yogi. You should practice meditation." He never got a clear answer from any one, until he met Sri Ramakrishna.

Sri Ramakrishna of Dakshineshwar – After finishing his school he went to college. Professor Hastie a professor of theology first mentioned the name Sri Ramakrishna in his class and asked everyone to see Him so that they can understand the very inner core of theology – "religious ecstasies" (2). Professor Hastie recognized Narendra's possibilities and said - "He is bound to make his mark in life." Narendra went to Dakshineswar with another friend. Strange as it may seem – Sri Ramakrishna had a clear vision that several young men would come to Him who would spread His message to the world (in course of time sixteen young men, some in their teens, came to him and took his monastic vows). He recognized Narendra at the very first sight – he took him to the verandah away from the visitors, gave him sweets and butter to eat – and then he cried in front of him and made him promise for a second visit. Narendra thought Ramakrishna must be mad – if he was sane – he would have to say John Stuart Mill, Herbert Spenser and the Brahmo reformers were mad. Narendra was embarrassed and decided not to come again – but he did come. This time as he was sitting inside Ramakrishna's room, Ramakrishna uttered something and suddenly touched Narendra's chest with his right foot – and Narendra lost his consciousness. When he woke up he cried and he realized he would never go back home. He cried because he had a family to support (his family lost all their fortune) and he had so many people at home. Similar incident happened again and this time Narendra lost his consciousness and at that moment Ramakrishna came to know all about Narendra - the divine being (3).

Sarada Devi consort of Sri Ramakrishna – After Sri Ramakrishna's mortal body died, at the insistence of Narendra and Rakhal (Swami Brohmananda) Sarada Devi had to fill the vacuum. Naren had enormous love and respect for Sarada Devi and she had absolute faith on Naren. Once Swami Viggayanananda came to see Sarada Devi and left quickly. Naren told him to go back and to fall flat on her feet. Because, he regarded her as the Devine Mother. According to Vedic theory, Brahman can have forms and attributes (that is what Durga or Kali or Shiva … to the Hindus). Brahman can be form-less but with-attributes (that is how the people within Christian and some other religions see God). Another Vedantic position is - Brahman with no form or attribute – "Nirakar Brahman". There is a Ramakrishna Mission temple in Mayavati in Northern India, designated for the worship of Nirakar Brahman. Narendra asked his brother monks to take out all

religious symbols including the photographs of Sri Ramakrishna – their Master. That created lot of commotions among the monks. Eventually the matter was referred to Sarada Devi – she supported Narendra.

Travel to the West – Alexander came to East and conquered it – and he became Alexander the Great. Narendra set sail for the West and conquered it – and became Vivekananda. This story is long. Some of the recent books have provided more light on his life in the States (4). In India he received lots of encouragement and most of the financial help from the Indian people outside Bengal and in the USA he received most of his help from the enlightened American ladies of that time (2)(4). Detailed descriptions and photographs also substantiate this fact. After his famous speech in Chicago in 1883, an eye witness, Mrs. Blodgett recalled –"When that young man got up and said – 'My Sisters and Brothers of America'- seven thousand people rose to their feet as a tribute to something they knew not what. When it was over I saw scores of women walking over the benches to get near him, and I said to myself, "Well, my lad, if you can resist that onslaught you are indeed a God" ".

Sense of Humor (5) – Vivekananda had a strong sense of humor. Probably it was a necessary element for his type of work and his personality. When he was in a relaxed mood he kept on making fun of every word any one said. He was a physically strong person and he took part in sports whenever he could. Once (in the later part of his life) Swami Brahamananda casually told him that he could not walk any more on his hands (which he used to do when he was young) – he immediately went out of the room and started walking on his hands – in the middle of the night – everyone woke up to see the fun. Another time, a missionary got hold of him and started denouncing all the religious practices he followed (Hindus). At the end the missionary told Vivekananda if he did not follow his preaching Vivekananda was sure to go to hell. At this point Vivekananda asked him where he would go after his death. The missionary confidently told him, "of course I will go to heaven". Vivekananda replied – "then I would like to go to hell". There are many such stories about him. Some time he made rustic jokes and used slangs with his fellow men like Girish Chandra and some of the senior brother monks to make his point. Some of that he probably inherited from Sri Ramakrishna who was a master in making rustic jokes. It was all for pure fun. He was a smoker. He left a pipe in a house in South-Pasadena, California – it is still there (at one time he lived there as a house guest).

Views on other religions—Vivekananda respected every human being and every religion – that was his guru Ramkrishna's teaching. He went out to proclaim that to the world – "Shrinwantu Vishwey Amritasya Putrah" (Listen all, O Children of Immortality). He proclaimed that there was no sinner, every path leads to God. He often recited from Gita -"Whatever path people may follow to worship- they always worship me. All of these paths lead to me [Gita-4/11]." "Those who worship other gods with devotion, even imperfectly, actually it is me they worship [Gita- 9/23]." He had the privilege of witnessing the validity of the above statements in the experiments done by his guru Ramakrishna (Ramakrishna worshiped God following the path described in various major religions and obtained realization). Vivekananda suggested the Christians to become better Christians, Muslims – better Muslims, Buddhists –better Buddhists, Hindus- better Hindus and the Jews – better Jews. Vivekananda had a special fascination for Buddha. Swami Vivekananda considered Buddha as the greatest man on earth. However, he said the following about Buddhism, "Buddhism historically the most important religion – historically, not philosophically – because it was the most tremendous religious movement that world ever saw, the most gigantic spiritual wave ever to burst upon human society…(6)."

His last days – In last three years of his life Narendra was falling ill time to time. But he did not stop working. Even in that condition he made his last trip to America (mostly for fund raising). In 1899 Vivekananda established Belur Math – he needed money for its survival. In fact he wanted to do more, as if he had realized that his time was up and lot more things to do. In his relentless teaching he often used the stories of Ramayana – where, Kumbhakarna, Ravana and Vivishana represented the three forces – Tamas (Ignorance), Rajas (arrogance and ego) and Sattya (Truth) (7). He praised America whole heartedly – he also criticized America severely for all her social ills. A year before his death he wrote a poem on 4th of July – American Independence Day – as if he knew – on that very day (4th of July) he would take a permanent exit (Vivekananda died on 4th of July 1902). The day he died, he sang a song on mother Kali ("Is Kali my mother really black? …), entered

his room and asked no one to disturb him. He stretched his body and remained calm. Only one young monk was present. Suddenly he saw small amount of blood came out of his nostrils and eyes – according to scriptures a perfect death for a yogi – a permanent Samadhi (2).

Legacy – Vivekananda's legacy will be of many folds. In A. T Balsam's words, " In passing of the years and the many stupendous and unexpected events which have occurred since [his passing away] suggest that in the centuries to come he will be remembered as one of the main molders of the modern world…". Vivekananda called everyone to come forward with the best offering they have, he called for the respect for the poor and unfortunate, he called for the complete religious tolerance --- above all he called for the understanding of universal oneness. To him humanity was first and religion was second – yet he offered all his work to Sri Ramakrishna – whom he considered as living God. If we have to name the top three persons who helped build modern India, Swami Vivekananda will be in the front of the list. Most of the top Indian leaders in the last century were influenced by his writings and by his life story.

Quotations:

"Vivekananda's words and presence brought Asia to the West decisively" – Huston Smith (writer).

"After hearing him I realized that my religion is also true" – A Jewish intellectual (Chicago address in 1883).

"He preached to his countrymen a more virile creed than any Indian had offered them since Vedic days – Will Durant.

"After hearing him we feel how foolish it is to send missionaries to this learned nation" – The New York Herald.

"To ask you Swami for credentials is like asking the Sun to state its right to shine" – "Here is a man who is more learned than all our learned professors put together" – Dr. John Henry Wright (Professor of Greek Classic at Harvard University)

References

1. Romain Rolland, "The Life of Ramakrishna", Pub: Vedanta Press, Calcutta.
2. Swami Nikhilananda, "Vivekananda –The Yogas and Other Works" – Ramakrishna Vivekananda Center, New York, New York -1953.
3. Christopher Isherwood, "Ramakrishna and His Disciples" -- Vedanta Press, Hollywood, California 90068.
4. Ashim Chaudhuri, "Swami Vivekananda in America – New Findings" –Advaita Ashram, 5 Delhi Entally Road, Kolkata 700014.
5. Shankari Prasad Basu, "Sawhashaya Vivekananda" (in Bengali) – Nababharat Publishes, 72 D Mahatma Gandhi Road, Kolkata 700009.
6. Compiled by Swami Suddhasatwananda, Sri Ramakrishna Math, Madras, "Thus Spake the Buddha".
7. Swami Swahananda, "Vedanta and Vivekananda" – Ramakrishna Monastery VSSC, 19961 Live Oak Canyon Road, P. O. Box 408, California.

"Each soul is potentially divine. The goal is to manifest this divinity within by controlling nature: external and internal. Do this either by work or by worship, or psychic control, or philosophy – by one or more, or all of these – and be free. This is the whole of religion. Doctrines, or dogmas, or rituals, or books, or temples, or forms, are but secondary details."

--- Swami Vivekananda

Vivekananda House-Kolkata
(Vivekananda's birth place renovated by Ramakrishna Mission)
Taken from the street
Feb-4-2012 (Pinaki Chakrabarti)

Koi Lauta De Mere Beete Huye Din (Can anyone give back those days to me!)

Subhashish Majumdar | 80 ME

The viva-voce examination ended with one of the panelists asking me to render a song – while glancing through my CV which spoke of my pursuits in this area. I responded instantaneously – and earned myself a seat in the Civil Engineering stream. My choice was Mechanical and I was assured that once the final list is declared, my choice of stream will be given due weightage.

Coming from an area which is 10 minutes drive from the Jadavpur University campus - I was indeed disappointed. Most of my schoolmates from South Point landed at JU – the separation was difficult to bear. And to think that I was also about to miss my cricket and football engagements at the Vivekananda Park – a stone's throw from my house at Keyatala! And of course the Adda at L9 stand at Gol Park!

It was a rainy day in August when the taxi traversed all the distance past the Howrah Station, took the congested G T Road and ended up in front of Hostel No 13 at the extreme end of the College. This seemed to be an acceptable location, with the room overlooking the Ganges and the Botanical Garden almost next to it – providing a much needed green cover. The campus was indeed an oasis amidst the squalor of the city of Howrah. There was a playground(named Oval) nearby, a Gymnasium and a plain level ground too – which was suitable for volleyball and any type of impromptu sports.

The class timings were bit odd - having being used to a laid back school life - where our afternoon classes used to start from around 11 AM and beyond - one was forced to join classes at 8 AM sharp and sit back till 11:40 AM with 4 periods of engrossing lectures testing your listening, reasoning and writing skills at the same time. There was a short break of around 90 minutes when you were supposed to ensure your bath and gobble a bit of the hostel lunch – before rushing back to the college building – a 15 minute walk in the scorching sun. The afternoon classes continued till 4 PM but had laboratory work too – which made them worth attending.

Nevertheless, the attending roll in Mechanical Engineering of around 75 started to take the toll within a week – with most of the city-dwelling "student babus" starting the bunking exercises and preferring to stay in the hostel room or the college canteen to avoid the suffocating knowledge imparting exercises. The word "proxy" became a serious issue for discussion – and most evenings were spent on how manipulative one can be to "manage" an attendance without being physically present in the classroom.

The sincere ones were thus targeted to provide the support. These were the ones coming from all parts of West Bengal - from unknown educational institutions of the districts having been guided to "crack" the Joint Entrance Examination to gain entry in a residential Government Engineering College of repute. They flocked the first two rows of the gallery style class rooms – armed with their subjectwise notebooks - properly bound and meticulously wrapped with the glossy calendar pages.

The differential was obvious in the classroom – at least in the initial days - but the barriers completely disappeared when we all combined to take the field after the class hours. It was indeed a God's gift for me – to have such dedicated sports loving guys in our midst – who demonstrated all the skills they have nurtured at their village or semi-urban locales – and made us imbibe them within no time. With that came the bondage – which shattered the rural-urban divide and integrated us as hostel mates or college mates with a sportsman like frame of mind.

So those were the afternoons I used to look forward too – right from the first week I spent in the college hostel. My father was shocked to see me in the sports field with seniors within days of joining college – when he came down to verify the "ragging" reports.

It was 1975 - emergency was declared in the country just a few months' back- and Bengal had passed through a serious political crisis in the last 5-6 years. There was a social tension too – the educational schedules were upset – the backlogs were being regularized and the students had little say in academic affairs. There was a bit of ragging –

but it all turned to be efforts of different political groups trying to gain the support of the freshmen joining the college.

And of course, I had a triumph card with my music. All my musical madness in listening to Rahul Dev Barman and loud music of Bollywood at home blossomed almost instantaneously – I performed at the college fresher's welcome with a band - jumped on the faculty table to sing at the departmental welcome – and it was music all the way after the sun went down and we all thronged at the moonlit terrace for the memorable musical exchanges. The focus was on a guy named Proloy who excelled in Tagore songs of Debabrata Biswas and self-composed tunes – mesmerizing us all. I was happy to play a second fiddle – till the moods heightened and the musical notes gradually converted themselves into yelling patterns. The Gardenreach shipping yard was just opposite – with the river separating us. The lights on the opposite bank, the reflections on the water and the moon – all combined to create a romantic environment. Can anyone refrain from humming musical notes in this environment?

But the music had to stop on certain occasions – when it was time for the examinations (we did not have semester patterns during our time) and we had to cuddle together in one room in the middle of the night to locate the class notes, the right pages of the text book or the probable suggestions which used to appear from nowhere on every night before the particular exam. Those were tough nights as well – as we had severe power cuts in the evening and night , political disturbances with change of guard in the centre and state in 1977, a mess strike to follow and thoughts of an uncertain future hammering the mind almost every day with a gradual decay in the industrial scene of the State.

Oval was my favorite – for cricket and football as well. The other place was the Institute Hall – where we all ventured to organize regular musical shows. The college social and BECA involvements came thereafter. It was a Manna Dey performance in my first BECA as part of a 5000 strong audience - how pleased was the artiste when we did not shout for any particular request song – and he went on to sing 32 in a 3 hour show. Personal linkages with some of the artistes, through my father's profession as a sound – recordist made me organize soirees as well – and I still remember the efforts put in to run after some of the musical stars of that time to confirm them for the REBECA evening programs. We had joy! We had fun! We had season in the Sun! Especially when one of the artistes asked for hot milk to revive her lost voice – that too at 2 AM - it made me rush to Pandit's shop nearby – bang his shutters to wake him up and make him prepare the milk !

One can never forget the fellow hostel-mates – even as I shifted to Hostel No 12, more closer to the Ganges and almost isolated from all other senior hostels. Mind you – there were no fans in the room – so getting a seat by the riverside hostel was a great privilege. Food was of course a common item of complaint – except a particular day of the month – when we celebrated a Grand Feast. The afternoon samosa and the Mughlai paratha in the 2nd gate compensated a bit – but then there was no money left for the Friday evening/night movie at the Lipi or the hot movies running at Lighthouse or New Empire. And to watch a hostel-mate called Asis managing the days with a simple diet of Chire or Muri – with a bit of sugar- day after day – it was indeed a lesson in life! Wherever you are dear bhai Ashish - I salute you even today for showing us the realities in life – which we still tend to ignore.

Then there were the afternoon adventures to Mohun Bagan ground – surprisingly the club had overwhelming support with my fellow batch-mates and hostel-mates. Bunking the last period, we used to set off by the 55 bus by 3 PM, take the ferry to the other side and rush to queue up before the public gates amidst the slush and the rains – with the mounted police cajoling us all through. Entry to the stands was minutes before the kick-off at 4:15 PM - the shout for support, the goals and the couplets aimed towards the opponents all continued till we took the ferry back to enter the hostel by 6:30 PM. How we miss those pseudo-fights over the Ghoti and Bangal – the Chingri and Ilish – the P K versus Amal Dutta drama – which continued even as we went to the dining table in the ground floor mess.

The days in the college made us independent – they taught us to face the world without begging for support – and above all, taught us to respect a human being. No matter what names we called our professors like Panchu, Ghora, Khoga – we all rushed to help them whenever they were in need for some support. Personally I can never forget the

influence of Dr. Seal in my life – even though I belonged to a different department. He was all praise for my music and even after I left college, I was in touch with him in various capacities. I also have fond memories of some of seniors and junior students. The last year of college spent in Sen Hall was made memorable by the bubbling batch of 1981 pass-outs.

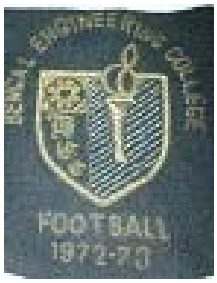
I conclude this part of my memoirs but promise to come back with a sequel next year with more on my class-mates and hostel-mates. How sad it is to get scattered all over the world with no linkages whatsoever. How I wish we all have them in the campus once again to recollect our formative years? KOI LAUTA DE MERE BITE HUYE DIN.

The Untold Story of a BE College Footballer

Subhankar De | 74 EE

Here I would like to share an incident with all alumni/alumnae, which happened a long 43 years back, as this is a right platform to do so, the first Alumni Day. The venue was the football ground of Bihar Institute of Technology, Sindri and the event being All India Inter Engineering College Football Tournament-1971 (ECFT).

This very particular incident, I am not sure whether believable to you at all or not, happened during the semi-final match of the tournament between the home team BIT, Sindri & our Alma Mater, B.E. College.



The match started as usual with a ground, packed with spectators, as one of the sides was the home team. We were under tremendous pressure from the spectators. During first half we conceded one goal. After the lemon break, the game resumed. At the very beginning, the opponents got a corner kick. As a defender, I had to jump in the air to come out of danger by a header. Unfortunately, one of their forwards pushed me in the air, throwing me on the ground. To make the matter worse, he lost control of

his body and fell on my head. After that, I lost my senses but physically continued to be in the game, as usual.

After some time, could not guess the duration, I came back to my senses and discovered myself inside the ground, playing as usual, in presence of thousands of spectators. Immediately on my so called "Come Back", I asked one of my team mates about the result of the match which was still in progress. He was taken aback, on being asked such a question from a 'playing teammate'. I came to know that we were still 0-1 behind. The match referee blew the final whistle very soon.

This is not the 'The End" of the story, my dear friends. On our way back to our place of stay, inside the BIT campus, all my team mates, the coach and a few of our supporters who accompanied us to Sindri came to congratulate me. Surprisingly they were in all out praise for my "grand performance" of the day. I was very much puzzled and shocked at that time considering the mysterious happening in my life, during the last 45 minutes together with the defeat of our team in that all India competition. All of them were univocal on my "Outstanding Performance" on the ground, saying –"tumi je eto bhalo khelte paro amader jana chhilona". Till date, I have not been able to get any plausible explanation of the incident from anyone whom I shared this. This inexplicable incident keeps reminding me of Shakespeare's famous line in Hamlet - "there are more things in heaven and earth, Horatio, than are dreamt of in your philosophy. "

I could not share the unbelievable (ALOUKIK!!) incident, with them, at that time because I became almost speechless. But could well understand from them that my performance of the day was far better than my usual form and this happened when I was not in my normal sense.

On my return I consulted my house physician. He also could not analyze the happening rather had a strange look at me. Do not know how the Medical Science will describe this incident.

A Case Study on the Land Slide of High Bank of River Hooghly at Chandannagar in July-2013

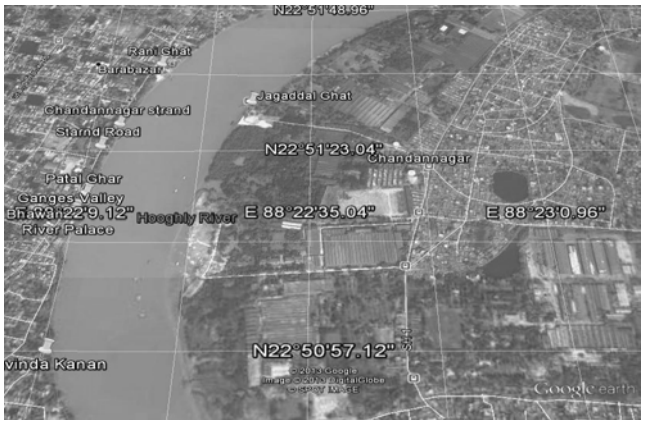
Snehashish Basu | 86 CE

Abstract

An abnormal landslide took place in the first week of July, 2013 at Chandannagar near Hatkhola. A study was carried out to find the probable causes and to formulate measures for Bank protection as short and long term needs.

Introduction

Inspection visits carried out on 05.07.2013 & 19.07.2013 Photographs from various angles taken at Major affected area i.e. Ganges Valley & River Palace Apartments. Red Cross Bhawan also partly affected. Dwellers in their own interest have started sand bag dumping and Hooghly Irrigation Division of Irrigation & Waterways Directorate, Govt. of West Bengal has also started dumping of Porcupines in the deep channel by boat. The Buildings are situated on the right bank of river Hooghly, eventually the zone is a kink like, where there is a sharp bend and the left bank is silting in nature and the right bank is scouring. In 1st week of July, 2013 huge flow of water from upstream flowed through the river which may have caused the sliding.



A mark of channel formation was noticed during site inspection. As the Zone is located between Saraswati and Hooghly river presence of any buried channel could not be ignored. It is reported that prior to 1770 the main maritime river channel in Hooghly district was river Saraswati (Ghosh Dastidar & Ghosh, 1964). After a havoc flood geomorphology of the region changed a lot and main flow became present Hooghly river and Saraswati river became a mostly dry channel like big storm water drainage.

A Google imagery of the Zone is attached for better understanding of the bend of Hooghly river. Another probability of this accident is continuous huge suction by mechanized boats of other bank for lifting of mud water. The right bank as appears is non-silting type and scour prone as the bank is in the concave part of the meandering channel.

From A recent survey, it is noticed that subsidence is about 4.0 Mtr for 16.0 Mtr wide areas in the vicinity of Apartments. It is also noticed from the survey data that the H.F.L. (High flood level) is 6.6 M. G.T.S. and L.W.L. is 1.00 M. G.T.S. High Embankment Level is 9.00 M. G.T.S. The early embankment was in slope of 2:1(Horizontal: Vertical). Generally in this slope some protective measure was required. Due to wear and tear and want of protective measure the embankment slipped. Deep Channel of river was near the embankment which helped in sub soil erosion by undercut.

Following alternative schemes for undertaking Protection of the High Bank utilities may be considered.

Temporary Measures

1. Ballah Piling of length 26 feet to 20 feet at Low Bank level for Tow sausage with Laterite boulders
2. Sand Bag dumping or Laterite Boulder pitching in slope to protect the Buildings.
3. Making Bamboo spurs / Porcupine spurs @ 10 Mtr intervals across the Channel from Low bank to Deep Channel along the affected area.

Permanent Measures

Alternative A

1. R.C.C. Retaining Wall about 4.5 Mtr high supported on RCC DMC Cast in Situ Piles 500mm dia 20.0 Mtr long from Patal Ghar to Rishi Aurovinda Kanan, as the disturbed area is in between as appears in my three Day's inspection 05.07.2013, 19.07.2013 and 03.08.2013 (A Sketch Prepared and attached).
2. Back filling the area after Construction of Retaining wall.
3. The Wall to be constructed from Patal Ghar to Rishi Aurovinda Kanan as both the Patal Ghar and Rishi Aurovinda Kanan are of Heritage value.

Alternative B

1. A Geotextile layer based Protection scheme also prepared and attached in the annexure for the Zone. Geotextile is a bye product of Petroleum which allows water to percolate but protects soil erosion. We have used in many River Protective schemes in South Bengal since early Nineties of last century and the embankment are still standing firm.

Affected Red Cross Building

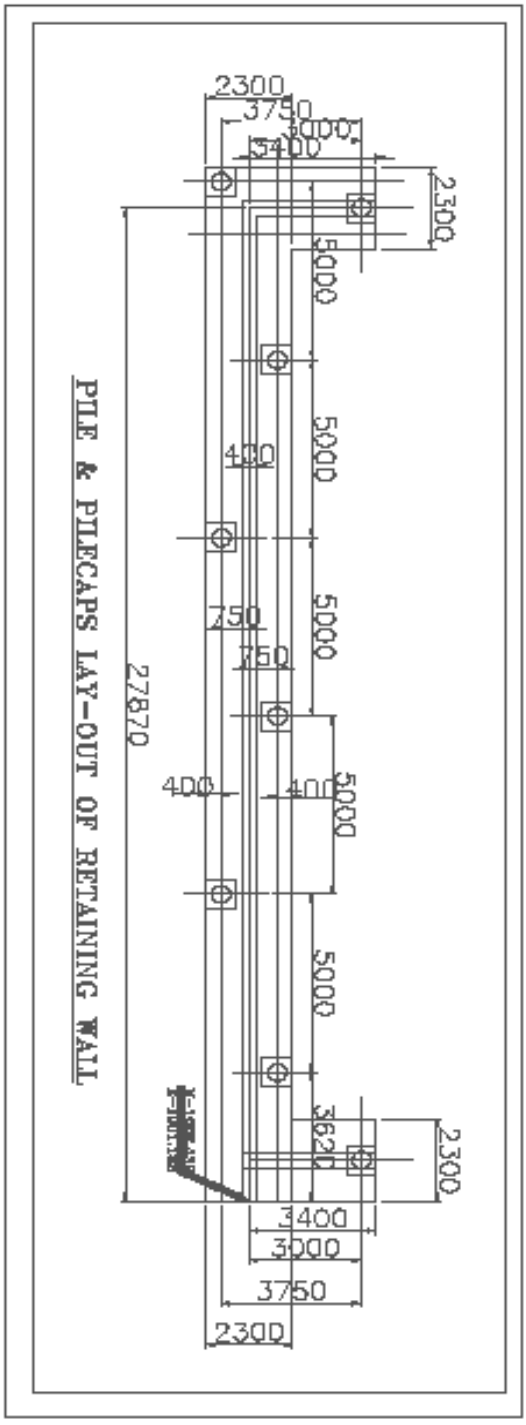
Ganges Valley Apartment badly affected

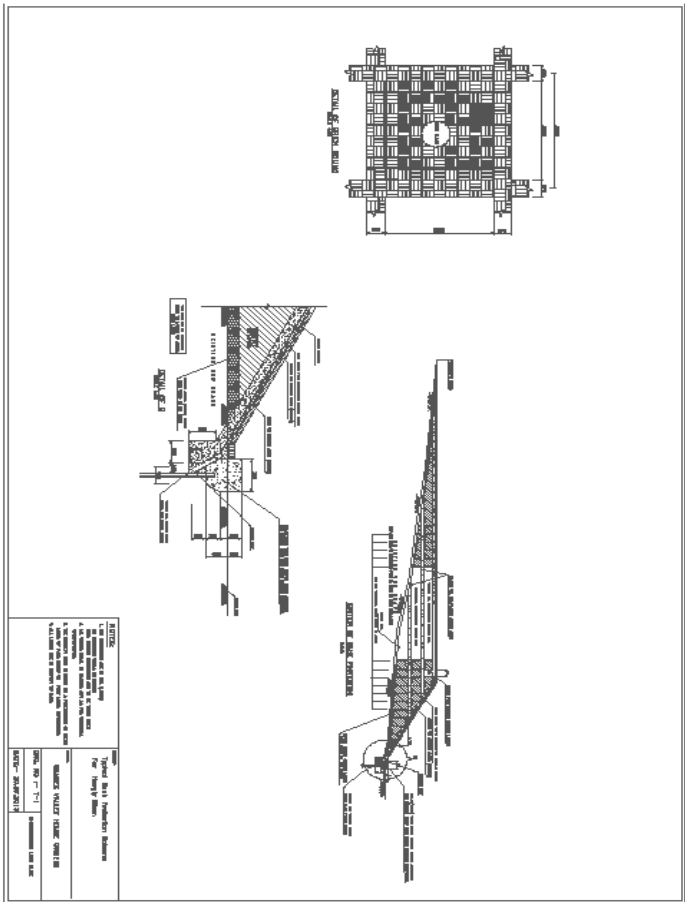
Both River Palace & Ganges Valley Apartments badly affected, some protective sand bag dumping being undertaken by Flat Owners

Mr. N.K.Pahan , one of Affected Flat Owner of Ganges Valley Apartment watching the river

Filling material below Plinth of Both River Palace & Ganges Valley came out as a result of Erosion

Due to measures taken by I & W.D., Govt. of W.B. urgently shifting of deep channel noticed apparently on 19.07.2013 afternoon





Conclusions

No piecemeal solution will be beneficial to protect a single building, a Zonal approach to be considered.

Further to above

In a visit on 25.08.2013 it was noticed that Hooghly Irrigation Division of Irrigation & Waterways Directorate, Govt. of West Bengal has initiated Bullah Piliing & drum sheet walling with sand filling. The photos also attached.

References

A Study of Subsoil Conditions of Calcutta by A. Ghosh Dastidar & P.K. Ghosh, published in 1964.

BESU's Contribution in Removal of Arsenic from Village Drinking Water Supplies in West Bengal

Arun Deb | 57 CE

Introduction and Background

State Universities such as BESU (now IIEST) are funded by public funds, and as a result such universities should have some responsibility of giving back to communities. I am proud to say that our Alma Mater, BESU/IIEST is in the forefront in this respect. In late 1980's, it was detected that in rural areas of West Bengal, a health crisis of devastating proportions developed due to contamination of arsenic in groundwater. Groundwater is also the main source of drinking water for rural populations of West Bengal. As early as in 1996, BESU took the initiative to find an appropriate solution for this problem.

Laboratory Study and Field Testing

With the initiative of Arun Deb ('57CE) in January 1996, Water for People (WFP), a non-profit organization, located at Denver, Colorado, USA, awarded Bengal Engineering College Deemed University (BECDU) a grant of $ 10,000 to conduct a laboratory study to select an appropriate arsenic-removal technology for sustainable use in rural areas. The environmental engineering laboratory of Civil Engineering Department, BECDU, under the leadership of Late Professor Amal Datta and Professor Anirban Gupta started the project with great vigor, conducted laboratory and pilot tests and developed a proper technology for removing arsenic. Locally available (Durgapur) activated alumina (AA) proved to have significant capacity for arsenic removal. Idea is that new AA adsorption units will be attached with the existing village tube wells to remove arsenic to acceptable limit.

Beginning in 1997, BECDU developed and operated pilot units for twelve affected communities for three years. The pilot field applications indicated their suitability for further replication to cater to the suffering millions. Regeneration methodology was developed and a regeneration plant was constructed in a rural village. The plant had been tested and was found to perform effectively after regeneration. Concept was to have each village one unit that could supply water to meet the drinking and cooking needs of approximately 200 families with a population of 1,000. It was determined that each unit would cost approximately INR 75,000. These units were named Amal Arsenic Units (ARU) in memory of Professor Amal Datta ('66CE), who was the first Principal Investigator for this project.

Implementation in Communities

In 2000, through WFP, a grant of $ 180,000 from Conrad Hilton Foundation, Rotary International Foundation along with Puerto Rico and Golf Green Rotary Club of Calcutta, and Das Foundation, BECDU expanded implementation of the Arsenic Units into other West Bengal communities. Three arsenic prone districts in West Bengal, Nadia, Murshidabad, and North 24 Paraganas were targeted.

Since then, the project installed more than 200 units in 200 villages of West Bengal supplying arsenic free water to about 200,000 people. Since then, the project extended its arms to install larger arsenic removal units for schools supplying water to about 2,000 students per school.

This is a great achievement for BECDU (which became BESU in 2004 and then became IIEST, an Institute of National Importance, in 2014).

Local Awareness, Social Mobilization and Willingness to Pay

In order to make the project sustainable for the long term, it is necessary that villagers take the ownership of the units and come up with funds for proper maintenance. Villagers should pay for the water and develop a program to mitigate the cost to operate and maintain the new system.

BECDU Project team headed by Professor Anirban Gupta spent many hours in meetings with communities and discussed benefits of these Arsenic Removal Units (ARU), and impressed upon the villagers to pay for their operational and maintenance cost. A professional drama group has been hired to promote this concept. This is the first time in West Bengal that villagers are paying for water.

Each village elected a water committee, engaging interested individuals in the process of mobilizing villagers to support project implementation. The committee set a

water tariff of INR 10 to INR 30 per family per month for proper maintenance of the units.

Social Infrastructure for Implementation and Sustainability

BECDU Project Team established guidelines. The Project Team provides training to water committees to ensure that they are adequately prepared to assume management responsibilities. These guidelines set minimum standards for committee membership and operations to help ensure effective, democratic and transparent operations. For example, guidelines specified that members must:

- Be elected annually by water users,
- Agree to serve on the committee without pay, as membership on the committee should be based on a desire to promote good health within the community,
- Ensure that one-third of the committee members are women,
- Abstain from engaging in politics while on the committee,
- Meet formally at least every three months and
- Hold an annual general meeting to gather formal feedback from users and support future planning.

The water committee collects and deposits funds each month in a bank or in a post office account, maintaining an accounting book of all financial transactions keeping it transparent. In addition, there are at least two signers for withdrawal of funds from the post office or bank account for repairs or maintenance, ensuring that use of funds are well monitored.

Maintaining and Sustaining the AMAL Filter Units

Operations and maintenance (O & M) is a relatively simple procedure. The key is regularity in performing O & M tasks. The water committee and caretaker coordinate with each other to ensure that several tasks are taking place on a regular basis. The most critical daily tasks are back washing of the unit to remove iron deposits and monitoring water collection practices to ensure proper use of the hand pump and unit and conservation of the media. Other monthly tasks include monitoring of water quality by sending out and posting results of water sample tests conducted by the institute (now known as IIEST).

AMAL Filter at Aurobindo Road, Chatra Near Maslandpur, North 24 Parganas. No. of Consumer Family - 200.

In 2003, BECDU Project Team constructed a local regeneration facility, which is now run by a trained staff. This changed the way regeneration was accomplished to minimize the down time of the filter.

BECDU's role in providing training and technical assistance to the communities for the year following project start-up was critical to implementation success. Field supervisors (who were employed and supervised by BECDU but lived in nearby villages) were responsible for the technical assistance provided to communities and visited them regularly. Thus, BECDU's support played an important role in preparing villages to sustain the Arsenic Removal Project. Field staff supervisors are able to work through various problems with water committees and caretakers to ensure that issues were remedied.

Women's Role is Critical

BECDU Project Team gave importance on involvement of women in the management of these units. Women are key stakeholders in this project. As the primary collectors of water, and as those responsible for feeding their families and maintaining household hygiene, women are a critical group of potential change agents in communities concerning water consumption and health practices. This project, requires at least one-third membership of women on water committees.

Impacts

Water users interviewed (typically women) generally felt that drawing water from Arsenic Filters was sufficiently convenient to meet their needs. They feel that use of the filter water minimized occurrences of water borne disease and they are saving about Rs 200 per month on medicine

cost. Clear and consistent rules for collecting water, monitored by caretakers and committee members, are very helpful.

Summary

Civil Engineering Department of BECDU/BESU/IIEST, with a leadership of Professor Anirban Gupta, has done a great service to poor communities of West Bengal. This aspect of BECDU's/BESU's/IIEST's contribution in providing arsenic free water to more than 200,000 villagers of West Bengal should be recognized.

We feel proud of our Alma Mater, and BEC/BECDU/BESU/IIEST Project Team for designing and implementing this project very efficiently to help a large number of rural populations of West Bengal.

One independent study by a U.S. based consulting company, while reviewing this project praised dedication of the team from our Alma Mater for the success of this project. It is not yet known if any other educational institution in India has provided such commendable service for the communities. Congratulations are due to our Alma Mater and the BECDU/ BESU/IIEST project team for this work.

This project has won a number of International Awards including:

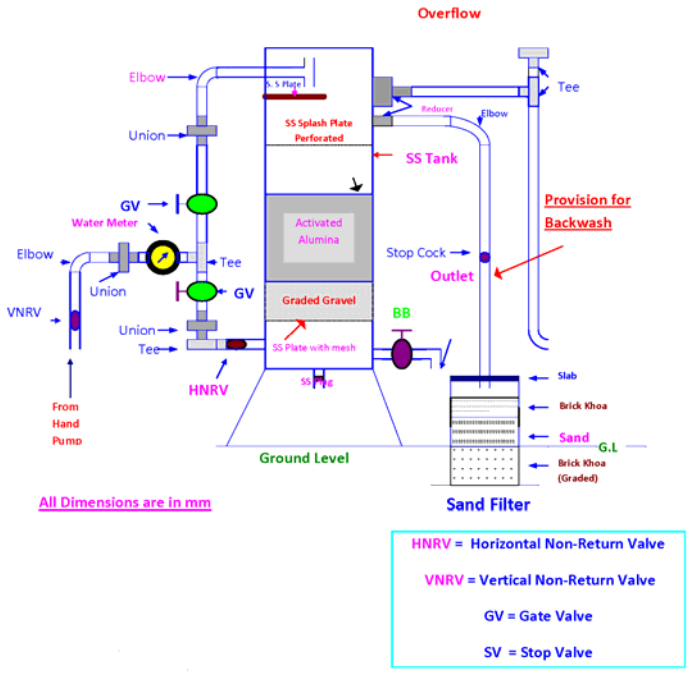
- National Academy of Engineering USA, Grainger Challenge Prize 2009- $ 200,000
- ASCE Opal Award Finalist 2008
- UNESCO Modialogo Award 2005
- Institution of Chemical Engineers, U.K. Dhirubhai Ambani Award 2008

Acknowledgements

Credit for success of this project goes to Dr. Anirban Gupta, BECDU/BESU , Dr. Arup Sengupta, Lehigh University, Pennsylvania, Dr. Sudipta Sarkar, Ex-Project Manager, Mr. Sudipta Barman, Ex-Health and Hygiene Specialist, Mr. Ranjan Biswas, BECDU/BESU and many other project staff and village community leaders.

Schematic of Hand Pump Arsenic Removal Units

AMAL Arsenic Removal Unit (Well Head or Hand Pump-Attached)



BEC 1953 Entrants – a proactive evergreen Alumni group

Amitabha Ghoshal | 57 CE

On the First Alumni Day at our beloved Institution, it is time to recall the golden memories of the years by gone.

Getting into BE College in 1953 was perhaps not as challenging, the number of applicants being only about 8000. In those days, there were very few engineering colleges apart from BEC and Jadavpur Engineering College (later Jadavpur University). At that time, Civil Engineering was not yet a course subject at Jadavpur. A newcomer had just arrived. IIT Kharagpur - which was yet to bring out their first batch of engineering students, and readily discarded by most of us – as a start-up inside the dreaded Hijlee Jail!

BEC used to accommodate students from neighboring states like, Assam, Manipur, Orissa, Bihar and also from neighboring countries like Nepal and Bhutan. All these students came through Government quota and they were lucky not to appear for Admission Tests.

The Admission Test for BEC was a big hurdle - with Engineering Drawing as one of the key subjects and applicants had to learn to draw, using Tee, Board and Set square by themselves, prior to appearing for the test. There were no coaching centres and the serious contenders had to find out, through their own contacts, someone who could teach them how to use those onerous equipment. Passing all subjects in the Admission Test was a rarity. Among the 1953 entrants of 180, there were only 21 lucky ones who earned the privilege of sharing 4 bedded room in Downing Hostel. Others had to share 8 bedded rooms or 16 bedded barracks - old asbestos sheds made during the World War for defense needs. From the 2nd year, we could aspire for single bedded rooms in new hostels like Richardson, Macdonald etc.

Time around then were highly favorable for engineering students in India. India was seriously embarking into Five-Year plans and demand for engineers were galloping in various new development projects like the first three Government owned steel plants in Bhilai, Durgapur and Rourkela (the only existing steel plants were TISCO at Jamshedpur and IISCO at Burnpur – both privately owned), the giant irrigation projects like Hirakund, DVC and the unfulfilled demands for state projects in Assam that had no engineering college. Despite this heavy demand for engineering graduates, the examination protocol in the college was tough and non-compromising. Failure in one subject would mean a repeat appearance in the supplementary examination to be held in November and failure in two subjects would mean 'Repeat' in the same class. For worse performers (who failed twice in the same class) - loomed the dreaded word 'CNR' – Can Not Repeat! Percentage of students who could complete the 4 year course in due time was low. Many had to appear for *Supplementary* or *Repeat* with the next year class. There were plenty of examples when a 'Gold Medalist' in B.Sc. from the revered Calcutta University will fail in his own subject of strength, Chemistry, in the second year examination.

It is with this background that we who entered in 1953 chose to have our get-togethers - in the style. For the "1953 Entrants" – after all the bondage was the strongest in the first year of hostel life – earning the well cherished freedom from parental control. Years after our exit from college, we still feel a surge of emotion every time there is an occasion to get face to face. We never tire of recalling the college pranks, hilarious events of the past – not always a civil affair that can be discussed freely in front of spouses. Incidentally, college was almost an all-male affair and friendship was primarily uni-gender, not scoffed yet as a gay relationship!

The first major get-together of the batch occurred in 1982, twenty-five years after the due pass- out year of 1957, and was a classy event with an entire 'ship' in our command to carry us to College Ghat inside Botanical Garden boundary, courtesy of our batch mates who were working in Second Hooghly Bridge project. Our venue for the get-together was the huge Annual Reunion pandal in the campus,- we took charge of it prior to the Reunion meeting. It was the first ever major get-together of BEC Alumni, with spouses and children of batch-mates, many of whom had not met each other since leaving college. A resolution was unanimously passed to have such get-togethers, whenever

we get opportunity. We also resolved to gather under the banner of "1953 Entrants". The pictures and reports of the event of 1982, attended by mostly batch- mates settled in India, made the substantial group of friends settled abroad, hungry for a bigger event. A get-together of 12 batch-mates from Europe, India and USA during the wedding party of daughter of a batch-mate, settled in US, triggered the first global get-together - the first boat party, held by hiring a motor boat from the Government of West Bengal Tourism department - with catering, music and dance facility in 1996. Compared to the subsequent events, it was a poor infrastructure arrangement, but that did not dampen the spirits - dancing and sharing of company together for a full day on the river Hooghly in the winter sun raised the cry – *Mera Dil Maange* More.

Golden Get-together, for celebrating 50 years of togetherness was held in 2003 with a three day event – first day on a large two storied pleasure boat with AC Hall, second day at Lake Club ground overlooking the Dhakuria Lake and the last day in our campus for a meeting with the then Vice Chancellor of BECDU and other senior faculties. Although, the idea to form Alumni Association as is seen in North American Universities was discussed in different local reunions, it is from this meeting, the formation of a Global Alumni Association for channelizing the support of all Alumni/Alumnae was crystallized. There were follow-up meetings at the Institution of Engineers building, at Writers Building, in the Campus, in USA, Canada and Middle East. The idea gained momentum through enthusiastic participation of alumni/alumnae abroad, who converted the concept into a reality.

By this time, the 1953 Entrants meet became an annual event with a day picnic, in exotic locations, with more lost faces joining in to revive their memories. The NRI batch-mates started rescheduling plans of their annual visit back home around this day and a database was created by bringing out a souvenir during the Golden get-together. This also spawned many group get-togethers at different locations all through the year.

In 2013, the undaunted 1953 Entrants, most of them hovering around 80 years, celebrated their Diamond get-together, first for any batch of Alumni anywhere in the country, and the footfall was 80, surpassing estimates. This was again a 3 day programme – first day on the same two storied pleasure boat, since revamped and decorated, the second day in Campus in the newly built Alumni Swimming Pool Complex, which provided an attractive backdrop for such a meet and the third day at Lake Club. There was long interaction with the VC and many senior faculty members at the Swimming Pool. A souvenir volume was released and productive dialogue for future development projects were initiated with the Institution authorities.

This year,1953 Entrants decided to merge their Annual get-together with the first Alumni Day organized by GAABESU, with the help of the authorities of the newly formed IIEST. 1953 Entrants, though, still like to think of it as the old BEC, as that creates the ripples in the heart - however more important IIEST may be to the present generation

This is a batch, that had favorable tail wind of development spurt behind them, and therefore could produce:

- More than 15 heads of large organizations, both in public and private sector
- Two Presidents for newly formed GAABESU
- 4 heads of large Alumni Associations in different centres
- 3 Recipients of Distinguished Alumni Award
- Recipients of more than a dozen major International awards
- Mention by name of two on the newly created BESUS History Gallery for being top office bearers of the first ever Students Union, constitution for which was also penned by other batch mates

They have been active supporters, for every Alumni sponsored event within the campus. 1953 Entrants had close association with the Alumni Seminar Hall, Alumni Swimming Pool and the latest successful venture for the renovation of the Gymnasium in campus.

BEC runs in their DNA and the campus has become a part of their family entity. Every time someone speaks well of BE College/ BECDU / BESU/IIEST, they feel happily proud, a pride that is a mixture of emotion and perpetual sense of belonging!!!

IIEST Shibpur - Mission Accomplished

Swapan Saha | 88 EE
Tarun Basu | 67 CE

(On behalf of an army of volunteers, dreamers and servants of our Alma Mater)

"As long as we have faith in our own cause and an unconquerable will to win, victory will not be denied us." – Winston Churchill

With the signing of the bill by the President of India, our Alma Mater becomes the first IIEST in the nation and our dream becomes a reality. Our mission to convert BESU to an Institute of National Importance (INI) has been accomplished. As we conclude our decade old efforts, we thought we would share with you how the mission started, how we planned and pursued it and how our mission was accomplished.

It has been an amazing journey since we posted our first message as an open appeal, to all alumni/ alumnae, in our web site, on August 10, 2003. The appeal came from the then BECDU Teacher's Association Secretary, Prof Santanu Karmakar, ('83ME). We didn't have any global organization, mailing list or any other channel to reach out. We launched a journey without knowing what we are getting into but as the days passed, we gradually became confident from the alumni responses that we are on the right track.

Between our first appeal on August 10, 2003 and President of India signing the bill on March 4, 2014, we witnessed change in power in Delhi from NDA to UPA 1 (then UPA 2) and in West Bengal from Left Front to TMC. These resulted changes in central cabinet (several Ministers at HRD, Delhi) as well as state cabinet (several Ministers of Higher Education, West Bengal). We also had changes in university administration (three VCs). Because of these changes, we encountered enormous challenges as we had to start afresh with every new administration. However, we kept our focus with strong faith in the cause. Our strategy was to get alums involved in this journey and went on to connect them one at a time. This created a snowball effect with 1000s of global alums becoming emotionally attached to the cause along with BESU students, faculty, staffs, administration, well-wishers, legislative branches in the state and at the center, executive branches in the state and at the center with a single goal to upgrade our Alma Mater to an INI first as an IIT and then as IIEST. To keep this note short, we are skipping all the details of turns and twists we had in our journey which is meticulously documented at www.becollege.org under "Mission: IIEST Shibpur".

"Faith is the bird that feels the light when the dawn is still dark."- Rabindranath Tagore

When we started the campaign, we said that it is going to be a marathon run but never expected that it is going to take over ten (10) years to achieve our goal. Our journey had ups and downs but probably more downs than ups as we had a huge challenge to convince and win one support at a time from alums, political leaders of all colors, students and administration. In the last couple of years, faculty members have pursued this goal with more intensity, often ahead of other stake-holders, led by strong leaders who did not care for any personal benefit while administration took formal process to pursue the conversion officially. Our strategy to involve everyone, to stay the course and always keeping on the top of the issues related to the campaign helped us to earn confidence of our alums who in turn helped the cause. We helped students in their campaign for the conversion that shows our Alma Mater in a positive light, collaborated with the faculty and sought help from local and national media to create awareness and legitimacy of the cause. We constantly monitored progress with our contacts and shared information with the administration to take official responses for our common cause. We believe we succeeded here as none of us were looking for personal interest or gain. As a result, we could always be objective, stay focused and transparent sharing information regularly (via web site posting and/or emails) with all our entire stake-holders, whenever and wherever required.

We thank all alumni/alumnae for their support, their passion, their trust and their active role in this historic transformation of our Alma Mater. We are sure that the present/in-transition/new administration will constantly strive to make our Alma Mater, a top tier institution in India, by fulfilling the missions and goals as envisioned by the MHRD-appointed expert commissions. We, the alums, are always ready to continue extending our hands and join other stake-holders in the rebuilding of our Alma Mater to make it a world class institution. Let us hope that our Alma Mater once again becomes the leader, as it was in the early days after independence, in training a newer class of engineers and scientists who will not only be leaders in their disciplines and but also help in meeting the growing demands of qualified technical personnel in academia and industry. As our efforts wind down, the administration will focus on the process for conversion and if any alumnus/alumna wants to help in any manner, GAABESU will be glad to get him/her in touch with them. Before we stop, we would like to remember Swami Vivekananda's words:

"Take up one idea. Make that one idea your life - think of it, dream of it, and live on that idea. Let the brain, muscles, nerves, every part of your body, be full of that idea, and just leave every other idea alone. This is the way to success."

Following Swamiji, we came up with an idea, we had our dream and we lived this dream to see our Alma Mater recognized as an INI.

বি ই কলেজের ছড়া

~ প্রসেঞ্জিত চক্রবর্তী
ইলেকট্রিকাল ১৯৮৭

বি ই কলেজ এর সুভেনিরেতে
একটা লেখা দেবার সাধ
কিন্তু, সম্পাদকের প্রবল নিষেধ
কপি করলেই সোজা বাদ /

পুরনো লেখাও চলবে না
তাতেও বিবাদ-বিসংবাদ,
তাই, গঙ্গাজলেই গঙ্গাপুজো
বিক্কলেজ-এই জিন্দাবাদ /

আঠারো থেকে বাইশ মোদের
চারটে বছর দিচ্ছে ডাক,
যেথায় আছিস, যেমন আছিস,
সবাই মিলে সুখেই থাক /

তিরাশি থেকে হিসেব কষলে,
তিরিশ বছর হচ্ছে পার,
আরো তিরিশ যোগ করলে
কজন পড়ে রইবো আর /

আগস্ট মাসের সে এক দিনে
জুটেছিলাম অনেক জন
সূটকেস, ব্যাগ, হোল্ড-অলেতে
বাড়ির ছোয়ায় ছুইয়ে মন /

প্রথম একা বাড়ির বাইরে,
মনের মধ্যে বিষম ভয়
র‍্যাগিং এর দেবতারা
অল্পে-স্বল্পে থামলে হয় /

কেউ বা ছিলাম পুরোই গ্রাম্য
কেউ বা আধা শহুরে
কেউ বা পুরো কালকাত্তাইয়া
পাত্তাই দেয়না নজরে /

তরপরেতে চারটে বছর
কেমন করে হয়েছে পার,
প্রথম দিকে দিন গুনেছি,
শেষ-এর দিনটা ভুলিনে আর /

অনেকদিনের পড়ে যখন
পিছনপানে তাকিয়ে দেখি
সুখের স্মৃতির ভিড়ের মাঝে
ঝাপসা দুঃখ জিতল সুখ-ই /

বি ই কলেজের বৌ ও জামাই

~ কৃষ্ণা চৌধূরী

(১৯৬৮ ইলেকট্রিকাল ইঞ্জিনিয়ারিং এর দেবু চৌধুরী'র স্ত্রী)

আমরা সবাই বি ই কলেজের বৌ ও জামাই
বহু যুগ দেশ ছেড়ে চলে এসেছি সবাই,
পেটের ধান্দায় এধার ওধার ঘুরে বেড়ালাম কত্ত-
কলেজের স্মৃতিতে তবু সকল সময় মত্ত।

যখন যেথায় পার্টি হত সবাই জড়ো হতাম
কলেজের সব জানা কথাই চোদ্দবার শুনতাম,
মাননীয় মাস্টারমশাইদেরকে এরা নিয়ে-
মজার মজার গল্পকথা বলত সব বানিয়ে।

বাসস্ট্যান্ডে প্রফেসারের প্রথম মোলাকাত
বৌয়ের কোলে এগারো নম্বর বাচ্চাটির সাথ,
হিন্দী শেখায় যে মাস্টার ঘেরাও করে তাকে-
ফার্স্ট ক্লাস দেয়নি বলে ফেলে দিল পাঁকে।

এমনি যত গাঁজাখুরি গল্প ভরা থলে
সারাজীবন শুনছি মোরা কাজকর্ম্ম ফেলে,
এবার যেটা বলব সবাই শুনুন দিয়ে মন-
সত্যি যেটা ঘটেছিলো করুন অনুধাবন।

পরীক্ষায় হলে বসে অঙ্ক কষতে গিয়ে
ভূলভাল সব উত্তর দেয় পর পর বসিয়ে,
ঘন্টা পড়ার সময় যখন হয়ে এল প্রায়-
হঠাৎ তখন ভূল বেরোল কি করি হায় হায়।

চোথাটি যে উল্টো করে হাতে ছিল ধরা
এতক্ষনে বোঝা গেল, এখন কি যায় করা?
সমস্যার সমাধান জলদি জলদি হল-
উত্তর সব কেটে কুটে তক্ষুনি বদলাল।

পরীক্ষার খাতা যখন পেল সবাই হাতে
বড় বড় গোল্লা দেখে ভয়েতে বুক কাঁপে,
এদের মধ্যে একজনা খুব সাহস করে বলে-
অঙ্কগুলোর উত্তর স্যার প্রায়ই গেছে মিলে।

মাস্টারমশাই রেগে বলেন শোন সবাই তোমরা
অঙ্কগুলো করেছ তো গোঁজামিলে ভরা,
ফাজলামির কি জায়গা পাওনি নামী কলেজ এটা-
পাশ করালে চাকরি যাবে বোঝোনা কি সেটা?

অঙ্ক ছিলো ওপেন চ্যানেল হাজার গ্যালোন উত্তর
সে জায়গায় কারোর খাতায় পেরোয়নি উনসত্তর,
ফাজিলটা তো ছাড়বেনা তাও যাবেই তর্ক করে-
মাস্টারমশাই জানেন বেশী ছাত্র গেল হেরে।

শেষকালে সেই ফাজিল বলে দেখুন তো স্যার ভেবে
চ্যানেলটা যে ওপেন ছিল খবর গেছে ছেপে,
বাষ্প হয়ে কত গ্যালন জল যে গেল উড়ে
গাঁয়ের বধু কলসী কলসী নিয়ে গেল ঘরে।

এরপরও যে ওইটুকু জল ছিল পড়ে সেথা
এটাই কি স্যার যথেষ্ট নয় ভেবে দেখার কথা?
এতগুলি সন্তানেরে হে বি ই জননী,
করেছো ইঞ্জিনীয়ার কিন্তু বড় তো করনি।

বি ই কলেজে ও মডেল স্কুল

~ পার্থ প্রতিম রায়
সিভিল ১৯৯৭

(ক) একটা না-প্রেমের কাহিনী

১৯৯৪ থেকে ১৯৯৬ আমরা থাকতাম হোস্টেল নয় ও তারপর হোস্টেল দশে। তখন মডেল স্কুলে ক্লাস নাইন থেকে ছেলে মেয়ে এক সাথে। আমাদের কিছু ছেলের বিকেলে কলেজ থেকে এসে বারান্দায় দাড়িয়ে মন চলে যেত স্কুলফেরত বালিকাদের দিকে। কিছু সম্পর্ক গড়ে উঠলেও, অনেকগুলো গড়ে উঠবে উঠবে করেও করেনি। এইরকম এক সম্পর্ক গড়ে না উঠার কাহিনী।

তখন আমরা হোস্টেল দশে থাকি। দুই বন্ধু, নাম ধরে নেওয়া যাক অমল আর বিমল। অমলের মডেল স্কুলের একটি মেয়েকে ভারী পছন্দ। কিন্তূ বলবে কিভাবে? সোজা রাস্তা, যদি মেয়েটিকে কোনোভাবে ইমপ্রেস করা যায়। বিমল অমলের প্রানের বন্ধু, বন্ধুর সাথে ঠিক করলো

একদিন স্কুল ছুটির সময় বিমল উল্টোদিক থেকে এসে মেয়েটিকে ইচ্ছে করে একটু ধাক্কা মারবে। প্লান অনুসারে অমল স্কুলের দিক থেকে এসে বিমলের জামার কলার ধরে দু-এক ঘা বসিয়ে দেবে। প্রত্যাশিত সেই মেয়েটি অমলকে এসে ধন্যবাদ জানাবে এবং সেই সুযোগে প্রেমকাহিনী শুরু হবে। সব ঠিক, প্লান অনুসারে অমল আর বিমল শেষ ক্লাসটা মায়া করে (মানে কেটে পড়ে) হোস্টেল চলে এলো।

স্কুল ছুটির সময় হয়েছে। দুজনে প্ল্যান অনুসারে সেই রাস্তায় নিজের নিজের জায়গায় চলে গিয়েছিল। অমল খুব উত্তেজিত, স্কুল ছুটি হয়েছে, সবাই বেরিয়ে আসছে। ওই তো সেই মেয়েটি। অমল দেখল উল্টোদিক থেকে দ্রুত হেঁটে আসছে বন্ধু বিমল। চরম উত্তেজনা, কিন্তু সেই উত্তেজনার বশেই ঘটে গেল দুর্ঘটনা।

অমল উত্তেজনার বশে ঠিক জায়গায় চলে এলেও, সময়ের একটু ভুল করে ফেলল। বিমল এসে ধাক্কা মারার আগেই হঠাৎ দৌড়ে এসে বিমলের উপর ঝাপিয়ে পড়ল। শুরু হলো কিল-চড়, যেগুলো উত্তেজনার বশে একটু জোরালোই হয়ে গিয়েছিলো। হঠাৎ কলেজের দুই ছাত্রের রাস্তায় মারামারি দেখে আশেপাশে লোকজন জড়ো হতে সময় লাগেনি। মেয়েটি ও তার বন্ধুরাও ঘাবড়ে গিয়ে দাড়িয়ে পড়ে। আশেপাশে জড়ো হওয়া লোকজন জানতে চাইলে অমল হাঁফাতে হাঁফাতে বলে, 'দেখুন না, এই ছেলেটি খুব অসভ্য। মেয়েদের সন্মান দিতে জানে না। এইতো জিজ্ঞেস করুন না এদের এসে ইচ্ছে করে ধাক্কা মারলো।"

মেয়েদের দল অবাক, 'কই এমন তো কিছু হয় নি! আমাদের সামনে আসতেই হঠাৎ এই দুজন এসে মারামারি শুরু করলো নিজেদের মধ্যে'।

বিমল তখন অমলকে প্রানপনে বোঝাতে চাইছে "অমল সময়ের ভুলে সব গণ্ডগোল হয়ে গেছে"। বুঝতে পেরে অমলেরও তখন ছেড়ে দে মা কেঁদে বাঁচি অবস্থা। জড়ো হওয়া লোকজনের বুঝতে অসুবিধে হলো না যে দুজনের কিছু বদ মতলব ছিল। তারপর সবাই মিলে অমল আর বিমলকে বেশ কয়েক ঘা দিয়ে ছেড়েছিল। তারসাথে জোটে মেয়েদের বক্রোক্তি। দুজনে জামা কাপড় ছিড়ে, মরমে মরে হোস্টেল-এ ফিরে এসেছিল। আমরা কলেজ থেকে ফিরে এসে অনেক পরে দুজনকে দেখতে পাই পাঁচতলার ছাদে জলের ট্যাঙ্কের উপর।

দুজনে গাঁজার কল্কেতে টান দিতে দিতে আকাশের তারা গুনছিল। হয়তো খুঁজছিল কোনো চিত্রা, অরুন্ধতী, রোহিণী বা স্বাতীকে।

(খ) মডেল স্কুল ও একটা হ্যাঁ-প্রেমের কাহিনী

ঘটনাটি আমাদের আসার অনেক আগেই হয়েছিল যার জীবনে তিনি কলেজের তখন (হয়তো এখনও) এক প্রফেসর। তাই নাম না বলাই ভালো। মুচিপাড়া থেকে কলেজ আসতে গেলে ওভাল আর উল্ফেনডেন হলের মাঝে একটা ভগ্নপ্রায় বাড়ি ছিল যেটা এখন আর নেই। ওটা ছিলো বিশপ কলেজের আমল থেকে অনেকদিন চালু থাকা পূর্তবিভাগের কেমিকাল ল্যাবরেটরি।

এই কাহিনীর নায়ক তখন বি ই কলেজের ছাত্র, মুচিপাড়ার এক হোস্টেলে থাকে আর নায়িকা তখন

মডেল স্কুলের ছাত্রী। অনেকদিন ইস্কুল ছুটির সময় নায়ক খালি হাতে, নোটবুক হাতে বা কোনো ফুল হাতে দাড়িয়ে থাকত, সুযোগ খুঁজত কবে সেই দিন আসবে যখন সেই ফুল নায়িকার হাতে দিয়ে বলবে 'প্রিয়ে, তুমি আমার ভাঙ্গা দাওয়ায় স্বর্ণচাঁপা রাজেন্দ্রাণী' বা গাইবে 'এই তো হেথায় কুঞ্জ ছায়ায় স্বপ্ন মধুর মোহে'। নায়িকাটির মনে কি হতো জানা না গেলেও যাবার পথে একটু হাসি উপহার দিত বা বান্ধবীদের নজর এড়িয়ে একটু পিছন ফিরে তাকাতো নায়কের দিকে, যেটাকে কলেজের ভাষায় বলা হত 'ঝাড়ি মারা'।

একদিন এক বর্ষার দিনে নায়ক দাড়িয়ে আছে; নায়িকার স্কুল ছুটি হয়েছে; সবার এক ড্রেস আর মাথায় ছাতা; নায়ক 'ঘেঁটে গেছে' (মানে confused); বুঝতে পারছে না কে সেই নায়িকা আর কে তার কোনো বান্ধবী; বিচলিত হয়ে শ্যাওলা ধরা সিড়িতে উপড় নিচে করতে গিয়ে পা পিছলে দড়াম; বেশ ভালো চোট পেয়েছিল আর তার সাথে হাত ভেঙ্গে আমাদের সেই বিখ্যাত হসপিটালে ভর্তি হতে হয়। নায়িকা হয়ত সেদিন স্কুলেই আসেনি বা এলেও এসব দেখেও স্লো মোশনে দৌড়ে আসেনি আর পিছনে একশটা ভায়োলিনও বাজে নি। বন্ধুরাই নায়ককে ডাক্তারের কাছে নিয়ে গিয়ে, হাতে প্লাস্টার করিয়ে হসপিটালে ভর্তি করে এসেছিল। আর উপদেশ দিয়েছিল এরপর থেকে আলুর দোষটা ত্যাগ করার। নায়কও ভগ্নমনে তাই মেনে নিয়েছিল।

এই কাহিনীর এখানেই শেষ হত বা হওয়া উচিত ছিল। কিন্তু কহানী মে টুইস্ট থা। তিন-চার দিন পরে সেই নায়িকা এক সিঁদুররাঙ্গা মেঘের পড়ন্ত বিকেলে টিউশন পড়তে যাওয়ার ফাঁকে একগোছা ফুল নিয়ে দেখা করতে এসেছিল। তারপর লাভার্স লেনে শরতের কাশফুল, শীতের দুপুরে বি গার্ডেনের গঙ্গার পাড়, ফুল না ফোটা বসন্তে বক্সিং রিং পেরিয়ে সেই নায়িকা আজ সেই নায়কের ঘরণী।

চিঠি

~ পিনাকী রঞ্জন চক্রবর্তী
সিভিল ১৯৬১

ছেলেবেলার বন্ধু তোরা এখন কেমন আছিস?
সদাই যেন তোদের কথা বড্ড আসে মনে ।
এখন কোথায়? কেমন তোরা?
মাঝে মাঝে কি ভুল করে আমার কথা ভাবিস?

সকাল থেকেই অস্থিরতা, স্কুলে যাবার আগে ।
খেলা না হোক, একটু তো আজ দেখা সাক্ষাত হবে ।
তোদের স্কুলটা উত্তরে আর আমার স্কুলটা পূবে ।
অধির হয়ে থাকি শুধু বিকেল কখন হবে ।

বিকেল বেলায়, সবার মেলায়, তোদের কথায়, আমার কথায়,
খেলার কথায় মজার কথায় আনন্দ যায় বয়ে।
ফুটবল বা ক্রিকেট খেলায়, কিম্বা লুকোচুরি খেলায়,
কথাও কোনো আপত্তি নেই কারো।

সন্ধ্যে হলেই চিন্তা হবে, এখন তো ভাই ফিরতে হবে,
কি করে ভাই থাকব বেশি আরো?
রবিবার দিন স্কুলে যাওয়া নেই।
সকাল থেকেই বেরিয়ে পড়, মাঠের মাঝে সবাই জড়ো,
খেলা একটা করতে হবে তাই।
কিম্বা যদি সময় থাকে, সবাই নিয়ে গুলতি হাতে
চল দুরের আম বাগানে যাই।

সময় হঠাত পেরিয়ে গেল, প্যান্টের ঝুল গেল বেড়ে,
ফল থেকে ফুল এসে গেল, চোখের নিমেষে।
কলেজ পাড়ার নতুন কথা, কালো চশমায় চোখটা ঢাকা,
চায়ের দোকান ছেড়ে জুটি কফি হাউসের অন্ধকারেতে ।

কিছু দিন না যেতেই আবার, কলেজ পাড়াও ছাড়তে হলো।
পোশাক-আশাক বদলে নিয়ে হাজির সবাই অফিস পাড়াতে।
সময় তো নেই কথা বলার সামনে আছে কাজের পাহাড়।
সকাল বিকেল ঠিক থাকেনা, চাকরি রাখার বিড়ম্বনা,
সময় যে যায় ব্যস্ততারই মাঝে।
বড় কর্তার মন যোগানোর কাজে।

এরই মাঝে এলো ঘরে নতুন ঘরনী।
অফিস-বাড়ির যাঁতায় পড়ে
ভাবছি যখন - এবার কি হয়? যায় না বুঝি বলা।
তারই মাঝে শোনা গেল চত্ব শিশুর গলা।
সংসারটা বাড়ল যত, কাজের সময় বাড়ল তত।
কমল শুধু আমার চুলের বাহার,
ডায়াবেটিস ঠিক করতে কমল আমার আহার।

ঘুমটা সেদিন হয়েছিল ভাল, সকাল বেলার কথা।
উঠে দেখি কালকে যারা ঘরে ছিল - নেইকো তাদের দেখা।
ঘরে শুধু আমরা দুজন একা।
শুন্য মনে হলো - আবার ভাবি, মাঝে মাঝে দেখা হওয়াই ভালো।
টাকা পয়সা নাই বা হলো, সবই আছে আগের মত।
বল্লে কি হয়?
শরীরটা তো মানবে না তা চেষ্টা করি যত।

আমার চিঠি পেয়ে তরা উত্তর তা লিখিস।
আমিও আবার লিখব তোদের,
সময় করে নিয়ম করে সব কিছু কাজ সেরে সুরে
ভুল হবেনা - সে কথাটা জানিস।
উত্তর টা যদি না পাস আমার,
মনে যদি চিন্তা উঠে তার,
বুঝে নিবি -
এখন থেকে চিরকালের মত আমার চিঠি আসবে না তো আর।

বি ই কলেজ, এক ভালবাসার মহাকাব্য

~ শ্যামল দাশগুপ্ত

মেটালার্জি ১৯৮০

বহু বছর পরে, যখন শেষ পারানির খেয়ায় উঠার দিন গুনছি, তখন মনে পড়ে গেল সেই সুদূর অতীতের এক দুপুরের কথা, যখন বাবার সঙ্গে এসেছিলাম, বি ই কলেজের হস্টেলে থাকতে। জিনিষপত্র গুছিয়ে বাবা যখন চলে গেল, তখন বারো নম্বর হস্টেলের ছাদের ট্যাংকের উপর থেকে সুয্যিদেব তার রক্ত ছড়াচ্ছিল, একটু পরেই ঝুপ করে আধার নেমে এসেছিল - ডাউনিং হলটাকে এক ঐতিহাসিক দুর্গর মতন লেগেছিল আর পাশের বি গার্ডেনের ছায়াঘন গাছপালা, সেইখান থেকে ক্ষণে ক্ষণে ভেসে এসেছিল শিয়ালের ডাক।

আলো আবছায়ায় হঠাৎ করে উদয় হয়েছিল, ছাটা গোঁফ, কোঁকড়ানো ঝাঁকড়া চুল-ওয়ালা - অভীকের । বলেছিল, সব ঠিকঠাক আছে, শনিবার সবাই বাড়ী গেছে, সোমবার থেকে গুলজার হয়ে যাবে । ভাবিস না, কালকে রামকৃষ্ণপুর লঞ্চঘাট থেকে গঙ্গা পেরিয়ে ময়দানে খেলা দেখতে যাওয়ার আছে, মোহনবাগান-বালি প্রতিভা, যাবি ত বল ।

সেই ঠিকঠাক পর্ব শুরু হয়ে চলেছিল পাঁচ বছর - কলেজ যখন ছাড়লাম, আজ থেকে চৌত্রিশ বছর চার মাস আগে, সেই কেটে যাওয়া বছরগুলো আজ শুধুমাত্রই একটা সংখ্যা। প্রত্যেকটা দিনই, এখনও মনে হয়, এই তো সেদিনের কথা। মস্তিষ্কের কোষে, রক্তের ডিএনএ তে মুদ্রিত হয়ে আছে সে সব দিনগুলো।

প্রথম দিন ক্লাস হয়েছিল হিউম্যানিটিস ডিপার্টমেন্টে, আলো-আবছায়ায় ভরা এক বিশাল গ্যালারিতে, সে ঘরের কড়ি-বরগা ওয়ালা ছাদ থেকে, এক বিষণ্ণ হাওয়া সারা ঘরে ঘুরপাক খাচ্ছিল - দেখেছিলাম ক্লাসের এক-তৃতীয়াংশ ভর্তি বাকী অংশতে সব ছায়া ছায়া মূর্তি বসে আছে আর মাঝে মাঝে তারা শুট-শাট করে অদৃশ্য হয়ে যাচ্ছে । সারা ক্লাস জুড়ে এক গভীর জলোচ্ছ্বাসের শব্দ ভেসে আসছে। এর মধ্যে অধ্যাপক মহাশয় গলার নীল শিরা ফুলিয়ে, প্রাচীন গ্রীস সভ্যতা ও সমাজজীবনে তার প্রভাবের উপর এক জ্বালাময়ী কিন্তু অবোধ্য ভাষণ দিয়ে চলেছেন। হঠাৎ দেখলাম, তিনি প্রচণ্ড উত্তেজিত হয়ে চতুর্থ সারির একজন অশরীরী ছাত্রকে উদ্দেশ করে বললেন, উঠে দাড়াও, তোমার রোল নম্বর কত ? ছাত্রটি সপ্রতিভ-ভাবে উত্তর দিল । 'সাড়ে সাত, স্যার'। সমুদ্রের এক বিশাল জলোচ্ছ্বাস আছড়ে পড়ল বেলাভূমিতে। আর লকগেটের ছাড়া পাওয়া জল তীব্র

গতিতে বেরিয়ে যেতে লাগল ক্লাস ছেড়ে । বিশাল ব্ল্যাক বোর্ডে লেখা হল, 'হাম কিসিসে কম নেহি' (সেই সময়ের এক বিখ্যাত হিন্দি চলচ্চিত্র)।

সেই ছিল শুরুওয়াৎ। পরবর্তী কালে আমি যার দ্বারা গভীরভাবে প্রভাবিত হয়েছিলাম, তিনি ছিলেন রসায়নের অধ্যাপক। যিনি এনট্রপি, থার্মোডায়নামিক্স পড়ানোর ফাকে ফাকে জীবনের জটিলতার গূঢ় তত্ত্ব নিয়ে আলোচনা করতেন। মধ্যপন্থা নেওয়ার যে জীবনদর্শন তিনি মাথার ভিতর ঢুকিয়ে দিয়েছিলেন, বহু যন্ত্রণা নিয়ে আজও তা বহন করে চলেছি। বি ই কলেজে ঢুকেছ, তিনি উদাসীন মুখ করে বলেছিলেন, দ্বিতীয় বা প্রথম হবার চেষ্টা কর না, জীবনের যে সুপক্ক যবের ঘ্রাণ তা বুঝতে পারবে না, দেখতে পাবে না কাঠবিড়ালির হুটোপুটি, পড়ন্ত বিকেলের বি গার্ডেনের মোলায়েম হাওয়ার আদর অথবা গঙ্গা পেড়িয়ে উৎসবের শহরের কিসিম মজা। আর শেষের দিকেও থাকার প্রলোভনটাকেও জয় করতে হবে - শেষে থাকার বড় যন্ত্রণা, জীবন যুদ্ধে এক অসুস্থ সৈনিকের মত অবস্থা হবে, রবি ঠাকুরের 'বাসবদত্তার' মতো পাচিলের বাইরে ফেলে দিয়ে সবাই এগিয়ে যাবে।

যাই হোক, সেই রোমাঞ্চকর ভাবে যে যাত্রা শুরু হয়েছিল, তা সবসময় 'সুখদা ভবতি' ছিল না। সাপ্লির হাতছানি, সেকেন্ড ক্লাসের রক্তচক্ষু, হাফ ইয়ারলি, অ্যানুয়ালের ভয়াবহ যন্ত্রণা আর ক্লাস টেস্টের খুচরো কষ্ট - হার্টের আয়ু যে অনেকটাই কমিয়ে দিয়েছিল তা বলাই বাহুল্য । কিন্তু যা সবকিছুকে ভুলিয়ে দিয়েছিল, তা হল মুক্তির স্বাদ, বাধন ছেড়ার আনন্দ । পকেটে এক প্যাকেট চারমিনার নিয়ে, ইন্সটিউট হলে, সিগারেট টানতে টানতে , ঝিরঝির করা পরদায়, শোলের 'অব তেরা ক্যায়া হোগা , কালিয়া' র উত্তেজনা, কিংবা রাত দুটোর সময় সেমেটারির পাঁচিল টপকে ভুত খুঁজতে নামা, তার কোনও জুড়ি আজও খুঁজে পাই নি।

কলেজে যখন প্রথম ঢুকি, তখন সারা দেশে জরুরী অবস্থা চালু ছিল, এক চাপা, দমবন্ধ পরিস্থিতি, চতুর্দিকে প্রতিবাদী কণ্ঠস্বরকে জোর করে গলা টিপে ধরা হচ্ছে, বি ই কলেজেও তার কোনও ব্যতিক্রম ছিল না। সেই অস্থির সময়ে, সেই সন্ত্রাসের সময়ে, নৈশ অভিযানে বেড়িয়ে, বন্ধুরা মিলে লাগিয়ে দিতাম পোস্টার, 'তানা-শাহী নেহি চলেগা', হস্টেলে চোরাগোপ্তা লিফলেট বিলি, যাতে সে প্রতিবাদ ছড়িয়ে পরে অন্যান্য জায়গায়। এই ছিল বি ই কলেজে, যে আমায় শিখিয়েছিল প্রতিবাদের ভাষা, কতিপয় অসংস্কৃত ছাত্রনেতার নীল রক্তের ঔদ্ধত্যের বিরুদ্ধে মেলে ধরেছিলাম প্রতিবাদের স্পর্ধা - সেই কলেজের জন্য আজও আমার গর্ব বোধ হয়। কত উজ্জ্বল তারকাকে লালন করেছে এই কলেজ, যতীন্দ্রনাথ সেনগুপ্ত, বাদল সরকার, বিনয় মজুমদার, বুদ্ধদেব দাশগুপ্ত, নারায়ণ সান্যাল এবং আরও আরও অনেকে। কিন্তু আক্ষেপ থেকে যায় সামগ্রিকভাবে এই কলেজ কোনদিন বাংলাদেশের সামাজিক, রাজনৈতিক বা সাংস্কৃতিক প্রতিবাদী পরিমণ্ডলের অংশ হয়ে উঠতে পারে নি। এমনকি স্বাধীনতা আন্দোলনের উত্তাল দিনেও বি ই কলেজের অংশগ্রহণের কোনও খবর আমাদের কাছে নেই। এব্যাপারে অন্য কোনরকম তথ্য থাকলে আর তা জানতে পারলে ভাল লাগবে।

বোধহয় যে অভিজাত পরিমণ্ডলের আবহে এই কলেজের জন্ম ও উত্থান, মেকলে সাহেবের চিন্তা-ভাবনার সফল রুপায়নের ফলে, বি ই কলেজ কোনদিন বাংলাদেশের রেনেসাঁর বা দেশের জাতীয়তাবাদী আন্দোলনের অংশ হয়ে উঠতে পারে নি। অবস্থার পরিবর্তন হয় ৭০ দশকে এসে, অগ্নিগর্ভ বাংলাদেশের মুল স্রোতে যুক্ত হয়ে যায় কলেজ।

১৯৭৮ সালে ভয়াবহ বৃষ্টি স্মৃতিতে এখনও উজ্জ্বল হয়ে আছে। ক্ষান্ত বর্ষণ নয়, তিনদিন ধরে প্রবল, অবিরাম সে বৃষ্টি। বারো নম্বর হস্টেলের চারতলার ঘরে বসে দেখতাম ফুসলে উঠা গঙ্গার জলে বৃষ্টির বারি ঝরছে, আর জলোচ্ছ্বাস আছড়ে পড়ছে শালিমার ঘাটে । সারা কলেজ ক্যাম্পাস ডুবু-ডুবু ।অবিরল ফোটা পড়ছে, লাভার্স লেনে, মডেল স্কুলের ছাদে, ডাউনিং হলের গম্বুজে, আড়াই নম্বর গেটে। মাঝে মাঝে যখন বৃষ্টি ধরে আসছিল, ধড়মড় করে উঠে পড়ছিলাম, কারণ অবিরাম বৃষ্টির শব্দ একটা নরম গানের মতন, একটা মনসুন সোনাটার মত শুনতে লাগছিলো, সেই সুরের জাল যখন ভেঙ্গে যাচ্ছিল, উঠে পড়ছিলাম, আবার বৃষ্টি শুরু আবার ঝিমুনি সেই তিনদিন দুবেলা জুড়ে খিচুড়ি আর লাবড়া খেয়েছিলাম, সেই অমৃত-সমান লাবড়ার গন্ধ আজও আঙ্গুলে লেগে আছে।

চৌত্রিশ বছর চার মাস পনেরো দিন পরে, যখন বি ই কলেজের ফার্স্ট গেটে দাঁড়িয়েছিলাম , সেই বৃষ্টিস্নাত কলেজ বিল্ডিং চোখের সামনে সজল হয়ে উঠেছিল - বাবার সঙ্গে কুণ্ঠিত, ভয়ার্ত চোখে একদিন যেখানে ঢুকেছিলাম, তখন ভাবি নি জীবনের কত উদ্বেল সময় , কত মনে না থাকা পুরনো কথা, কত দুঃসময়, প্রেমে-অপ্রেমের বিক্ষত মুহূর্ত, কত বন্ধু, সাথীদের স্মৃতি, কত নস্টালজিয়া এখানে জমা রেখে গেছিলাম। সেই ইট-কাঠ-কংক্রিটের বিল্ডিং সার করে নিয়ে এলো কত অনিশ্চয়তা, ব্যর্থতা আর সাফল্য ও ভাললাগার কথা।

অন্তহীন পথে আলোর যাত্রী

~ ড: অমরনাথ কুমার
মেটালার্জি ১৯৭৩

সেনট্রিনারি গেট দাঁড়িয়ে থাকে
হাতছানি দিয়ে কাছে ডাকে –
বছর বছর নিত্য নতুন মুখগুলোকে,
ভিন্ন নাম, ভিন্ন আদল, ভিন্ন তাদের চলন বলন
বেহালা কি বর্ধমান, মালদা থেকে মৌরীগ্রাম
এখান ওখান সেখান থেকে আসে উঠে পথ বেয়ে
হাত ধরে আর কাঁধ মিলিয়ে নিজস্বতা যায় হারিয়ে
এখান থেকেই চলার শুরু, পায়ে পায়ে পথ হাঁটা
দেড়শো বসন্ত পার হয়ে গেল –
তবু, আজও তো শেষ হোল না অন্তহীন এই পথে চলা
তেমনি ধারায় গড়িয়ে চলে আসা যাওয়ার নিত্য খেলা
ক্যাম্পাসে কি আজও ভাসে কোকিলের সেই মিঠে গলা
?
গেট পেরিয়ে একটু দূরে, দেবদারুদের ছায়া মাড়িয়ে
ইনস্টিউট হল ডাইনে রেখেই প্রথম প্রধান লবি

লবির পাশে ধাতুবিদ্যা বিভাগ, অরুন শীলের ছড়ি
স্মৃতির পাহাড়ে জমা আছে, নস্টালজিক কত ছবি
কলেজ সোসাল কি লবিতে হোত?
শ্যমল, আরতি, বালসারা, বটুক জমিয়ে দিতো
হাতল ভাঙা কাপের চা আর ঠোঁটের কোণে জ্বলা চারমিনর
ইস্টবেঁগল মোহনবাগানের তর্কযুদ্ধে কলেজ ক্যান্টিন মুখর
মধ্যিখানে ঝিলের পাড়ে দাঁড়িয়ে টাওয়ার ঘড়ি
ক্যাম্পাসের সব ঘটনার সাক্ষী– এক অতন্দ্র প্রহরী
কত মুখ, কত প্রেম, উত্থান, পরিবর্ধন, পরিবর্তন
দেড়শো বছর ধরে আজও লিখে যায় ইতিহাস
আজও কি ভেসে আসে গঙ্গার স্নিগ্ধ কোমল উদাস বাতাস?

ভাসছে মনে কত স্মৃতি –
ব্যক্তিত্ববান লর্ড মুখারজী, শঙ্কর সেনতো বাম ঘেঁষা
সুযোগ পেলেই কামদাবাবুর মিহি সুরে জ্ঞান দেওয়া
বসাক স্যার কড়া মেজাজী, পি পি দাসের মাছের নেশা
রোজ দুপুরে ঝিলের ধারে ছিপটি ধরে চুপটি বসা
দুর্গা ব্যানারজী ব্যক্তিত্বহীন, অলস ছিলেন ভূপাল দত্ত
চোখ নামিয়ে অঙ্ক শেখাতেন লাজুক জ্ঞানী দাশগুপ্ত
ETC'র হেড বড়াল সাহেব, অগাধ ছিল তাঁর পাণ্ডিত্য
আরও কত মুখ পড়ছে মনে, দেখা হত তখন নিত্য
ঘোড়া চ্যাটারজী, পাগলা ব্যানারজী–
এঁদের আসল নাম সবাই গেছে ভুলে
ডাউনিং সাহেবের অতৃপ্ত ছায়ামূর্তি
আজও কি দেখা যায় ডাইনিং হলে ?

ওভালে ক্রিকেট, শীতের দুপুর
লর্ডসে সকার, বৃষটি টাপুর টুপুর
দেবদারু আর কদম গাছের পাতা চুঁয়ে
নবীন কিশোর বন্দী ল্যাবে, ক্লাসে
হৈমন্তী রোদ, উদাস মন
বেড়ায় ঘুরে কোন্ ষোড়শীর মন ছুঁয়ে
ক্লাস পালিয়ে প্রক্সি দিয়ে নয়তো কিশোর
বোটানিকস্রে ছায়ায় বসে প্রেমে বিভোর
ক্যারাম, দাবা, প্লানচেট্ থেকে তিন পাত্তি
বিকেল গড়িয়ে সন্ধ্যা, নিদ্রাহীন মধ্যরাত্রি
'নাইট্ শো'তে সিনেমা, ফিরে শান্তি অখাদ্য রান্না
ফিস্ট ID কবে কোথায় এটাই যেন সবার ভাবনা
রাত দুপুরে তর্ক জমতো সাহেব বনাম মুচি পাড়া
জ্যাঠামশাই মিষ্টান্ন ভাণ্ডার আজও কি চলে –
জিলিপি, কচুরি, সন্দেশ, সিঙ্গারা?

মধুর কত স্মৃতি আজ হয়ে গেছে ধূলিধূসর
রুমমেট কবে কে ছিল–ন্যাপা, চিত্ত, ভাস্কর?
১২র দুতলার ব্যারাকে-ছিল শান্তি না ভিখারী
কত টাকা কবে একবার গিয়েছিল কার চুরি ?
অসীমদা দলনেতা ছিল -কংগ্রেস নাকি নকশাল
কলেজ বন্ধ, পরীক্ষা স্থগিত–জানি না কোন সাল?
জলে ডুবে মারা গেল বিশু, অনুপমটা গেল কি করে?
৭১র স্পোর্টস মিটে আমরা কি শেষে গেলাম হেরে?
ড্রয়িং ক্লাসটা কে যে নিতেন, প্রক্টর ছিলেন কে
NCC ক্যাম্প কোথায় হল, ভুলে যাই কত কি যে

দেড়শো বছর ধরে হেঁটেছে এ পথে
কৃতি উজ্জ্বল অসাধারণ কত নাম

পড়ায় খেলায় সংগঠন বা শিল্পকলায়
চলতে চলতে জ্বালিয়ে গেছে কত আলো
কেউ দাদা, কেউ বন্ধু, কেউবা ছোট ভাই
অল্প কথায় তাদের একটু স্মরণ করে যাই
বাঙালীর গর্ব স্যার R N মুখারজী, স্যার বীরেন মুখারজী
মৈনাকদা, সুব্রত রায়, ভোলা সেনের কি ছিল
মেটালারজি
নির্মাল্য, প্রদীপকে সবাই চেনে-আমার ব্যাচের প্রথম
সারি
অমিতাভদা, চৈতন্যদা, ইন্দ্রনীল-এদের কি আর ভুলতে
পারি
মনে রাখার কত নাম-জ্যোতি, সমরদা, প্রতীপ, সমীর
বংশানুক্রমে হেঁটেছে এ পথে এমনি কত আছে নজীর ।

নতুন মুখে আর নতুন নামে
হাত ধরে আর কাঁধ ঠেকিয়ে
মাটি ছুঁয়ে আর পা মিলিয়ে
দেড়শো বছর ধরে আমাদের এই যে অন্তহীন পথ চলা
আজও তো শেষ হল না
হয়তো শেষ হবে না কোনদিনও
তাই, নব প্রজন্মকে নতুন করে স্মৃতি বিস্মৃতির গল্প বলা
।।

~ জুলাই ২০১৩

ভাল থাকার কলা ও কৌশল

(THE ART OF BEING WELL)

একটি বৈজ্ঞানিক ও ব্যবহারিক উপায়ে স্পন্দনশীল স্বাস্থ্য

~ জহরলাল গঙ্গোপাধ্যায়
মেকানিকাল ১৯৬৭

সুস্বাগত। আপনি কি চান সুস্বাস্থ্যের অধিকারী হ'তে? আপনি কি এখন যেরকম অনুভব করছেন, তার থেকে আরও ভাল অনুভূতি চান? যদি উত্তর হ্যাঁ হয় তবে পড়ুন। আমি *জীবনানন্দ, আপনাদের "আরোগ্য চমৎকার" প্রসঙ্গে কিছু বলতে চাই।*

"আরোগ্য চমৎকার"

আপনি যদি অন্ধকার ঘরে বাতি জ্বালান, তবে অন্ধকারের কি হয়? অন্ধকারের বিনাশ হয়। ঘর আলোকিত হয়, তাই না? আপনাকে এই নিয়ে কোন বচসা ক'রতে হবে না, মারামারি ক'রতে হবেনা, পরীক্ষা করতে হবে না, এমনকি এটা কি করে হ'লো তাও বুঝতে হবে না, আপনাকে শুধু সঠিক বোতামটি টিপতে হবে তাহ'লেই অন্ধকারের বিনাশ।

এই "*আরোগ্য চমৎকার*" *প্রায় আপনার শরীরের বাতির বোতামটি টেপারই মতো। আপনি আপনার শরীরের সঠিক বোতামটি টিপুন এবং* সুস্বাস্থ্যের *অধিকারী হোন।* আপনাকে এই নিয়ে কোন বচসা ক'রতে হবে না, মারামারি ক'রতে হবে না, পরীক্ষা করতে হবে না, এমনকি এটা কি করে হ'লো তাও বুঝতে হবে না, আপনাকে আপনার শরীরের সঠিক বোতামটি টিপতে হবে তাহ'লেই শরীর আলোকিত এবং নিরাময় হবে। *আপনি কি এবিষয়ে জানতে উৎসুক?* যদি উত্তর হ্যাঁ হয় তবে পড়ুন।

১.০. ভূমিকা

"মানুষ মরণশীল" - একথা ধ্রুব সত্য। তাহ'লে আমরা কেন চাই না একটু ভালভাবে বাঁচতে?

আমাদের জীবনকাল অল্পস্থায়ী। ভাগবত গীতায় শ্রীকৃষ্ণ বলেছেন, "জাতস্যহি ধ্রুব মৃত্যু..." তাহ'লে আমরা কেন অযথা সময়ের অপচয় করি? আমরা এই মূল্যবান সময়ের অপচয় বন্ধকরে তার যোগ্য প্রয়োগ করি না কেন?

আমি যখন অষ্টম শ্রেণীতে পড়ি, আমাকে একটি রচনা লিখতে হয়েছিল। বিষয় ছিল, "আজ যদি আমার জীবনের শেষ দিন হ'তো, আমি তাহ'লে কি করতে চাইতাম!" - এ প্রশ্ন আমার মনে সর্বদাই জাগে, এমনকি আজও এ প্রশ্ন আমাকে অভিভূত করে।

তখন হাতে মাত্র ২৪ঘন্টা সময়, আর আমি কিংকর্তব্যবিমুঢ় - কিযে করবো, কি-বিষয়ে লিখবো তার কূলকিনারা ক'রতে পারছি না। তখন হঠাৎ আমার মন ব'ললো – "তোর যা ভাল লাগে, তোর যা ভাল মনে হয়, তাই কর না?"। তখন আমার যেন ধ্যান ভাঙ্গলো। ভাবলাম সত্যিই তো, আমার যা বিশ্বাস, যা ভাল মনে হয়, যা সকলের জন্য ভাল - তাই করি না কেন!

এ প্রশ্ন আমার মনের গভীরে বাসা বাঁধে, আজও আমাকে স্মরণ করিয়ে দেয় যে আগামী দিনে আমার কি করণীয়। এ প্রশ্নই আমার পাথেয়, আমার আগামী পথের আলো, এ আলোই আমার ভবিষ্যতের পথ প্রদর্শক।

একথা সত্যি যে একদিন আমাদের এই গ্রহ থেকে বিদায় নিতেই হবে। কোথায় যাব তা আমাদের জানা নেই। তবে আমরা কেন এই অবস্থানকালকে মধুর ও ফলপ্রসূ করে রাখার চেষ্টা থেকে বিরত থাকি? আমাদের এই লক্ষ্যে পৌঁছুতে আমাদের প্রথমেই দরকার - সবল, নীরোগ শরীর, সুস্বাস্থ্য।

তাহ'লে আমরা ব'লতে পারি যে আমাদের দরকার সুস্বাস্থ্য। স্বাস্থ্যই সম্পদ। সুস্বাস্থ্য নিয়ে আসবে সুখ,শান্তি ও সমৃদ্ধি। তাই না?

তাহ'লে আমাদের জানা দরকার স্বাস্থ্যরক্ষার প্রকৃষ্ট উপায় এবং কি ক'রে আমরা এই সম্পদের অধিকারী হ'তে পারি?

- KUP ক'রে
- K হ'চ্ছে Knowledge, মানে জ্ঞান আহরণ
- U হ'চ্ছে Understanding, মানে সঠিকভাবে বোঝা
- P হ'চ্ছে Practice, মানে অনুশীলন

২.০ জ্ঞান কিভাবে পাওয়া যায়?

- পড়ে
- বিভিন্ন শাস্ত্র/ ধর্মগ্রন্থ – বেদ, বেদান্ত, বাইবেল, কোরান, টোরা ইত্যাদি
- মহাকাব্য - রামায়ণ, মহাভারত, ইলিয়ট, ওডিসি ইত্যাদি
- গীতা
- বিভিন্ন লেখকের লেখা
- কথোপকথন শুনে ইত্যাদি

২.১ সঠিকভাবে কি ক'রে বোঝা যায়?

- আমাদের চিন্তাধারা থেকে - নিরন্তর পড়াশুনো, জিজ্ঞাসা?
- নিজেকে, শিক্ষককে, গুরুকে ইত্যাদি

২.২ অনুশীলন কিভাবে ক'রতে হবে?

ভাল থাকার কলা ও কৌশল (AoBW) প্রয়োগ ক'রে

৩.০ আমাদের স্বাস্থ্য কিভাবে প্রভাবিত হয়?

- আমাদের চিন্তাধারা ও আমাদের ব্যবহার
- এক নজরে মনে হবে আমরা যা ভাবছি তাই ক'রছি, কিন্ত বিশেষভাবে দেখলে বোঝা যাবে আমাদের ভাবা আর করার মধ্যে অনেক অন্তর থাকে
- সুতরাং, আমাদের ভাবার ও করার মধ্যের অন্তরকে দূর করতে হবে। তার জন্যে চাই বিশেষ শিক্ষণ। সুস্বাস্থ্যের জন্যে চাই আমাদের দৈনন্দিন জীবনে বিশেষ নির্দেশিকার প্রয়োগবিধি - বিশেষজ্ঞদের কাছ থেকে অথবা নিজের অন্তঃকরণ থেকে এই প্রয়োগবিধি উপলব্ধি করা যায়।

৩.১ শুধু অনুশীলনেই কি ফল হবে?

- শুধুমাত্র অনুশীলনে হবে না।
- বারবার অনুশীলনের প্রয়োজন। রোজ অন্তত ৪০ মিনিট।
- শুধুমাত্র শারিরীক অনুশীলনে হবে না।
- মানসিক অনুশীলনেরও প্রয়োজন।

৪.০ স্বাস্থ্য নীতি

সৃষ্টিকর্তা সমস্ত রকম দরকারি উপাদানের ব্যবস্থা ক'রে আমাদের শরীরকে গঠন করেছেন যাতে আমাদের শরীর নিজের শক্তি ব্যবহার করে ২৪ x ৭ আমাদের স্বাস্থ্য বজায় রাখতে পারে। এর জন্যে বাইরের কোনও সাহায্যের দরকার হয় না, অবশ্য তার জন্যে আমাদের শরীরকে যথাযথ ভাবে তৈরি ক'রতে হবে। যা করে ঐ সমস্ত প্রয়োজনীয় উপাদান প্রকৃতি থেকে নিয়ে শরীরে সংরক্ষিত থাকে। আমাদের শরীর আসলে নিজেই ডাক্তার, নিজেই কেমিষ্ট। প্রয়োজনমত ওষুধ তৈরি করে নেয়। কি, বিশ্বাস হচ্ছে না? "বিশ্বাসে মিলিবে বস্তু তর্কে বহু দূর" । আমাদের শরীর শতসহস্র ট্রিলিয়ন কোষ দিয়ে

গঠিত। প্রতিনিয়তই শতসহস্র কোষ মরছে এবং আমাদের শরীর নিজেই দরকারমত ঐ মৃত কোষগুলোকে প্রতিস্থাপন ক'রছে শরীরকে সুস্থ রাখার জন্য। একাজ শরীর নিজেই চমৎকারভাবে অহরহ সুসম্পন্ন ক'রছে - এর জন্য শরীর কারোর নির্দেশের অপেক্ষা রাখে না। কি, বিশ্বাস হচ্ছে? যদি তা না হ'তো তাহলে আমরা অহরহই অসুস্থ হ'য়ে পড়তাম।

সুতরাং আমরা ব'লতে পারি যে আমাদের স্বাস্থ্যকে বজায় রাখার জন্য শরীর প্রতিনিয়তই অসীম সংখ্যক সংশোধনী কার্য্য নিপুনভাবে ক'রছে - এইতো একটা চমৎকার, বিস্ময়। কি, তাইনা? এ যদি সত্যি হয় তবে মানুষ কেন স্বাস্থ্য হারায়!

৪.১ স্বাস্থ্যহানির কারণ

আমাদের শরীরের পুষ্টির জন্য দরকার যথেষ্ট পরিমাণ শক্তি ও প্রোটিন। এটা আমরা বাতাবরণ ও জীবনধারণের রসদের মাধ্যমে পাই। সুতরাং পৌষ্টিক আহার এবং শুদ্ধ বাতাবরণের প্রয়োজন। কিন্তু আজ বাতাবরণ দুষিত, খাদ্যও তথৈবচ। এমতাবস্থায় শরীর যদি সংশোধন কাজে অক্ষম হয় তবেই স্বাস্থ্যহানি ঘটে।

সুতরাং শরীরকে আরও বেশী সচেতন ও সজাগ রাখা প্রয়োজন। এটা সম্ভব যদি আমরা সেভাবে শরীরকে তৈরি করি। শরীরকে আমরা যথেষ্ট পরিমাণে শক্তি ও প্রোটিন সরবরাহ করি যা ক'রে শরীরের প্রয়োজনমত দরকারি উপাদনগুলো শরীরে বজায় থাকে, অভাব নাহয়। প্রয়োজনীয় সামগ্রীর অভাব হলে শরীরে কোষের পতন শুরু হয় এবং শরীর অসুস্থ হ'য়ে পড়ে।

৫.০ প্রতিকারের উপায়

ডাক্তারের পরামর্শ! প্রেসকিপশন্ মত ওষুধ খাওয়া!! আমাদের রোগের কি ঐ ওষুধ খেয়ে নিরাময় হবে?

আসলে পৃথিবীতে এমন কোনও ওষুধ আজও তৈরি হয়নি যে সেই ওষুধে রোগের সম্পূর্ণ নিরাময় হবে। সাময়িক উপশম সম্ভব তবে নিরাময় নয়। আবার হবার সম্ভাবনা এবং ফলে কোষের আরও ক্ষয়, ক্ষতি ও পতনের সম্ভাবনা থাকে।

৬.০ কি করা প্রয়োজন?

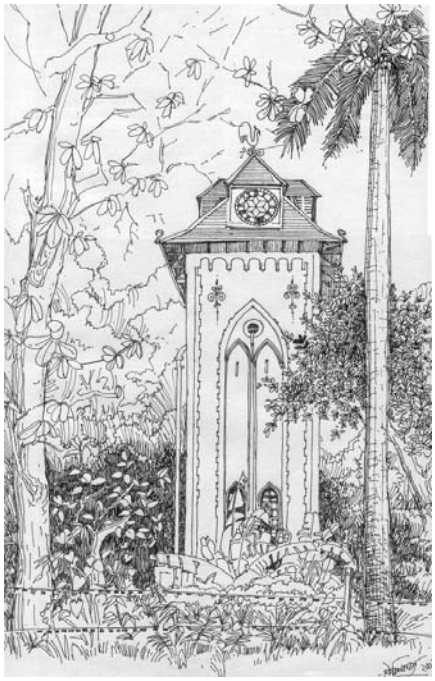
- কোষ পতনের রোধ ও পূনর্জন্ম।
- বিপরীতমুখী প্রক্রিয়া।
- শরীরের প্রয়োজন মত খাদ্য ব্যবস্থা
- অপ্রয়োজনীয়, অস্বাস্থ্যকর খাদ্য পরিত্যাগ

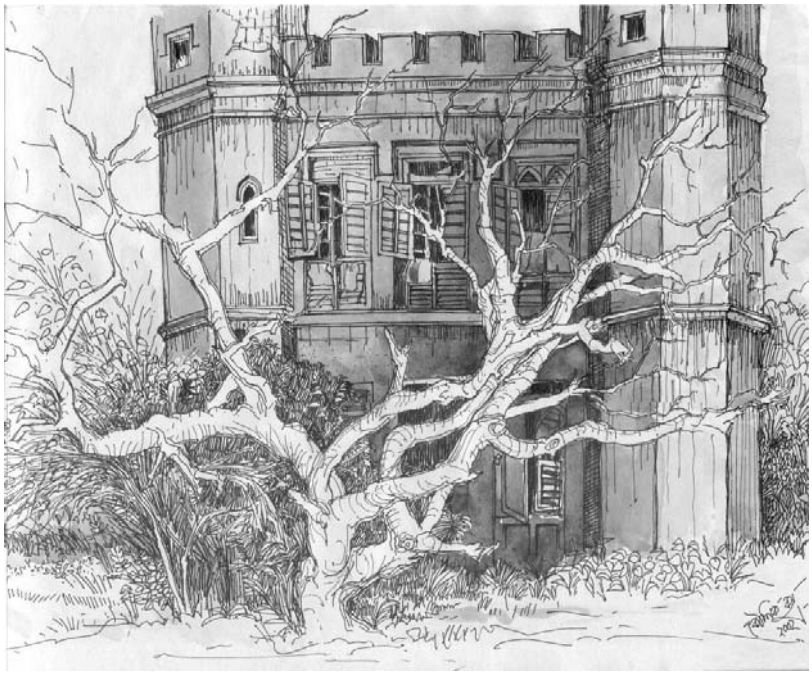
৬.১ আপনি, শুধু আপনিই এ ব্যাপারে সচেতন ও সজাগ থাকতে পারেন

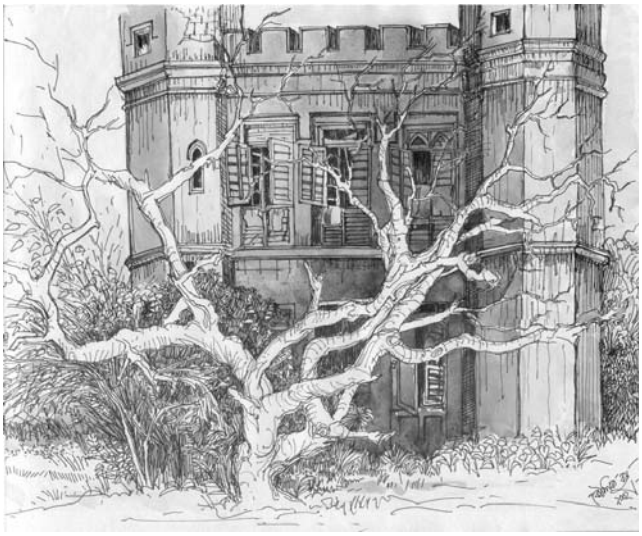
- আপনিই আপনার মাস্টার। বাইরের কোনও লোক এ ব্যাপারে সাহায্য করতে পারবেন না।
- আপনিই পারবেন আপনার শরীরের কোষ পতনের রোধ এবং ওদের পুনর্জন্ম প্রক্রিয়া শুরু করতে।
- ঐ প্রক্রিয়া শুরু হ'লেই স্বাস্থ্যের উন্নতি এবং হৃত স্বাস্থ্য পুনরুদ্ধার

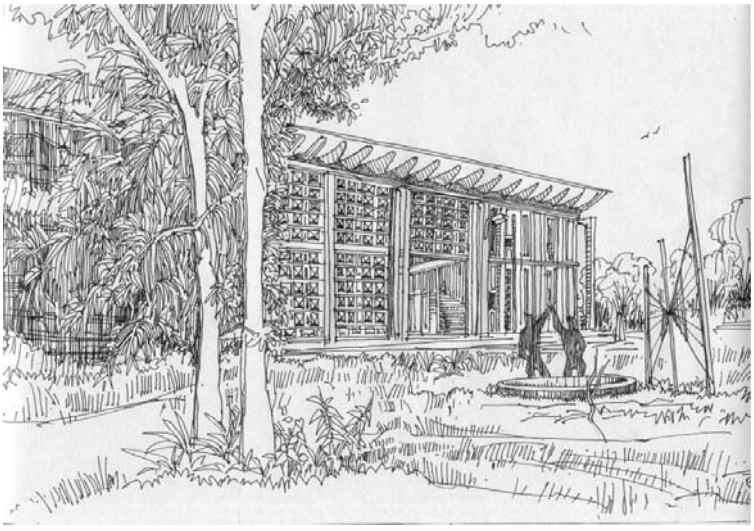
"Early to bed early to rise makes a man wise"

আসুন আমরা আমাদের কাজ করি, বাকী কাজ শরীরকে করতে দিন



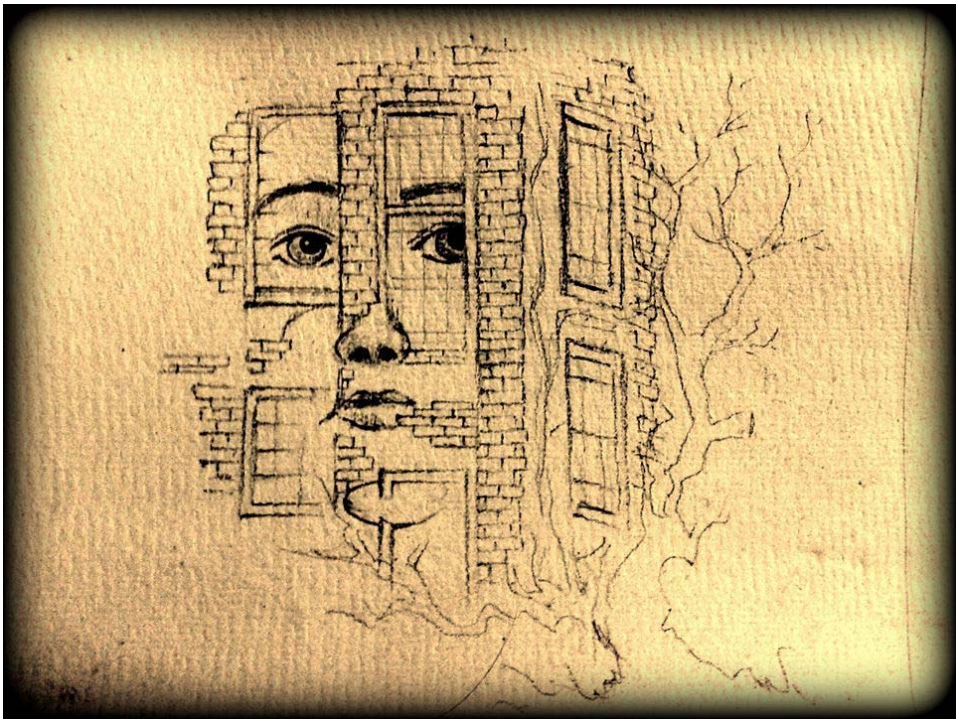






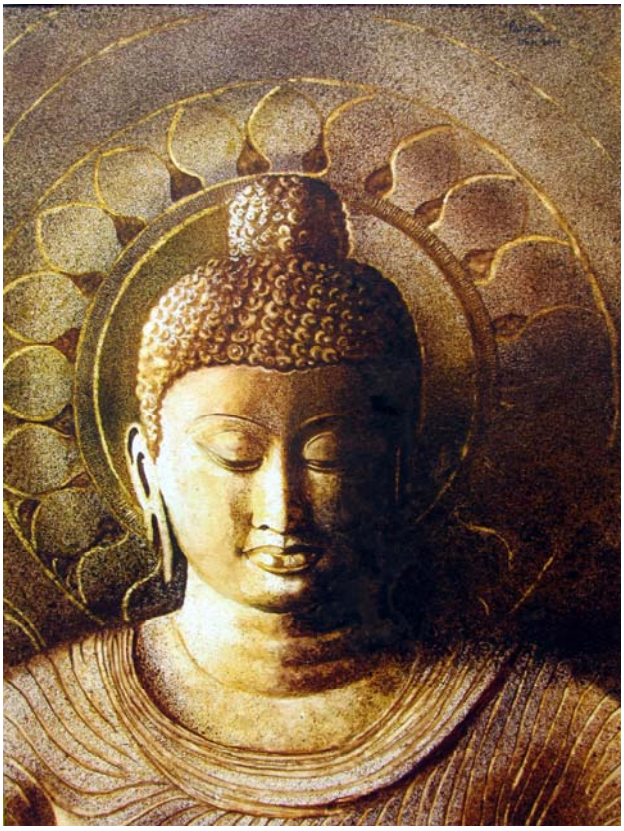
Sketches by:

Kaushik Basu | 03 **EE**



Sketches by:

Nirabhra Mandal | 3rd Year **ETC**

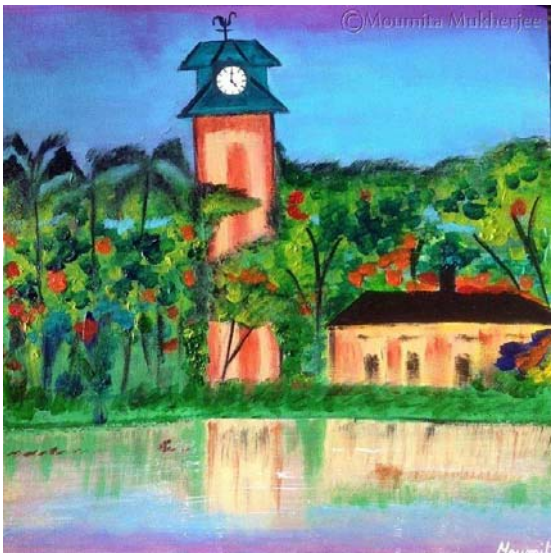


Sketch by:

Partha Pratim Ghosh | 67 CE

Sketch by:

Rajjyoti Mandal | 12 ME



Artwork by:

Moumita Mukherjee | 94 CE

Chapter Photos

BEC Group Muscat Picnic, 2012

BEC Group Nepal, 2013

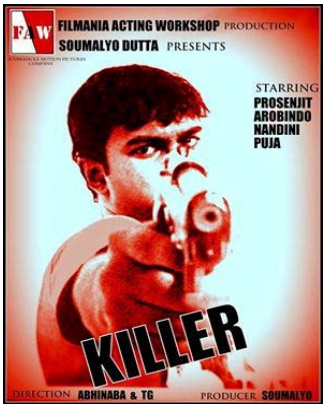
BEC Group Ranchi

BEC Group UAE, 2014

BEC Group UK, 2009

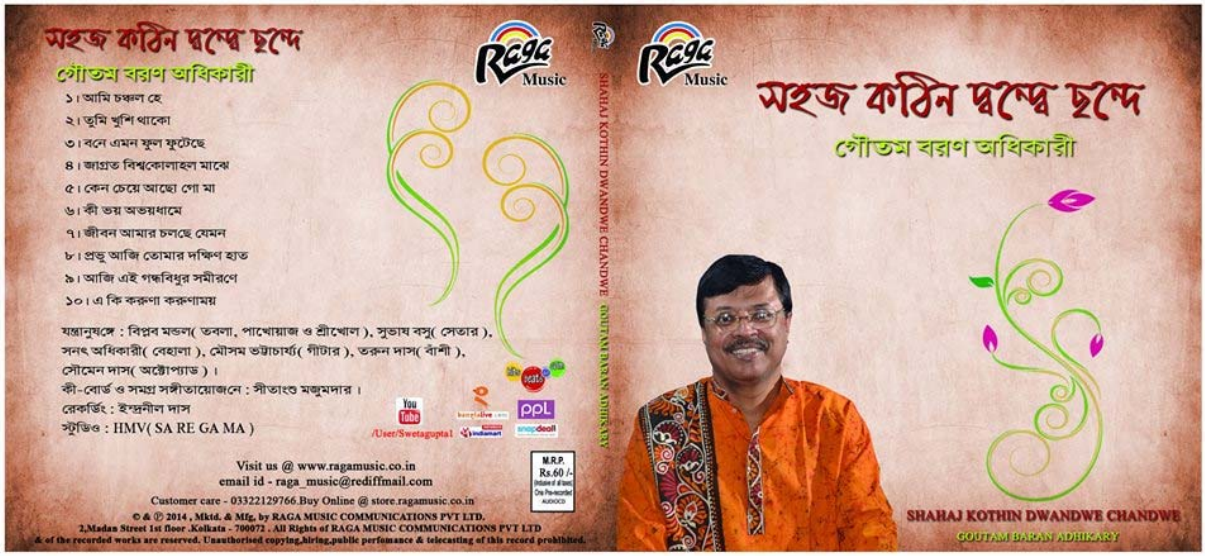
BEC Group UK, 2007

BEC Group UK, 2008

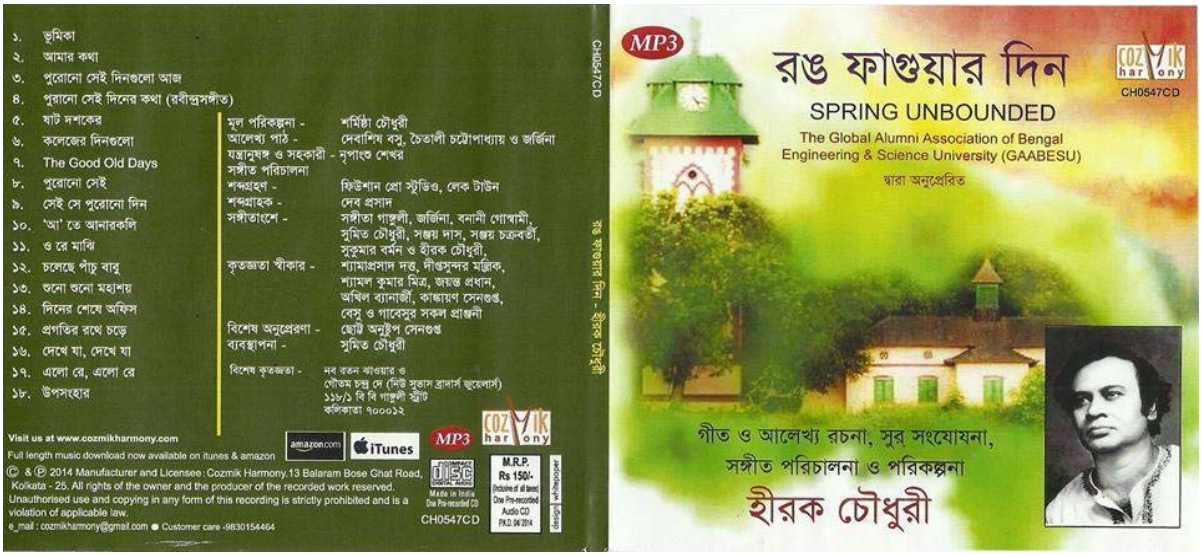


Tathagata | **13** CE

Saptarshi Sarker | 14 ME

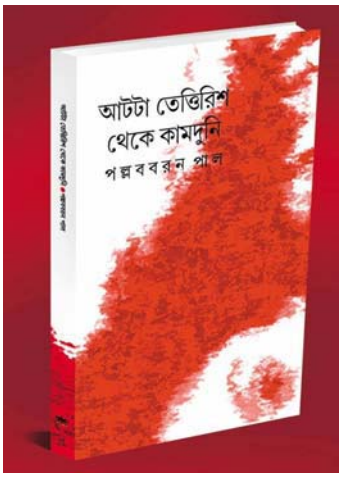


Goutam Baran Adhikary | 78 ARCH

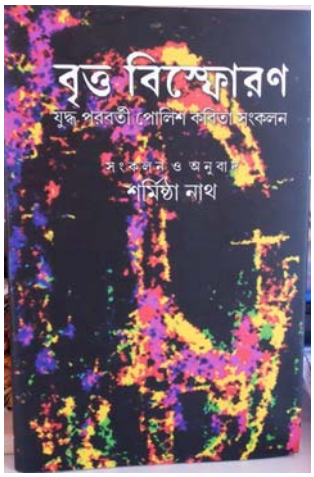


Hirak Chowdhury | 69 ME

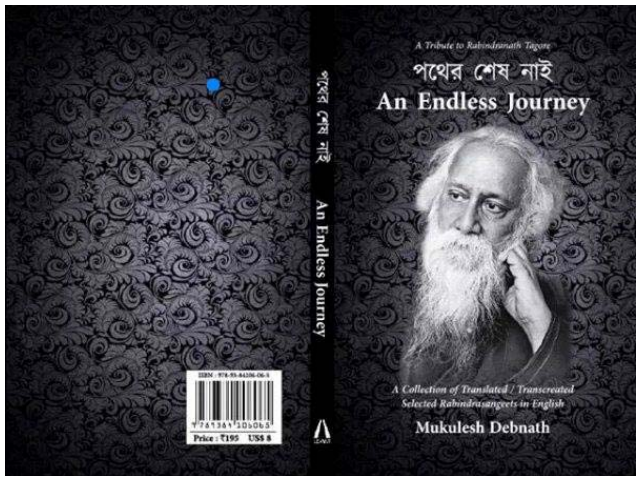
Book Releases By Alumni



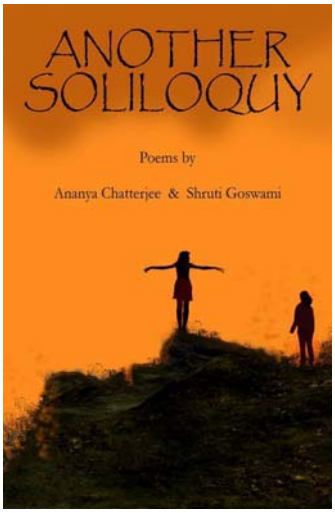
Pallab Baran Pal | 75 ARCH



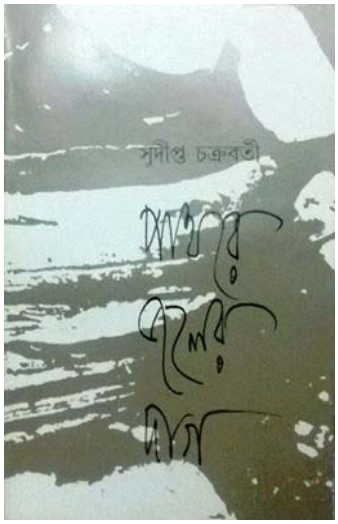
Sarmistha Mukhopadhyay | 87 CST



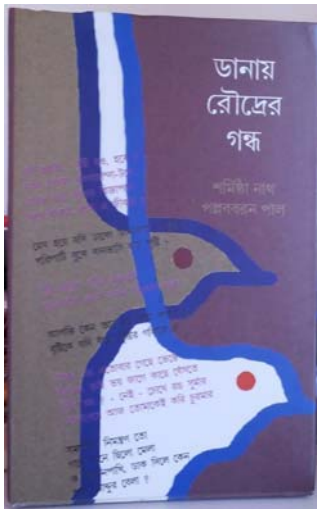
Mukulesh Debnath | 95 CE



Shruti Goswami | 04 ARCH



Sudipto Chakraborty | 82 ARCH



Sarmistha Mukhopadhyay | 87 CST

OBITUARIES: 2014

In 2014, many of our alumni left us for the heavenly abode. The following provides a comprehensive alphabetical list of such alumni that GAABESU has been made aware of.

NAME	YR	DEPT
Abhijit Ghosh	1988	MIN
Alok Basu	1963	CE
Alok Kumar Banerjee	1974	MET
Anup Chakraborty	1974	CE
Arabinda Sain	1965	CE
Arun Kanti Basu	1947	CE
Ashis Chakravarty	1982	ME
Bhaskar Sarkar	1980	EE
Bidyut Kanti Dutta	1969	MET
Bipul Bardhan Roy	1951	CE
Chandan Chaudhuri,	1970	ME
Debasis Majumdar	1975	EE
Gopal Kumar Mukherjee	1958	CE
Himangsu Sekhar Sinha	1950	CE
Kalyan Basu	1966	CE
Kalyan Kumar Biswas	1947	CE
Madhusudan Paldas	1959	CE
Nibaran Manna	1974	EE
Parimal Chandra Ray	1963	CE
Parthasarathi Bhattacharya	1965	ME
Prabal Datta	1979	ME
Prabir Nath	1965	ME
Pradip Kumar Ray	1965	CE
Pradip Kumar Sandel	1964	ME
Pradip Ranjan Dhar	1969	MET
Prashanta Pal	1974	ME
Pratap Sengupta	1966	CE
Priyabrata Sen	1963	EE
Ranjit Ghosh	1968	EE
Ratneswar Bose	1950	CE
Samar Basu	1966	MET
Sambhunath Ghosh	1956	CE
Soumitra Mukherjee	1972	CE
Souvik Ghosh	1999	CE
Subhabrata Bagchi	1967	CE
Subhas Chakraborty	1969	ME
Sukanti Ray	1981	EE
Sukhen Chatterjee	1957	CE
Tapan Mukherjee	1963	CE
Tarit Pandit	1957	CE
Tuhin Ghosh	1967	CE
Uday Sankar Das	1971	CE

On behalf everyone at GAABESU, we offer our sincere condolence to their families and friends. We pray for the eternal peace of the departed souls.

Donor List For 2014 Alumni Day

Name	YR	DEP	Sum	State
CANADA (in USD)				
Tapas Das	1978	CE	100	AB
Dilip Dasmohapatra	1966	CE	100	AB
Jyoti R Sengupta	1954	CE	100	ON
Sushanta K Bhattacharyya	1981	CE	100	AB
UNITED STATES (in USD)				
Tarun Podder	1988	ME	100	OH
Saroj Bhol	1965	CE	100	NJ
Indrani Ghatare (Datta)	1989	MET	200	CA
Tarun Basu	1967	CE	100	TX
Amitabha Chatterjee	1965	CE	100	NJ
Geeta Pyne	1989	CST	100	CA
Sujit Ghosh	1990	ETC	100	OH
Avijit Saha	1981	EE	100	NJ
Saumitra Sinha	1981	MET	100	WA
Prabal Mukherji	1963	ME	200	NY
Biswajit Sengupta	1981	EE	100	NJ
Bhaskar DasGupta	1981	EE	250	NJ
Debabrata Chaudhuri	1968	EE	100	NJ
Surajit Pramanick	1989	MIN	500	CA
Shyam Adhikari	1973	MET	100	VA
Subhasis Saha	1981	ETC	100	CA
Biswajit Ray	1981	EE	100	PA
Biman Ghosh	1981	MET	100	OH
Swapan Saha	1988	EE	200	CA
Jyoti Mazumder	1972	MET	100	MI
Pratik Moulik	1963	CE	151	TX
Sujan Bhattacharya	1981	CE	100	GA
Pinaki R. Chakrabarti	1961	CE	101	CA
Hemendra Talesara	1981	ETC	100	TX

Name	YR	DEP	Sum	State
INDIA (in INR)				
Kaustubh Dasgupta	1997	CE	5000	WB

GAABESU Member List: 2014 (Upto 12th December, 2014)

Over the years, many alumni have become life members of this organization. The following is a comprehensive list of members by year of graduation and department.

Associate Members

Suryasarathi Barat
Elizabeth Sengupta
Prabodh K. Chatterjee
Debasis Baral
Mainak Sengupta
Subhasis Bhaumik
Smita Chowdhry
Prabir K. Paul
Amartya Kumar Bhattacharya
Debashis Pal

Members

**Deceased*

Full Name	Year	Dept
Mihir Chatterjee	1945	CE
Satyabrata Sarkar	1945	MET
Kambunath Chakraborty	1948	CE
Sunil K. Majumder	1948	ME
Ashis Bindu Ghosh	1949	ME
Chiranjib K. Sarkar	1951	CE
Himangshu Guha Biswas	1951	CE
Sushil K. Basu	1951	ME
Bhudeb Lodh	1952	EE
Asish Sengupta	1953	CE
Himangshu K. Bhanja*	1953	CE

Full Name	Year	Dept
Dhruba N. Roy	1953	ME
Deba Prasad Maitra	1954	ARCH
Jyoti R. Sengupta	1954	CE
Tarun K. Basu *	1954	CE
Biswanath Chatterjee	1954	EE
Diljit S. Ahluwalia	1954	ME
Matindra N. Bagchi	1955	CE
Nihar Kumar Sen	1955	CE
Nirmal K. Basu *	1955	CE
Promode Ranjan Dutt	1955	CE
Rajendra K. Banerjee	1955	CE
Satyen M. Guha Biswas	1955	CE
Sitanshu S. Ganguli	1955	CE
Srikumar Ghosh	1955	CE
Jyotirmoy Ray	1955	MET
N.K. Mitra	1955	MET
Dhiraj Chanda	1956	CE
Kajal K. Gupta	1956	CE
Bimal K. Bose	1956	EE
Rory A. Fonseca	1957	ARCH
Amar Banerjee	1957	CE
Amitabha Dasgupta	1957	CE
Amitabha Ghoshal	1957	CE
Amiya K. Dan	1957	CE
Apurba K. Dasgupta	1957	CE
Arun K. Deb	1957	CE
Asoke K. Shee	1957	CE
Gouranga Ganguli	1957	CE
Gunendu K. Majumdar	1957	CE
Manju K. Chowdhury	1957	CE
Nirendra N. Banerjee	1957	CE
Paramesh Ranjan Dhar	1957	CE
Ranendra N. Banerjee	1957	CE
Rathindra C. Bardhan	1957	CE
Shankha K. Banerji	1957	CE
Sudhangsu S. Chakrabarty	1957	CE
Suhas Choudry *	1957	CE
Susanta Kumar Dutta	1957	CE

Full Name	Year	Dept
Bimal De	1957	EE
Subinoy Mazumdar	1957	EE
Utpal K. Roy	1957	EE
Arun K. Mazumdar	1958	CE
Binay B. Nag	1958	CE
Biren Thakur	1958	CE
Debabrata Kar	1958	CE
Dulal C. Datta	1958	CE
Ajit K. Chattopadhyay	1958	EE
Dipak Chatterjee	1958	MET
Parijat K. Chatterjee	1958	MET
Pranab Sen	1959	ARCH
Yatin Ghosh	1959	ARCH
Anandapran Gupta	1959	CE
Ashok K. Mukherjee	1959	CE
Basudeb Mukherji	1959	CE
Debnarayan Indu	1959	CE
Himansu K. Banerjee	1959	CE
Satchidananda Sur	1959	CE
Somendra K. Majumder	1959	CE
Somesh Ch. Mitra	1959	CE
Subrata Ray	1959	CE
Sujit Roy	1959	CE
Madan M. Bera	1959	EE
Ranjay Roy	1959	EE
Debabrata Bhattacharjee	1959	ME
Karunamoy Bose	1960	ARCH
Deepak Mitra	1960	CE
Girindra C. Roy	1960	CE
Jadavendra N. Roy	1960	CE
Moulir Kishore Chatterjee	1960	CE
Mukul Ray	1960	CE
Nripen Acharya	1960	CE
Subir K. Sarkar	1960	CE
Ajit K. Saha	1960	EE
Ajit Mukherjee	1960	EE
Arun Kanjilal	1960	EE
Sourindra M. Bose	1960	EE

Full Name	Year	Dept
Sumit Roy	1960	EE
Sanjib Mukherji	1960	ME
Tushar K. Roy	1960	MET
Asoke Kumar Sengupta	1961	CE
Kanishka Bishi	1961	CE
Kumud R. Roy	1961	CE
Nilkamal Sengupta	1961	CE
Pinaki R. Chakrabarti	1961	CE
Samir P. Lahiri	1961	CE
Siba Prosad Basu Mallick	1961	CE
Tapas K. Sarkar	1961	CE
Tapobrata Sanyal	1961	CE
Dilip K. Bhattacharya	1961	EE
Manoj K. Ghosh	1961	EE
Paresh N. Coomer	1961	EE
Rabindra K. Rai Dastidar	1961	EE
Rajat Bhadra	1961	EE
Subir K. Ghosh	1961	EE
Achyut Ghosh	1961	ME
Chirantan Chattopadhyaya	1961	ME
Jyotsnamoy Chakraborty	1961	ME
Madan G. Singh	1961	ME
Rupak Datta	1961	ME
Subrata Datta	1961	ME
Tarak N. Mitra	1961	ME
Amiya Chakrabarty	1961	MET
Arun K. Ghosh	1961	MET
Niti R. Nag	1961	MET
Prodyot Ganguly	1961	MET
Sanat Kumar Roy	1961	MET
Syamal K. Lahiri	1961	MET
Borun K. Basu	1961	MIN
Kalyan Dasgupta	1961	MIN
Parimal K. Chakrabarti	1961	MIN
Amal K. Dam	1962	CE
Amal K. Sen	1962	CE
Amar Nath Ray	1962	CE
Arobindo Dutt	1962	CE

Full Name	Year	Dept
Asim K. Mitra	1962	CE
Asit K. Sahu	1962	CE
Bibhas C. Neogi	1962	CE
Chandan Ray	1962	CE
Kalyan K. Mukherjee	1962	CE
Kartik C. Ta	1962	CE
Prabir K. Neogi	1962	CE
Prabir K. Som	1962	CE
Pradip K. Basu	1962	CE
Prasad K. Datta	1962	CE
Sadhan R. Banerjee	1962	CE
Sailendra N. Chatterjee	1962	CE
Salil C. Roy	1962	CE
Samarjit Chatterjee	1962	CE
Sheikh Manihudin	1962	CE
Sitansu Saha Bhowmik	1962	CE
Tapan Datta	1962	CE
Tapan Kumar Datta	1962	CE
Taraprasad Basu	1962	CE
Jamini K. Das*	1962	EE
Prabir K. Basu	1962	EE
Sibabrata Mukherjee	1962	EE
Amitabha Ghosh	1962	ME
Amiya K. Dey	1962	ME
Arun Banerjee	1962	ME
Samir Gupta	1962	ME
Tapas K. Bagchi	1962	ME
Kalyan M. Goswami	1962	MET
Debjani Majumdar	1963	ARCH
Dipak Majumdar	1963	ARCH
Monideep Chattopadhyay	1963	ARCH
Alok Ghosh	1963	CE
Amitabha Sen	1963	CE
Arun K. Hazra	1963	CE
Ashok K. Dasgupta	1963	CE
Asish Das	1963	CE
Asish Kamal Basu	1963	CE
Gan Mukhopadhyay	1963	CE

Full Name	Year	Dept
Jayanta Majumder	1963	CE
Nandalal Ghosh	1963	CE
Partha Ganguly	1963	CE
Pradip K. Bhaumik	1963	CE
Pratik Moulick	1963	CE
Prodyot K. Basu	1963	CE
Sankar P. Mitra	1963	CE
Santosh K. Saha	1963	CE
Sitanshu S. Sinha	1963	CE
Subrata Saha	1963	CE
Sunil K. Das	1963	CE
Abdul Karim	1963	EE
Asit K. Palit	1963	ME
Priya K. Das	1963	ME
Jayanta Mazumdar	1963	MET
Manoj Guha	1963	MET
Nabendu S. Choudhury	1963	MET
Samares Bandyopadhyay	1963	MIN
Subhash C. Ray	1963	MIN
Dulal Mukherjee	1964	ARCH
Arjun G. Roy Mukherjee	1964	CE
Arunkumar Sur	1964	CE
Asim Mukhopadhyay	1964	CE
Asok K. Mookerjee	1964	CE
Chira P. Roy	1964	CE
Kamala P. Ghoshal	1964	CE
Nirmal K. Maitra	1964	CE
Sanat K. Ghosh	1964	CE
Sauren Guha-Majumdar	1964	CE
Subir K. Sen	1964	CE
Amarendra K. Samaddar Chaudhuri	1964	EE
Chiranjib Chatterji	1964	EE
Kalyan Basu	1964	EE
Prabir Sen	1964	EE
Samir Basu	1964	EE
Satyen Basu	1964	EE
Debasish Samanta	1964	ME
Kusal Das	1964	ME

Full Name	Year	Dept
Priyatosh Majumdar	1964	ME
Subrata Mitra	1964	ME
Siba P. Ray	1964	MET
Pijush K. Dey	1965	ARCH
Abhijit Ghosh	1965	CE
Amarnath Chakrabarty	1965	CE
Amitabha Chatterjee	1965	CE
Arun K. Niyogi	1965	CE
Asok Datta	1965	CE
Bijan Behari Datta	1965	CE
Biplab K. Ganguly	1965	CE
Dipak Sengupta	1965	CE
Madhusudan Kundu	1965	CE
Manoj K. Ghosh	1965	CE
Milanendu Chakravorty	1965	CE
Partha S. Chakrabarti	1965	CE
Pradip K. Mukherjee	1965	CE
Pradip Kumar Ray*	1965	CE
Pranab K. Gun	1965	CE
Prasenjit Datta Roy	1965	CE
Rathindra Guha Majumdar	1965	CE
Santosh K. Sinha	1965	CE
Saroj Bhol	1965	CE
Dhruba Majumdar	1965	EE
Dilip K. Pal	1965	EE
Jayanta K. Mitra	1965	EE
Santanu Chatterjee *	1965	EE
Baidya N. Roy	1965	ME
Dibyendu Bhattacharya	1965	ME
Dipankar Ganguly	1965	ME
Ramesh Chatterjee	1965	ME
Rathin Basu	1965	ME
Samir K. Pal	1965	ME
Utpal Sen	1965	ME
Dibyajyoti . Aichbhaumik	1965	MET
Asok Ku. Ghosh	1965	MIN
Aloke Kr. Sinha	1966	CE
Amalendu Ghosh	1966	CE

Full Name	Year	Dept
Arunabha Saha	1966	CE
Asim K. Mukhopadhyay	1966	CE
Basab Majumdar	1966	CE
Bibek Bose	1966	CE
Bisuddha N. Datta	1966	CE
Dilip K. Dasmohapatra	1966	CE
Dipak Bhattacharya	1966	CE
Kalyan K. Basu	1966	CE
Pankaj Chakravorty	1966	CE
Pradip K. De	1966	CE
Rajat K. Chakrabarty	1966	CE
Saroj K. Kayal	1966	CE
Shyamal Bhattacharya	1966	CE
Shyamalesh Sanyal	1966	CE
Subodh K. Nandy	1966	CE
Subrata Mukherjee	1966	CE
Tarun Tarafdar	1966	CE
Tathagata Roy	1966	CE
Biswa B. Nandy	1966	EE
Gauranga Mookherjee	1966	EE
Manasij Das	1966	EE
Pijush K. Deb	1966	EE
Siharan De	1966	EE
Arya K. Sengupta	1966	ME
Chunilal Saha	1966	ME
Pijush K. Das	1966	ME
Arun Deb Mukherji	1966	MET
Santosh K. Pattanayak	1966	MIN
Gourdas Roy	1967	ARCH
Sabyasachi G. Dastidar	1967	ARCH
Aloke K. Chowdhury	1967	CE
Amal K. De	1967	CE
Arjun Banerjee	1967	CE
Bhabani P. Ghosh	1967	CE
Bhaskar Nandy Majumdar	1967	CE
Chandidas Sanyal	1967	CE
Deba Prasad Datta	1967	CE
Dulal C. Dey	1967	CE

Full Name	Year	Dept
Dulal Goldar	1967	CE
Jahar R. Sarkar	1967	CE
Jyoti Ranjan Roy	1967	CE
Kajal Ghosh	1967	CE
Md. Rafique	1967	CE
Partha Pratim Ghosh	1967	CE
Partha Sircar	1967	CE
Prabir Joardar	1967	CE
Pradip Ra. Dutt	1967	CE
Pradosh P. Ghosh	1967	CE
Prasanta K. Saha	1967	CE
Sanjatamitra Basu	1967	CE
Shankar Bose	1967	CE
Shyamal K. Mitra	1967	CE
Sisir K. Das	1967	CE
Subrata Mazumdar	1967	CE
Sunandan Dasgupta	1967	CE
Syama Prasad Datta	1967	CE
Tapash K. Roy Chowdhuri	1967	CE
Tarun K. Basu	1967	CE
Asok Kumar Goswami	1967	EE
Biplab Mukhopadhyay	1967	EE
Dipankar Ghosh	1967	EE
Ashok K. Pal	1967	ME
Dipak Chaudhuri	1967	ME
Jaharlal Gangopadhyay	1967	ME
Malay K. Kar	1967	ME
Manindra Hazra	1967	ME
Narayan P. Mukherjee	1967	ME
Ranjit Kumar Mitra	1967	ME
Rathindra M. Ghosh	1967	ME
S Chidambar	1967	ME
Santanu Chatterjee	1967	ME
Sunil K. Das	1967	ME
Syamal B. Ghosh Dastidar	1967	ME
Syamalendu Chakrabarti*	1967	ME
Subrata Dasgupta	1967	MET
Amarnath Chakrabarti *	1968	CE

Full Name	Year	Dept
Asit Chakrabarty	1968	CE
Bidyut K. Saha	1968	CE
Chandan K. Mukhopadhyay	1968	CE
Himangsu K. Ghosh	1968	CE
Manojit Sukul	1968	CE
Nara N. Ray	1968	CE
Prabir Das	1968	CE
Prabir K. Sen	1968	CE
Rebati Das	1968	CE
Saibal Ghosh	1968	CE
Swapan Das	1968	CE
Ujjal Dasgupta	1968	CE
Indra Kumar Basu	1968	EE
Kishore C. Acharya	1968	EE
Mantu Dey	1968	EE
Subir C. Set *	1968	EE
Dipak Chaudhuri	1968	ME
Nirmal Sarkar	1968	ME
Shyam S. Ganguly	1968	ME
Subhendu Dasgupta	1968	ME
Asim K. Basu	1968	MIN
Prasad R. Das	1969	ARCH
Amit K. Sarkar	1969	CE
Amitava Sarkar	1969	CE
Anuj K. Banerjee	1969	CE
Asim K. Mazumdar	1969	CE
Champak Sadhu	1969	CE
Debabrata Datta	1969	CE
Premdas Ray	1969	CE
Shanta BS. Tuladhar	1969	CE
Subir K. Basu	1969	CE
Susobhan Ghosh	1969	CE
Anuradha Saha	1969	EE
Asok K. Pal	1969	EE
Asok Mukherjee	1969	EE
Asok Sur	1969	EE
Paritosh Chatterjee	1969	EE
Prabir K. Sengupta	1969	EE

Full Name	Year	Dept
Biswanath Datta	1969	ME
Hirak Choudhury	1969	ME
Jhankar Basu	1969	ME
Prabir K. Bagchi	1969	ME
Ranjit K. Sen	1969	ME
Asok K. Chakrabarti	1970	CE
Biplab K. Dey	1970	CE
Debendra K. Banwet	1970	CE
Debidas Dutta	1970	CE
Dwijendra N. Ghosh	1970	CE
Gautam Chattopadhyay	1970	CE
Kallol K. Sarkar	1970	CE
Nihar Biswas	1970	CE
Pradip Das	1970	CE
Ramaprasad Bhattacharya	1970	CE
Sushil K. Sengupta	1970	CE
Tapan Mukherjee	1970	CE
Mrinmoy Ghosh Choudhury	1970	ME
Pranab K. Dutta	1970	ME
Rabindra N. Sarkar	1970	ME
Ranesh K. Ray	1970	ME
Sankar Ba. Das	1970	ME
Smritis C. Pattanayak	1970	ME
Sisir K. Gangopadhyay	1970	MET
Abhijit Sen	1971	ARCH
Amalendu Basak	1971	CE
Deb K. Majumdar	1971	CE
Dhrubajyoti Bhattacharya	1971	CE
Ramesh R. Handa	1971	CE
Sarosij Majumdar	1971	CE
Shyam S. Mondal	1971	CE
Smarajit Roy Chaudhury	1971	CE
Somnath Ghosh	1971	CE
Subir Chowdhury	1971	CE
Sujit Das	1971	CE
Sujitendra N. Chakraborti	1971	CE
Apurba N. Das	1971	EE
Prabal Ka. Choudhury	1971	EE

Full Name	Year	Dept
Probir K. Roy	1971	EE
Vivekananda Sengupta	1971	EE
Amitabha Sen	1971	ME
Ardhendu Chatterjee	1971	ME
Arun Basak	1971	ME
Barun K. Basak	1971	ME
Biplab K. Das	1971	ME
Dhruba Brata Ray	1971	ME
Indrajit Karmakar	1971	ME
Pradip K. Mukhopadhyay	1971	ME
Prasad Ranjan Sen	1971	ME
Probir Chandra Chatterjee	1971	ME
Ranjit K. Bhaumik	1971	ME
Sougata Chaudhuri	1971	ME
Sukhendu Majumdar	1971	ME
Swapan K. Ghosh	1971	ME
Tapas K. Som	1971	ME
Ajit K. Roy	1971	MET
Asish K. Saha	1972	CE
Balaram Mukherjee	1972	CE
Nirmalya Daschaklader	1972	CE
Prabir C. Basu	1972	CE
Swapan Kumar Nag	1972	CE
Partha S. Ghosh Roy	1972	EE
Sarat K. Sarkar	1972	EE
Barun Majumdar	1972	ME
Chandan Mohinta	1972	ME
Ranjit Chaudhuri	1972	ME
Shyamal K. Chakraborty	1972	ME
Tapan K. Mandal	1972	ME
Jyotirmoy Mazumder	1972	MET
Ashok K. Sarkar	1972	MIN
Ananta D. Dutta	1973	CE
Badri N. Basak	1973	CE
Buddhadeb Ray	1973	CE
Hillol Ray	1973	CE
Nirmalya Bandyopadhyay	1973	CE
Partha Aich	1973	CE

Full Name	Year	Dept
Pradip Chattopadhyay	1973	CE
Ritwik Datta	1973	CE
Sanjib Chaki	1973	CE
Amal K. Adhikari	1973	ME
Pradip C. Mukhopadhyay	1973	ME
Rathindranath Kundu	1973	ME
Tapan Mukherjee	1973	ME
Shyam Adhikari	1973	MET
Pradip Sarkar	1974	ARCH
Sandip Kumar Mukhopadhyay	1974	ARCH
Abhijit Dutta	1974	CE
Alok Gupta	1974	CE
Amitabha Datta	1974	CE
Ansuman Bhattacharya	1974	CE
Debendra Narayan Chattopadhyay	1974	CE
Dipankar Mukherjee	1974	CE
Manik Chandra Banerjee	1974	CE
Nirmal Basu	1974	CE
Parimal C. Ghosh	1974	CE
Saibal Baul	1974	CE
Sanjoy K. Chakraborty	1974	CE
Satyesh Datta Majumder	1974	CE
Subir Mitra	1974	CE
Sudip K. Mukherjee	1974	CE
Sukanta Chatterjee	1974	CE
Tushar Ranjan Mukherjee	1974	CE
Nagarajan Prabhakar	1974	EE
Nirmal K. Bhattacharyya	1974	EE
Subhankar De	1974	EE
Sukumar C. Konar	1974	EE
Ajoy Kumar Ray	1974	ETC
Dipankar Mukherjee	1974	ETC
Saibal Chattejee	1974	ETC
Sekhar R. Bhadra Chaudhuri	1974	ETC
Tarun Bhattacharyya	1974	ETC
Debmalya Sinha	1974	ME
Dipak Kumar Mazumdar*	1974	ME
Dipta Sundar Mallick	1974	ME

Full Name	Year	Dept
Himadri Ghosh Hazra	1974	ME
Saroj Deb	1974	ME
Karun K. Saha	1975	CE
Pradip Sengupta	1975	CE
Somnath Chatterjee	1975	CE
Tarun K. Ganguli	1975	CE
Ashis K. Ghosh	1975	ME
Asim K. Bose	1975	ME
Basab Mukherjee	1975	ME
Jayanta Bhaduri	1975	ME
Jhulan Basu	1975	ME
Shantanu Chakravarty	1975	ME
Bholanath Sen	1975	MET
Nilratan Bandyopadhyay	1975	MET
Subrata Chatterjee	1975	MET
Sujay K. Dutta	1975	MET
N. Chakraborty	1976	ARCH
Naba K. Chakrabarty	1976	ARCH
Amit K. Samanta	1976	CE
Ashok Arya	1976	CE
Dipak Chakrabarty	1976	CE
Barun Bhattacharya	1976	EE
Debashis Ghosh	1976	EE
Dipankar Chakraborty	1976	EE
Gautam Bandyopadhyay	1976	EE
Gautam Nath	1976	EE
Anjan K. Ghosh	1976	ETC
Arabinda Roy	1976	ETC
Bholanath Pal	1976	ETC
Pradyot Biswas	1976	ETC
Subhasis Sanyal	1976	ETC
Amitava Jana	1976	ME
Chandan Chowdhury	1976	ME
Dulal C. Ray	1976	ME
Pradip K. Sengupta	1976	MIN
Saibal Nandy	1977	ARCH
Amitava Ghosh	1977	CE
Deb Prosad De	1977	CE

Full Name	Year	Dept
Debananda Basak	1977	CE
Gautam Bhattacharya	1977	CE
Himadri Kanti Pal	1977	CE
Rajkumar Das	1977	CE
Sekhar Basu	1977	CE
Debabrata Guha	1977	EE
Moloy K. Ganguly	1977	EE
Sumanta Chaudhuri	1977	EE
Anjana Ganguly Roy	1977	ETC
Arnab Banerjee	1977	ETC
Asim Deb	1977	ETC
Sukanta K. Roy	1977	ETC
Swapan Baidya	1977	ETC
Tapan K. Goutam	1977	ETC
Abhijit Dutta	1977	ME
Amit Palit	1977	ME
Anup Rakhit	1977	ME
Debanjan Datta	1977	ME
Nikhil R. Banerjea	1977	ME
Sandip Datta	1977	ME
Sandip Rudra	1977	ME
Swapan Talukdar	1977	ME
Anjan K. Das	1978	CE
Deb K. De	1978	CE
Kausik Banerjee	1978	CE
Pranab Kumar Basu	1978	CE
Sudipta Chakraborty	1978	CE
Tapas Das	1978	CE
Manoj Bhattacharya	1978	EE
Bijnan Bandyopadhyay	1978	ETC
Amit K. Bose	1978	ME
Gautam Chaudhuri	1978	ME
Satyajit Bose	1978	ME
Sisir K. Guha	1978	ME
Somnath Chakrabarti	1978	ME
Sujit K. Basak	1978	ME
Partha S. Mallik	1978	MET
Sumit Banerjee	1978	MET

Full Name	Year	Dept
Aditya Bandyopadhyay	1979	ARCH
Deepa Ray	1979	ARCH
Rupak K. Bhattacharyya	1979	CE
Sandip K. Bhadra	1979	CE
Siladitya Ganguly	1979	CE
Srikumar Bhattacharya	1979	CE
Sriman K. Bhattacharyya	1979	CE
Amit K. Das	1979	EE
Amitabha Ghosh	1979	EE
Asim K. Sen	1979	EE
Kalyan Sircar	1979	EE
Nirmal Hazra	1979	EE
Sarada P. Banerjee	1979	EE
Manu Das	1979	ETC
Ramanath Datta	1979	ETC
Sankar P. Mandal	1979	ETC
Sumitra Sinha	1979	ETC
Swapan Basu	1979	ETC
Archan K. Bhattacharya	1979	ME
Ashish K. Das	1979	ME
Gautam Biswas	1979	ME
Gour G. Choudhuri	1979	ME
Pradip K. Ray	1979	ME
Pranab Sengupta	1979	ME
Sandip Pal	1979	ME
Subrata R. Debnath	1979	ME
Sukdeb Sarkar	1979	ME
Tanmoy Das	1979	ME
Arunava Lahiri	1979	MET
Asit Biswas	1979	MET
Tilottama Lahiri	1980	ARCH
Gautam Mandal	1980	CE
Amit K. Chatterjee	1980	ETC
Pallabi Chatterjee	1980	ETC
Rajat Gupta	1980	ETC
Anjan Bhattacharya	1980	ME
Anuj Biswas	1980	ME
Asish K. Das	1980	ME

Full Name	Year	Dept
Chitrabhanu Ray	1980	ME
Debasish Chakraborti	1980	ME
Parthasarathi Bandyopadhyay	1980	ME
Sankar Nath Shome	1980	ME
Saradindu Mitra	1980	ME
Subhashish Majumdar	1980	ME
Anjan Gupta	1981	ARCH
Biswajit Mondal	1981	ARCH
Subhas C. Basu	1981	ARCH
Supratik Bhattacharya	1981	ARCH
Agnimitra Bhattacharya	1981	CE
Chandi P. Khanra	1981	CE
Debashis Ghosh	1981	CE
Gautam Mukhopadhyay	1981	CE
Goutom Bandyopadhyay	1981	CE
Nikhil R. Chatterjee (Chattopadhyay)	1981	CE
Purnendu Ray	1981	CE
Ranjan Palit	1981	CE
Rupak Sarkar	1981	CE
Saumitra Ray	1981	CE
Subhasish Bhattacharyya	1981	CE
Subrata Kar	1981	CE
Sujan K. Bhattacharya	1981	CE
Sujit Mukhopadhyay	1981	CE
Sushanta K. Bhattacharyya	1981	CE
Swarup Bhattacharjee	1981	CE
Tamal Bhattacharya	1981	CE
Ajoy Chakrabarti	1981	EE
Amitava Roy	1981	EE
Atanu Ghosh Chowdhury	1981	EE
Avijit Saha	1981	EE
Basab Ghosh	1981	EE
Bhaskar Dasgupta	1981	EE
Biswajit Sengupta	1981	EE
Biswajit Ray	1981	EE
Biswarup Saha	1981	EE
Debabrata Sengupta	1981	EE
Dilip Basu	1981	EE

Full Name	Year	Dept
Dipankar Guin	1981	EE
Jaydip Gupta	1981	EE
Pallab Bhattacharya	1981	EE
Ranjit Ganguly	1981	EE
Somnath Ray	1981	EE
Soumitro Banerjee	1981	EE
Sriparna Chattopadhyay (Samanta)	1981	EE
Subrata K. Kapat	1981	EE
Sushanta Roy	1981	EE
Ajit C. Bordoloi	1981	ETC
Aloke R. Bhunia	1981	ETC
Bani P. Guhathakurta	1981	ETC
Debasish Datta	1981	ETC
Dhiraj Bhaumik	1981	ETC
Hemendra Talesara	1981	ETC
Jagadish C. Maity	1981	ETC
Kabita Jha	1981	ETC
Nirmal Das	1981	ETC
Saibal Pal	1981	ETC
Subhasis Saha	1981	ETC
Sunit Datta	1981	ETC
Amaresh Chowdhury	1981	ME
Arindam Ghosh	1981	ME
Basab Roy	1981	ME
Chanchal Bardhan	1981	ME
Chanchal K. Nath	1981	ME
Gautam Das	1981	ME
Gour M. Bakshi	1981	ME
Manas Kumar Samanta	1981	ME
Manimay Ghosh	1981	ME
Mrigankamauli Ray	1981	ME
Panchanan Banerjee	1981	ME
Parag Majumdar	1981	ME
Prabhat K. Paul	1981	ME
Ratan Basu	1981	ME
Sabyasachi Sarkar	1981	ME
Samir Dey	1981	ME
Samit Datta	1981	ME

Full Name	Year	Dept
Sankar P. Ghosh	1981	ME
Shyamal Bhattacharya	1981	ME
Somnath Basu	1981	ME
Sukanta Dey Roy	1981	ME
Tilak Raj Datta	1981	ME
Tushar K. Nanda	1981	ME
Arun Baran Ghosh	1981	MET
Bidyut Chakrabarty	1981	MET
Bikash Ch. Roy	1981	MET
Biman Ghosh	1981	MET
Biswajit Hazra	1981	MET
Gurprit Singh	1981	MET
Pinaki Ranjan Nag	1981	MET
Pradip Goswami	1981	MET
Pradip K. Patra	1981	MET
Saumitra Sinha	1981	MET
Subhasis Sircar	1981	MET
Susil Das	1981	MET
Bhaskar Nath	1981	MIN
Prabir K. Palit	1981	MIN
Soumitra Chatterjee	1982	ARCH
Amit Chakraborty	1982	CE
Biswajit Mitra	1982	EE
Prabir Kumar Chattopadhyay	1982	EE
Samir K. Bhowmick	1982	EE
Sudip Majumder	1982	EE
Tara Sankar Adhikari	1982	EE
Arup Bhattacharya	1982	ETC
Barun K. Biswas	1982	ETC
Gouri S. Das	1982	ETC
Kausik Sengupta	1982	ETC
Bhim C. Sadhukhan	1982	ME
Debabrata Maiti	1982	ME
Debkanti Bandyopadhyay	1982	ME
Dibyendu Sarkar	1982	ME
Saktimoy Goswami	1982	ME
Tapas Ghosh	1982	ME
Bhatu K. Pal	1982	MIN

Full Name	Year	Dept
Indranath Sinha	1982	MIN
Devkusum Datta	1983	ARCH
Joydeb Ghosh	1983	ARCH
Sarbani Kar	1983	ARCH
Abhijit Pakrashi	1983	CE
Arnab Chatterjee	1983	CE
Ashish K. Basu	1983	CE
Biswajit Chakraborty	1983	CE
Debashis Roy	1983	CE
Nirjhar Dhang	1983	CE
Prasanta Ku. Ghosh	1983	CE
Sandipan Goswami	1983	CE
Sankha Roy	1983	CE
Saumitra K. Maiti	1983	CE
Sourabh Mukhopadhyay	1983	CE
Subhajit Saraswati	1983	CE
Tanmay Biswas	1983	CE
Abhijit Bhaumik	1983	EE
Amitabha Chatterjee	1983	EE
Aniruddha Ray	1983	EE
Arunava Mukhopadhyay	1983	EE
Bhaskar Thyagarajan	1983	EE
Chinmay Kumar Haldar	1983	EE
Kanai Banerjee	1983	EE
Lipika Chatterjee	1983	EE
Pritam Basu	1983	EE
Rajiv Murarka	1983	EE
Goutam Biswas	1983	ETC
Nidrita Mitra Sinha	1983	ETC
Satyaranjan Mukhopadhyay	1983	ETC
Subhadip Bose	1983	ETC
Biswajit Nandy	1983	ME
Partha Sarathi Banerjee	1983	ME
Santanu Bagchi	1983	ME
Santanu K. Karmakar	1983	ME
Santanu N. Goswami	1983	ME
Somnath Das	1983	ME
Sudipta K. Mukherjee	1983	ME

Full Name	Year	Dept
Tarun K. Singha	1983	ME
Indranil Manna	1983	MET
Biswajit Mukherjee	1984	ARCH
Banibrata Mondal	1984	CE
Biman Bandyopadhyay	1984	CE
Prasanta Ku. Das	1984	CE
Sarit Banikchaudhuri	1984	CE
Sumitava Bhattacharya	1984	CE
Sundar Banerjee	1984	CE
Debal Banerjee	1984	EE
Hari Balasubramanian	1984	EE
Prasid Syam	1984	EE
Tapash Sengupta	1984	EE
Amit K. Kar	1984	ETC
Angshuman Chattopadhyay	1984	ETC
Prasanta Sarkar	1984	ETC
Manoranjan Nandi	1984	ME
Supriya Maity	1984	ME
Partha Protim Chattopadhyay	1984	MET
Arup Sarkar	1985	ARCH
Debasish Kar	1985	ARCH
Keya Mitra	1985	ARCH
Abhijit Ghosh	1985	CE
Amit K. Das	1985	CE
Debashish Dey Chowdhury	1985	CE
Kuntal Majumdar	1985	CE
Manoj K. Maiti	1985	CE
Pranab K. Gajendra Mahapatra	1985	CE
Sujit Das	1985	CE
Debanjan Ray	1985	EE
Amitava Datta	1985	ETC
Debjani Chatterjee	1985	ETC
Tirthankar Barari	1985	ETC
Amaresh Chakrabarti	1985	ME
Anjan Majumdar	1985	ME
Arjun Lahiri	1985	ME
Jayanta Sadhukhan	1985	ME
Joydeep Roy	1985	ME

Full Name	Year	Dept
Pranab Chakraborty	1985	ME
Sujay K. Mukherjea	1985	ME
Gautam Maitra	1985	MIN
Malay K. Ghosh	1986	ARCH
Dipalok Das	1986	CE
Prasanta Kundu	1986	CE
Sanjay Mukherjee	1986	CE
Surjya Nandi	1986	CE
Surya Nandi	1986	CE
Swapan K. Mallik	1986	CE
Amitava Majumdar	1986	CST
Debjani Das	1986	EE
Hafizur Rahaman	1986	EE
Jayanta K. Lahiri	1986	EE
Kripamoy Mondal	1986	ETC
Paramesh Bhattacharyya	1986	ME
Pijush K. Mitra	1986	ME
Netai C. Dey	1986	MIN
Aditi Dass	1987	ARCH
Debatosh Sahu	1987	ARCH
Somnath Sinha Ray	1987	ARCH
Soumyendu Biswas	1987	ARCH
Sudipta Ray	1987	ARCH
Amitava Burman	1987	CE
Amlanjyoti Basu *	1987	CE
Aniruddha Bhattacharya	1987	CE
Arnab Bandyopadhyay	1987	CE
Arun K. Chakraborty	1987	CE
Dilip K. Baidya	1987	CE
Kaushik Mukherjee	1987	CE
Manojit De	1987	CE
Mohit K. Kar	1987	CE
Prithwish Das	1987	CE
Saumyen Guha	1987	CE
Kalpana Majumdar	1987	CST
Prasanta B. Ghosh	1987	CST
Aparup Sengupta	1987	EE
Ashis K. Ghosh	1987	EE

Full Name	Year	Dept
Asis K. Ray	1987	EE
Debasis Basu	1987	EE
Gopal C. Halder	1987	EE
Indrajit Sarkar	1987	EE
Indranil Sanyal	1987	EE
Prosenjit Chakraborty	1987	EE
Sandip Goswami	1987	EE
Sumita Dutta Nag	1987	EE
Tapan Mandal	1987	EE
Goutam Chattopadhyay	1987	ETC
Partha S. Bag	1987	ETC
Purba Ghosh	1987	ETC
Samit Chaudhuri	1987	ETC
Kanu G. Pilsima	1987	ME
Samir Saha	1987	ME
Subhendu Mukherjee	1987	ME
Usha Shankar Bhattacharya	1987	ME
Manikana Datta	1987	MET
Subhasis Datta	1987	MET
Subhasis Sinha	1987	MET
Sudarshan Das	1987	MET
Anup Chattopadhyay	1988	CE
Arup K. Roy	1988	CE
Bidhu B. Barman	1988	CE
Biswanath Bhowmick	1988	CE
Debabrata Pal	1988	CE
Dhiman Saha	1988	CE
Mrinmayee Bhowmick	1988	CE
Pritam Laha	1988	CE
Sanjib Basu	1988	CE
Sekhar C. Dutta	1988	CE
Sisir Biswas	1988	CE
Somenath Ghosh	1988	CE
Saibal K. Ghosal	1988	CST
Shome Sengupta	1988	CST
Subroto A. Das	1988	CST
Amit Das	1988	EE
Partha Chanda	1988	EE

Full Name	Year	Dept
Rajdeep Dutta	1988	EE
Rajib Guptasarma	1988	EE
Sambhunath Roy	1988	EE
Sukanta Chakraborty	1988	EE
Swapan Saha	1988	EE
Vedabit Nag	1988	EE
Anirban Roy	1988	ETC
Arindam Gangopadhyay	1988	ETC
Arup K. Bhowmick	1988	ME
Dipanjan Jana	1988	ME
Jayanta K. Pal	1988	ME
Joydeep Nag	1988	ME
Pradip K. Bandyopadhyay	1988	ME
Sanjoy K. Adhikari	1988	ME
Saswata Roy	1988	ME
Subrata Purohit	1988	ME
Sudip Sinha	1988	ME
Tarun K. Podder	1988	ME
Indrajit Mukherjee	1988	MET
Paramita Mukherjee	1988	MET
Sudip Roy	1988	MET
Supriya Sinha	1988	MET
Dipanker Koley	1988	MIN
Ujjwal Tah	1988	MIN
Bhaskar Mukherjee	1989	ARCH
Suvo Ghosh	1989	ARCH
Anirban Gupta	1989	CE
Koushik Sengupta	1989	CE
Samir Naskar	1989	CE
Soumyabrata Roychowdhury	1989	CE
Subhankar Nag	1989	CE
Subhro S. Roy	1989	CE
Subrata Mahata	1989	CE
Swapan Sasmal	1989	CE
Santanu Sen	1989	CST
Konika Das (Bhattacharya)	1989	EE
Barit Roy Sarkar	1989	ETC
Biman Saha	1989	ETC

Full Name	Year	Dept
Saikat Bhowal	1989	ETC
Amit Roy Chowdhury	1989	ME
Anupam Ghosal	1989	ME
Ashis Maity	1989	ME
Deba P. Chakravorty	1989	ME
Salil Haldar	1989	ME
Sudipta De	1989	ME
Arijoy Roy	1989	MET
Arup K. Datta	1989	MET
Bhaskar Dutta	1989	MET
Suranjeeta Dhar	1989	MET
Arun Ka. Ghosh	1989	MIN
Samaresh Pradhan	1989	MIN
Surajit Pramanick	1989	MIN
Amitava Roy	1990	ARCH
Dibyajyoti Dutta Roy	1990	ARCH
Piyali Dey	1990	ARCH
Sujoy Majumdar	1990	ARCH
Dipak K. Chaki	1990	CE
Mayukh Datta	1990	CE
Palash Guha Neogi	1990	CE
Pranesh Biswas	1990	CE
Prosenjit Datta	1990	CE
Provatkusum Ghosh	1990	CE
Saikat Dey	1990	CE
Subhamoy Kar	1990	CE
Suhas Ghosh	1990	CE
Suman Roy	1990	CE
Tamal Moitra	1990	CE
Amitava Lahiri	1990	CST
Himansu Pal	1990	CST
Prithwish Kangsabanik	1990	CST
Baishali Raychaudhuri	1990	EE
Banaja Bhaduri	1990	EE
Itesh Simlai	1990	EE
Pradip Saha	1990	EE
Sabyasachi Hazra	1990	EE
Sampa Pramanik	1990	EE

Full Name	Year	Dept
Suprakash Adhikari	1990	EE
Binoy K. Shyam	1990	ETC
Gurupada Mandal	1990	ETC
Koushik Chatterjee	1990	ETC
Mustakim Middya	1990	ETC
Sujit Ghosh	1990	ETC
Surya Bhattacharyya	1990	ETC
Arindam Mukhopadhyay	1990	ME
Nimai C. Majumdar	1990	ME
Samir K. Nath	1990	ME
Supriya Nandi	1990	ME
Anupam Banerjee	1990	MET
Jyotsna Dutta Majumdar	1990	MET
Pratik Dutta	1990	MIN
Shuvendu Bakshi	1991	ARCH
Suman Deb Ray	1991	ARCH
Ananda Bhattacharya	1991	CE
Avijit Chakraborty	1991	CE
Nirjhar Chakraborty	1991	CE
Nityananda Nandi	1991	CE
Subrata Chakraborty	1991	CE
Tanusree Chakraborty	1991	CE
Tanmoy Sabud	1991	ME
Anibandha Mukhopadhyay	1991	MIN
Sumit K. Gupta	1991	MIN
Anup K. Dutta	1992	CE
Basudeb Bhattacharyya	1992	CE
Md. Yousuf Alam	1992	CE
Pushpendu Bhattacharyya	1992	CE
Saikat Dey	1992	CE
Kaushik K. Basu	1992	EE
Udayan Bhattacharjee	1992	EE
Santanu Bhadra	1992	ETC
Tushar K. Nag	1992	ETC
Kausik Datta	1992	MCA
Naresh C. Murmu	1992	ME
Sandip K. Sadhukhan	1992	MIN
Sanjoy Bose	1993	CE

Full Name	Year	Dept
Supriya Ganguli	1993	CE
Sanjay Konar	1993	CST
Rajib Sarkar	1993	ETC
Chanchal Das	1993	ME
Debasis Bera	1993	ME
Prasenjit Kayal	1993	ME
Sudipta Pan	1993	ME
Apurna K. Ghosh	1993	MIN
Parijat Chakrabarty	1993	MIN
Dipankar Ghosh	1994	ARCH
Dipanjana Maulik	1994	CE
Santanu Kar	1994	CE
Swarup Duari	1994	CE
Amitava Chatterjee	1994	CST
Arshad Alam	1994	CST
Saswata Misra	1994	CST
Prantik Jana	1994	EE
Rajib Dutta	1994	EE
Swapan Deb	1994	EE
Swapan Sinha	1994	EE
Arunava Biswas	1994	ETC
Debashis Das	1994	ETC
Harihar Das	1994	ME
Subhas C. Mondal	1994	ME
Sumana Ghosh	1995	CE
Anjan Das	1995	CST
Rajarshi Ray	1995	CST
Aruni Dasgupta	1995	EE
Saptarshi Majumdar	1995	EE
Prosenjit Santra	1995	ETC
Shyamapada Karmakar	1995	ME
Manas Dey	1995	MET
Sudipto Chakraborty	1996	ARCH
Debashis Bose	1996	CE
Krishnendu Pal	1996	CE
Somnath Mukherjee	1996	CE
Ardhendu B. Samanta	1996	EE
Mihir Naskar	1996	EE

Full Name	Year	Dept
Sharbaroop Mallik	1996	EE
Abhijit Sarkar	1996	ME
Bimal Dey	1996	ME
Pallab Bhattacharyya	1996	ME
Swarup Pal	1996	ME
Sudipta Mukhopadhyay	1996	MIN
Kaustubh Dasgupta	1997	CE
Partha Pratim Roy	1997	CE
Sanjukta Jana	1997	CE
Saugato Datta	1997	CE
Sharmila Sikder	1997	CE
Sitangshu Roy	1997	CE
Souvik Das	1997	CE
Parbati Bose	1997	CST
Amar Misra	1997	EE
Saibal Chatterjee	1997	EE
Koustuv Debnath	1997	ME
Sankha Karbhowmick	1997	MIN
Debargha Sengupta	1998	ARCH
Tirthankar Mandal	1998	CE
Chandrani Pal	1998	CST
Koushik Chakrabarty	1998	CST
Namami Ghosh	1998	CST
Anamika Chakraborthy	1998	EE
Dipyaman Chakraborty	1998	EE
Indrajit D. Choudhury	1998	ME
Nilanjan Mallik	1998	ME
Sandeep Chatterjee	1998	ME
Bhaskar Ghosh	1998	MET
Pradip Sarkar	1999	CE
Rajiv Mukherjee	1999	CE
Rathin Ghoshal	1999	CE
Seema Patra (Konar)	1999	CE
Shamse Alam	1999	CE
Kaushik Das	1999	CST
Somnath Mukherjee	1999	EE
Priyanka Mondal	1999	ETC
Susmit Bagchi	1999	ETC

Full Name	Year	Dept
Debabrata Mukherjee	1999	ME
Debarshi Mandal	1999	ME
Kumar Bappaditya Salui	1999	ME
Viking Bhattacharya	1999	ME
Vinod K. Singh	1999	ME
Biswanath Chakraborty	1999	MET
Rajdwip Mukherjee	1999	MIN
Apalak Khatua	2000	ARCH
Sadhan Ghosh	2000	CE
Suman Banerjee	2000	CE
Debabrata Pal	2000	EE
Nilay Ray	2000	EE
Sumit Goswami	2000	ETC
Banibrato Sikdar	2000	ME
Dalimkumar Nanda	2000	ME
Koustav Biswas	2000	ME
Niladri Chakraborty	2000	ME
Shyamtanu M. Banerjee	2000	ME
Suvalaxmi Bhattacharya	2000	MET
Arunjyoti Sarkar	2001	CE
Ayan Basu	2001	CE
Niladri Sannigrahi	2001	CE
Rajkumar Banerjee	2001	CE
Shovini Dasgupta	2001	CE
Subha Sankar Chowdhury	2001	CE
Subir K. Pal	2001	CE
Santanu Halder	2001	EE
Gunjan Mandal	2001	ETC
Dhananjoy Maji	2001	ME
Gautam Datta	2001	ME
Sourav Kr. Ghosh	2001	ME
Mohammad Raihan	2001	MET
Bidyut Chakraborty	2001	MIN
Santanu Bhowmik	2001	MIN
Sukanta Das	2002	CST
Debashis Mandal	2002	ETC
Ramen Dutta	2002	ETC
Sayan Dey	2002	ETC

Full Name	Year	Dept
Arindam Singha	2002	ME
Dhrubajyoti Guha	2002	ME
Rajat Saha	2002	MET
Arnab K. Bhattacharya	2003	CE
Goutam Aditya	2003	CE
Ranja Bandyopadhyaya	2003	CE
Arghya Mandal	2003	EE
Puspasourav Biswas	2003	EE
Mahua Dasgupta	2003	ETC
Aniruddha Mukherjee	2003	MET
Pratik K. Mallick	2003	MET
Amarjit Biswas	2003	MIN
Aminul Islam	2004	CE
Arnab Ghosh	2004	CE
Sanjib Mitra	2004	CE
Somenath Mukherjee	2004	CE
Tanmoy Konar	2004	CE
Debasis Ganguly	2004	IT
Sukamal Naskar	2004	MET
Tathagata Ghosh	2004	MIN
Sudeshna Ghosh	2005	ARCH
Tania Pramanik	2005	ARCH
Banshi D. Dutta	2005	CE
Santanu Saha	2005	CE
Saptarshi Ghosh	2005	CST
Someswar Chakraborty	2005	EE
Rathijit Sarkar	2005	IT
Moumita Mazumder	2005	ME
Subha Sinchan Sarkar	2005	ME
Tanmoy Manna	2005	ME
Karna Jalan	2005	MIN
Rathin Biswas	2005	MIN
Saumitra Das	2005	MIN
Uttam Ghorai	2005	MIN
Parag Keshar Ghosh	2006	ARCH
Abhishek Chakraborty	2006	CE
Manabika Mandal	2006	CE
Sovan Brata Chattopadhyay	2006	CE

Full Name	Year	Dept
Subhajit Chaudhuri	2006	CE
Debanjali Dutta	2006	CST
Haimanti Paul	2006	EE
Manish Baheti	2006	EE
Amit Mahajan	2006	ETC
Ashirbani Saha	2006	ETC
Dibyendu Mukherjee	2006	ETC
Asmita Nag	2006	IT
Debojit Chakrabarty	2006	IT
Subir Mondal	2006	MIN
Abhijit Patra	2007	CE
Anuja Roy	2007	CE
Atanu Sahu	2007	CE
Soumya De	2007	ETC
Sujoy Sinha Roy	2007	ETC
Aniruddha Singharoy	2007	ME
Anupam Ray	2007	ME
Kaustav Bandyopadhyay	2007	ME
Rakesh Mondal	2007	ME
Subhadeep Saha	2007	ME
Abhijit Naskar	2008	CE
Manojit Samanta	2008	CE
Soham Bandyopadhyay	2008	CE
Abhishek Chanda	2008	CST
Nirmal K. Sahana	2008	EE
Ayan Pal	2008	IT
Arijit Datta	2008	ME
Saikat Manna	2008	ME
Shyamasis Das	2008	MET
Alok Kumar	2009	CE
Arnab Sarkar	2009	CE
Avishek Dey	2009	CE
Bodhisatwa Roy	2009	CE
Dipak Rakshit	2009	CE
Koushik Datta	2009	CE
Mrinmoy Nath	2009	CE
Rajat Nag	2009	CE
Saubhik Shah	2009	CE

Full Name	Year	Dept
Saurabh Dandapat	2009	CE
Tapas Das	2009	CE
Shuvajit Bala	2009	EE
Soumik Sen	2009	EE
Soumya Das	2009	EE
Jayanta Laha	2009	ETC
Narendra Nath Maji	2009	ETC
Roshan Shaw	2009	ETC
Tapeswar Paul	2009	ETC
Piyalee Das	2009	IT
Rajarshi De	2009	IT
Ayan K. Banerjee	2009	ME
Dibakar Adhikary	2009	ME
Jogjiban Dey	2009	ME
Manjesh K. Singh	2009	ME
Alok Sarkar	2009	MET
Madhumanti Sanyal	2009	MET
Naba Kumar Mahata	2009	MET
Piyas Palit	2009	MET
Sk Md. Hasan	2009	MET
Sabyasachi Mukherjee	2009	MIN
Souvik Sarkar	2009	MIN
Sumik Chakraborty	2009	MIN
Chandan Nandi	2010	ARCH
Chittaranjan Das	2010	CE
Kinjal Bhattacharyya	2010	CE
Krishnendu Datta	2010	CE
Pallab Goswami	2010	CE
Saikat Gupta	2010	CE
Samir Ruidas	2010	CE
Subhankar Pramanick	2010	CE
Subhojit Mukherjee	2010	CE
Susen Deuri	2010	CE
Swarup Mahato	2010	CE
Devleena Ghosh	2010	CST
Rikhiya Ghosh	2010	CST
Abrez Mondal	2010	EE
Pratik Gupta	2010	EE

Full Name	Year	Dept
Saurav Patra	2010	EE
Somnath Rana	2010	EE
Souradyuti Chatterjee	2010	EE
Tapas K. Mandal	2010	ETC
Atanu Maity	2010	ME
Suman Nihar	2010	ME
Lopa Thandar	2010	MET
Rahul Deb Das	2010	MIN
Ankit Maheswari	2011	CE
Gourabananda Pahar	2011	CE
Souvik Karjee	2011	CE
Subrata Hazra	2011	CE
Aitijhya Sarkar	2011	CST
Avishek Dan	2011	CST
Sreerupa Chatterjee	2011	CST
Saikat Subhra Ghosh	2011	EE
Soumava Mukherjee	2011	ETC
Souvik Pal	2011	IT
Debapriya Patra Karmakar	2011	ME
Richard K. Bose	2011	ME
Sanjoy Maji	2011	ME
Gopinath Thirunavukarasu	2011	MET
Aveek Mangal	2011	MIN
Subrata Biswas	2012	CE
Bharti Mahawar	2012	CST
Mohammad Mobashir	2012	CST
Sinchan Garai	2012	CST
Soham Sinha	2012	CST
Ashish Singhi	2012	ETC
Bonolata Dasgupta	2012	IT
Soumyajyoti Sinha Ray	2012	ME
Shreayan Nandy	2012	MET
Monodip Mukhopadhyay	2013	CE
Prithviraj Nag	2013	CST
Avishek Dasgupta	2013	EE

ISO 9001 COMPANY

LLOYD

LIVE THE FUTURE

FEDDERS LLOYD CORPORATION LIMITED


Education


Health


Water


Industrial Projects


Power


Irrigation & Agriculture


Infrastructure


Mining

Global
Infrastructure Development

GLOBAL PRESENCE

Overseas Offices:

China, Czech Republic, Houston (USA), Dubai(UAE)

Overseas Presence:

AFRICA: Burkina Faso, Ghana, Kenya, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Swaziland, Tanzania, Uganda, Zambia

SAARC & SOUTH EAST ASIA: Bhutan, Cambodia, Laos, Myanmar, Nepal, Sri Lanka, Vietnam, Bangladesh

MIDDLE EAST: Iraq, Jordan, Kuwait, Yemen

LATIN AMERICA: Guyana, Jamaica, Suriname

CIS: Ukraine, Uzbekistan

FEDDERS LLOYD CORPORATION LIMITED

International Projects Division
159, Okhla Industrial Estate, Phase III,
New Delhi-110020 (INDIA)
P: +91 11 41627200, 40627300,
F: +91 11 41609909
W: www.feddersIloyd.com

Mr. S.S. Dhawan
Whole-time Director
Mobile : +91 9810137761
E: ssd@feddersIloyd.com, ss_dhawan@rediffmail.com

Mr. N.C. Soral
Vice President - International Project Division
Mobile: +91 9650694468
E: ncsoral@feddersIloyd.com, ncsoral@gmail.com

With best compliments from

M/s. KAMALA ENGINEERING WORKS

31/9, HALDAR PARA LANE

HOWRAH : 711 101

[Government Contractor & General Order Suppliers]

Mobile: + 91 98303 68194 & 9062856875

E-mail: subhodeep_polley@rtediffmail.com

With best compliments from

D. D. CONSTRUCTION

Government Contractor & General Order Suppliers

26/1, Halder Para Lane

Howrah – 711 104

Phone: 033 2640 5643, 2640 6573 Mobile: 98301 87704

Our Best Wishes to GAABESU

www.UsBengalForum.com

Sponsored by

Computer Control and Support Inc.

With Best Compliments From:

C.D. AUTOMATION PVT. LTD.

Authorise Dealer / Channel Partner of:

Schneider Electric, EMERSON Network Power, HENGSTLER, COOPER Bussmann, OMRON, GE, 3M, RITTAL, PHOENIX CONTACT, LAPP KABEL

Registered Office:

8, Parsee Church Street, 3rd Floor, Kolkata – 700 001
Phone: 033-2215-7080/1374, Fax: 033-2215-2931

Corporate Office:	*Project & Marketing Office:*
Stephen Court, *18A, Park Street,* *Flat No.18A, 1st Floor,* *Kolkata - 700071*	*PS Pace, Unit – 102, 1st Floor* *1/1A, Mahendra Roy Lane* *Kolkata – 700046* *Phone: 033-4068-6032/15*

Email: response@cdautomation.co.in **Website: www.cdautomation.co.in**

GPT group

With Best Compliments from

GPT Infraprojects Limited
GPT Castings Limited
ILS Hospital









Participating in Construction of **World's first 800 KV Multi-Terminal HVDC** Project under clientele of BHEL & POWERGRID

GPT Centre
JC – 25, Sector-III, Salt Lake
Kolkata – 700 098
Tel: +91-33-4050 7000 / 7001
Fax: +91-33-4050 7999
Email: info@gptgroup.co.in
Web: www.gptgroup.co.in

What drives an organisation to make more than just products?

For us at Lafarge, it is the desire to constantly innovate, so whatever we create **does** not only meet market demands, but also sets new standards in construction.

Since way back in 1833, **it** has helped us to create landmark structures like the New York Stock Exchange, the Millau Viaduct and the Seoul Peace Bridge; and **take** the brand on its journey across the world, in over 60 countries. Over the years, our advanced R&D centres have helped us create groundbreaking cements and expand our portfolio **to** value-added concrete products and a range of high performance aggregates. But it is not just technology that drives us; at Lafarge, no matter what we **build**, sustainability and safety are always on the forefront, ensuring that no harm comes to **the** environment, local communities and our workers. Even here in India, we use this global expertise to build better cities.

So when you build the nation, who better to partner with than the best in the **world?**

Cement | Aggregates | Concrete

Lafarge India Pvt. Ltd. Crescenzo Building, B-Wing, 10th Floor, C-38 & C-39,
G Block, Bandra Kurla Complex, Bandra (East)
Mumbai- 400 051, Tel: +91 (0)22 66306511 Fax: +91 (0)22 66306510, www.lafarge.in

LAFARGE
Building better cities™

Rediffusion-Y&R/Kol/Lafarge/nb0605

Infrastructure solutions

mageba is a leading supplier of high-end components for infrastructure and buildings. Well over 10,000 structures, including many of the world's finest bridges, have been equipped with mageba products. Please visit **www.mageba.in** for more information.




mageba
India www.mageba.in
engineering connections®

■ structural bearings ■ expansion joints ■ seismic protection ■ structural monitoring

ASHOKA

Ashoka Buildcon Limited

Our Recent Achievements

Two Bridges (1.1 kms each) built across River Roopnarayan in West Bengal, 18 months ahead of Scheduled Project Completion Date

Ashoka had taken up a challenge that no other construction company was willing to take.

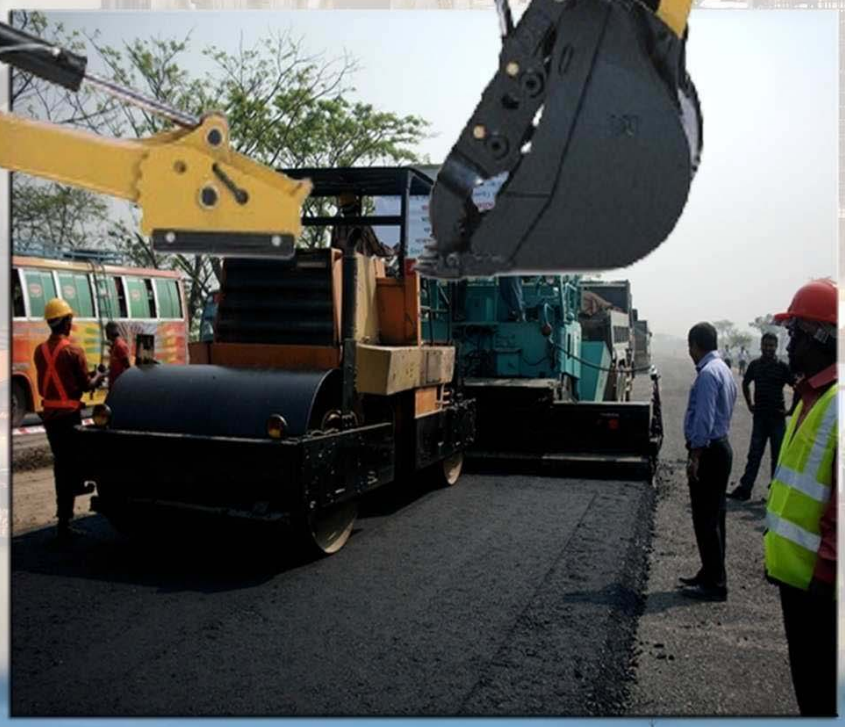
The challenge was to complete a bridge that was left halfway by the previous construction company. We not only completed the bridge before time, we constructed another one parallel to it , all this, in a very short period of time which was 18 months ahead of schedule.

These bridges posed some of the most daunting difficulties in history of Indian bridge construction. Team Ashoka overcame these challenges with the help of technology , sheer determination and hard work.

www.ashokabuildcon.com

SPECTRA ENGINEERS LIMITED
(A CONCERN OF SPECTRA GROUP)

We are specialized in constructing Building, Roads, Highways And O & M operations



House # 17, Road # 106, Block CEN(F), Gulshan-2, Dhaka 1212
Tel: 02 8816192, 9888049, 9892597, 9892598, Fax: 02 8819932
email: infosel@spectragroup.com.bd