RNI Reg. No. DELENG/2001/4847

July 2006 Vol. VI No. III

LIGHT the official NEWSLETTER

of the **indian society of lighting engineers**

Printed & Published by Mr. Harcharan S. Mamak, A 274, Defence Colony, New Delhi 110 024 on behalf of Indian Society of Lighting Engineers and printed by him at Graphic Point Pvt. Ltd., WZ-429 B, Naraina Village, New Delhi.

FROM THE PRESIDENT'S DESK

With the passing away of Tapas Sen, an era in Indian lighting has ended. Our tribute to him is contained in the Obituary column.

Though this is indeed a great loss for Indian lighting and for ISLE, that is the way life goes. The great innovators in any field make their mark and pass on the baton to the succeeding generations. Though Mr. Sen will not be there, the last project he was involved in, the lighting of the Howrah Bridge, will be completed for the 50th anniversary of the Calcutta Port Trust.

And ISLE is proceeding actively with its mandate to promote good lighting in India.

You will find in this issue that Karnataka State Centre has begun a series of workshop and lecture programmes across the state to make more people aware of the issues that go towards ensuring good lighting practice. The State Centre is also a partner in the high profile EULightIndia project. I would like to make a request to all of you to spread information about this project to potential beneficiaries for maximum effectiveness of this initiative.

Mumbai State Centre has had an interesting lecture programme and also a Workshop in Pune to help yet another institution of higher education to introduce lighting into their academic curriculum. As a result, MIT in Pune proposes to start a post graduate programme from the current academic year. Indore Local Centre has also run an interesting programme exploring the relationship between vaastu and lighting with more programmes planned in the coming months.

Delhi State Centre has taken the campaign for lighting awareness to Rajasthan and has initiated the process for starting a new Centre at Jaipur.

I feel that the greatest tribute we can pay to Mr. Tapas Sen is to ensure that we continue to work towards improving the lit environment in India. That is after all why we created this Society.

S. Venkataramani
President

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EDITORIAL

This issue carries an obituary of the recently departed Tapas Sen by P.K. Bandypaodhyay who is one of the many ISLE members who knew him personally and had the good fortune to work with him. We have also reproduced the Keynote Address that Mr. Sen made at the first International Conference that ISLE organized, Prakash'91, where he looked back on his fifty years in lighting.

Talking about the early years in theatre lighting he says, "looking back to the takeoff period, when we, the theatre workers were literally in the dark about developments outside our own country, it can be said that at least in our case it was the imagination and passion that mattered in bringing out the result with bare minimum resources in the art of theatre lighting". His imagination and passion will continue to inspire us.

We are also happy to share in this issue the recognition being given to our members. Dr. Biswajit Ghosh has been given a Royal Society Award to work at Surrey University and Dr. Biswanath Roy has been invited to work at the Lawrence Berkeley National Laboratory in California.

You will find reports on the activities of the different State Centres that the President has referred to in his column. We need to sustain this level of activity across the country on a regular basis. This should be possible as there are so many new members (younger members) coming into the ISLE fold.

Dr. Sastri's R&D column gives us a look at the interesting possibility of sheet lighting. Among the items that we have in the WebWatch column this time is a global lighting report that warns that present trends indicate that the energy used by lighting will be 80% higher by 2030, underlining the need for energy efficient lighting.

We carry a glimpse of some of this years IALD award winning projects.

I find a growing interest in CIE publications and would like to remind readers once again that they can order these and get 50% off if they are fully paid up ISLE members.

H.S. Mamak
Editor

Please note our current contact details

ISLE
A 274 Defence Colony, 1st Floor
New Delhi-110 024

Tel: +91 11 41551786, 41551752
Fax : 41551789
E-mail: isledel@vsnl.com

OBITUARY

Mr. Tapas Sen (1924 -2006)

On 28th June, 2006 the brightest Light from the Indian Lighting World suddenly went out in Kolkata. Mr. Tapas Sen was 81, and even though he had not been in the best of health for the past two years, he continued to be active in high profile lighting projects right up to the last day.

A Fellow Member of ISLE, Tapas-da was a member of the Calcutta State Centre of ISLE since its inception, a Governing Body Member in the nineties, delivered a Keynote Address at the Prakash'91 International Conference in Lighting and was one of the judges for the ISLE Lighting Design Competitions held in the nineties.

He was also an Honorary Member of the Association of Lighting Designers whose membership roll comprises world renowned experts.

He received the Sangeet Natak Akademi Award for Excellence. In 2004 he was selected as a Fellow of the Sangeet Natak Akademi. As he could not travel to New Delhi due to ill health, the Chairman of the SNT, Mr. Ram Niwas Mirdha went to Kolkata at the beginning of 2005 to handover the plaque and citation to Tapas Sen in person.

Lighting Design as a profession was unknown when India became independent. Tapas Sen was a pioneer and became the most well-known face of the profession – a living legend. Some of us were extremely fortunate to work closely with him and to know him personally well.

For the benefit of young ISLE members, who may not know him and the new entrants to the profession, I would like to record what Tapas–da has achieved in all kinds of creative and decorative lighting starting from a modest background. Many of those were landmark projects. Those done for stage effects for plays in theatres and other one-time effect lighting have not been recorded properly. They live in the memory of the fortunate audiences and viewers. The man, who in the last decade of his life studied the latest works of Stephen Hawking hoping to incorporate new ideas in his work, started out as a Switch Board Attendant in the New Delhi Municipal Corporation and later became an electrical Overseer.

But even at that young age he dared to expand his horizons and became a Founder–Member of the Delhi unit of the Indian Peoples' Theatre Association (IPTA), and did the lighting for the famous Sadhana Bose.

In 1945 he started working in Puppet Theatre with his friend, philosopher and guide, Pratap Sen, a drawing teacher in Raisina School.

In 1946 he moved to Bombay to work in the film industry. He did not stick there, but developed his concepts on stage lighting.

Then came the lighting of the most remembered plays like *Rakta Karabi* (Bahurupi group of Sambhu and Tripti Mitra), and *Kallol* (Bombay Naval Mutiny), *Setu* (with its famous scene of the illusory run of a steam engine) and *Angar* (flooded coal mines) with Utpal Dutta - all in Calcutta. During this decade he proved the superiority of his craft and ingenuity over technology, or rather the lack of it. He created history with the support of Sambhu Mitra and Utpal Dutta by using objects like 'Dalda' containers, rejected drums, polythene sheets, cellophone paper, glazed paper, poles, ropes etc. in front ordinary lights to create images on the stage.

During that time and later he has worked with other Theatre personalities like Balasaraswati, Alkazi, Chandralekha, Birju Maharaj, Kelucharan Mahapatra, Mrinalini Sarabhai, Vijay Tendulkar and Shyamanand Jalan.

Tapas Sen was involved in the design of AIFACS, Kamani Auditorium, The Rabindra Rangeshala and Sri Fort Auditorium in Delhi, Kalamandir in Calcutta and many others in the rest of the country.

Towards the end of 1960s *the Son-et-lumiere* (Sound and Light) concept came to India. ITDC appointed Tapas Sen as the Lighting Consultant for the Red Fort project followed by the one at Teen Murti House in New Delhi. Gwalior Fort came in mid 1980s and in the next decade two smaller projects in Agra Fort and Purana Quila at New Delhi. The National Museum of Photography, Film and Television, UK, invited Tapas Sen in 1993 to participate in its fourth colloquium on film, TV and theatre – "Showlight" – at Bradford. He was the first Indian to be invited by this body and he delivered a paper on "Light, Mind and Lighting" covering the effect of light and shadow on the sensitivity of living beings.

In 1994, Tapas Sen started his own Academy for Research in Light and Shadow. The members of its Advisory Committee are Kapila Vatsyayan, Mrinal Sen, Vijaya Mehta, Ashok Mitra and Ebrahim Alkazi.

In 1995 he delivered the three-day Shriram Memorial Lecture at the Shriram Centre, New Delhi covering more than half a century long work on Lighting in which he came out victorious in spite of limitations in the availability of products and technology in India. Meanwhile, he has completed writing an autography titled "Fifty Light Years" which he started in 1992, his golden jubilee year of Stage Lighting. He has also written other books and articles in Bengali.

He was a Lighting Adviser in several India Fairs organized overseas by the Government of India.

In 1998 he attended the Time and Space exhibition organised by the Society of British Theatre Designers (SBTD) at the Royal College of Art, London. The Association of Lighting Designers (ALD) entered a collective exhibit including the work of some professional members like Mr.Tapas Sen. At the same time British Council, London, organised a Seminar on Theatre Lighting including visits to many well–known Theatres and Operas.

Age and bereavement had slowed him down in recent years. In the beginning of 2004 he lost his wife and teenaged grandson, very close to him, in quick succession. Still he picked up the threads and continued working into his last years.

One of India's seniormost theatre directors Habib Tanvir and his Naya Theatre from Bhopal collaborated with Kolkata's foremost director Usha Ganguli and her Rangakarmee to produce Tagore's *Visarjan* and Tapas Sen had to be a part of this team. The Play premiered in Delhi and in Kolkata in January 2006.

At the same time he was working on a project which when completed would have the highest visibility (quite literally). Calcutta Port Trust has undertaken the job of providing decorative lighting for the famous city landmark Howrah Bridge (*Rabindra Setu*). CPT had appointed Tapas Sen as the Artistic and Aesthetic Adviser. He was very happy to be associated with this project, as in his own words "... the project is challenging, the light design must show up above the light pollution in the area and be visible from different angles." He was looking forward to working with modern equipment like Arenavision, Nocturnes and LEDs imported by Philips, whose lighting design team will carry out the job. He felt that his 64-year lighting career would reach a new high with the lighting of this 62–year old unique engineering marvel.

But that was not to be!

The project is scheduled to be inaugurated on October 17, CPT's foundation day; three weeks after Tapas Sen would have completed his 82 years.

He has left behind a son and a daughter – Joy and Jayanti. Our heartfelt condolences to them and the family.

May his soul rest in peace. But will not Tapas–da be working out a design to illuminate the Pearly Gates?!

Pranab K. Bandyopadhyay.

ISLE ACTIVITIES

EU Light India

A Training Program on Street Lighting and External Lighting organized under the EU Asia Invest program

Street Lighting and External Lighting are basic features of the environment outside the home, which encourages (beyond daylight hours) social interaction, safety and security, tourism etc. Facility for such activities are even more important in a tropical country like our India as for a major part of the year the daytime temperature is not conducive to activities outside the built environment and the external lighting provides the opportunity to extend such activities. ISLE having considered the importance of the External Lighting has organized a three day training program.

The European Commission, under its Asia Invest Program and as a result of such association, supports this initiative, we get the services of experts from Europe to conduct the training program. ASSISTAL and ACAI from Italy and IRSEP from Poland are the partners from Europe. EU-India Chambers is another partner from India.

Under this program selected experts will give their presentations on different aspects of external lighting, design aspects, energy conservation, controls, standards related to design and standards (EU standards and CE Marking as well as BIS standards and ISI Marking) for the related components, testing, certification and marking. The course content would of interest to the industry and also the lighting providers such as the local bodies (municipalities, electricity distribution agencies) tourism development agencies and small and medium industries manufacturing components for the Indian market and also those looking for exports.

There would be a nominal registration fee of Rs. 5000 per participant (with a Rs.1000 rebate for ISLE Life Members). The program is non residential. Lunch and tea have been arranged. The successful participants will get a certificate and will also be eligible for consideration for participation in the second level of the program.

In the first stage the participants shall undergo a training program and a workshop. Three such programmes are being conducted. The first one is scheduled to be held at Mumbai at the Convention Hall, 4th Floor, YB Chavan Center, Gen. Bhosale Marg, Mumbai from September 20 to 23, 2006. (There will be similar programmes in New Delhi in November 2006 and in Bangalore in January 2007.)

In the second stage of the program, selected participants from these three training programs, desirous of attending an advanced training program will be invited to participate in either of the two second level training programs for a period of one week in Italy (ten persons) or in Poland (ten persons). This program will include conducted visits to installations of excellence and manufacturing facilities.

We are requesting you to consider participating in the program, which would benefit both the learner and the organization. The registration nomination form for the program at Mumbai is enclosed with this newsletter. The detailed program including specifics will be intimated on registration. Please return the registration form with the fee to ISLE latest by September 10, 2006 to the address below.

Mr. M.S.N. Swany
EU ISLE Project Coordinator
8 PR Layout, 1st Main Seshadripuram
Bangalore 560020
Tel.: 9341231755, 23441952
isleeu@gmail.com

CALCUTTA STATE CENTRE

Election for New Committee

The election process for ISLE, CSC Committee (2005-2007) has been completed. The following seven members were elected:

Mr. Indra M. Asthana
Mr. Bipin Dattani
Ms. Suchandra Bardhan
Mr. Biswanath Roy
Mr. Prakash K. Chatterjee
Mr. Ajay K. Khandelwal
Mr. Ramesh K. Bhandari

The other members of this Committee are:

Prof. A. K. Datta, Immediate past Chairman
Mr. B. Joarder Immediate past Hony. Secretary
Mr. H. Mukherjee, Hony. General Secretary/GB member
Prof. B. Ghosh, Hony. Treasurer/GB member

The ISLE, CSC Committee (2005-2007) met and elected the following office bearers unanimously.

Mr. Indra M. Asthana	...	Chairman
Mr. Prakash K. Chatterjee	...	Secretary
Mr. Biswanath Roy	...	Treasurer

At the 17th AGM in the last week of May the outgoing Committee handed over charge to the new Committee.

DELHI STATE CENTRE

Seminar on New Technologies in Lighting
May 19, 2006, Jaipur

A seminar on New Technologies in Lighting was organized in Jaipur, by the ISLE, Delhi State Center on May 19 with the aim of creating awareness for new technologies in lighting in the Government Departments as well as the Electrical Consultants and Architects of Rajasthan.

On the dais were Mr. N. Nagarajan, Chairman ISLE DSC, Mr. G. Aghi, Secretary, ISLE DSC, Mr. O. P. Bhola, Treasurer ISLE DSC, Mr. M. Vij, SE CPWD, Mr. R. K. Saxena, SE PWD, Mr. S. Dakshini, SNV Industries, Jaipur.

The first speaker was Mr. S. Chakraborty, Sr. General Manager (Tech.) from Bajaj Electricals and spoke on the new and upcoming technologies in Lighting, including new Lighting applications and LEDs. Mr. Firoz Badar, Sr. Manager Key Accounts (N&S) from Bajaj Electricals spoke on outdoor Lighting Controls.

Mr. Gulshan Aghi addressing the gathering

This was followed by Ms. Megha Soni, Deputy Manager LiDAC of Philips who spoke on new technologies in Lamps, LEDs and Indoor Lighting Controls. Finally Mr. N. Nagarajan, CE CPWD Delhi gave a very interesting presentation on the Fiber Optic lighting for Ajanta Caves and the Façade lighting of Kumbalgarh Fort at Rajasthan (a part of this presentation was covered by Mr. Meena, EE CPWD, Jaipur).

Rajasthan as a state already has 21 ISLE members. With this event, 12 participants became members – 2 as Fellow Members, 2 Institutional Members and 8 Life Members. It is now proposed to start a Local Centre of ISLE at Jaipur. The Delhi State Centre has put up the proposal to the Governing Body.

To this end, at a separate meeting of existing members and other professionals dealing with lighting, it was decided to form a Committee of the following professionals to help guide the Jaipur Centre into being: Mr. R.K. Saxena, SE PWD, Mr. Mukesh Vij, SE CPWD, Mr. S. Dakshini, SNV Industries and Mr. Anoop Bartarya, Architect.

MUMBAI STATE CENTRE

Lecture on Development of New Light Sources
April 13, 2006, Mumbai

Mumbai State Centre organized a lecture on April 13 at the MIG Sports Club in Bandra. The program began with Ar. Rohini Mani, Hon. Secy. MSC welcoming the guests and introducing the Sponsors - Thorn Lighting represented by Mr. Paresh Desai. Mr. Prakash Barjatia, Chairman, MSC then introduced the Speaker for the evening, Prof. Bijoy Kumar Dash from the USA - a noted inventor of light sources and lighting hardware with some 30 patents to his credit and Chairman of the Invention and Research Center, MIT, Pune.

Mr. A Auddy and Ar. Rohini Mani, felicitating Dr. Dash

Prof. Bijoy Kumar Dash began by elaborating on his mission to introduce the spirit of invention among Indian students to develop new and innovative low cost sources of light which will be of great benefit to our country. He demonstrated various light sources developed by him to the audience of around a hundred people. Of greatest interest was the LCD projector with built in CDROM which uses sunlight channeled through light pipes as the light source. This mini projector, which is expected to be available at a very low cost will be a boon to educational institutions and public service organisations as it saves on initial lamp costs as well as replacements due to mishandling in conventional projectors.

A lively question and answer session followed during which the audience were invited to Shegaon (Akola, Maharashtra) to witness the on-going development of new light sources.

After the presentation, Mr.Barjatia summed up the proceedings and appealed to the audience to support to the ISLE, MSC membership drive which would strengthen their hands to arrange such programs. He thanked Prof. Dash and Mrs. Dash for coming to the Program, and also Mr. Alvares and Mr. Mavinkurve for making the program successful.

Mr. Stan Alvares then proposed a Vote of Thanks to Prof.Bijoy Kumar Dash for the enlightening presentation, the Sponsors, Thorn Lighting India Pvt.Ltd, Mr.Naveen (Convenor, Tech / Education, MSC) as well as Mr.Prakash Mavinkurve (Convenor, Membership,MSC) for their support in organising the program.

This was followed by cocktails with a display of Thorn products and a very enjoyable dinner.

Chairman's visit to Shegaon

Following the lecture Mr. Barjatia visited the Shri Gajanan Invention and Advanced Research Centre at Shegaon at Dr. Dash's invitation on April 30. The purpose of the visit was to check out the possibility of lighting related activities and even starting a Local Centre covering the Vidarbha region. After going around the simple but impressive campus, Mr. Barjatia, addressing a meeting of Faculty members chaired by Dr. Dash, highlighted the activities and scope of ISLE. Prof. M.A. Beg, Head, Department of Electrical Engineering assured him that after the commencement of the academic session, an initiative would be taken to start a Local Centre.

National Workshop on Vision for Lighting Technology, Education and Research in India

April 20, 2006, Pune

To highlight the important issues of improvement in lighting efficiency and energy conservation and the need for developing lighting education and research, a National Workshop on Vision for Lighting Technology, Education and Research in India was organized jointly by the ISLE Mumbai State Centre and MAEER's Maharashtra Institute of Technology (MIT) at the MIT Campus in Pune on 20 April 2006. It was well attended by more than 60 participants including top lighting professionals not only from India but also from the USA. Major lighting companies like Philips India, Bajaj Electricals, Arya Filaments, Arclite, Litex, and others were represented in the Workshop to discuss the need of professionals at different levels. Academicians from University of Jadavpur, Amaravati, Calcutta, Mumbai and Pune were present to discuss the present scenario of education in the field of Lighting and Illumination Engineering in the country. Leading Architects, Interior Designers, and Consultants expressed the need for application oriented professionals.

The Workshop took off with the inaugural function in the grand Sant Dnyaneshwar Hall of MIT, Pune. After welcoming the Chief Guest and all other invitees and participants of the Workshop by Mr. Prakash Barjatia, Chairman of Mumbai State Centre of ISLE, the background and need of this Workshop was highlighted by the eminent

Dr. V. D. Karad and Mr. S. Venkataramani lighting the lamp

Scientist from USA and the Convenor of Workshop, Prof. Bijoy Kumar Dash. Inaugurating the Workshop Mr. S. Venkataramani, President ISLE and Executive Director and Sr. Vice President, Philips Electronics India Ltd. emphasized the need of such interactive sessions between the professionals, academicians and the users. Dr. Vishwanath D. Karad, Executive President and Founder Trustee, MAEER, Pune and Chairperson of the Workshop presided over the function. In his highly illuminating and motivating speech he expressed the need of not only visible light but also the eternal light to bring peace to mankind. In his vote of thanks, Prof. P.D.Chidgupkar, Principal, MIT Womens Engineeing College, Pune and the Coordinator of the Workshop appreciated the efforts of ISLE for taking the initiative and making this Workshop successful.

Technical Session - I

Chairman : ***Prof. Bijoy Kumar Dash***
Rapporteur : ***Prof. P. D. Chidgupkar***

Mr. H.S.Mamak, Vice President, CIE Board of Administration spoke on the Scope of Lighting Technology Developments in India in various fields like entertainment, information technology, communication, healthcare etc. Being one of the Founder Members of ISLE, and former President, he emphasized the role of ISLE. He welcomed the proposal for starting a PG Program in Lighting Technology at MIT and complimented them for their idea of starting a Lighting Research Centre. He felt that it would be a Win-Win situation for both institution and industry. He emphasized that the research could be done at any level – Fundamental, Strategic, Applied and Adaptive, but there must be customers for research work.

Mr. Anil Valia, Lighting Designer and Educator, and the author of Designing With Light - A Lighting Handbook highlighted the different types of lighting education courses that can be imparted like Masters, Bachelors, Diploma, Certificate etc. At the same time there is a necessity of developing lighting professionals and teachers by providing opportunities through Continuing Education, Distance Learning, Training the Teachers etc.

Technical Session - II

Chairman : ***Mr. S.Venkataramani***
Rapporteur : ***Mr. Prakash Barjatia***

Mr. S. Chakraborty, Sr. General Manager, Bajaj Electricals.Ltd. spoke on the opportunities for engineers in the lighting industry. His presentation covered the basics of illumination engineering, lighting calculation and realistic situations where lighting is a significant factor. Emphasising the need for quality students required by lighting industries, he said that basic and applied photometry should be an integral part of the Program. Also the students needed to have good working knowledge of software programmes like Dialux, Relux and AutoCAD design.

Prof. P. D. Chidgupkar, Principal, MIT Women Engg. College, Pune in his presentation explained the aims, objectives and eligibility criteria for the Proposed PG Program in lighting Technology at MIT, Pune. He submitted the proposed syllabus for open discussion with the intention of determining whether the syllabus fulfilled the expectation of industry and also whether it was useful for students, keeping in mind their placement opportunities.

The participants took active interest in putting forward their views. Some of the suggestions put forward were -

- During the proposed program, the First Year (Sem. I & II) should be devoted to the fundamental subjects covering photometry in detail. During Second Year (Sem III & IV) students need to spend time in industry and develop a professional approach towards the subject.
- Students enrolled for the Program could be given a choice of the field of interest in the subject. They may join research and innovation (both fundamental and applied), manufacturing, sales or marketing stream of any lighting industry.

Dr. V.D.Karad joined the later part of the session and mentioned that the Syllabus would be finalized after due consideration of the views of all. Mr. S.Venkataramani summing up the proceedings of the session felt the need of designing and conducting different courses according to the requirement of the users.

Technical Session - III

Chairman : **Dr. Avinash Kulkarni**
Rapporteur : **Prof. Milind Pande**

Mr. P. K. Bandyopadhyay, Past President of ISLE and Director - CIE India Committee shared his vast experience in the field of lighting with all the participants putting forward some important facts. He suggested the

probable areas in which innovative research work can be carried out in the country -

- Road lighting
- Efficient luminaire design for Indian environment
- Outdoor lighting laboratory
- Upto date data on electricity consumption in lighting in India
- Light and health

Prof. Bijoy Kumar Dash, Chairman – MIT's Invention & Research Academy made an exhaustive presentation on the various lamps and luminaires useful for diverse applications. He also suggested the possible improvements and innovations in each of them with practical demonstrations of a large number of these. In his opinion highly efficient and economical lighting equipment can be made according to Indian standards and environmental conditions obviating the need for expensive imports.

Summing up the proceedings of the session the Chairman, Dr. Avinash Kulkarni supported the views of Prof. Dash and narrated some of his experiences and achievements on inventions.

Concluding Session

Concluding the Workshop Mr. S. Venkataramani. suggested that there was a need for more interaction between the Institutes like MIT and the CEOs of the leading Indian lighting Companies. He promised to provide all necessary help.

Follow up Meetings

Manipal Institute of Technology, Manipal

In line with the recommendation of the Workshop for the need to study the existing lighting education programmes being conducted in the country, a team consisting of Mr. Prakash Barjatia, Chairman, ISLE - MSC and Prof.(Dr) O.N.Awasthi visited the the Manipal Institute of Technology on May 22, 2006. They had meetings with Dr.Vinod Thomas, Prof. & HOD - (E&E), Prof. (Dr.) R.S.Aithal and other faculty members on the existing syllabus of M.Tech. Course in Illumination Technology

and the possibilities for improving it. A copy of the Directory of the Lighting Industry in India, 2005 was also presented to the Institute.

ELCOMA GB Meeting

To discuss the proposed launch of the Post Graduate Program in Lighting Technology from this academic year, Mr. Prakash Barjatia, Chairman, ISLE - MSC and Prof. P.D.Chidgupkar, Principal, MIT Womens College of Engg., Pune made a presentation at the ELCOMA GB Meeting in New Delhi on 23 June, 2006. Members present were appreciative of the initiative taken by Mumbai State Centre of ISLE and MIT, Pune for designing an industry oriented programme and looked forward to seeing the results of this programme

INDORE LOCAL CENTRE

Lecture on Vaastu and Lighting
June 10, 2006, Indore

A lecture was organised by Indore State Centre on the unusual topic of Vaastu and Lighting at the Amarvilas Hotel in Indore on June 10. The speaker was the well known Vaastushastri, Er Pankaj Agrawal of Vaastu Shilp Consultancy with offices in Indore, the US and UK.

Photo the function from Nai Duniya

The focus of the talk was on how electrobiology affects the human body and its systems and the effects of colours of light on the human mind and body. He explained that the placement of electric appliances and the direction and colour of lighting affects our health and the ability of our body to resist disease. In his presentation Mr. Agrawal made use of instruments such as Dr. Guass' Meter, Rad Alert, Electro Stress Meter, Lecher Antennae etc.

Mr. Ashok Das, Revenue Commissioner for Indore was the Chief Guest. Mr. Pramod Das, the Commissioner Commercial Tax (Madhya Pradesh) presided over the function. He said that there was a need to modify our lifestyles to match the science of nature to lead happier and healthier lives.

Mr. Dileep Dharkar, Chairman, Indore Local Centre and Mr. Akhilesh Jain, Secretary said that this programme had been organised because of the growing interest in Vastu over the last decade.

Dr. R.L. Sawhney distributed the mementos to the dignitaries.

KARNATAKA STATE CENTRE

Workshop on Lighting
June 1, 2006, Chickmaglur

The first of three programmes conducted in the month of June by Karnataka State Centre was a one-day workshop in collaboration with AIT Chickmaglur focussing on improving energy efficiency and the quality of life.

Standing in for Mr. Sanjay Jadhav, Chairman KSC who was not able to make it, Mr. M.S.N. Swamy, Hon. Secretary, KSC was the Chief Guest. He emphasised the importance of proper lighting to save energy without compromising the quality and quantity of light through the correct selection light sources and luminaries. Speaking about ISLE and its objectives, he expressed satisfaction that while there was still a long way to go, at least now people were talking about lighting. Recognising this, KSC has embarked on an extensive programme to bring future engineers in contact with the professional world of lighting applications and technology.

Dr. Subbaraya addressing the workshop

Dr. B.K. Chandrasekhar, Technical Director of the John F Welch Technology Centre invited the participants to visit this world-class research centre in Bangalore and take any help needed from him.

Mr. Raja Mukherjee, Southern Regional Manager GE Consumer and Industrial, said that they could offer suitable projects for students and that there were employment opportunities for bright students with a flair for lighting.

The workshop began with an invocation by a student and the lighting of the lamp by the Chief Guest. Mr. Mohan welcomed the gathering and the students of AIT introduced the speakers.

The workshop covered the following topics:

The Physics of Light and LEDs
by Dr. B.K. Chandrashekar,
Conserve Energy and Save the Environment by
by Mr. M.S.N. Swamy
Modern Trends in Lighting
by Mr. Raja Mukherjee.

Dr. Subbaraya, Principal AIT Chickmaglur thanked ISLE for taking this initiative and said he would form a committee to look into the possibility of introducing lighting into the syllabus. He also said that he would try to implement the energy conservation measures discussed in the workshop on the AIT campus.

The programme concluded with a vote of thanks by Prof. Leela, Head of Department E&E.

The 120 participants included students, faculty members from AIT, Davangere, Shimoga, Engineers from the Electricity Board and the Municipality and local Contractors and Dealers. Faculty members are going to form groups to take up projects and Dr. Subbaraya has agreed to monitor these and send a report.

The programme was sponsored by GE Consumer and Industrial and was covered in the local press.

Teaching Programme on Fundamentals of Lighting
June 9, 2006, Bangalore

On June 9, 2006 The Indian Society of Lighting Engineers, Karnataka State Centre, joined hands with Department of Architecture at Dayanandasagar College of Engineering and organised a teaching programme on Fundamentals on Lighting for the students who were taking exams.

Mr. Nirmal

The focus was on the basics and language of lighting. Further they were also exposed to design parameters for better lighting and the importance of conserving energy and saving of environment.

Mr. M.S.N.Swamy Hon. Secretary ISLE, KSC introduced the Speakers and the Teaching Programme.

Mr. Nirmal of GE Consumer and Industrial took the students through a presentation on Physics and the Language of Light.

Mr. Bhavani Prasad gave them an insight into how to go about the designing of Light. While explaining the parameters for lighting design he illustrated these by showing examples of Good Lighting and also Bad Lighting. He emphasised the need for integrating Lighting with the Architecture from the initial planning stages.

Mr. M.S.N. Swamy spoke on the various light sources available today for an Architect to play with Light as compared to 60's when he started his career as a Lighting Engineer. He demonstrated the various applications of Fibre Optics and LED's. He also explained how energy can be saved by incorporating proper lighting schemes including controls at the beginning of an installation. He spoke on the need to reduce pollution through proper disposal of discharge lamps.

Prof R. Jegannathan HOD, Architecture proposed a vote of thanks and requested that ISLE hold such a workshop some time during September 2006 and said the School of Architecture would host the Training Programme.

Workshop for BSNL

June 29, 2006, Bangalore

The Indian Society of Lighting Engineers, Karnataka State Centre, joined hands with BSNL and organised a Workshop on Lighting for their Engineers and Contractors on June 29.

The focus was on the application of lighting technology to improve energy efficiency and quality of life for the users.

Mr. Sriram, SE BSNL welcomed the Faculty and said that such a workshop was being held for the first time. Mr. M.S.N.Swamy Hon. Secretary ISLE, KSC welcomed the delegates and thanked them for their active participation in the workshop. The speakers were introduced by the BSNL.

Mr. Raja Mukherjee, Southern Regional Manager (PLP) GE Consumer & Industrial took them through Modern Trends in Lighting. He explained need to look for suitable alternatives considering the task for which they are designing. The selection of light sources and luminaries if incorporated at the planning stages with proper controls would not only help to enhance the ambience but also lead to proper utilisation of energy.

Mr. Bhavani Prasad explained what is meant by Good Lighting and elaborated the criteria to be considered. Taking the example of the auditorium where the workshop was being conducted he highlighted the importance of proper positioning of controls for easy handling and proper maintenance. He showed how the existing installation in a building could be modified to save energy and improve the lighting.

Mr. Bhavani Prasad

Mr. M.S.N. Swamy spoke on the large variety of modern light sources available demonstrating the various applications of Fibre Optics and LED's. He pointed out the importance of these new sources for museum lighting and covered the applications for signage, showcase and façade lighting as well. He also pointed out the need to prevent environmental damage by proper disposal of discharge lamps.

The workshop concluded with a vote of thanks by Mr. Pradeep Nettur appreciating the quality of presentations and also the interest that it had created amongst the participants. There were about 40 participants including Engineers and Contractors.

CIE ACTIVITY

The CIE and the International Lighting Vocabulary

The first formal activity of the CIE in the field of the "International Lighting Vocabulary" was decided in 1921 at the Paris meeting by the appointment of a Study Committee entrusted with examining the question of photometry definitions and symbols and submitting proposals on the subject to the Commission at its next session. Following the conclusions of the study committee, at the 1924 Session in Geneva, a subcommittee to consider a vocabulary on illumination is appointed.

After a large number of meetings and some very important work, the first edition of the International Lighting Vocabulary was published in 1938. The year after, in 1939, at its 10th Session, in Scheveningen (the Netherlands), the CIE decided on the preparation of a 2nd edition of the Vocabulary in collaboration with the International Electrotechnical Commission (IEC). This second edition was published in 1957 only by the CIE, but some experts of the IEC took part in the work.

In 1964, the CIE and the IEC came to an agreement on a common International Lighting Vocabulary to both organisations. The 3rd edition of the Vocabulary, common to the CIE and IEC, was published in 1970 and, in 1987, the 4th edition was also published as a joint document.

The permanent goal pursued by the CIE in working, almost since its beginning, on vocabulary matters is very well explained in the prefaces of the successive editions of the International Lighting Vocabulary.

- 1957: "The present vocabulary forms an official recommendation of the CIE; it expresses the greatest possible measure of international agreement on the terminology of illumination, especially as regards fundamental concepts."
- 1970: "The establishment of this vocabulary has necessarily compelled concessions on the part of those holding divergent views, and the eventual acceptance of majority decisions in order to obtain the greatest possible international agreement in this wide field of lighting terminology. It constitutes, by way of recommendations of the CIE, especially in respect of units, quantities, symbols and fundamental concepts, a working document in a form comprehensible to all."
- 1987: "The aim of this edition of the International Lighting Vocabulary comprising some 950 terms and their definitions is to promote international standardisation in the use of quantities, units, symbols and terminology in this field."

The goal pursued by the next edition of the International Lighting Vocabulary, at the present time in process of completion, is always the same:

Provide a working document in a form comprehensible to all, based on the greatest possible international agreement especially as regards fundamental concepts, to promote international standardisation. But times have changed. The field of lighting has been dramatically enlarged by the development of new fields of research on the effects of optical radiation not only on the human eyes but also on a large number of photobiological effects, and the development of new technologies for light sources, optical radiation detectors and image processing, leading to the definition of a large number of new terms. Fortunately, new information and communication technologies offer new opportunities for handling and processing a large amount of information.

The present edition of the vocabulary was prepared in a different way from the previous editions. Instead of having a special technical committee in charge of the vocabulary for all the CIE, each CIE division was entrusted to offer the terms for the vocabulary relevant to its activities. But this method of working, perfectly justified by the large number of very specific terms which need to be defined by experts in the field, induces some difficulties. Each division having its own approach to the terminology and its own rhythm of work, the provided documents contained some discrepancies (fortunately not too many) and were difficult to combine.

In order to clear up these difficulties, a harmonising committee was set up with the member in charge of the vocabulary matters in each division as members. At its meeting in León, in 2005, this committee studied the best ways to clear up the discrepancies and to publish the next edition of the International Lighting Vocabulary.

For the study of "conflicting" terms it was decided that the persons in charge of the Vocabulary matters in each division will carry out the work under the control of the chairman of the Interdivisional Harmonising Committee.

In order to speed up the process for publishing the CIE International Lighting Vocabulary it was also decided that the very strict rules of the IEC, used for the last edition, for preparing such a document will be abandoned, but contacts with IEC will be maintained for offering them the new edition of the CIE vocabulary for a joint CIE-IEC standard. At the present time the International Lighting Vocabulary is divided into 11 sections, the next edition will be split only into two parts, one for general terms and another one for terms related to applications. The part for general terms concerns mainly divisions 1, 2, 6 and 8 and is related to sections 1 to 6 of the present vocabulary. The part for terms related to applications are mainly in the field of divisions 3, 4 and 5 and are related to sections 7 to 11 of the present vocabulary.

The vocabulary will be published only in an electronic format with a search engine, For that the terms in the new edition of the vocabulary will be presented in alphabetic order. In a first step the publication will be a technical report only in English. In a second step the translation of the document (only terms or terms and definitions) will be done by the appropriate National Committees and published when ready.

At the present time, due to the hard work of the members of the harmonising committee and of the Central Bureau, the "harmonisation" of the terms is almost completed and the final draft of the two parts of the document are in preparation and should be ready soon.

The International Lighting Vocabulary is certainly one of the major tasks the CIE has to achieve. To take into account the rapid changes in the lighting field and to minimise the difficulties encountered with the preparation of the next edition of this document it is necessary to develop a structure to deal with this problem. A possible way should be the appointment of a specific "working group" in charge of the vocabulary with the following tasks:

- Check for every CIE publication, before publication, if the vocabulary used is in agreement with the CIE International Lighting Vocabulary in use.
- Look for the new terms and definitions introduced in CIE publications and discuss if they need to be included formally in the vocabulary or if they are only applicable to that publication.

- Update at least once a year the vocabulary for including the new terms and definitions.
- Revise every 5 years the complete vocabulary for checking that the definitions in use are still valid, and, if necessary, remove the obsolete terms and definitions.

In a world which is experiencing a very fast technological evolution, with the development of a lot of new concepts and new equipment, it is necessary to have Vocabularies giving clear and precise definitions of the terms used in order to improve the communication between people working in related field of activities. CIE has a major role to play in offering the International Lighting Vocabulary to the members of the optical radiation community.

Jean Bastie
CIE Vice-President

(Reproduced from CIE News)

New TC

The following new TC was established:

CIE TC 8-10 Office Lighting for Imaging
Chair: Todd Newman, USA

Terms of Reference: To report on the spectral power distribution and illumination levels used to view images in office lighting conditions. The report is to be based on empirical research.

TC members: J. Aranabat Benedicto (Spain), T. Khanh (Germany), J. Schanda (Hungary), H. Yaguchi (Japan)

According to CIE By-Laws 2.5, a NC may appoint a representative who is prepared to be active.

CIE PUBLICATIONS

Fundamental Chromaticity Diagram with Physiological Axes – Part 1
CIE 170-1:2006

CIE established, in 1991, the Technical Committee TC 1-36 with the following Terms of Reference: "Establish a fundamental chromaticity diagram of which the coordinates correspond to physiologically significant axes".

Part I of the report is limited to the choice of a set of colour matching functions and estimates of cone fundamentals for the normal observer, ranging in viewing angle from 1° to 10°.

The report starts with the choice of the 10° Colour Matching Functions (CMFs) of Stiles and Burch (1959). Then, following the ideas put forward by Stockman and Sharpe (2000), by application of König's hypothesis, and using the most modern data on the spectral sensitivity functions of dichromats, it is followed by the derivation of the spectral sensitivity functions of the long-wave sensitive (L-), medium-wave sensitive (M-) and short-wave sensitive (S-) cones, measured in the corneal plane for a 10° viewing field, the so called "cone fundamentals".

Next, by correcting these functions for the absorption of the ocular media and the macular pigment, and taking into account the optical densities of the cone visual pigments, all for a 10° viewing field, the low density absorbance functions of these pigments were derived.

Using these low density absorbance functions one can derive, taking the absorption of the ocular media and the macula, and taking into account the densities of the visual pigments for a 2° viewing field, the 2° cone fundamentals.

Using the same procedure one can derive cone fundamentals for every viewing angle between 1° and 10°. Effects of age can also be incorporated by application of the relationship of the absorption of the lens as a function of age.

Tables are given, with intervals of 5 nm, of

- 10° cone fundamentals, both in terms of energy and quanta;
- optical density of the macular pigment;
- optical density of lens and other ocular media;
- the photopigment low density absorbance spectra;
- 2° cone fundamentals, both in terms of energy and quanta;
- maximal optical density of the macular pigment as a function of field size;
- the optical density of lens and other ocular media as a function of age;
- the maximal values of the optical density of the visual pigments as a function of field size.

The report is written in English, with a short summary in French and German. It consists of 53 pages with 10 figures and 12 tables, and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 56,— (Members of the CIE National Committees get 50% discount).

Tubular Daylight Guidance Systems
CIE 173:2006

Tubular daylight guidance systems are linear devices that channel daylight into the core of a building. They consist of a light transport section with, at the outer end, some device for collecting natural light and, at the inner end, a means of distribution of light within the interior. Collectors may be either mechanical devices that actively

focus and direct daylight (usually sunlight), or be passive devices that accept sunlight and skylight from part or whole sky hemisphere. The transport element is usually a tube lined with highly reflective or prismatic material or may contain lenses or other devices to redirect the light. Light is distributed in an interior by output components, commonly diffusers made of opal or prismatic material.

The major emphasis of this Report is on passive zenithal systems, the most commercially successful type of daylight guidance being installed in many parts of the world.

The Report includes a contextual review of the technology of all generic types of daylight guidance system. The major part of the report is concerned with photometry of components and systems, design methods, maintenance issues in both design and use, energy aspects, cost and benefits, human factors and architectural issues in the context of passive zenithal systems. The report includes case studies showing good practice.

The report is written in English, with a short summary in French and German. It consists of 73 pages with 44 figures and 5 tables, and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 64,— (Members of the CIE National Committees get 50% discount).

Photocarcinogenesis Action Spectrum (Non-Melanoma Skin Cancers)
CIE Standard S 019/E:2006

Solar ultraviolet radiation is recognized as a major cause of non-melanoma skin cancer in man. Skin cancer occurs most frequently in the most heavily exposed areas and correlates with degree of outdoor exposure. Describing the relationship of exposure (dose) to risk (skin cancer) requires the availability of a biological hazard function or *action spectrum* for photocarcinogenesis. This standard proposes the adoption of an action spectrum (weighting function) derived from experimental laboratory data and modified to estimate the non-melanoma tumor response in human skin. The experimental data are sufficient for estimating effectiveness down to about 250 nm, but experimental data are not sufficient for specifying effectiveness above 400 nm.

This standard has been approved by CIE National Committees. It may be obtained via the website of the Central Bureau of the CIE (www.cie.co.at).

Price of this standard: EUR 28,- (Members of CIE National Committees get 50% discount).

FORTHCOMING EVENTS

Razsvetljava / Lighting Engineering 2006
October 12-13, 2006, Bled, Slovenia

This conference is organized by the Lighting Engineering Society of Slovenia and the Slovenian National Committee of CIE. The emphasis is both on the research and practical applications. This year's topic of interest: Lighting of Work Places.

The working languages will be Slovene and English

Registration fee:

EUR 184,- (before 29 Sep.)
EUR 205,- (on-site registration)

For further information, please contact:

Mr. Matej B. Kobav
Faculty of Electrical Engineering Trzaska 25
SI-1000 Ljubljana, Slovenia
tel: +386 1 47 68 759
fax: +386 1 47 68 289
e-mail: matej.kobav@fe.uni-lj.si
http://www.sdr.si

International Conference on Colour Harmony
April 24-26, 2007, Budapest, Hungary

Call for Papers

The following main topics will be covered:

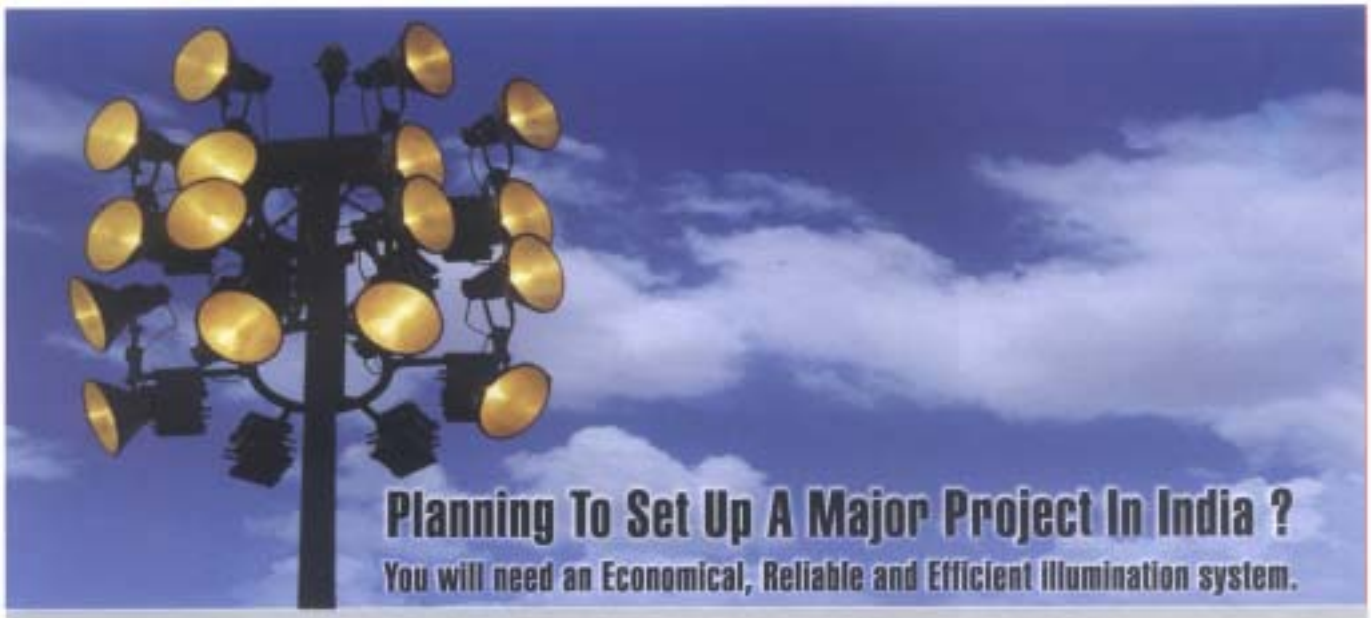
- Theory and the colour harmony (harmony systems and models, colour vision, colour preferences, etc.)
- Colour harmony in architecture (architecture, interior decoration, environmental design, etc.)
- Colour harmony in art and design (fine arts, graphic arts, applied arts, arts and crafts, handcrafts, fashion, etc.)
- Colour harmony in the folk art (colouration and toning in the folk architecture, folk wear, folk handcrafts, etc.)
- Colour harmony in the nature (lifeless nature, living nature, etc.)
- Computer technology and the colour harmony (web design, colour display, etc.)

Abstracts (no more than one page A4, in pdf or .doc format), should be submitted before 31 October 2006.

Registration fees:

EUR 200,- (before 31 Dec.2006)
for students: EUR 100,- (before 31 Dec.2006)

Continued on page 23



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111 South Wacker Drive lobby

Chicago, Illinois, U.S.A.

A luminous ceiling bathes the white core walls with a cool, diffuse northern light and accent lights provide more dramatic lighting effects at night. The lighting of the underside of the garage ramp reinforces the radial pattern using dimmable fluorescents in architectural coves. Radial slots were cut into the ceilings to integrate lighting equipment used to stimulate plant growth. This building achieved a LEED Gold rating.

Principal Lighting Designer: Stephen Margulies, IALD
Cosentini Lighting Design, New York City
Other Lighting Designer: Fernando Soler

Chanel, Ginza

Tokyo, Japan

The inspiration for the lighting design of the 10-story flagship store, located in Tokyo's most upscale shopping district, was a classic Chanel twed. The lighting of this contemporary, architectural icon embodies the mega-luxurious identity of the fashion house. Its two-foot deep curtain wall controls sunlight integrating glazing, electrochromic film, metal louvers and white LEDs. Custom electronics provide precise control of the view, pixel brightness, and shade position. The result is a shimmering skin of artistic imagery using light and spectacle to unite the building and brand. This project got a Special Citation for technical integration of facade and aesthetic sensitivity to brand image.

Principal Lighting Designer: Matthew Tanteri, IALD
Tanteri and Associates, New York City

Louis Vuitton Global Lighting Design

Madrid, Spain

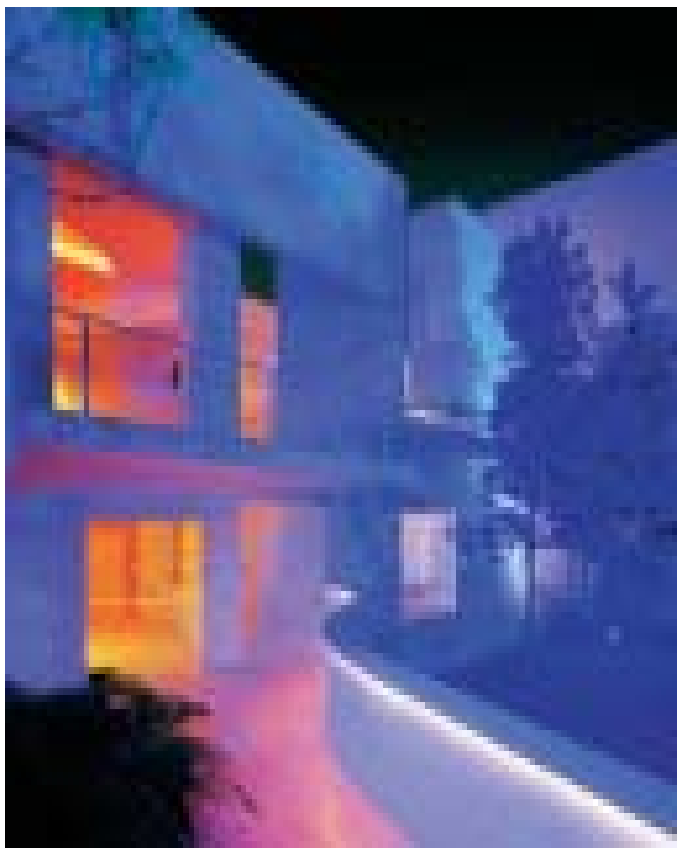
The intent was to reduce running costs and HVAC load and enhance the luxury retailer's brand image throughout its 350 stores worldwide. The Madrid store represents this work. At the store entrance, a slot in the ceiling accommodates all fixtures for a clean, sophisticated image. At the entrance to the low ceiling, the application of light behind surfaces, in coves and in pull back ceilings integrates the scheme with the architecture. The number of different ceiling fixtures is limited to two main types, each with two different beam angles. The slot in the stucco ceiling has two built-in tracks to mount the fixtures and has greatly reduced installation costs.

Principal Lighting Designer: Rogier van der Heide, IALD
Arup Lighting, Amsterdam
Other Lighting Designers: Simone Collon and Ben Kreukniet

Hue-Chroma House

Mexico City, Mexico

The design objective of the Hue-Chroma House was to achieve quiet in a city that is overwhelmed with information that includes lighted graffiti and advertisements. Light had the crucial role in supporting the experience of contemplation and visual silence. The principal illumination of the facade is the interior light that moves from exterior, reflecting toward the white walls. The project was awarded the IALD Special Citation for innovative use of materials and techniques for daylight control.

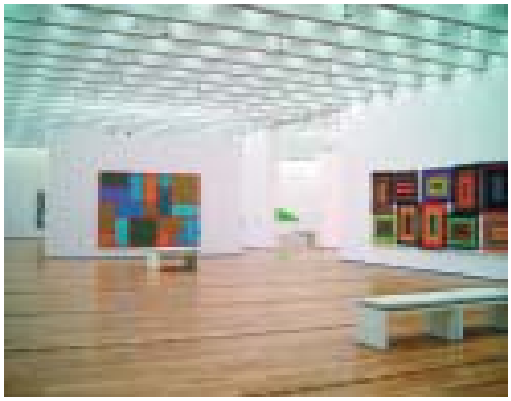


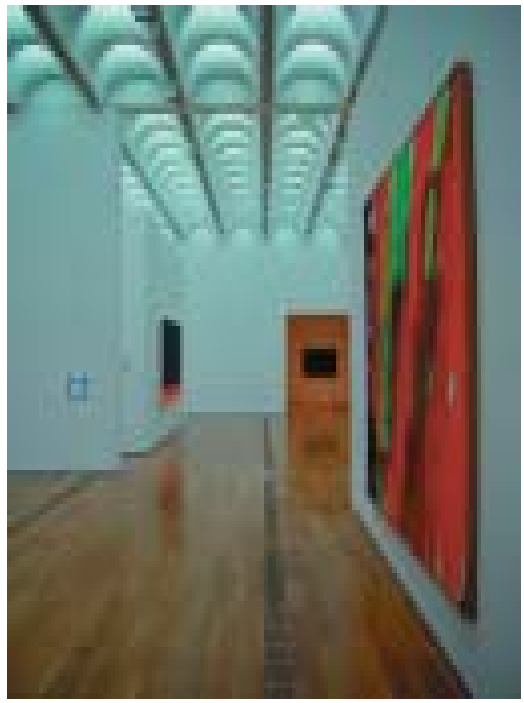
Principal Lighting Designer: Gustavo Avila
Lighteam Gustavo Avila , Mexico City

High Museum of Art

Atlanta, Georgia, U.S.A.

A key aspiration was creating gallery spaces in which natural light was the primary source of illumination. Skylights on the roof were designed to allow diffused north light and reflected sunlight to enter the gallery, while excluding direct sunlight. The design process involved many stages of evaluation and prediction to ensure conservation limits were not exceeded, also ensuring that artworks would not be damaged from excessive light exposure. The resulting quantity and distribution of natural light minimizes electric lighting energy consumption in 25 percent of the new gallery spaces. The High Museum of Art also won the first IALD Sustainable Design Award.





Principal Lighting Designer: Andrew Sedgwick, Arup Lighting, London
Other Lighting Designer: Arfon Davies

Kyoto State Guest House

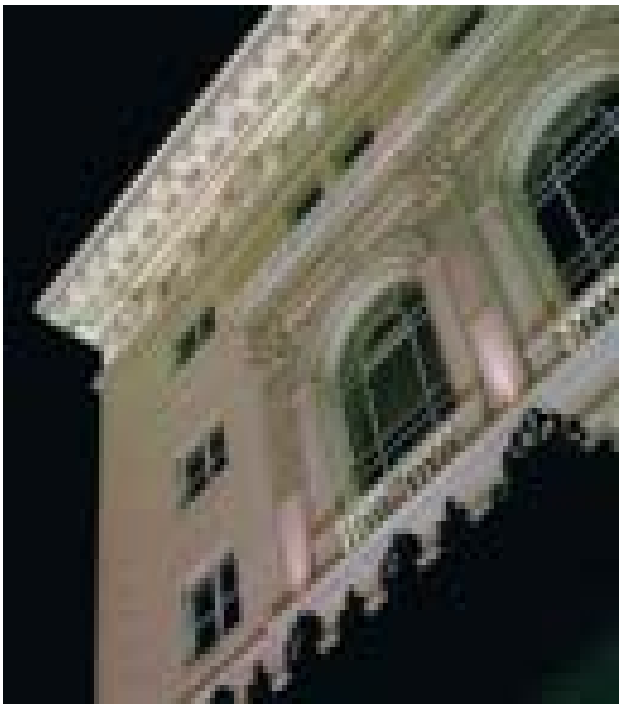
Kyoto, Japan

The guest house, located in the traditional and culturally-rich Kyoto, Japan. The lighting design used high-level optical equipment, an elaborate integration of architectural and furniture details, and natural light. The result is a rich expression of contrast, reflection, permeation, and an ever-changing choreography of light along routes of circulation.

Principal Lighting Designers: Kaoru Mende, IALD, Ryuichi Sawada Aki Hayakawa
Lighting Planners Associates, Tokyo, Japan

Detroit Athletic Club,

Detroit, Michigan, U.S.A.



Maintenance, energy consumption and budget were critical client concerns, while difficult mounting restrictions created further design challenges. A layered lighting approach establishes the building's presence, while also accentuating the facade's intricate detailing. The major challenge was lighting the cornice from a small ledge. Designed in early 2004, white 3000K LEDs were utilized for intensity, size and extended life. A creative mounting assembly minimizes damage to the historic facade. This innovative design renders the historic architecture with reverence, while appropriately utilizing the newest white LED sources and driving development of new dimming capabilities.

Principal Lighting Designer: Jeff Gerwing, IALD, Smith Group, Detroit
Other Lighting Designers: Rodrigo Manriquez, IALD, and Chris Coulter

Igreja de Sao Francisco de Assis,

Belo Horizonte, Minas Gerais, Brazil

The renovation of this structure was that the light would enhance the architecture and diminish the visual interference of lighting fixtures that could distract the eye. The lighting of the facade was intended to accentuate the volume to the curves and intensity to the base.

Principal Lighting Designer: Monica Luz Lobo
Monica Luz Lobo Lighting Design Studio, Rio de Janeiro, Brazil
Other Lighting Designers: Ines Benevolo, Danielle Valle and Gabriel Vinagre

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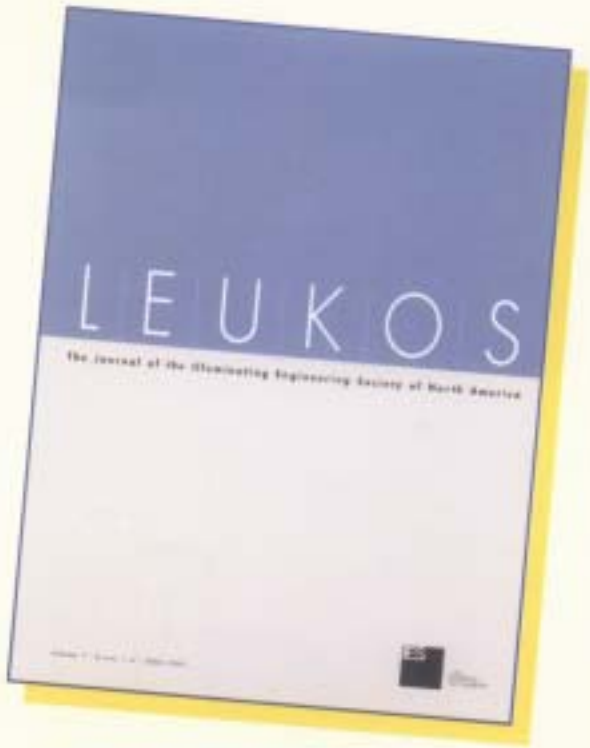

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For further information, please contact:

ICCH'07
International Foundation Light and Colour
1145 Budapest
Mûegyetem rkp. 3
Hungary
tel./fax: +36 1 2202618
e-mail: colour.harmony@t-online.hu

Lighting, 2007
June 10-12 , 2007, Varna, Bulgaria

This conference is organized by the Bulgarian National Committee on Illumination.

Topics include:

- Energy efficiency in lighting and ecology
- Indoor lighting
- Outdoor lighting
- Ergonomics and physiology of vision
- Photometry and colorimetry
- Daylighting
- Architectural, decorative and advertising lighting
- General aspects of lighting, terminology, standardization

An exhibition of lighting products will be held during the conference.

Registration fee:

EUR 100,-.
Deadline for abstracts: 25 February 2007.

For further information, please contact:

Ms. Nicolina Yaneva
Technical University Sofia
tel.: +359 2 965 27 14
e-mail: niya@tu-sofia.bg

Light Pollution and Urban Lighting
September 6-8, 2007, Istanbul, Turkey

Turkish National Committee on Illumination, TUBITAK National Observatory, Turkey and Ýstanbul Kültür University are planning an international meeting entitled "Light Pollution and Urban Lighting" in September, 2007, in Istanbul, Turkey. Despite the increasing awareness of light pollution worldwide, improvement in application of better light is minimal. This puts a constant demand on lighting for better applications. The aims of the symposium are to enable the meeting of people working on various subjects of lighting and especially urban lighting such as research, design, application and production, to ensure the exchange of knowledge and experience, to contact with people and companies concerned in lighting for revealing the accumulation in preserving natural night time environment and promoting dark skies, and to observe the developments.

Topics

- Urban lighting and natural night time environment,
- Urban lighting and skyglow,
- City beautification,
- Vision and Colour,
- Physical Measurement of Light and Radiation,
- Lighting and Signalling for Transport,
- Exterior and other Lighting Applications,
- Photobiology and Photochemistry,

Abstracts about 200-400 world should be sent to the Congress Secretariat. There will be simultaneous translation during sessions between English and Turkish.

Dates

- **15 September 2006** Deadline for submission of abstracts and/or return of registration form
- **16 October 2006** Deadline for notification of acceptance and instructions to prepare the papers
- **06 June 2007** Deadline for submission of final papers

Registration

All registrations will be made online at:
http://mimweb.iku.edu.tr/light07/

For further information contact:

Dr. Emel D. Birer
Res.Asst. Serhat Kut
e-mail: light07@iku.edu.tr

NEWS ABOUT MEMBERS

Royal Society Award for Biswajit Ghosh

Dr. Biswajit Ghosh, ISLE Fellow and Hon. Treasurer of the Society has been awarded the Royal Society's International Short Visit Award to work at the University of Surrey.

Dr. Ghosh's expertise in electrical contact development in semiconducting devices is well known and he has done innovative work on the electroless coating technology for contact development

to high workfunction semiconducting materials. Surrey University is conducting a novel project on development of CdZnTe devices for high energy image processing applications under EPSERC funding of the British Government. CdZnTe is a large workfunction material and electrical contacting is difficult. It is to this end that the Royal Society Award has been given to Dr. Ghosh.

Dr. Biswajit Ghosh is the Director of the School for Energy Stadies at Jadavpur University.

Dr. Biswanath Roy at LBNL, USA

Dr. Biswanath Roy, MISLE, Reader, Illumination Engineering, Electrical Engineering Dept. at Jadavpur University has been invited by the Lawrence Berkeley National Laboratory, Berkeley, California, USA for orientation on the latest work in the field of Daylighting Systems. He will be working with Dr. E.S. Lee at the Environmental Energy Technologies Department at the LBNL.

Members may recollect that Dr. Biswanath Roy was the ISLE Scholar working with Prof. Dr. Sunil Ranjan Bandyopadhyay on the ISLE Research Project, "Architectural Models under Artificial Sky" at Jadavpur University in the nineties. Subsequently he obtained a Ph.D on the same subject to become the first doctorate on a Lighting subject from an Indian University. Presently, he is guiding Ph.D work in "Daylight integrated artificial lighting system."

He is also the Joint Director, School of Illumination Science, Engineering & Design, Jadavpur University and the Hon. Treasurer, Calcutta State Centre, ISLE.

It is expected that this visit will lead to collaborative research programmes with LBNL and develop experimental facilities and data analysis with emphasis on field study.

Utpal Bhattacharjee becomes ED, CESC

From April 1, 2006 Mr. Utpal Bhattacharjee, Member of Kolkata State Centre has become Executive Director (Corporate Services) of Calcutta Electric Supply Corporation, a leading electricity and distribution company in Calcutta, Howrah and suburbs. He was earlier General Manager CESC.

R& D UPDATE

Organic LEDS and Sheet Lighting

The developments during the last few years in inorganic semiconductor LEDs hold high promise for their application in general lighting. At the same time the progress in the technology of organic LEDs also offers promise as a future light source.

Organic LEDs (OLEDs) are doped layers of polymers deposited on thin film substrate and sandwiched between a high work function anode and a low work function cathode. The anode is usually indium tin oxide with good electrical conductivity and high transparency to visible light. When a small electrical voltage is applied to the device, positive and negative charges are injected in the device which recombine and produce light. The wavelength and output light level depend on the nature and structure of the organic layers. One can maximize the light output by choosing appropriate structure of the layers and anode and cathode.

Since the organic layers can be deposited on a thin film substrate using plastics, they can be made in the form of sheets which can cover any surface, curved or plane. Panels of these sheets can be put on walls, windowpanes or ceilings, turning them into light sources.

Earlier attempts to make white light LEDs using phosphorescent dyes for red, green and blue colours had the problem of burn out of the blue component. Stephen Forrest of the University of Michigan and Mark Thompson of the University of Southern California, reported a solution to this problem in a paper published in *Nature* about two months ago. They used a fluorescent dye for the blue component which gave a longer life to the blue and used 20% less energy. There is another hurdle for the use of these devices. All plastics that the OLEDs use are porous to humidity and this will degrade the performance of the OLED device. Experts feel that this problem can eventually be solved.

Fast developments are taking place on LEDs and OLEDs and both will soon find application in general lighting. There may be overlaps in some of their applications, and experts feel that each will find its own niche.

V D P Sastri

WEBWATCH

Global Lighting Report Gives Dim View of Future Energy Use

The United Nations' International Energy Agency (IEA) warns that the amount of energy used for lighting will be 80 percent higher in the year 2030 than it is today, if quick action is not taken. It is the first detailed global analysis of the energy used by lighting and includes a thorough review of the technologies and policies, which can reduce the amount of energy used by lighting. The book reviews the impact of lighting energy-efficiency policy actions to date and maps out the sets of measures that will be needed if an energy-efficient lighting future is to be reached.

Full story at: http://www.iea.org/

Novel Concept for Lighting Homes and Offices

The Alliance for Solid-State Illumination Systems and Technologies (ASSIST), an LED industry group organized by the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute, unveiled a novel concept for lighting homes and offices. The design integrates light-emitting diode (LED) technology with building materials and systems to create electronic walls and ceilings. The design includes interchangeable, modular panels with integrated LED lighting fixtures that "snap" in and out of an electrical grid. Occupants can change the location of light fixtures or introduce new fixtures on a whim to satisfy their needs or their mood.

Full story at: http://www.lrc.rpi.edu/resources newsroompr_story.asp?id=60

Lighting for the Elderly

Everyone's vision deteriorates with age, but there are ways to lessen its impact. Good lighting can make the difference between seeing and not seeing for older adults.

The Lighting Research Center (LRC) at Rensselaer Polytechnic Institute developed principles for lighting for older adults and tested those principles in two assisted living facilities. The test results demonstrated that lighting helps older adults maintain their independence and improves their quality of life.

The AARP Andrus Foundation awarded the LRC a Dissemination Grant to develop these guidelines for designing lighting for older adults.

Full story at: http://www.lrc.rpi.edu/programs/lightHealth/AARP/index.asp

Light In Jyväskylä – Event Illuminates Alvar Aalto Architecture

The world famous Finnish architect Alvar Aalto has said: "Let the buildings sleep at night". It's not exactly known what he meant with it and if it's just a legend. But now, the city of Jyväskylä and its co-operators from the architectural lighting field will challenge this thought! The buildings in Jyväskylä University campus area, designed by Aalto, will be illuminated temporarily this autumn. The event will take place from September 28th to October 22nd 2006.

These workshop light installations are part of the *Light in Jyväskylä* –happening. The event is a visible celebration of Jyvaskylä's strategic aim to become the City of Light in Finland. There will also be a seminar concentrated on lighting methods on architecturally, culturally and historically significant sites and on lighting design process issues from design to installation phase. The seminar is held in Finnish and will not be translated. Next time the event will take place in 2008.

For more information and inquiries about guided tours around the illuminated campus area and other sites in Jyväskylä, contact the event coordinator Annukka Larsen (tel. +358 40 740 4717, annukka.larsen@jkl.fi).

Small visualisation pictures attached, 300dpi resolution pictures downloadable from: http://pop.materials.fi/Light in Jyväskylä 2006 folder.

Links:

www.jyvaskyla.fi/valo
and
About Alvar Aalto:
http://www.alvaraalto.fi/indexe.htm

OTHER NEWS

Post Graduate Programme in Lighting

Following the National Workshop held in Pune on April 20, That MAEER's Maharashtra Institute of Technology, Pune with the support of ISLE Mumbai State Centre has decided to start a Post Graduate Programme in Lighting Technology from the current academic year.

The course will be industry oriented with an emphasis on practice rather than theory with much greater laboratory time than in conventional courses. During the 3rd semester students will select the subject of specialization and during part of the 3rd as well as the 4th semester students will work on applied projects under the guidance of industry experts with joint monitoring of progress by both Industry and the Institute.

Students will receive Award of Certification by the National Council on Qualifications for Lighting Professionals (NCQLP) of North America.

The faculty will be drawn from Engineering Colleges, Research Institutions, Practising Architects, Interior Designers, Electrical and Lighting Consultants, Industry Experts, Testing Houses and Institutions from India and overseas.

Duration	:	2 years (4 semesters)
Intake	:	40 students per year
Eligibility	:	B.E. (Electrical/Electronics)/E&TC or M.Sc. (Physics/Electronics) or equivalent
Fees	:	Rs. 1,65,000 per annum + NCQLP Fees (one time) US$ 100

For further information contact:

Prof. P.D.Chidgupkar
Principal MIT Woman Engg.College
MIT Campus Pune
Tel.No: 020 25431795
Cellphone No: 9822206041
e-mail : pdc@mitpune.com

Mr.Prakash Barjatia
Chairman, Mumbai State Centre
Indian Society of Lighting Engineers
Cellphone No. 09370144389
E-mail: jainpcb@hotmail.com

SPECIAL PAPER

Glimpses of 50 Lightyears

Tapas Sen

Prelude

In a city with a background that is rich in culture, a city of poets, writers, artists, the city where the pioneers of science of this country like J.C. Bose, C.V. Raman and Meghnad Saha worked in their pursuit of physics and light, it was intriguing coming across in a leading Calcutta English daily, the mention of "Planetarium" in the advertisements for "Theatre". There are days when only one theatre is published in this column - the "Planetarium". As a person of theatre for over half a century, involved with a vast range of playwrights - Tagore to Shakespeare, Ibsen to Brecht, Gorky to Chekov, Vijay Tendulkar, Girish Karnad to Badal Sarkar and Mohan Rakesh - one always felt, why? Why, has "Planetarium" been consistently mentioned in the theatre column?

The answer possibly lies in the fact that, the grand spectacle is theatre at a cosmic level in contrast to our theatre of tragedies and comedies of love and despair, of joy and sorrow with sentiments and emotions of the dramatis personae.

This drama of stars and galaxies spread over the stage space of the universe, thousands and millions and billion lightyears across remembering the velocity of light - one hundred eighty six thousand miles per second - the spectacle of the Sun, the Moon and the remote quasers and pulsars at the edge of our perceptual horizon where the message comes every night not only through our trusted messenger of visible light but also through another powerful medium (of the electromagnetic wave) by the radio telescopy.

Here, a mention may be made of Prof. D. Kent Cullers with the capacity to see beyond what the most powerful telescope on this planet fails to see. Cullers, has no eyes to see, as his retinas were totally impaired before his premature birth due to an excess supply of oxygen to take care of his failing lung system. Dr. Cullers, in spite of his total blindness, is a doctrate in Physics and his extraordinary receptibility through hearing has enabled him to hear the faintest radio signals coming from the remotest reaches of the universe, where light rays from the most powerful stars, some perhaps million times larger and brighter than our sun, fail to reach even through the biggest telescopes of our planet. To quote Dr. Cullers in his own words, "I can see what other human beings with their perfect and complete visual apparatus will not be able to see ever !"

Talking about the amazing human ability to overcome physical dictates, how can we refrain mentioning Stephen Hawking, the physicist who has already become a legend in his life time. Hawking, a worthy successor in the realm of physics after Newton and Einstein, a physically disabled person, for many years he could not move from his wheelchair and even his ability of speech is lost. Yet he expresses his wonderful concepts about science, in particular, his epoch making book for laymen like us, *"A Brief History of Time"* is so thought provoking, disturbing and mind boggling. Like Kent Cullers, Hawking has the courage and conviction to go ahead in his pursuit to understand and interpret reality - an inspiring example for us, the lesser mortals on this planet in our venture to achieve more and more meaningful light to dispel the darkness - both in scientific pursuit and implementation of better lighting ideas and both in the theatre and the society of mankind.

This paper will not dwell on illumination levels and standards, lux and foot candles, photometric information,

Sun and Earth - dance sequence
Director - V. Shantaram, 1969

the efficiency of energy saving luminaires and reflectors. It gives the personal point of view of a bystander who has watched (literally) from the wings the drama of this world theater of social and national and International upheavals, conflicts, turmoils in war and peace, in revolution and counter revolution, coups, betrayal and negotiations at the highest level as in the forum of summit talks or tense deliberations at the United Nations, Security Council sittings, etc.

The experience and feelings of a Lighting Artist may be like the tiniest photon, a particle of light that, in spite of its subatomic scale of smallness has its own strange behavior, as it was watched by Thomas Young in his double slit experiment, way back in the year 1803. Light has been observed, and experiments uncovered the wavelengths of the visible light of a very narrow range from 400 to 700 nanometres approximately.

This has opened our eyes by enabling us to analyse the spectrum of light from distant planets, stars and galaxies to ascertain their contents in terms of hydrogen, helium, iron, copper, mercury or gold, and presence of all elements and even their percentage in the specific remotest sources, lightyears away from our eyes. Our eyes translate the entire reality through the message carried by the sensation of light from the retina of the eyes on to our brain's visual centre called the Striate Cortex area 17 of Brodmann. The neural perception enables us to respond and react from the time we first begin to see and understand, till the day when all lights fade out and the curtain comes down finally on the night of our final exit from this theatre.

But this conscious cerebration leaves its mark on the memory system of human culture of all humanity on this planet. Perhaps Prof. Cullers and his colleagues will some day be able to ascertain and perhaps respond to the intelligent being's call in their pursuit of SETI (The Search for Extraterrestrial Intelligence) with or without light, or maybe with radio wave messages across the vast space of the theatre of the Universe !

With this background, we feel, we can see the justification of classifying a "Planetarium" as a theatre - a theatre with its majestic characters and events of a drama, the prologue of which took place some time when time also began; time in its truest sense, not time only but time-space and not time and space. Current physics has taught us about the concept of time-space and about the strange ideas on space warps, curvature of space, of time warps.

In the twilight zone of our dreams, we come across many unexplained and mysterious situations. Modern science and technology is just on the verge of uncovering the mysteries of mind and matter, it is almost on the threshold of solving them with the help of its newly acquired equipment of electronics, laser rays, holography and finally with its magic wand of computers.

The configuration of neurons in the brain of specialized locations have been identified recently to be capable of handling sensory impulses of definite nature - for example, vertical, horizontal and diagonal images activate distinctively separate regions in the minutest scale inside the brain and these have been verified with electrodes capturing impulses in the brains of live cats and monkeys. In human beings too, much advance has made it possible to record in the dream process by probing a phenomenon called REM (Rapid Eye Movement) of the person experiencing a dream in his sleeping state with electrodes making interesting graph patterns expressing the dream process. This pursuit of dream events reveal visual and other perceptual sensory associations and have started revealing fascinating information on the subconscious mechanisms of dream psychology.

* * *

The development and use of electricity for illumination followed closely the history of the application of incandescent lamps abroad. At the turn of this century by and large, buildings both private and public equipped themselves with electrical installations and had the incandescent lamps replacing the earlier oil lanterns and wax candles. Metropolitan cities like Bombay and Calcutta had seen gaslight for general street lighting, and continued to have these kind of gas mantle ornate brackets on street light posts till as late as the 1960s. For the general domestic purposes the tungsten filament lamps had already taken over.

The strange longish shapes of the electric bulbs of yesteryear with their typical carbon filament bunching will be remembered with nostalgia by those who had seen them in 1920s and 1930s. The slow transformation of the bulb shape and further improvements with inert gas filling and introduction of coiled coil filament occurred, almost unobtrusively, during the beginning of the second world war days in India.

Over the years, the incandescent lamp light became almost a way of life in the urban social environment. With the outbreak of the second world war, the darkness of night got an extra dimension of gloom and ominous feeling when the big air raid prone cities started experiencing what were known as Blackout exercises. All lights, whether internal lights of homes, or of public buildings were protected, so that no light escaped outside and even all the street lamp poles were provided with extra ARP (Air Raid Precaution) light guarding masks to throw a small dull pool of light, right under the lamp post only. Those were the days and nights when all the black evils started. Blackout, Black money and the Black market, which continue as the most corrupting residual reminder of the second world war-ravaged economy of India, still limping since the preindependence days.

The traumatic experience became somewhat symbolic with the severe restrictions of light use accompanied by famine and hunger, as a corollary to war in the International arena too. But along with this, came some remarkable transformations in technology with the introduction of Radio Broadcasting channels more particularly.

The mid 1940s saw the introduction of gas discharge lamps of various kinds, the most notable is the fluorescent lamp, popularly known as the tube light. This lamp with its bright bluish white light slowly invaded the lighting environment all over: offices, factories and it found its permanent place in homes, in drawing rooms and kitchens. The introduction of this new kind of lamp with its accompanying plus point and utility value has become the natural order for nearly half a century in our country and the world over.

The street lights after being replaced from gas mantle lighting by incandescent lamps were subsequently elbowed out by the newly arrived tube lights changing the look of the streets after dark. Simultaneously, the other gas discharge lamps known in the common man's parlance as Mercury and Sodium lamps, not only decorated the Marine Drive, Rajpath, Janpath, Marina, Chittaranjan Avenue and Esplanade of Bombay, Delhi, Madras and Calcutta, but the high level of illumination with their bright bluish and golden orange lights changed the environmental perception altogether and has found its place in Literature, Painting and Movies of the generation with creative artists all over the country.

The effects of light and artificial illumination, have had impact on famous painters of the West like Rembrandt and others. In India too the traditional two dimensional painting was soon followed by a school of modern painters who started using these inspirations, breaking newer dimensions of surfaces, planes and texture in their painting, using their palettes of all shades of tints and hues of the spectrum.

This way of looking and recreating reality has influenced one particular area of illumination - the use of the lighting effects for the theatre, dance, ballet and drama. The association of moods and emotions through the use of controlled illumination had its root in the feeling that the conscious human eyes and mind get, all through life, by sensitive perception from the day the newly born homosapien opens his or her eyes to look around.

The tools for the general illumination at home and outside came as a powerful weapon in the hands of the Artists and Designers in one of the oldest form of performing Arts - the theatre. The magic of light and colour was explored fully with the ability of having control of lighting with spot lights, complete with lenses and reflectors, enabling the theatre man to control the beam of his recently acquired electric lighting equipment. Starting with general purpose illumination to dispel the darkness to achieve clearer and better visibility for the spectators in the theatre, later the spotlights and the dimmer control system enabled the Director and the Designer to be more selective and partial, to pick and choose special areas and characters to emphasise a particular situation in a play or dance. The effects of lower and higher intensity of various compositions and configuration of lighting units were attainable with conscious operation of the dimmer control console, according to the judgement of the Director and the Producer, to satisfy the mood and sentiment of the performance in question.

Along with the progress and development of lighting technology, there were logical changes in the bulbs to suit the requirements of special lighting units for the theatre and movies. The so called conventional bulb had undergone many changes. From ordinary lamps of standard wattages of 60 to 150 watts — to bulbs for floodlighting, a wider range of application areas came into existence. Rated 300 to 1500 watts, or even higher, these lamps were quite big in size and unlike the domestic lamps with bayonet caps and holders, these were mostly screw cap holders or the bipost, to mount them in the larger housings.

The parameters of lighting, both in the Stage and Movie studio became more and more demanding for still more brightness and concentrated light sources. As a result came special kind of bulbs in contrast to the aforesaid type of general purpose lamps.

The subsequent lamps were specially manufactured keeping in view the higher light requirement of the projectors, stage and studio spot lights. It has been a sort

of convention to refer to these lamps as projection lamps from the early usage in the slide and home movies projection. Unlike the regular commercial cinema houses, using high intensity Arc lamps, the compact movie projector used these special lamp systems, at times with fan attachments that keep the glass bulbs at a reasonable temperature to avoid swelling or blistering of the glass by uneven and excessive heat. There are several types of these projection lamps and there are International standard names for classifying them.

With the extra efficient light output, further advantages of such lamps are their comparative compactness in size and shape. However, there are some limitations. Some of these bulbs have limited burning hours - from fifty to two hundred hours. Moreover, many of these special lamps carry along with them clear instructions about the burning positions such as “Burn cap down” or “cap up” or burning angle not beyond 45 degrees or so.

Of late, there has been a new set of lamps with bright white illumination called Halogen lamps, in contrast to the existing old tungsten filament lamps. These are for floodlighting and for the spotlights and other special fixtures in stage lighting and have resulted in compact arrangement of both floodlight and magazine batten compartments light, for general broad illumination of the stage. Special use of the floodlighting housing units is to evenly illuminate the background surface (called Cyclorama in theatre language). The cyclorama is really a neutral surface mostly white, grey or light blue in colour to represent the space beyond the acting area with setting of walls, doors and windows. This space of the surface represents the sky. The natural impression of any sky has its constantly changing hues from dawn to dusk, to evening to late night dark sky, at times with the moon and stars and changing patterns of clouds, as we experience them in day to day life. This so called sky, the cyclorama, needs a special arrangement of light distribution, of even lighting, both from top and bottom. This is made possible by placing a battery of floodlights of different colours from top and bottom. Clever manipulation of the lights on the cyclorama provides endless effect of hues by permutation and combination of intensities with the help of the dimmer banks from the Light Control panel.

The tungsten Halogen lamp with its higher intensity appeared more brilliant white in comparison with the previous conventional yellowish light of the earlier generation of incandescent lamps. Naturally, preference was automatically given to use both spots and floods with Halogen lamps. Now the cyclorama lighting becomes all the more rewarding with the use of smaller and brighter set up of lights giving the Designer far more scope for more pictorial effect, both in the playing area and the cyclorama with all the enhanced embellishments that any artist desires for a successful implementation of his visual dramas in any theatrical venture.

Besides theatre, the Halogen floodlight is now effectively used in all open air installations - sports stadia, airport and railways. In about thirty years the Halogen concept has pervaded all fields of lighting: the films, TV, theatre and the commercial world. The Halogen is no more a novelty, it is an inseparable entity in its own right since the sixties.

This strange business of painting the stage with lights was visualised by that great personality of the theatre, rightly called the father of stage lighting, Adolph Appia. Towards the end of last century when none of the modern equipment, nor use of electricity and optics had come into existence, Appia in one of his treatises on Wagner’s opera *“Tristan and Isolde”*, described with remarkable foresight his outline and an accurate scheme of lighting pattern down to the last detail. It is amazing to think of his ideas when directional light sources with spotlights and control of their intensities were a thing of the future. Technological advancement after almost half a century fulfilled his dreams set out on paper.

Man has learned from nature, sunrise to sunset’s glorious magical effect of crimson clouds. Romantic silver soft mellow moonlight percolating through the leaves of trees, inspired poets and painters of all generations, everywhere, irrespective of language, community or religion. Man in the theatre got his cue from nature and thought of tinting with the the colours of the spectrum. In this pursuit, starting from the basic primary colours of Red, Blue and Green, in course of time patient research and development made possible the use of synthetic plastic materials to create a myriad of colours - up to sixty or seventy different shades and hues. There are so many blues and greens, at least seven or eight shades of each. This new range of colour filters effectively changed the state-of-the-art of the phenomenon of special lighting in the theatre, creating a continuous flux, of ebb and flow of lighting from different sources,

The Royal Hunt of the Sun
platform Theatre, Mumbai, 1997

Madhav Malanchi Kanya
Anya Theatre Workshop Production, 1998

placed at strategically chosen angles, to create different zones of stage setting with the choreography and action of the actors in plays.

The coloured lighting, originally, was tried with sheets silk cloth of different colours. Then attempts were made to dip the bulbs in the lacquers, subsequently replaced by dyeing the glass plates to be placed in front of luminaires, as it is still practised in the enacting of spectacles in the form of outdoor *Son-et-Lumiere* shows. To prevent cracking of the glass, special heat resistant glass was manufactured and in the square pieces, glass filters were cut into strips and placed leaving a hair-line airgap in between the narrow strips. This took care of the temperature of higher wattage lamp in special luminaires. Moreover, the open air locations of the luminaires leave the filters exposed to dust, rain and moisture. In the long run the efficiency of the directional coloured light was reduced, as the filters, gradually, over the years tend to become more opaque, losing their original transparency. So an important function of filtering a particular colour on the target area of the ancient monument during the Sound and Light show gets impaired.

The application of special illumination in the field of *Son-et-Lumiere* shows feature significantly all over the world. It will not be out of place here to mention several shows in India starting from the Red Fort in Delhi depicting the interesting romantic episodes of the Moghul era; Shalimar Gardens in Kashmir; Sabarmati Ashram in Ahmedabad, where Mahatma Gandhi lived and from where he undertook his famous march to the sea shore of Dandi, to break the infamous Salt Act of the British rulers; the Gwalior Fort in Central India depicting important phases of Indian history and culture, where legendary musicians like Tansen and Baiju Bawara figured in the courts of King Mansingh, whose romantic encounter with a charming, village belle who would become his queen Mriganayani (gazelle eyed); the Cellular Jail in the Andaman Islands in the Bay of Bengal, where the condemned prisoners of the Indian freedom movement were sent in exile by the British authorities during the early part of this century.

The Art and Technology of artistic lighting has grown up with the progress in the development of the optical system of the luminaires. From the Arc lamps in the early phase of special lighting, the lens had been the vital device to concentrate the light to a narrow beam by refracting the scattering rays of light to a desired direction. The tungsten incandescent lamp fixtures were developed with more and more precise lens attachment and reflectors to attain better control of the beam shape with cutters, shutters and iris control of the light aperture system. But the most important device to control the intensity of the lamp light is by controlling gradually, the connected lamp voltage instead of sudden switching on or off. There are many approaches to this dimming - starting with the so called water dimmer. A movable metal plate is immersed in saline water in an earthen or procelain jar, which is connected to the electric lamp wiring. The other end of the wiring is connected to a base metal plate placed in the water jar. As the moving plate is slowly immersed into water and approaches the fixed plate, the lamp gradually becomes brighter and brighter and when the moving plate finally touches the fixed plate, we get the full intensity from the connected lamp. The water dimmer is one of the crudest but important aspects of light control, at least in the Indian context.

The next set of dimmers took the form of a variable rheostat with Nichrome wires of various gauges wound on a non-conducting bar or plate and a movable carbon terminal travelling over the resistance path.

The family history of dimmer control underwent a big change when variable transformer systems came into existence. The Auto transformer or Variac dimmer is largely used in this country, especially in permanent theatre buildings. The earliest modern lighting system in India has, as its dimmer board, a system called the Sunset type introduced by Strand Electric of UK way back in the early 1950s, at the AIFACS theatre in New Delhi, perhaps the first theatre with modern spot lights, dimmer control and special effect projectors for cloud, rain and other lighting effects. Now, over the years many of its outfits like the dimmer control board have become almost obsolete with the rapid progress and development of the stage lighting technology.

The most modern of the dimmer control systems is the electronic dimmer console that enables the lighting designer to operate a large number of lighting circuits from a convenient position, preferably at the back of the auditorium. The console system is very compact, and with the small knobs at the finger tips of the operator, a kaleidoscopic possibility is a reality of the theatre in terms

of elaborate visual configuration, facilities of presetting, memory system, cross fade arrangement and instant black out and grouping circuits according to the requirements of production and production by the patch panel board for desirable connection of circuits for the dimmer board.

The Siri Fort Theatre in Delhi has in its installation the modern electronic dimmer control system, along with the system of the latest tungsten halogen spots and special effects luminaires to take care of cyclorama lighting in this newly built theatre during the 1982, Asian Games. In the course of about a decade, these may prove to be somewhat obsolete with fast improvements in the current special lighting technology.

All things considered, the Art of lighting in theatre in India has started from a blank slate, from scratch like all over the world. Looking back to the take off period, when we, the theatre workers were literally in dark about the developments outside our own country, it can be said that at least in our case it was the imagination and passion that mattered in bringing out the result with bare minimum resources in the art of theatre lighting.

Obsession in theatre and passion for lights resulted in improvisation and innovation with crude indigenous material like throw away biscuit containers and home made rollers with stencil cut out designs of flame and water waves resulted in productions of a drama on the flooding of a coal mine, *Angar* a play written and directed by Utpal Dutt, music composed by Ravi Shankar and the effects were created with success in Calcutta by a relatively less known Indian designer of lights in December 1959 almost at the earliest phase of modern lighting in India.

Another talking point at the same period, the illusion of an approaching train, was created expressionistically with pure combination of sound and light effects. The tape recorders were used to simulate the sound effect of a fast approaching train, menacingly advancing with all its sound and fury towards the heroine memorably played by the great actress of the Indian theatre Tripti Mitra. This one minute sequence evolved out of imagination, out of dream, out of passion and love for the theatre and the impact was the result of collective synthesis of several components of a total theatre and remembered by all those who had witnessed the play *Setu* in Calcutta thirty years back with a record run of five years and over a thousand performances.

Looking back with nostalgia, it may be said that it is human curiosity and the observation of the so called trifling phenomenon of everyday life all around that provoke us, push us to break newer ground in performances and playing with light in the plays that involve all of us, whether Scientists working in pursuit of

Space, Time and Light
Bharatendu Drama Academy, Lucknow, 1995

light or spacetime, or Engineers competent to handle and calculate the lumens and lux values of daylight, moonlight or spotlights and projectors for special magic effects in the theatre.

The Magic of Light draws everybody irresistibly, children to adults of all ages of all countries, and will continue to do so as long as we have our eyes and mind.

1st January, 2000

When we arrive in a little over eight years at the dateline 1st January 2000, who knows, there will be many more tools for the stage lighting artist with laser beams and fibre optics. Newer kinds of light will open up newer creative situations for the next generation of Theatre Designers and Illumination Engineers.

Tapas Sen
26, H Naktala Lane
Calcutta 700 047

This paper was delivered as the Keynote Address at the Prakash 91 International Conference on Lighting Technology in New Delhi on October 9, 1991.

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

Members admitted on 16h June 2006

M. No	Name & Addresses	Grade	Centre
I-0119	Electrica Engineers (India) Pvt. Ltd Survey No: 615/18 Bhinarpada Road Ambeshiv Budruk Badlapur Ambernath, Thane Maharastra	Institutional	Mumbai
IM-0119	Niranjan J. Damle C/O Electrica Engineers (India) Pvt. Ltd Survey No: 615/18 Bhinarpada Road Ambeshiv Budruk Badlapur Ambernath, Thane Maharastra	Institutional representative	Mumbai
M(L)-1265	Mr. Ravi Shankar 5/4, Sector 2 Rajendra Nagar Sahibabad Ghaziabad - 201 005	Member (Life) Transfer from AM 0415	Delhi
A- 0896	Mr. Nehal Shah E/11, 2nd Floor Bardar Patel Society Nehry Road, Vileparle (East) Mumbai 57	Associate	Delhi
A - 0897	Ms. Sharon Martis B Wing Technopolis Knowledge Park Andheri (E), Mumbai	Associate	Delhi
S-0197	Mr. Amit Kaushik Flat 4, Vidyut Nikunj Patparganj Plot No 112, I.P. Extn Delhi 110 092	Student	Delhi
S-0198	Mr. Sandeep Singh Sagoo A-534 /2, Shastri Nagar Delhi 110 052	Student	Delhi
S-0199	Mr. Aakash Vishwakarma C-232/A Greater Kailash - I New Delhi 110 048	Student	Delhi
S-0200	Mr. Viren Gupta 2821, DLF, Phase IV DLF City Gurgaon - 122 002	Student	Delhi
S-0201	Mr. R. B. Thiruvengadam 6/126, DDA Flats Madangir New Delhi 110 062	Student	Delhi
S-0202	Ms. Neha Kapoor 315, Bhera Enclave Paschim Vihar New Delhi	Student	Delhi
S-0203	Mr. Ami Dhar D-49 Pamposh Enclave New Delhi	Student	Delhi
S-0204	Mr. Akarsh Kumar 2560 Sector D, Pocket 2 Vasant Kunj New Delhi 110 070	Student	Delhi
S-0205	Mr. Debyoti Dey A-41, 1st Floor Chittaranjan Park New Delhi	Student	Delhi
S-0206	Mr. Abhigyan Neogi B-23 Dayanand Colony 1st Floor, Lajpat Nagar IV New Delhi	Student	Delhi
S-0207	Ms. Medha Dixit H-38 (II Floor) Jangpura Extn New Delhi 110 014	Student	Delhi
S-0208	Mr. Tarun Garg 443, IInd Floor Main Mathura Road Bhogal New Delhi 110 014	Student	Delhi
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Prof. (Dr.) Shalini Garg
Cell: 9881370193
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Mr. Prakash Barjatia
Cell: 9370144389
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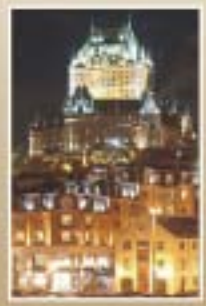


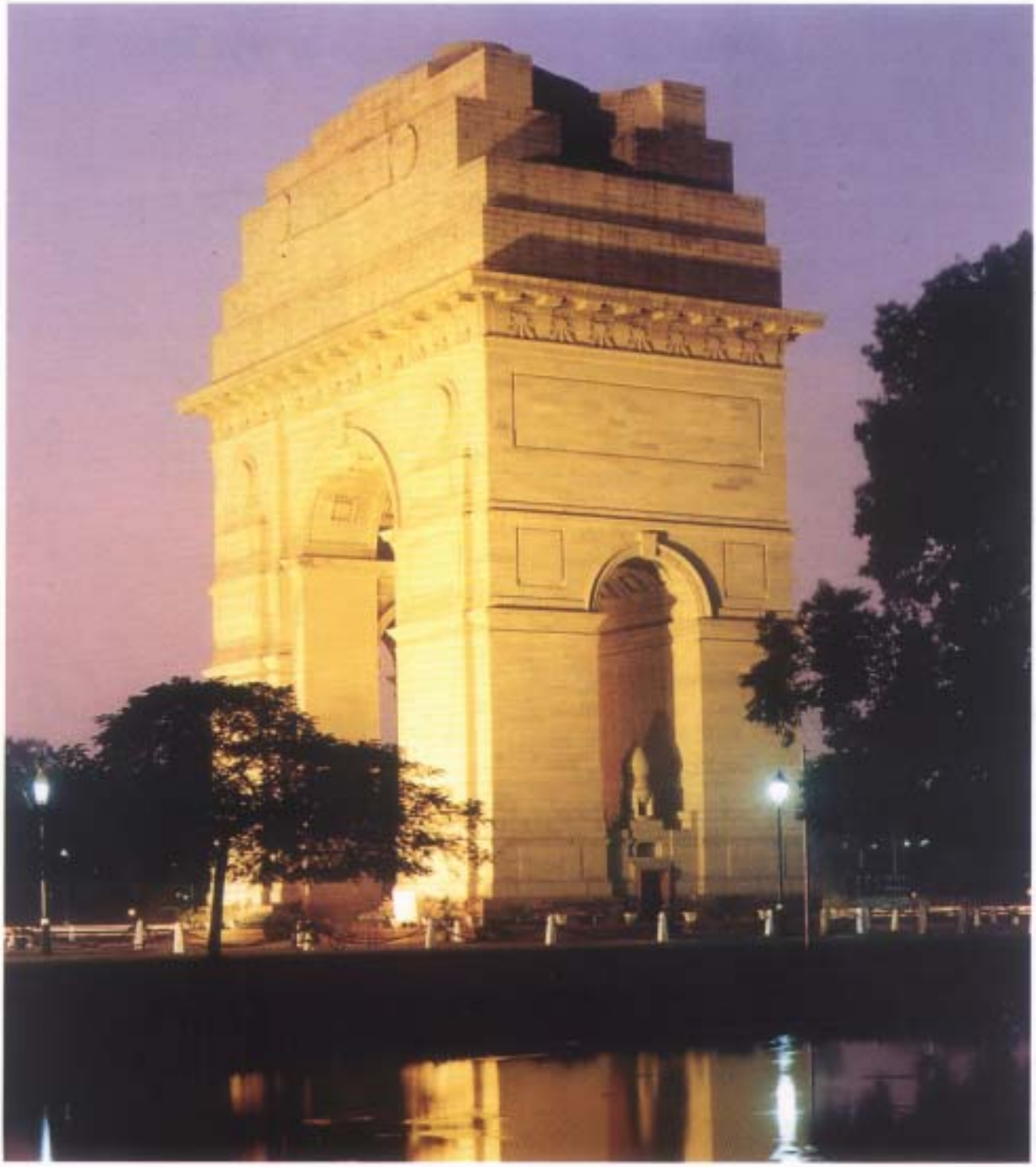

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