

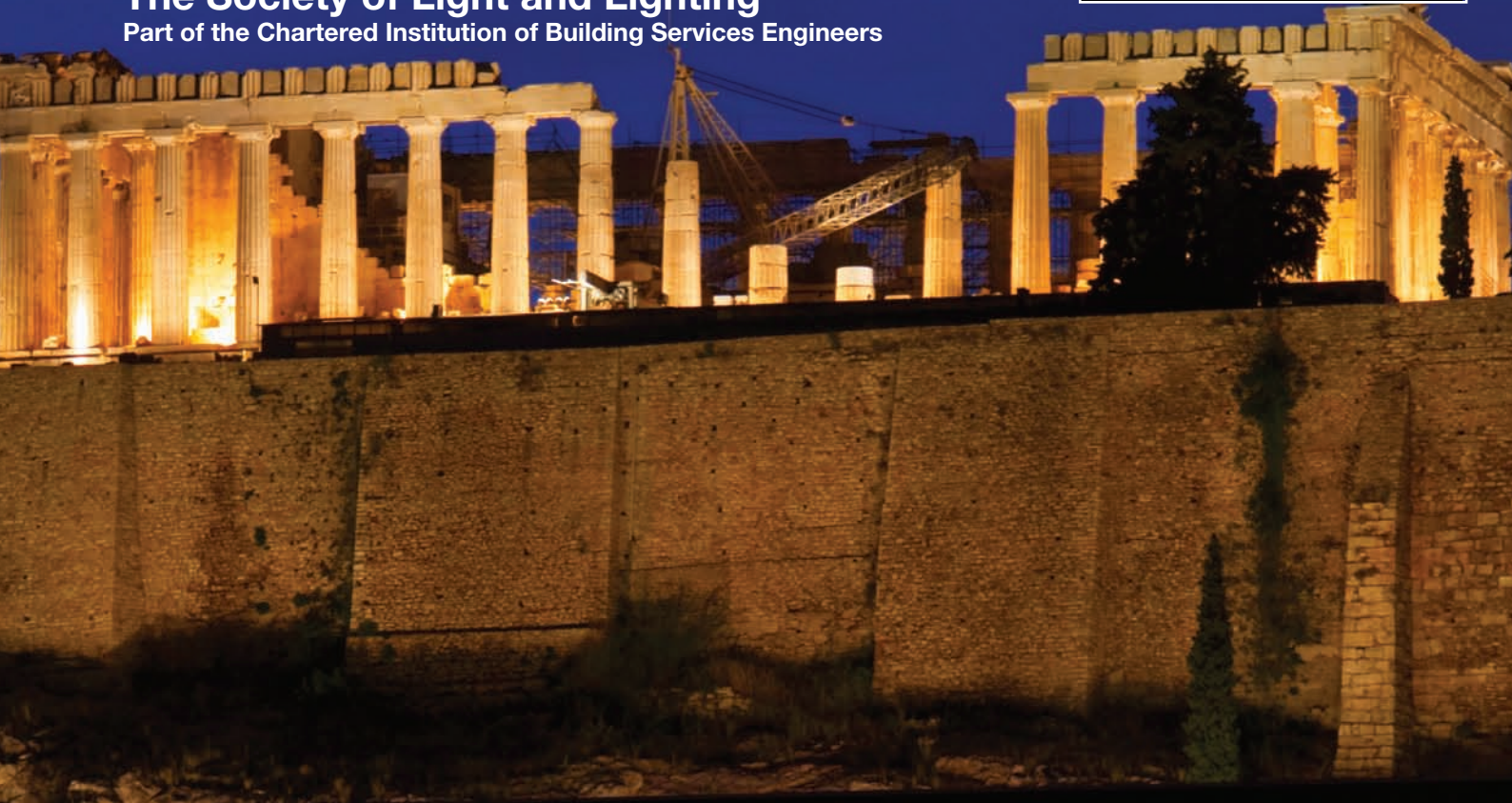
# Newsletter

The Society of Light and Lighting

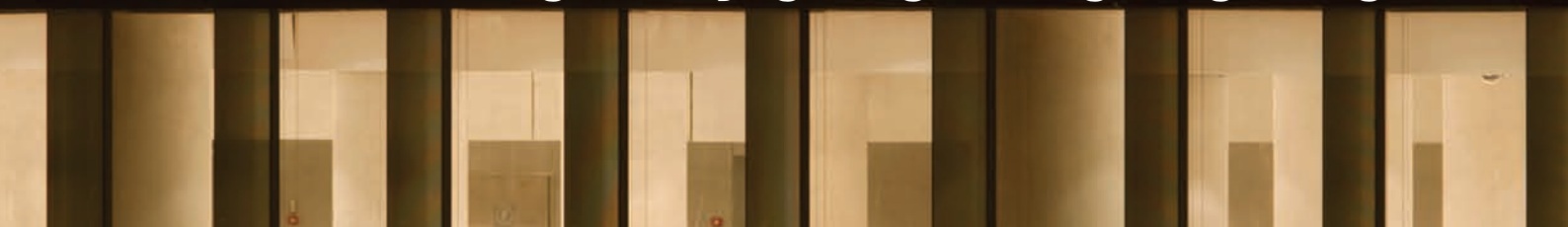
Part of the Chartered Institution of Building Services Engineers

SOCIETY OF LIGHT AND LIGHTING

100  
YEARS



- **SLL: the next 100 years**
- **Centenary lecture: art before science**
- **Natural advantages: daylighting and lighting design**





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'Daylighting has always been the poor relation of the industry – there was no money in it – and while paying lip service to the concept of daylight, it has been left to the scientists to come up with new ideas, none of which tell an architect much more than was known in the days of Byzantium.'

As evidenced by the above extract from the preface to his book *Daylighting: Natural Light in Architecture*, Derek Philips was concerned some years ago that the lighting designer should be playing a more holistic role in building design rather than being restricted to artificial lighting.

The arguments for augmenting the role of natural light in our buildings are incontrovertible, whether it be from a sustainability point of view or a matter of human health and well-being. The next consideration is how, as Philips suggested, the lighting designer can be involved in promulgating those arguments and moving into this area of expertise at a time when daylight often doesn't even figure as a subject on the architectural syllabus.

Martin Lupton, director of lighting at BDP Lighting, argues that the lighting fraternity should have a coherent approach in this area if it is to be effective, and that there are commercial reasons as well as moral imperatives for doing so (p10).

The cover project (p11) amply demonstrates that even in a sensitive area such as a museum (albeit where protection from light was not a conservation issue) daylight, diffuse though it is, can provide the crucial modelling of artefacts when skilfully exploited and applied.

Looking at future potential is also what we invited members – both prominent figures and those new to the SLL – to do in terms of the society itself (p6). A centennial year inevitably invites reflection on the past but, more important, it also involves looking forward. The views expressed



are strictly the personal opinions of the individuals concerned but we hope they will inspire (provoke?) thought and discussion. Anyone who would like to respond to the ideas and suggestions aired will be very welcome to do so in the pages of the next issue.

On a somewhat lighter note, as we mark the passing of the 100W GLS lamp this month, we can reveal that actually the whole thing was a communist plot, according to the Telegraph (www.telegraph.co.uk, 12 September). 'The man responsible for the Europe-wide ban on traditional light bulbs can be revealed as a former Soviet Communist party member from Latvia', proclaims the Telegraph under the headline 'Official responsible for light bulb ban is a former communist'. The dastardly individual in question is none other than Andris Piebalgs, the European Commissioner for Energy.

So now you know.

**Jill Entwistle**  
jentwistle@cibse.org

**Front cover:** Daylight scheme by  
Arup Lighting for the new Acropolis  
Museum at the Parthenon in Athens  
(see project profile p11)



It's been a busy few summer months and we now have in place a fantastic range of events for the forthcoming year – something for everyone to enjoy.

The London Sessional meetings kick off on 13 October with an afternoon from the LR&T Journal on High Dynamic Range Imaging for Photometric Measurements. This new image-based technique has been described by one of the speakers, John Mardaljevic, as 'both simple and revolutionary'. The following evening, we are honoured to be hosting a lecture from internationally renowned lighting designer Kit Cuttle. This will be held at the Bartlett and is being run in partnership with our colleagues at the IALD. More information and free registration can be found on the SLL website ([www.sll.org.uk](http://www.sll.org.uk)).

The highly successful SLL Masterclasses start again in October with the theme of Lighting for the Future. Topics will include LEDs and OLEDs, Lighting for Education, Low Carbon Lighting and 100 years of Lighting – the past, present and future. Venues will be Manchester, Glasgow, Newcastle, Leicester, Portsmouth, Telford, Oxford and London, and this year we are delighted to be joined by guest speakers from the IALD.

On 18 November, the centenary celebrations culminate in the opulent surroundings of the Criterion Restaurant in Piccadilly with a black-tie dinner. Both the venue and the date are historic for the society. On 9 February 1909, an informal dinner was held at the Criterion to discuss the possible formation of an Illuminating Engineering Society in Great Britain, while on 18 November the same year, the inaugural meeting of the Illuminating Engineering Society took place. Places are restricted for this very special event so guests of members are required to pay the full rate. Tickets are £65 for members and £85 for non-members.

As you will have read in the last issue, David Loe was made an honorary fellow of the society at the AGM and, to mark the centenary, we have two further honorary fellows: Baroness Betty Boothroyd and Kevin McCloud. Baroness Boothroyd has a passion for lighting and, in fact, was instrumental in the formation of the All-Party Parliamentary Lighting Group (APPLG). The group still meets several times a year at the House of Commons and enables us to voice our lighting issues directly with MPs, now under the guidance of Joan Whalley MP.



Kevin McCloud may be familiar to you in his role as presenter of Channel 4's *Grand Designs*, but his early career was in lighting and he had his own lighting company long before home-improvement television programmes were dreamed of. He always stresses the importance of good lighting in all his programmes. It's fabulous to have two such high-profile people within the society.

It has been a little while coming – we wanted to make sure it was the most up-to-date it could be – but the new Code for Lighting CD is now available. Immense thanks go to Peter Raynham for the many days he put into producing it and thanks must also go to Neal Paley who designed the cover and insert for us. It's marvellous when members with such brilliant skills can help the society and it makes such a difference to us.

In fact we are always looking for members to play a role – and not just for our committees. We know that time is valuable to you all but sometimes you may be able to help without making a large time commitment. Please do get in touch if you would like to get involved.

**Liz Peck**  
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## Editorial 2

## Secretary's column 3

## News 4

## Centenary lecture 5

Speaker Jonathan Speirs on the subservience of science and technology to creativity



## SLL: the future 6

What the society should – and should not – be doing to survive and thrive over the next century

## LR&T essentials 8

Alan Tulla digests the latest issue

## LR&T Symposium 9

Alan Tulla reports on the recent centenary event aboard HMS Belfast

## Opinion 10

Why lighting designers should play a greater role in daylighting, according to Martin Lupton

## Project profile 11



Seeing daylight at the new Acropolis Museum

## Events 12

# Cuttle turns lighting on its head

New Zealand-based architectural lighting academic and author Kit Cuttle will give a lecture at UCL in mid-October, a joint SLL/IALD event sponsored by Philips and Selecon.

Cuttle looks at the idea of stages to identify the main themes that have directed the objectives of the lighting profession. He proposes that the objective of the first stage was the provision of uniform illumination over a horizontal plane, while the aim of the second stage has been to provide illuminance suited to human need, based on visual performance.

However, the second stage has failed to achieve its objective, he

argues. 'While codes and standards pay lip service to visual performance, the reality is that for the vast majority of situations the aim is to meet user expectations for the spaces they occupy to appear adequately lit.'

Cuttle inverts familiar ideas of lighting effectiveness and efficiency, advocating an entirely different way of thinking about interior lighting design: switching from assessing light incident on planes to assessing light arriving at the eye, 'a precursor for the third stage of the lighting profession'.

Cuttle has formerly been head of graduate education in lighting at the Lighting Research Center in New York,

and senior lecturer in architecture at both the Victoria University of Wellington and the University of Auckland, New Zealand.

*Towards the Third Stage of the Lighting Profession takes place on 14 October at the Front Engineering Building, UCL, London WC1, starting at 6.30pm. Entrance is free but please register at [www.sll.org.uk](http://www.sll.org.uk)*



## Submissions invited for new award

As announced at the recent AGM, the SLL, in conjunction with the Lighting Education Trust, has instituted a new award in honour of former president Jean Heap (right) who died last year.

The Jean Heap Award For Excellence in Sustainable Lighting reflects both her lifelong dedication to lighting education and her particular interest in daylight, fenestration and low energy buildings, areas where she completed important research.

Colleges are now invited to submit candidates from their student body for the award, which is for a student with an outstanding piece of work concerning sustainability and lighting.

The winner will be presented with



the award at the Society of Light and Lighting's annual awards ceremony.

Applications for the 2010 Award should be submitted to the SLL by 30 September 2009.

*More information and nomination forms from Liz Peck on 020 8772 3622 or at [lpeck@cibse.org](mailto:lpeck@cibse.org)*

## ... and on the lighter side

● LEDs might be playing an obscure role in resolving the energy crisis. LA-based OriginOil, the developer of a breakthrough technology to transform algae – apparently the most promising source of renewable oil – into a competitor to petroleum, has announced a breakthrough LED-based Dynamic Control System designed to respond continuously to the algae's behaviour. It ensures the right types and amounts of light are used at all times as the algae grows to maturity. LEDs evidently also greatly improve productivity in dense cultures. 'We are using the new system to test lighting variations such as concentration, angles, distribution, and pulsing intervals,' said Dr Vikram Pattarkine, CTO of OriginOil. 'We expect this study to yield a wealth of data about what works best in algae lighting.'

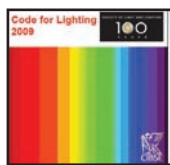
● St Ranieri, the patron saint of Pisa, is celebrated every summer with the Luminara festival. A recent city law means a €500 fine can be imposed on anybody caught by the police without a candle in their window. This is to prevent 'black holes' which not only spoil the appearance but have been deemed a security hazard as the public lighting is switched off and the candles are the only illuminant. It is not clear whether electric candles are acceptable but presumably with 80,000 candles on the go the fire brigade is on high alert.

(Richard Forster)

## SLL launches latest edition of Code

The 2009 Code for Lighting is now available, the first update since 2006. The new edition includes an additional section on road lighting, as well as Lighting Guide 9: Lighting for communal residential buildings. The majority of the material is presented in the same easy-to-read format as the SLL Lighting Handbook.

The Code for Lighting, first published more than 70 years ago and in CD-ROM format since 2002, is the primary guidance document on lighting in the UK. It encompasses all aspects of the design, installation and maintenance of lighting. It covers both electric lighting and daylighting, as well as their integration.



*The price is £85 for members and £143 for non-members. Order online at [www.sll.org.uk](http://www.sll.org.uk)*

## Towering achievement

Bartlett MSc lighting student Nathan Gummow is the first winner of a new annual award from the Lightmongers, sponsored by the Electrical Safety Council, which involved a competition to design new lighting for Tower Bridge for the 21st century. The award was organised in cooperation with the Corporation of the City of London.



# Ideas and ideals

## Jonathan Speirs outlines the essence of his presentation – Creativity, Creativity, Creativity – delivered for the SLL Centenary and CIBSE Annual Lecture at the Royal Institution

It has long been a debating topic that lighting is a combination of art and science. I believe, in reality, architectural lighting design is primarily about creativity, about inspiration, about the idea. This is not to diminish the importance of technology and the inherent science behind technology. It is rather that we see this aspect as being subservient, and that the spark, the creative leap, is what matters most.

So, where do ideas come from? What inspires us to dream? Can we use light to truly change the way people see? As a designer I revel in being astonished and delighted by the medium we work with: be it the slow reveal of a landscape at dawn, the unbelievable magic of the aurora borealis, or the slowly morphing texture created by sunlight interacting with trees or architecture. Or the buzz of a rock concert enriched by the dramatic and overt use of light, the immersion into a theatrical production where the subtlety of light brings to life the story being enacted. These are what inspire me.

I have purposely chosen not to talk about architectural lighting in the usual and 'normal' sense but to talk about ideas – the ideas that help to reinforce the experience and delight of the space. A lighting scheme is not just about illuminating what the architect or interior designer is building so you can see it and move around safely – the process is more creative than that, and ultimately more valuable both for user and owner.

So, how do we go about this process? For me, this is where the inspirational experiences come in. A lifetime's memories and an almost photographic recall of details and buildings come in extremely handy. We debate in the studio the vibe or the experience we are trying to instil in the viewer or visitor to a space, sometimes pinning this down to a place or show or even a movie.

From there we allow ourselves to become

**'I truly believe that if you cannot visualise in three dimensions then your abilities as a lighting designer are significantly impaired'**

immersed in walking around the space in our minds, understanding the parameters. I truly believe that if you cannot visualise in three dimensions then your abilities as a lighting designer are significantly impaired.

It is at this stage that we allow our minds to start the creative process, and brainstorm either individually or together to get to the idea that we believe is the right one for the project. This process can be purely with my colleagues, on my own, or with the architect.

We are very fortunate in that the majority of architects and designers with whom we work inherently trust our creative skills and as such we are permitted to propose architectural changes that enhance the lighting concept.

Once an idea finds favour we start to render and model and test mock-ups – the point where the idea and inspiration begin to become reality.

See [www.cibsewebcast.com](http://www.cibsewebcast.com) for a podcast of the lecture. ■



In a 25-year career in architectural lighting design, Jonathan Speirs has helped promote the creative approach to light in the built environment. From co-founding LDP (the first purely fee-based UK architectural lighting design consultancy) in the early 1980s, through to Jonathan Speirs and Associates in the early 1990s to the current Speirs and

Major Associates, his practices have consistently won top international awards.

# SLL: the future

**We invited a selection of SLL members, both old guard and young recruits, to outline what they believe the SLL should do to survive and thrive in its second century**

## Grant Daniels

Managing director of Thorn Lighting

In my view the SLL should:

- Stop trying to unite with other lighting groups – the SLL family silver is the codes and guides. Build on these and promote them.
- Stick to its strengths and its current foundation: building services lighting. Leave exterior, street lighting and exterior floodlighting to others (keep sports lighting).
- Build its image to achieve high awareness, especially in the property domain. The starting point is the British Council for Offices (BCO). Confront the BCO's Guide head on and publically critique the bias towards property developers' box-ticking lighting design.
- Market membership as a 'must be' for anyone designing lighting in building services. Especially take note of the growing design-and-build contract type where contractors carry out the design. (Formulate a new membership class targeting this group).
- Do not focus on the independents. Let them continue with their atriums, fountains and statues. Rather look to cast IEE members who are electrical engineers already paying £200+ for IEE membership. They will not pay the same again for SLL, so create a new membership class for an existing MIEE. Membership is key. The captive market for these two groups is huge and the target should be 6000-7000 new members from this pool.
- Start early to promote to careers officers the potential opportunities in building services.
- Get new codes and guides out quicker. Move to a drive-the-market rather than react-to-the-market idiom.
- Develop a revenue stream from academics and academic institutions who crave for their deliberations to be published in LR&T (for example, £1000 per paper and £200 per author)
- Step aside from the joint Lighting Design Awards which are devalued by populist hype and unqualified judges. Maybe stay in the awards scheme, but ask for two or three SLL-specific prizes where the judges use lighting engineering design criteria and consider the real benefits falling to the real end-user in terms of comfort, service through-life, sustainability and other critical factors. Lighting design awards should be for the people who use the room eight hours a day over many weeks, not judges who come in and view it for two minutes.



## David Burton

Managing director of Fifth Dimension Associates and past president

There's doubt that the existence of the IES and its members has had a major impact on the development of lighting science and technology over the past century. I don't have a crystal ball but it's certain that the world over the coming 100 years will see more dramatic change, far greater than we can imagine right now, and that small bodies such as the SLL will have less influence than in the past.

There are several reasons for this. In the first half of the 20th century, Britain was at the forefront of technology and industrial production, so our learned bodies and their output were respected internationally. That's no longer the case. Latterly the drive toward European and international 'normalisation' has marginalised standards and codes from individual nations and institutions such as ours.

We are faced with ever-more legislated prescription, and the process of educating ministers ought to be higher on our agenda than trying to live in the past continuing to produce lux tables. The SLL has become a victim of its own success since on the basis of 'guidance' we've penned, laymen provide a lux value to stay out of jail and think they're okay – but the quality of lighting is often dreadful as a result. For the future, it's down to us to change this approach.

Needless to say as a past president of the SLL, I'm gutted that recent moves to unify the profession have fallen victim to turf wars. In reality, any move to separate the SLL from its parent institution was doomed to failure, since the overwhelming majority of SLL members aren't hard core lighters at all, but building engineers who do a bit of technical lighting.

The original aim when the SLL was created, to embrace both the art and science of the discipline, has not yet been met – we are really just the Society of Lighting Applications. So if I have one hope for the future, it's that we can set aside personal agendas and speak with one voice to bring the value of our historic legacy to bear for the benefit of future generations.





**Natalie Bell**

Lighting designer with Kevan Shaw Lighting Design and Young Lighter of 2009 for best-presented paper

The SLL is very reputable, especially in the engineering and street lighting sector, but I feel it should be as well renowned in the field of lighting design.

A primary aim should be to make the society more accessible to the younger generation of lighting designers. Education is the most important attribute such an organisation can achieve. It would be beneficial, for example, for the SLL to provide workshops and lectures on the qualities and nature of light.

As a student of architectural lighting design, I have been involved in many inspirational show-and-tell lectures, which have proven to be the most educational in terms of lighting technologies. As lighting is such a broad subject, ranging from science to art, it is important to teach all aspects.

At present the SLL mainly concentrates on the technicalities of lighting and perhaps overlooks the essential aesthetic qualities that need to be considered.

The society should have more first-hand involvement

with lighting workshops and accessible, affordable CPDs. The hands-on approach to research would help formulate the society's lighting guides and recommendations.

Most important, the SLL should encourage a wider membership in other groups such as the police and local councillors. These groups are particularly important now because of the new Secured By Design initiative that is being enforced in many new architectural planning requests. This interaction should help create more user-friendly, community-orientated lighting design schemes and urban environments.

Finally, it would be beneficial if the SLL was more involved with educating lighting designers and other crucial bodies that influence the design of our town and cities. This will have a positive impact on the reputation of the lighting design sector as a whole and help to ensure more successful lighting designs in the future.

**David Loe**

Past president and honorary fellow

The Illuminating Engineering Society was formed in the UK with the idea of making illumination better for people by considering the art and science of the subject. The aim was to provide a focus on which the lighting profession could develop. The individuals who comprised the early membership ranged widely from eminent scientists, medical practitioners, architectural artists and stage lighting designers through to representatives of the gas and electrical industries.

The professional lighting institutions have lost that breadth of input, which is a pity. Somehow this needs to be corrected. The whole lighting community needs to recognise the importance of all the parts essential to create illumination that is greater (better) than the sum of the parts. It is pointless for the engineers to scorn the designers and vice versa as they both have considerable roles to play. But some people are more skilled in one

aspect than another and their understanding is different, leading to different priorities and occupations. They also often come from different educational backgrounds.

This means that the modern SLL needs to be able to admit all those involved with lighting so that all can benefit from their individual skills. This was one of the original intentions of the SLL.

This leads one to the view that an illumination society that does not encompass all the parts will not succeed. That does not necessarily mean it will fail, but that it will not achieve the ultimate. Somehow we have to find a way to create a society that also involves scientists, engineers, designers and artists.

*This is extracted from chapter 5 of Reflection on the Last One Hundred Years of Lighting in Great Britain by David Loe and Rosemary McIntosh which looks at future prospects.*

**Iain Carlile**

Senior lighting designer at DPA Lighting and member of the Communications Committee

One of the things I believe to be a strength of the SLL is its inclusivity, encouraging the involvement of all the different aspects of the industry which have an interest, large or small, in lighting. I hope the SLL can build on this and further encourage a greater number of members from areas which may generally have a lesser involvement with lighting but still a keen interest, for example, architects and practitioners specialising in daylight design.

I would also like to see the society attract a larger number of younger members. This would help the society to become more vibrant and interesting, and also help to develop its future direction, keeping its activities relevant.

On top of the excellent technical meetings, Young Lighters competition and masterclasses, I would like to see an increase in educational activities, particularly more

hands-on opportunities. This is particularly essential for younger members, who may have a thorough academic grounding but little practical experience. The annual Ready Steady Light competition already provides an opportunity like this and it would be good to see this expand in future, perhaps into regional heats.

I would also like to see continued advancement of the methods of disseminating information to those members who are unable to attend events but who still wish to stay in touch with the latest developments.

Finally, I believe the SLL needs to continue to increase awareness of lighting issues, not just within the construction industry, but also – through involvement with other lighting bodies – among both the Government and the general public.



### Patrick Baldry

Managing director of Urbis Lighting and immediate past president

The prime objective of the SLL is the unification of the lighting profession. In this way, we will be more effective and forceful as communicators with influential policy makers such as national and local politicians, civil servants and the media. By speaking with one voice, we are clear, systematic and rigorous in our objectives, and we avoid the duplication of effort in many fields of our profession –for example, the education of young lighters, technical issues, publications and the ongoing education of experienced professionals in new technological developments such as LEDs.

The impetus to go forward with such issues was kick-started in 2008. At that time, there was some awareness that this potentially pioneering programme could be kicked back by some conservative, nay inflated egos, combined with fearful vested interests.

The way forward is to forge a consensus among far-sighted thinkers who can contribute to painting a broader canvas. Surely by 2108 we will have achieved some progress. Slowly, slowly catch a monkey.

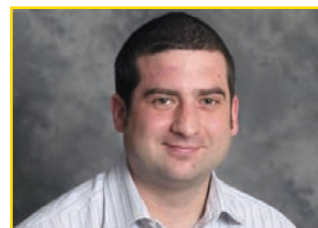


### Neal Paley

Cover designer for The Code for Lighting 2009

I'm proud to be a member of a society that is more than 100 years old, but I do think its image needs to appeal more to the younger generation. An example is the Lighting Guide covers, many of which look dated now.

As the SLL moves into its second century I also feel that it needs to play a major role in issues such as climate change, sustainability and globalisation. The society has the influence to have a say on Government policy issues.



### LR&T essentials

## Alan Tulla picks the bones out of the latest issue

Lighting researchers investigate a wide variety of topics and the latest edition of LR&T reflects this diversity.

**Colour quality:** It has long been known that the standard CIE CRI ratings given to white LED sources often contradict those given by users, hence a variation of CRI known as the colour harmony rendering index.

The pleasantness of an interior depends to a large degree on the harmonious appearance of the colours seen side by side. A descriptor of how strongly a light source distorts the colour harmony is therefore a logical further step in measuring light source quality. In 2007, CIE Technical Committee 1-69 set out to develop a new colour quality metric. There was no agreement about the factors to be included but the colour harmony rendering property was declared to be an observable quality.

White phosphor LEDs and RGB LEDs showed marked differences, with the latter showing non-systematic colour shifts which differ not only in size but direction.

**Glare:** One paper discusses a model for the explanation of discomfort and pain in the eye caused by light. The model is based on the functioning of the nervous system rather than (as with most studies) the observer response to various luminous conditions.

**Light pipes:** Vertical light pipes for domestic and low-rise commercial buildings are increasingly gaining acceptance as an option to enhance daylight penetration. A more recent development is the facade-mounted horizontal light pipe that could, in principle, be used in buildings of any height.

**HDR:** The list of applications of high dynamic range (HDR) photography grows almost weekly. A paper describes how a single camera sensor can replace the multiple sensors used in conventional automated systems to control light switching, shading devices and so on. The intention is to demonstrate proof-of-principle.

**Fluorescent lifetime:** The life of fluorescent lamps when run on a 12V DC supply is investigated. This is of particular relevance in isolated rural areas where the only electrical supply is from stand-alone photovoltaic installations.

#### LR&T Vol 41 No 2 contents:

- Editorial. John Mardaljevic
- A model for the explanation of discomfort glare and pain in the eye caused by light. PT Stone
- An experimental study of a facade-mounted light pipe. V Duc Hien and S Chirattananon
- A camera as a sensor for lighting and shading control. GR Newsham and C Arsenault
- A colour harmony rendering index based on predictions of colour harmony impression. F Szabo, P Bodrogi and J Schanda
- Lifetime prediction of fluorescent lamps used in photovoltaic systems. FG Rosillo and NM Chivelet
- Book review LG2. David Moore

LR&T is available online to members at [www.sll.org.uk](http://www.sll.org.uk)



# Green and pleasant

## The LR&T centenary symposium looked at saving energy with new technologies and techniques. Alan Tulla reports

Sustainability is the watchword nowadays and all artificial lighting involves expending energy. Wout van Bommel, past president of the CIE, defined sustainability as 'balancing the positive effects of lighting on living beings with the negative impacts of that lighting on the environment'.

The first presentation was Energy Efficiency in Lighting: Considerations and Opportunities by David Loe (who was earlier presented with a CIE Long Service Certificate by chairman David Carter). He first examined conventional ways of lighting offices and compared them with more modern approaches. According to Loe, four basic techniques could save up to 50 per cent of the energy used for lighting without compromising the quality of the visual environment: a task-to-background ratio of 3:1, a daylight factor of more than two per cent, better use of controls and improved vertical illumination in the critical 40-degree zone (see LR&T Vol 40 No 2).

Controls tend to be seen as an expensive add-on. Loe proposed that the electrical consumption of the lighting be measured separately. In this way, controls would be seen to be an essential component in saving energy. Lastly, he raised the question of whether light from compact fluorescent lamps is seen to be as bright as that from tungsten. In other words, people claim that lumens from CFLs are not so bright as the same quantity from a GLS lamp.

Meanwhile Brian Jacob from Philips Lighting extolled the benefits of CFLs as a way of reducing CO<sub>2</sub>. An interesting statistic cited by Jacob is that a 100W GLS lamp burning for 30 minutes produces enough CO<sub>2</sub> to fill a party balloon. One disconcerting fact to emerge was that not all CFLs have power factor correction. Many sold in the UK have only a 0.3 PF so the actual VA consumed is three times higher. Suddenly, the 4x energy savings over GLS almost disappear. If, as David Loe says, light from tungsten lamps appears to be subjectively brighter, then all the advantages disappear.

John Mardaljevic proposed a departure from the daylight factor. He pointed out that for a given building design, the DF for a north-facing window in St Petersburg is the same as for a south-facing window in Miami. This makes sense in terms of contrast from the inside to outside, he said, but doesn't relate to how much usable light there is to perform a task. He proposed the new metric of Climate-Based Daylight Modelling (CBDM). This uses absolute values based on real climate data and includes direct sunlight. This then gives a Useful Daylight Illuminance (UDI). In this way, daylighting could be properly integrated into the overall lighting design.

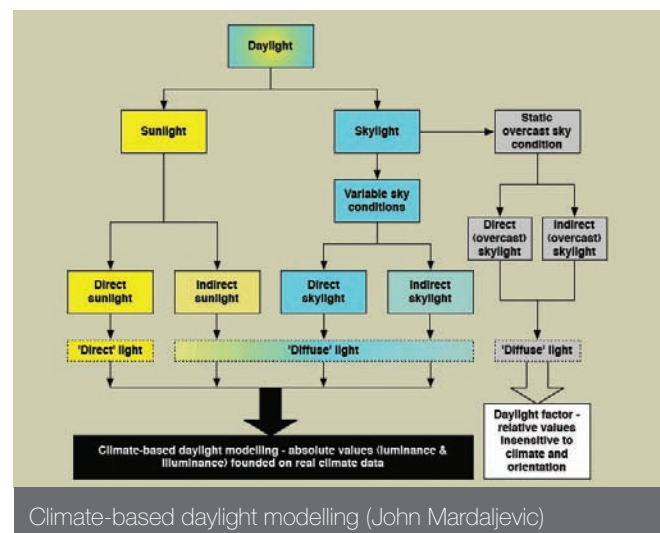
Street lighting is seen as a major area for energy saving, partly, perhaps, because it is so visible. It accounts for 0.73 per cent of the UK's total energy consumption (compare that with the one per cent consumed by Tesco stores). The paper presented by Peter Boyce, written in conjunction with Steve Fotios and Malcolm Richards, started by showing the distribution of this energy by class of road and lamp type. Changing a 125W MBF/U to a 70W Son could recoup the energy in about a year, said Boyce. However, if the lantern is changed at the same time, this would extend to maybe more

than 11 years. While Son is less efficient than Sox in terms of lm/W, its greater optical efficiency in a lantern can lead to energy savings. Replacing on a one-to-one basis would not.

Of particular interest was where Boyce compared road lighting requirements in different countries. Japanese and US standards only demand around one third of the luminance for their motorways as Europe. Similarly, major roads and secondary roads only require half the luminance. Generally, the USA and Japan have lower requirements for uniformity. In the UK, the highest luminances are allocated to roads with the fastest traffic. In the USA they are given to the roads with greatest risk of pedestrian conflict.

Teresa Goodman of the NPL (who received the Walsh Weston Award from David Carter) suggested ways of improving the basis of our measurements. There were shortcomings with LEDs, for example, where thermal management and source geometry are more important than with conventional lamps. Describing complex glazing systems, was another instance, said Goodman, where simply measuring the light transmittance does not adequately describe the light-directing and solar-control properties.

She then went on to describe the problems of measuring mesopic vision. This is particularly pertinent to road lighting where drivers constantly move from photopic to mesopic vision. The centre of focus, the fovea, always operates under photopic conditions, whereas the rods operate under both. It is worth emphasising that there is no such thing as a mesopic lumen, a much-used term by manufacturers of road lighting lanterns. The argument is that the more the eye-response curve shifts to the blue, the better people can see. Goodman pointed out that the curve only moves to the blue as the scene becomes darker and darker, so the argument is nonsense. *Good Lighting with Less Energy: Possibilities for the Future* was supported by the SLL and National Physical Laboratory. LR&T No 3, due in September, has the papers in full. SLL members can view them at [www.sll.org.uk](http://www.sll.org.uk). ■



# Natural progression

**Daylight is good for the planet and could be good for the lighting profession, argues Martin Lupton**



**Martin Lupton is director of lighting at BDP Lighting and current president of the PLDA**

I don't think anyone would argue that sustainability isn't a big issue in lighting design. Over the past few years many leading figures in lighting design have expressed opinions on the subject. Some have viewed sustainability – and the legislation it brings with it – as the harbinger of death for the profession, while others see it as the greatest opportunity we have had to achieve recognition.

I would lean towards the latter – finally there is an issue that people want to talk about in relation to lighting. What we need to do now is to get our collective acts together and agree on the right approach. This shouldn't be about the indiscriminate and political application of legislation and numerical criteria, but a holistic approach that considers all of the important elements of sustainability – social, economic and environmental.

Technology will play a significant role – obviously LEDs will figure strongly and, more important, better control of light in use – but professional lighting design is also fundamental. If we just look for a technological sticking plaster then we will only be pushing back the curve a bit. The world is growing – the technology might be more efficient, but we will just end up using more of it.

We need to think in terms of decision architecture. We need to change the way people (architects, clients and end-users) think about the use and application of light, and the greatest opportunity to do this is in the promotion and use of natural light. It is the only truly sustainable source of light.

Around five years ago I began to suspect that architects had forgotten about daylight design. I was constantly seeing elevations of buildings where the facade design rationale was only about the image the building presented to the street. The windows were merely decorations, and there was no connection being made between the elevation design and the daylight performance of the space.

Over the past two years my practice has been involved in a lot of public buildings, funded by the Government, where the initial design brief contains prescriptive targets about daylight. We have worked with a variety of architects from different practices, and having this focus on daylight in the brief has strengthened my belief that, while some do design their buildings to use natural light in a very instinctive, skilful and considered way, daylight design is an art that is becoming lost to many of them.

In fact, many architecture courses don't even teach daylight as an element of the curriculum any more, so it is no surprise that the skill is disappearing among architects.

This presents professional lighting designers with a great opportunity. If we arm ourselves with knowledge, and the relevant skills, we can contribute to building design and creating spaces for people at a higher level than ever before. We can open up a new role in the design process for the profession, which in these economic times can only be the right thing to do. More important than that, we can take control of the one element of building design that really can make a difference to our carbon footprints.

At the moment understanding natural light is an additional skill, but it needs to become part of our standard skill set. We need to go on the offensive and take control of natural light. We need to be the ones banging the drum about its importance. We need to push for more independent research. We need to develop our vocabulary on light to include natural light. How many times have you heard, or used, references to natural light in lighting design concepts?

A wise man once said to me that 'there is no such thing as artificial light – it's all light. There is natural light and electric light'. This terminology has stuck with me to this day and it remains useful because it reminds us where the energy comes from to create the light – electricity or nature. Which one do you prefer? ■

**'If we arm ourselves with knowledge, and the relevant skills, we can contribute to building design and creating spaces for people at a higher level than ever before. We can open up a new role in the design process for the lighting design profession'**



# Frieze framed

## Natural light plays a key role in the new Acropolis Museum in Athens

The exploitation of light, especially natural light, is central to the architectural design of the new Acropolis Museum. The strategy was to introduce daylight into the building to create the outdoor conditions under which the sculptures and statues would customarily have been viewed. 'Large areas of glass in the facades and roof provided wonderful opportunities to introduce the natural light of the Attic sky, with its special luminosity, into the interior,' says Florence Lam, head of Arup Lighting.

Arup developed and tested various window and roof light configurations, modelling the effects of different daylight scenarios on the displays to produce the optimal daylighting and viewing conditions, while maintaining good thermal and visual comfort.

Adopting principles more commonly found in the theatre, the daylighting strategy for the Parthenon Gallery is based on continuous linear roof lights which allow daylight to enter from above and graze down on to the friezes. This adds a dramatic effect to the otherwise flat light from the side windows, enhancing the modelling effects by day.

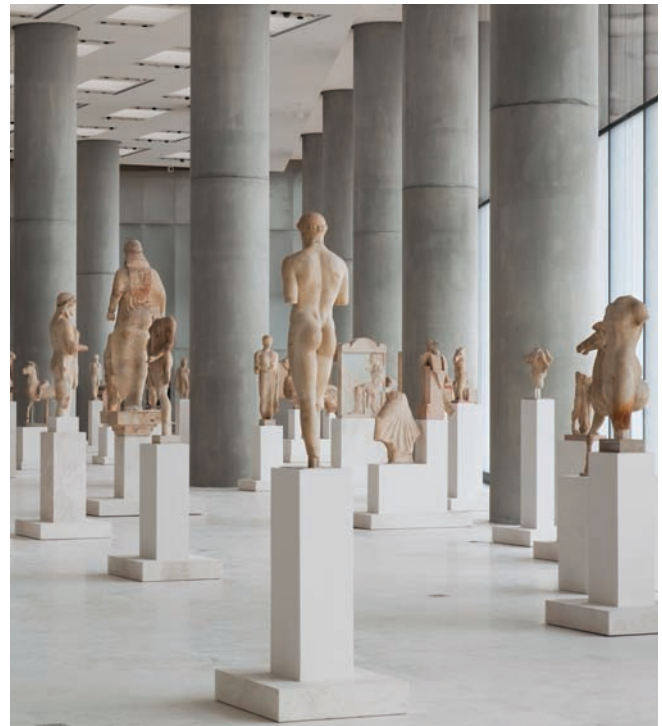
A different approach was adopted in the Archaic Gallery where passive daylighting is used. Square rooflights and a glazed facade allow daylight levels in the gallery to

**'Large areas of glass in the facades and roof provided wonderful opportunities to introduce the natural light of the Attic sky, with its special luminosity, into the interior'**

vary with the season, time of day and with the weather. A screen-print treatment is used on the lower panels of the glazed facade, while overlapping dim-out blinds are applied on the upper panels for optimum solar screening. This facade treatment contributes to the soft, uniform daylight of the gallery, while the glass screen-print technique helps mask the views of the adjacent buildings.

All modelling is based on natural light with artificial light (tungsten halogen spots and fluorescent) only switched on at night. In both galleries the lighting is integrated with the roof lights so that the visual clutter above is minimised and the flow of light always emanates from the same point on the ceiling.

The frieze in the Parthenon Gallery is made up of original pieces sitting alongside new pieces, which have been made in a different material to ensure they are clearly identified. Under daylighting conditions the whole frieze is illuminated, but under artificial light only the original pieces are illuminated, reinforcing their status. ■



### Project:

The new Acropolis Museum, Athens

### Lighting design (natural and artificial):

Arup Lighting

### Architect:

Bernard Tschumi

### Supplier:

iGuzzini (spotlights)

## 1 October

Lighting Masterclass  
Location: Manchester  
Time: 10am-4pm

## 13 October

High dynamic range imaging for photometric measurement  
Speakers: Axel Jacobs, John Mardaljevic and Birgit Painter  
Venue: The Army and Navy Club, 36 Pall Mall, London  
Time: 1.30pm for 2 pm

## 14 October

Third stage of the lighting profession  
Speaker: Kit Cuttle  
Venue: Front Engineering Building, UCL, Torrington Place, London WC1  
Time: 6.30-9pm  
Please note that prior-registration is essential for this event

## 29 October

Lighting Masterclass  
Location: Glasgow  
Time: 10am-4pm

## 18 November

SLL Centenary Dinner  
Venue: The Criterion, Piccadilly, London, W1  
Cost: Members £65. Non-members £85  
Time: 6pm-11pm

## 24 November

CIBSE Presidential Address – the director's cut!  
Speaker: Mike Simpson  
Venue: The Grosvenor Thistle Hotel, Victoria, London SW1  
Time: 5.30pm for 6pm

## 26 November

Lighting Masterclass  
Location: Newcastle  
Time: 10am-4pm

## 15 December

Festive lighting: friend or foe?  
Joint meeting with the Institution of Lighting Engineers. Followed by a Christmas drinks reception  
Speakers: Nick McLaren and Peter Harrison  
Venue: iGuzzini showroom, Business Design Centre, Islington, London N1  
Time: 5.30pm for 6pm



**November 18:** SLL Centenary Dinner, The Criterion, Piccadilly

## 2010

### 19 January

LG5: Lighting in education  
Speaker: Iain Macrae  
Venue: to be advised  
Time: 1.30pm for 2pm

### 28 January

Lighting Masterclass  
Location: Leicester  
Time: 10am-4pm

### 3 February

Young Lighter of the Year final  
Venue: The ARC Show 2010, Earls Court 2  
Time: 4.30pm-6.30pm

### 3-4 February

The Arc Show and IALD Enlighten Europe Conference  
Earls Court 2  
[www.thearcshow.com](http://www.thearcshow.com)

### 16 February

Residential lighting  
Speakers: Benedict Cadbury and Rebecca Weir  
Venue: to be advised  
Time: 5.30pm for 6pm

### 25 February

Lighting Masterclass  
Location: Portsmouth  
Time: 10am-4pm

### 16 March

Trotter Paterson Lecture: Mesopic Vision  
Speaker: John Barbur  
Venue: to be advised  
Time: 5.30pm for 6pm

### 25 March

Lighting Masterclass  
Location: Oxford  
Time: 10am-4pm

### 11-16 April

Light+Building  
Venue: Frankfurt  
[www.light-building.messefrankfurt.com](http://www.light-building.messefrankfurt.com)

### 20 April

Optical materials  
Speaker: Peter Thorns  
Venue: to be advised  
Time: 1.30pm for 2pm

### 29 April

Lighting Masterclass  
Location: Telford  
Time: 10am-4pm

### 18 May

AGM, presidential address and awards reception  
Venue: to be advised  
Time: 6pm-9pm

### 27 May

Lighting Masterclass  
Location: London  
Time: 10am-4pm

### Lighting Masterclasses:

Masterclasses are kindly sponsored by Holophane, iGuzzini, Philips and Thorn. For venues and booking details, see [www.sll.org.uk](http://www.sll.org.uk)

### Mid Career College: the

college runs various courses across the whole spectrum of lighting and at sites across the UK. Full details at: [www.cibsetraining.co.uk/mcc](http://www.cibsetraining.co.uk/mcc)

**LIF courses:** details from John Hugill, 0208 529 6909, or email [training@lif.co.uk](mailto:training@lif.co.uk)