

# The mother of invention



Technical innovation has developed lighting design in unexpected directions, says Mindseye's **Admir Jukanovic**. Here he looks at how new technologies, from fluorescents to the downlight, have inspired designers to come up with new architectural solutions



Inventors such as Thomas Edison and Edmund Germer may have hogged the limelight when it comes to the history of lighting technology, for their work on incandescent and fluorescent lamps respectively, but when London-based designer Admir Jukanovic looks back in time, he first focuses on a technology that had no single inventor: the recessed downlight.

"People take the downlight for granted and don't realise that it had its own beginning. We all know who designed the incandescent light, or the tungsten light, but no one has claimed the downlight. That's because there was never a 'eureka' moment, just a gradual development from the 1940s, with the improvement of more and more details and features."

"In America they're called 'can lights' and in Canada 'pot lights', and that's because originally they developed from people putting lights on the ceiling lodged in cannisters or pots," continues Jukanovic. "Soon someone clever started recessing these in ceilings and by the 1950s and 60s

**Down not out**  
Major public architecture such as the United Nations General Assembly featured recessed downlights from the 1940s and 50s

they started to become smaller, as halogen lamps became popular – halogens could deliver the same highlight output as a standard incandescent but from a much smaller space in the ceiling. Then reflectors became a core feature, which allowed greater recession of the lamp, and glass covers helped reduce glare further."

Jukanovic adds that churches were the first public buildings in which recessed downlights became commonly used. "They suit spaces like churches where artificial lighting needs to be fairly discrete while still having an impact on architectural features and sculptures. It's a theatrical type of light and it can be created with just three simple steps: cutting a hole, putting in a reflector and adding a lamp." But the ease of executing such high-impact illumination has led to its undoubted overuse. Nowadays many ceilings are cluttered with downlights, without any thought about whether those lights really need to be there, whether they have their place there. It's gone a bit too far, but use it in the right way sporadically and you can achieve something dramatic."

The first fluorescent tube went on the market in 1938, sold by General Electric and consummated a consumer love affair with the linear lamp that has lasted to this day. "Lighting design moved at that time from a point light source to a linear light source: designers had the possibility of illuminating an area with lines of light," Jukanovic explains. "They realised the huge potential, as fluorescents could be extremely efficient in terms of output and lifespan in comparison to incandescent lamps. But architects were also wary of how bright fluorescents were to the eyes, so they introduced light covers into buildings in which to mount the lamps. The light is softened as it bounces off the ceiling and this indirect light is not too bright or anonymous."

Fluorescent lights became perhaps most ubiquitous and influential, however, out on the street, where they were soon harnessed to illuminate billboards and light-boxes. When curved and coloured cold cathodes became common, designers started to "suddenly write and draw with light, bend light... It certainly opened up a completely new world. What was impossible before became possible. In America in the streamlined-style diners and take-away bars from the 1950s, you can see how cold cathodes start as part of the



**Taking control** Mindseye's control system for London's Barbican Centre was only possible thanks to small diameter cables

architecture, but then, as they move around the exterior, they suddenly turn into typography and create the bar's logo."

Lighting design has also been influenced enormously by miniaturisation: the production of ever-smaller technologies that are just as powerful as their larger counterparts. "Halogen and xenon lights have become so compact that we have moved from their integration in buildings to their integration in furniture, such as shelving units, in which one can easily hide xenon strip lights. They can run off a very low voltage, so one can use a cable with a small diameter that remains hidden."

## Twisting technology

What fascinates Jukanovic most is how these technological twists and turns have, in turn, affected trends in his profession. "In the cold cathode movement in the 1950s, you had a form of lighting design which was really expressive. Now we have all moved to an emphasis on integration and invisibility. There is not that expressive potential; now the ideal is to not even see the lamps. If a lighting designer is employed today on a scheme and you notice the lamps, he has normally failed."

But miniaturisation has also allowed architects and

designers more freedom when it comes to installing control systems in challenging environments. An interesting example is a project that Jukanovic and his Mindseye colleagues completed at London's Barbican Centre in 2007. "The Barbican is this big Brutalist building and its ceiling is covered in huge coffers that have all been precast in concrete. These coffers had previously been illuminated in a fairly dull way. We decided to install a powerful metal halide >>



## Hit the ceiling

The invention of fluorescent lamps influenced architecture, with coves created to soften their bright light



**Neon dreams** Cold cathode and other fluorescent lights have revolutionised the design of outdoor advertising



**Hidden talents** The integration of slimline lighting is central to the style of minimalist contemporary designers

Photo: Lee Woo Jin

Courtesy: Design Museum, London/John Pawson

» downlight in each of the coffers to light the main space, but also a fluorescent uplight to illuminate the coffers in different colours, which would be changed by the Barbican for different events via a control system.

“In the past, even a couple of decades ago, you wouldn’t have been able to install a system to control the colour scheme in those coffers. That was not because of the control hardware, which might have been available, but because of the cables: there are only very small conduits for cables in between those coffers and you wouldn’t have been able to run through them any of the cables available at that time. We were able to use a category 5 cable, a turn-of-the-century cable which is very thin, to make the scheme possible.”

The LED looms large for anyone looking to the future of lighting technology. “Everyone in the lighting industry is aware that LEDs will one day replace most of our luminaires and lamps, maybe in the next 20 years, maybe sooner or later. We’ll not see them any more,” says Jukanovic. “The LED will add a new chapter and what I find most interesting is how the LED will be used by people other than us in the West.

“A project has been launched in Uganda to replace kerosene lamps with LEDs. More than 4 million Ugandans still use kerosene to light their homes at night, which is

hugely expensive, and very unhealthy, the same as smoking two packets of cigarettes each night. The influence of the price is key: now LEDs are cheaper, so that for \$10 Ugandans can buy an LED light and a solar panel to put on top of their house. They have been using a technology from the 1850s and suddenly they will be able to throw it away and make a great leap forward with LEDs. In this way, LEDs will be much more influential for them than us.” ■

● *Admir Jukanovic was talking to Sam Phillips*

**Great leap forward** A project in Uganda is persuading people to swap their oil lamps for now-affordable LEDs powered by solar panels



Photo: Barefoot Power