

PROFESSIONAL LIGHTING DESIGN



Magazine for
professional lighting design

MAIN TOPIC

Loud light and quiet light in
urban design

LIGHTING DESIGN

Hyllie Square in Malmö/S

Footbridge over the River Aare
in Windisch/CH

PHILOSOPHY

Light design – The Dark Art

Howard Brandston on
Lighting Design as an Art

The aesthetic of lighting atmos-
pheres in the public realm

URBAN LIGHTING PLANNING

Urban environments under
electric light

INTERVIEW WITH EXPERTS

Changes in the practice
of lighting design

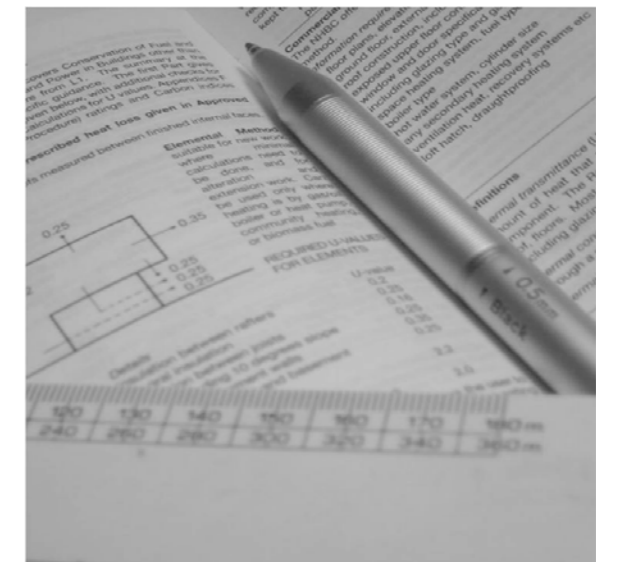
Light design – The Dark Art

Text: Chris Lowe, PLDA, Philip Rafael, PLDA

An understanding of darkness is essential for truly inspirational light design.

So, why is good use of darkness within architectural light design so rare?

Is darkness absent from the light designer's palette?



Design by numbers.

Defining architectural form using light and shadow: British architect John Pawson's 'House of Stone' at the 2010 Think Tank exhibition in Milan. Linear LED (MoMo2-B) manufactured by KKDC; stone construction by Salvatori, Italy.



Contrast creates interest in the Liverpool One project. Lighting design: BDP. Photo: David Barbour/BDP.

Many designers wish to utilise darkness in their light designs – whether that is by creating darker spaces, or by simply using higher levels of contrast in a scheme, there is an aspiration for darkness to be an intrinsic part of design. However, there seems to be uneasiness towards darkness within the light design profession. This is due to both internal and external influences with biology, evolution, beliefs, culture, and regulations playing a part.

As professional designers we have an obligation to comply with existing standards and regulations. Even in situations where guidance is not legally mandatory, it is often enforced on the designer by the wider design community. Despite the worthy intention, regulations often act to limit and impose rules

on our creativity. It is not that the industry wishes to be of detriment to the light designer's creativity, it is simply that many times the existing guidance or legislation is the only frame of reference it has to lighting. Clients find comfort within the parameters set by official documentation.

As a generalisation, Architectural Light Design uses light with the intent of eliminating darkness to create a functional space allowing the user to perform certain visual tasks. 'Feature lighting' may play its part in this but usually this consists of adding another layer of light to the already lit scheme; rarer is subtracting light to create feature or spectacle. To help us better understand our own profession it is useful to juxtapose the theatrical light designers' creative perspective

with that of the architectural light designers'. Theatrical light designers use light and dark without constraints to evoke a strong emotional response from the viewer while architectural light designers must consider aspects such as longevity, safety and regulations.

This article will explore the importance of darkness in light design, identifying obstacles which may limit our freedom to create exceptional designs with the use of darkness. By looking into what the origins of the current mindset are and presenting alternative views on the topic we enable ourselves to influence the future of our profession.

Day and night

In the beginning, the origin of our relationship with light was through the sun. For 50,000 years humans have been born, have lived and died under the light of the sun. "Every morning the sun would rise, bringing vision, warmth, and security, saving man from the cold, blind, predator-filled darkness of night. Without it, the cultures understood, the crops would not grow, and life on the planet would not survive." [The Zeitgeist Movement]

We understood the daily rhythm, the sun rising in the east and setting in the west, and how the days changed throughout the seasons. We evolved with shifting light patterns and varying light intensities. We lived in a high contrast environment with rays of light passing through the leaves as we walked under the shade of trees and vegetation. The origins of the human species had a very rich light experience and our eyes are adapted to work with full spectrum light, dynamic light levels and contrast. But our origins were also with darkness; it is worth remembering that 50 per cent of human evolution was spent in darkness. Nonetheless, for our ancestors, the light of day brought colour vision, and warmth and safety, which was pre-

ferable to the mysterious darkness of night. As a survival mechanism humans developed an apprehension towards darkness. These uncertainties and fears gave rise to many beliefs and superstitions as a way of understanding and explaining the unknown.

Religion, superstitions and fear

Alongside our growing curiosity and understanding of the planet we inhabited, many belief systems began to evolve, for which the light of day and the darkness of night provided inspiration. Astrology is the worship of the stars and heavenly bodies as deities [OED]. This is the first known form of religion with evidence originating around 10,000 BC, although it is likely to have evolved millennia before. At that time, we understood the importance of the sun and depended on it for our survival – this reality made the sun the most consistently adored object in history. In the 6th century B.C. Zoroastrianism emerged as one of the first religions to worship God through light as followers prayed in the presence of light. It is around this time that we begin to see symbolic meaning applied with 'Light as good' and 'Dark as evil'. Darkness was something to be feared. The imagery of light and dark as good and evil is ubiquitous throughout the world's major religions:

⇒ "Christianity: Jesus said "I am the light of the world; he who follows me will not walk in darkness, but will have the light of life." Bible, John 8.12.

⇒ "Islam: "God is the Light of the heavens and the earth. The parable of His Light is as if there were a Niche and within it a Lamp" Qur'an 24.35.

⇒ "Hinduism "Then that boundary is crossed, night becomes day; for the world of Brahman is light itself." Katha Upanishad 5.15.

⇒ Native American [Iglulik Eskimo]: "The enlightenment consists of a mysterious light... for he can now, even with closed eyes, see

through darkness and perceive things and coming events which are hidden from others."

The fear or phobia of darkness is known as nyctophobia. 'It is triggered by the brain's disfigured perception of what would or could happen when in a dark environment.' [William L Mikulas] This is a very common fear – many of us as children experienced a fear of the dark at one stage or another. This phobia may be an extreme example, but it also allows us to understand that darkness can manufacture emotions.

In the past, the scarcity of light, warmth and security and the abundance of dark, cold and lack of security gave the fear of darkness an evolutionary purpose. Our modern environment has now changed. However, the subjective concept that light is good and dark is bad still seems to have an influence. Within the last century the circumstances of society have reversed. Darkness is now scarce within our over-lit environments with light pollution being a modern-day scourge of our cities. Nonetheless, we find it difficult to surpass these negative preconceptions of darkness.

The vision organ

The human eye has evolved over millions of years with the purpose of gathering and communicating visual information to the brain. The dynamic nature of our lit environment has evolved an eye which is capable of extremes of vision. 'The human visual system can process information over an enormous range of luminances, but not all at once. It continually adjusts itself to the prevailing conditions' [Human Factors in Lighting – Boyce]. The extremities of our visual capability range from direct sunlight (32,000 to 130,000 lux), to a dim starlight night (less than 0.01 lux).

Along with the objective attributes of vision, evolution has given us subjective attributes that are innate to the vision organ. In the ocular

globe there are blind spots that are not visible to our day-to-day vision but can be found with the use of difficult exercises. This is because the brain processes all visual information and makes assumptions to 'auto-fill' the gaps. There are many optical illusions which play on the brain's visual auto-fill and interpolation weaknesses. It is interesting to note that even on a physiological level, vision is subjective.

Light, darkness and shadow are an important part of spatial perception. The early stages of our evolution were spent in areas with dense vegetation. In this environment there was no such thing as linear perspective [Light Volumes, Dark Matters – Claudia Dutton]. Our understanding of spatial perspective was defined by patterns of light, shade and the variance of luminance of the surrounding vegetation which enclosed our environment. We have not lost this capacity; variation of light and darkness are key to understanding the space, volume and texture of our surroundings. This is a concept which is not always appreciated by architects, or, in fact light designers.

Darkness is complex

It may be useful at this point to examine darkness itself. Darkness is an absence of, or a limited quantity of, light – this much is simple, but our understanding of darkness is complex. It is not only the pitch black extreme of darkness that we refer to; there are many shades of darkness, many variations of shadow.

Darkness is a reduction of visual information which stimulates our other senses, allowing us to appreciate our surroundings in a different manner and at a different pace. It offers us privacy, enclosure and de-stimulation. There are many positive attributes to darkness which revolve around mystery, intimacy and calmness.

The modern-day artificial environment is over-lit, light-saturated

and therefore unbalanced. People seek refuge in locations of darkness – it allows them to balance themselves and recharge their batteries. This is probably no better illustrated than with the clichéd scene of a candlelit restaurant.

In Western culture our feelings towards darkness vary but they are mainly associated to ignorance and fear, yet these feelings are all very relative. In the oriental culture the importance of darkness and shadow is acknowledged and indeed praised. Eastern culture recognises that a balance between light and dark is key; they understand and

appreciate this natural balance, the Yin and Yang of day and night. Junichiro Tanizaki eloquently conveys this simple concept in 'In Praise of Shadows': "...the person who would shine a hundred-candlepower light upon the picture alcove, drives away whatever beauty may reside there."

Darkness is vital for beauty to exist, as beauty is not only what one can see, but also what one cannot see. Darkness liberates our imagination and establishes spaces in which our minds are permitted to be introspective, no longer seeking and absorbing external stimulation.



Chiaroscuro in art is characterized by strong contrasts between light and dark.



The 'Praça Diogo de Meneses' in Caiscais, Portugal presents all operational lighting restricted to the vertical surfaces of the fort wall. Replicating ancient Portuguese sailing charts, the linear recessed feature lighting provides guidance and direction to the users. There are no columns within the entire square. Short-listed for the Mies Van Der Rohe 2011 Award. Lighting design: Miguel Arruda Arquitectos Associados in cooperation with Donker - Light Glass Technology". Photos: Miguel Arruda Arquitectos Associados.

Darkness in the Arts

Within the Arts in general there appears to be an intrinsic understanding of the value of darkness; its ability to communicate emotion and create spectacle. In many of the Renaissance paintings, the symbolic meanings ascribed to lightness and darkness are implicitly understood and exploited, with Good represented by light and Evil by darkness. This duality is commonly used to highlight hope

and despair. Great painters such as Caravaggio, Rembrandt and Baglione used bold contrasts between light and dark.

Known as the chiaroscuro technique, strong contrast was often used to define space, volume and hierarchy within the images of the Renaissance period. The artists understood the value of the intelligent use of darkness within a scene; darkness hides extraneous details and draws the eye through

the scene as the painter intended, thus revealing a story piece by piece. There are many lessons which the architectural light designer may learn from these artists.

Theatrical and cinematic lighting is highly artistic and emotive, it uses light to engage the spectator in the scene, enhancing the spectacle, generating and communicating emotion. However, unlike architectural light design, this form of artistic lighting is not limited by standards and regulations. There is no average workplane illuminance criterion or uniformity ratio to meet – the design is limited only by the technical limits of the equipment available and the imagination of the theatrical light designer. This freedom to explore the possibilities can result in exciting and expressive designs which we as architectural light designers ought to study to expand our creative repertoire.

Light design, the Dark Art

Light design should comprise the duality of light and dark. In the natural world light and dark exist in equal measure, and in balance – we must recognise this within our approach to light design. This immediately begs the question: 'Why is the good use of darkness in lighting schemes so rare?' We surely agree that we aspire to create exceptional and emotive designs. Is there anything preventing us from exploring the darker side of light design? It is as if light designers suffer from collective nyctophobia.

We believe that many designers have a disfigured perception of what would or could happen in a dark environment. This apprehension originates from the threat of potential litigation resulting from the non-compliance with standards and regulations. This in turn results in the self-limitation of the designer, a negative consequence of the fear of litigation.

Standards and regulations

We are obliged to follow lighting regulations. They exist to provide

us with guidance and to ensure the health and safety of the user. Regulations define levels for average illuminance, minimum illuminance, uniformity and glare. The result is that designers face increasingly stringent design regulation which sometimes acts to restrict good design and limits creativity. These criteria combined with a design-by-numbers ethos create the equivalent of an artificial, uniform, dull grey sky producing no shadow, no dynamics or contrast. It is not surprising that these spaces rarely feel good, since they are not the lit environments we evolved with and are adapted to. Spaces lit in this manner are not only artificial due to the

method of light production, they are also unnaturally illuminated.

Throughout history, technology has provided us with the means to create more and more light. Going back to Junichiro Tanizaki's quote from 1933: "The progressive Westerner is determined always to better his lot. From candle to oil lamp, oil lamp to gaslight, gaslight to electric light – his quest for a brighter light never ceases, he spares no pains to eradicate even the minutest shadow."

Our eyes have not appreciably evolved in the last 200 years, so how can we justify massive increases in recommended light levels? With each technological advance comes an increase in lumen output. Standards and regulation have followed these trends – with the ability to generate more light comes the regulation to stipulate that more light should be used. Peter J.G. Pearson states in 'The Price and Use of Light in the United Kingdom', that "The average British family uses 200 times more light per year, while as an economy we consume around 25,000 times

more light than we did in 1800". If, for example, it was inexpensive to light spaces at night to daylight lux levels, should we? Even if technically possible the potential does not create a cogent mandate for doing so.



Darkness as a backdrop. The void of light and information allows all focus to be drawn onto the catwalk. Light installation for the Y-3 autumn 2010 fashion show in New York City designed by United Visual Artists. Photo: 2010 © United Visual Artists.

We would like to argue that if one lux is sufficient and deemed safe for an emergency evacuation, why should we be concerned with 100 lux in a corridor or 200 lux in a lobby? Our eyes are innately more adaptable than regulation would permit them to be. Some of the most inspiring light designs may be found in restaurants, bars and clubs – in these spaces people are often under the influence of alcohol, yet there is no evidence of widespread problems due to lighting in these environments. There appears to be a common irrational fear of litigation resulting from non-compliance to regulations. Excluding emergency lighting, planning, and light pollution cases, we have not been able to find evidence of litigation against a light designer.

At this point it may be useful to clarify the parameters of our argument; it is obvious that not every space should be lit in a dramatic and emotive way with high levels of contrast and darkness – there must be a reasoned limit between aesthetics and functionality. There

are many scenarios which require a high level of uniformity and/or illuminance in order for people to perform certain functions – these may loosely be labelled as task areas. We do not wish to argue that emotive light design be used in these specific situations. However, there is no reason that elements of interest cannot be included within these surroundings. Take for example a standard office environment – it is practical to require a high level of uniformity on the work surfaces such as desks and meeting tables, yet it is still possible to include drama and contrast in such an environment. Circulation space, meeting rooms, breakout areas, lobbies, receptions, in fact anywhere which is not absolutely necessary for high uniformity to exist (a non-task area) need not be treated uniformly.

Why make our artificial environment and lighting even more artificial than it need be? Spaces should be assessed in terms of their realistic usage with localised lighting for specific tasks, the surrounding spaces as a canvas for creative inspiring lighting. Interestingly enough, Chinese lighting standards have a considered approach to contrast. These standards allow for different illuminance levels depending on the surrounding contrast, whether it is high or low; lower light levels for high contrast environments and higher levels for low contrast environments. This is a good example for us westerners who deem ourselves to be progressive.

We should not be limited to uniformly monotonous design; instead we should draw from a palette consisting of both light and darkness in balance. We believe in lit spaces which have the capacity to engage, inspire and fulfil and we should strive for these ideals.

Conclusions

We believe over-lighting is the visual equivalent of white noise: a background static with no focus

or hierarchy, visual anarchy. Darkness provides a sanctuary from our light-saturated environments. Understanding and using darkness as a design tool enables us to create spaces where our minds are permitted to be introspective, no longer seeking and absorbing external stimulation. Just as the darkness of night plays on our hopes, our fears, our dreams – shadow and mystery are the antidote to our age of visual information overload. Darkness allows for our imagination to work and enables us to dream.

There are many justifications for permitting spaces to be darker: emotive light design, energy consumption, or melatonin suppression caused by overly bright spaces at night. The fact that standards and regulations limit our use of darkness is wrong, and not suitable to our emotive human qualities.

It is not that we disagree with the existence of standards and regulations, not having them would be chaotic. But if in order for one to design something that is appealing and emotive, a designer must to break the rules, there is a good chance that the existing rules are not suitable or out of date – maybe even wrong. It is pointless to have standards if you do not follow them.

As a community, lighting designers have the ability to influence standards. What we want is for the standards to evolve to more adequately accommodate darkness and encourage attractive designs. To achieve this there must be a more open dialogue whereby designers speak up, join in the debate and collectively contribute to the evolution of the light design profession. There are many aspects to consider, many voices which must be heard – get involved in the discussion, add your voice to the debate at thedarkart@groups.facebook.com

Let there be darkness.