

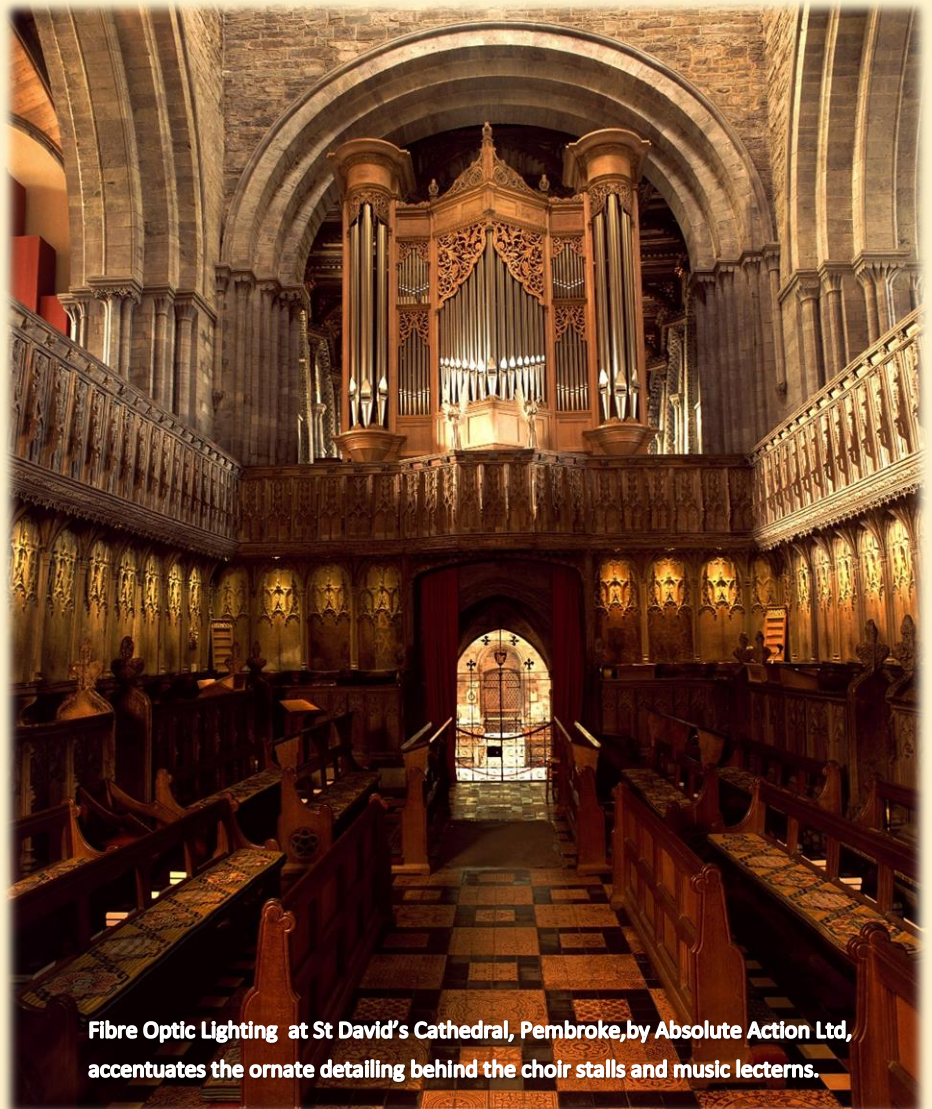
Lighting Places of Worship

A central theme to all major religions is the intrinsic power of light as a symbol of life, hope, knowledge and all that is both good and powerful in the world. Light is something to be celebrated. In many religions, God's first gift to the world was light. To Christians, Jesus Christ is the 'light of the world' and Muslims speak of Allah as the source of light. The Diwali Festival of Lights is so named by Hindus, Sikhs and Jains who light lanterns to symbolise the triumph of good over evil ... and Hanukkah is also referred to as a festival of light by Jewish people who light candles on the menorah during the eight day holiday.

It is therefore of very little surprise, then, that people take the lighting of their place of worship very seriously from a *spiritual* perspective as well as from an economical and conservational one. A church or temple is a place for people to focus on their God, and to look

for a guiding light through the darkest moments of life. It is also often the case that the church or temple in question has been providing its incumbents with such spiritual focus for hundreds (sometimes thousands) of years – and the very fabric of the building needs to be cared for and *conserved and preserved* in order to ensure its longevity for future generations. Ecclesiastical buildings are also frequently very lofty, with high vaulted ceilings reaching aspirationally up to the heavens. And, of course, the vast majority of these magnificent structures were erected centuries ago – before the existence of any kind of lighting other than the naked flame being carried by each worshipper.

So the introduction of lighting today needs to be undertaken with great sensitivity and care, and many of the early attempts were not renowned for their subtlety. These are gradually being replaced and up-graded as technologies and attitudes improve. We now appreciate that lighting needs to be safe to keep hazard of fire or heat-damage to a minimum, and issues of maintenance and energy consumption are increasingly important.



Fibre Optic Lighting at St David's Cathedral, Pembroke, by Absolute Action Ltd, accentuates the ornate detailing behind the choir stalls and music lecterns.

Glass fibre optic lighting uniquely satisfies so many of these considerations. With a lamp at source positioned remotely, the lighting itself is completely passive, free from any electrical current, heat or UV emissions; no maintenance is ever required at the point of output, so that light heads can be mounted at very high positions or even integrated into the fabric of the structure; beautiful quality lighting can be delivered from multiple heads across a substantial area from a single source; and the component elements of glass and metal will endure as long as the building itself. Fibre optic lighting thus provides the perfect long-term solution for the needs of both the conservation and spiritually minded alike, and its cost-effectiveness means that more of each institutions' precious funds can be directed towards preserving the beauty of their more fragile ancient features.

Absolute Action Ltd has specialised in advanced fibre optic lighting systems since 1983. In that time, the company has designed and installed bespoke lighting solutions to places of worship throughout the UK and the world at large. Above is a picture of the fibre optic lighting at **St David's Cathedral** in Pembrokeshire for which Absolute Action designed and installed fibre optic lighting particularly to highlight the beauty of the ancient and ornate artwork behind the choir stalls.

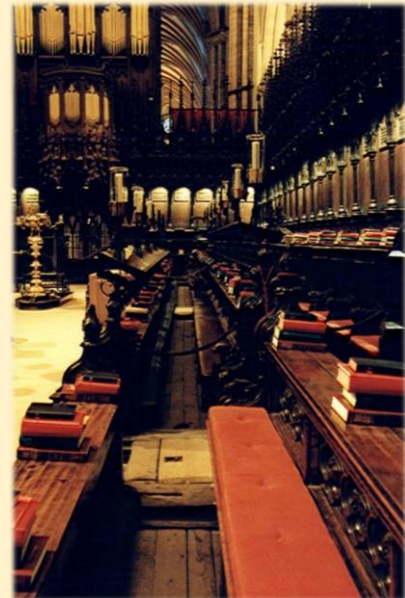
At **Eton College Chapel**, below, Absolute Action modified a version of its own extruded track system which was then discreetly placed behind the bench seats along one wall of the Ante Chapel. The end result is that a beautifully balanced and diffused light laps the bronze plaques of Old Etonians who had given up their lives in the service of their country, from the Boer War onwards. The warm tone of the engraved brass plaques is beautifully enriched by the warm colour temperature (3000°K) of the lamp at source. Low-speed fans were used to prevent noise disturbance and dimming of all MH systems was via an integral 0-10 volt interface.



Fibre optics were also used within the Chapel itself to provide emergency lighting. The light heads, powered at source via a maintained battery back-up system for a low voltage lamp, are almost entirely invisible, having been concealed within the carved woodwork at the base of the choir stalls and finished in a matching antique bronze, thus ensuring that that the integrity of the architectural and aesthetic beauty of the chapel was unaffected. Older places of worship are invariably darker than more modern buildings courtesy of dark stained-glass windows that emit very little natural light, and emergency lighting is an essential consideration for safety reasons in the event of a power-cut.

The safety, effectiveness and longevity of fibre optic lighting is no better illustrated than at **Lincoln Cathedral**. Our original installation of the fibre optic lighting with a 0-10v dimmer system in the canon stalls in St Hugh's choir, the rear stalls and the music stands - along with two emergency fibre optic lighting systems - took place over 16 years ago in 1998. The main consideration was keeping heat sources away from the delicate dry woodwork of the carving of the canon stalls. This was achieved by installing two fibre optic cables into each of the 70 stalls and with the seven light generators mounted away from the flammable woodwork. Plaques naming the various deaneries, which are written in gold leaf on the back of each choir stall, were highlighted by one of the fibre optic cables; the other fibre optic cable provides light directly onto the canon's hymn book. Previous attempts to light these areas had proved very difficult as lighting from Triforium level was cut off by the hood over the canon stalls. Finally, slender fibre optics were intricately integrated into the bespoke candle sconces to provide cool and practical illumination to the choir's music books. In all applications, minimal intrusion into the fabric of the building, combined with the facility to customise and miniaturise light fixtures, makes the lighting uniquely discreet and unobtrusive.

Since 1998, all that has ever needed replacing at Lincoln Cathedral are consumable elements and component replacements such as new lamps every few years (for the Spectralux 6000 150W metal halide light sources), fans and dust filters. The main installation of fibre and lenses is as perfect now as it was 16 years ago owing to the fact that we only ever use the highest quality glass fibre and fittings ... and the fact that fibre optic lighting systems are, by definition, very cost efficient to maintain, requiring only a few hours' work annually replace any bulbs or fans that are tiring. We fully expect the story to remain the same in another 16 years!



While lighting can be used to enhance the beauty of historical tributes to God, it can also be used to dramatic effect to breathe life into modern tributes, such as in **the Columbarium at St Mary's Presbytery**, near Sloane Square in Central London. Built in 1999, the purpose of the Columbarium is to provide the loyal subjects of the church with a final resting place (there being no graveyard); the ashes of the deceased are housed in each of 70 dedicated mahogany chambers which are inscribed with the respective names and dedications. Omar Ramsden's Reliquary of the True Cross is on permanent display, securely sealed behind engraved glass in the central wall of the Columbarium. A specially-commissioned tympana, above the cornice, represent three resurrections.

All elements combine to provide a magnificent place for relatives and friends of the deceased to pay their respects to them in an area specifically dedicated to enhance his or her understanding of the Christian belief in life after death. Light is synonymous with life and fibre optics were used internally to illustrate the relic cross itself – no access being necessary for their maintenance – and to edge-light the protective glass, making the etched message glow richly (see inset picture, right). Further heads are mounted on the cornice around the Columbarium niche to illuminate the richly coloured tympana above, emphasizing the sense of radiating light. A combination of bare-tipped polished glass fibre and focusing optical lenses mounted on articulate bracketry were used in a range of configurations to deliver general diffused illumination as well as to accent lighting onto the cross detail.



At **St. Paul's Church in Deptford** (a Grade 1 Listed building constructed in 1731), both performance and appearance were critical when Absolute Action was asked to solve the dim lighting conditions that had plagued the congregation for centuries, and save the Church the expense and hazard of constantly re-lamping the existing chandeliers. The solution was required to deliver between 50 and 100 lux at floor level from the very high ceiling (in excess of 10 Metres) whilst ensuring that the fabric of the building was not marred with noticeable light fixtures. Consequently, Absolute Action custom-made a series of 12 fibre-head roses which were camouflaged within the existing ceiling plasterwork through which the original chandeliers had been suspended, with the holes for the chain being used to bring fibres through from the attic space above (see inset pictures). In all, the whole church nave was illuminated through five locations from just 10 fibre optic projectors.

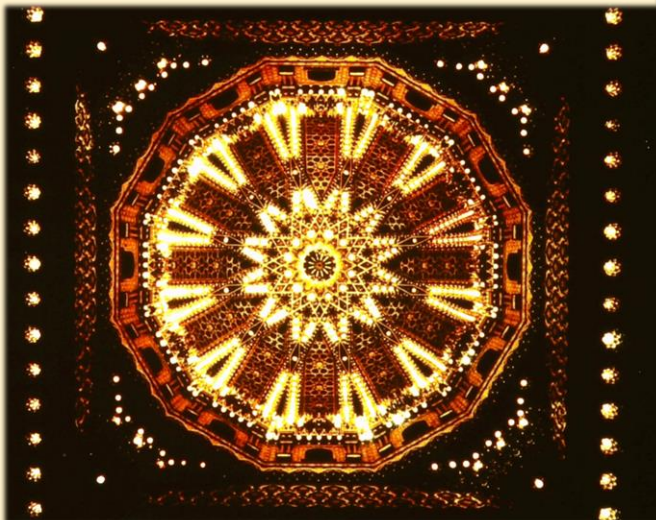
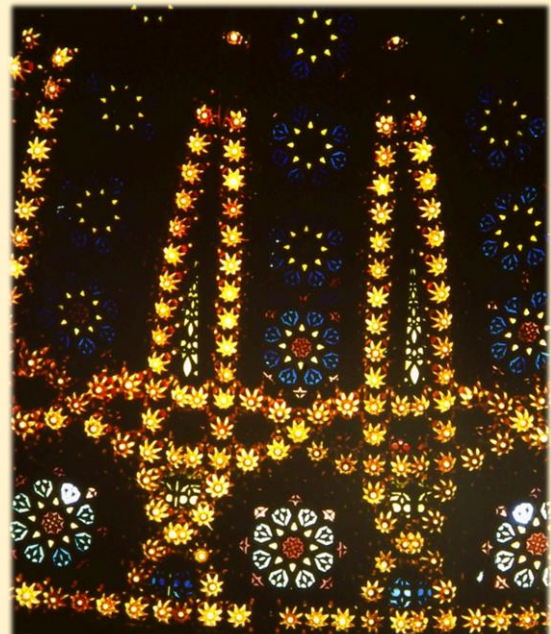
When the architect, Brian Lofthouse, contacted St Paul's three years' later, the parish priest reported that the light output from the fibre optics alone provided enough light for the congregation to read, as it was designed to do so, and were often the only light source used during church services. St Paul's Church's experience illustrates how lofty interior spaces can very effectively be lit at a high level using fibre optics, with the projector sources easily accessible for maintenance without the need for scaffolding.



A slightly more elaborate means of remembering those who have passed from this life to the next is epitomised by the **Mausoleum for King Mohammed V**, which was built in the 1930s and sits in the city of Rabat, the capital of Morocco. In Islamic tradition, the sarcophagus is contained in a room below ground level. On entering the mausoleum, visitors are able to look down at the sarcophagus from a walkway at ground level. Above this, there is an intricately carved wooden dome, eight metres in diameter, its centre rising some 45 metres above the ground, and which was extensively decorated with 1000 flowers adorned with gold-leaf.

The dome was suffering extreme levels of degradation from the heat emanating from the many incandescent light bulbs that had been used over the years within the gold-leaf flowers, and Absolute Action's urgent task involved the replacement of each of these light bulbs with cool fibre optic lights, each being crystal-tipped, one per flower.

The fibre optic lighting solution proved an ideal means of enhancing and highlighting the decorative and ornate carved woodwork of the dome, perfectly juxtaposed with the colourful stained glass panels that were lit by natural daylight. The fibre optic lighting has enhanced the natural splendour of the surroundings whilst preventing the continued fading of the gold leaf. It has also significantly reduced the risk of fire posed by the former lighting system's generation of intense heat in close proximity to the dry woodwork.



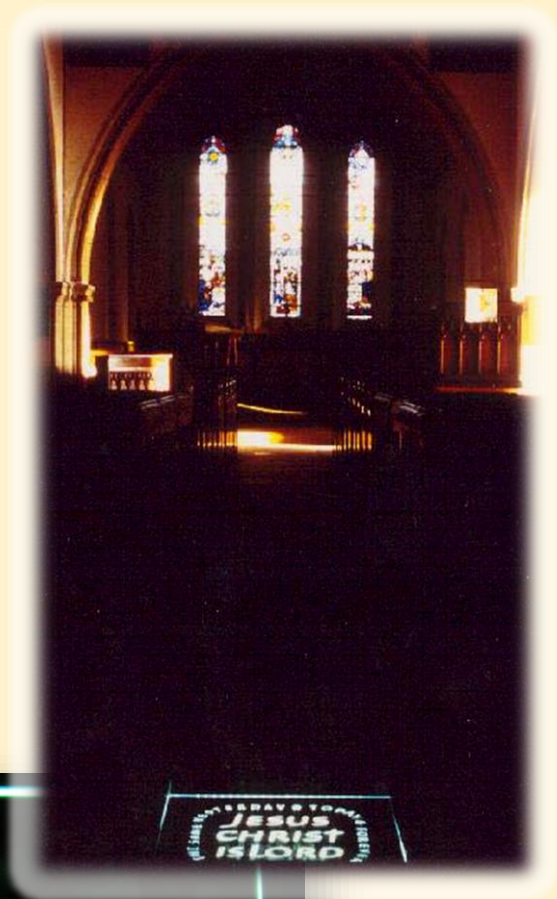
Furthermore, with fibre optic light sources located along accessible walkways, the hazard that had been associated with changing so many light bulbs at such high and precarious locations has been completely eliminated.

From a cost efficiency perspective, the energy load resulting from lighting the dome has been reduced by 11.2 kw. All in all, safety, conservation, efficiency and aesthetics have all been enhanced with the use of fibre optics.

At the **Church of St Thomas A Becket in Pagham**, the Rev John Maynard, in the late 1990s, had been seeking an enduring means of celebrating the dawn of the new millennium and decided upon the idea of an engraved glass slab with a message that formed a permanent source of light within the church that would remind all her entered the building and saw the slab of the eternal light of God's message to them.

The specialist etching was carried out by Charmian Mocatta to two different depths within the glass and fibre optic light was introduced into the edges at both levels – to ensure that each message was in balance with the other and clearly depicted. The glass slab is set in its final place, embedded inaccessibly within the ancient church's paved floor, with the metal halide light source being discreetly located beneath an adjacent pew and therefore available for easy maintenance.

The Pagham Millennium Slab is permanently illuminated and, at night, generates such an intense glow that the aura of light can be seen from across the churchyard.



To the right is an additional example of the power of fibre optic lighting in the precise and beautiful illumination of a glass engraving within the private side chapel of **Saint Botolph's Church, Aldgate**. Both the dove and the gift of light symbolise hope, and the fusion of the two provides a source of inspiration and solace for those entering the chapel.

Also at Saint Botolph's is a stunning ancient wood carving which has also been shown to greatest effect by the use of multi directional and discreet fibre optic lighting. The colour and fabric of the three dimensional wood carving will continue to be perfectly conserved since the light has no heat at output and no ultraviolet emissions.



So, lighting of places of worship using fibre optics has the simultaneous benefits of conservation and comfort since the light from the optics is cool, causing no discomfort when near people, is glare-free, generating no distractions to contemplation, and the absence of ultraviolet emissions is a major advantage when ancient parchments, woodwork or manuscripts are to be lit. They are also demonstrably cost-effective in terms both of maintenance – in easily accessible locations – and running costs, given that a single, high-efficiency lamp can power up to 50 useful light heads.

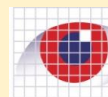
As Lincoln Cathedral so aptly demonstrates, a well-designed, quality fibre optic lighting system will also endure for decades and decades. Lofty interior spaces – such as at St Paul's Church in Deptford – can be well lit from a very high level owing to the immense projecting power of lensed fibre optic light. As demonstrated at St Thomas a Becket and St Mary's, glass fibres can be integrated into the built structure of a permanent architectural feature with no risk of disturbance or decay over time – stained glass windows bear testament to the durability of glass as a material of great permanence! And, as is also the case at St Paul's, minimal intrusion into the fabric of the building, combined with the facility to customise and miniaturise light fixtures, makes the lighting very discreet and unobtrusive.

Fibre optic lighting really does dramatically enhance the ambience of a place of worship safely and with enduring results.

*Below: dramatic fibre optic uplighting of the **South African Cloisters at Charter House, Godalming, Surrey.***



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