

# DRAMA BY DAYLIGHT

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Brian Roberts introduces the first in a series of three articles which present a pictorial history of lighting for the theatre and stage through the centuries.

Act I: The First 2000 Years

The house lights dim, the curtain rises to show an illuminated stage, another play begins. This is the modern theatre. But its origins probably go back to the religious rites of the earliest communities and some say derive from the funeral ceremonies of the early Egyptians (c3000 BC). However, it is generally accepted that the first great theatrical age was that of Greece in the 5th century BC.

Dionysus and Daylighting, 4th century BC (Figure 1)

It was in Greece that plays and festivals in honour of Dionysus (the wine god), were first performed in special buildings or areas set aside for the purpose. The most famous and best preserved of these is the Greek theatre at Epidaurus which was in the open air and relied on daylighting. Starting time was at daybreak and citizens would often sit through as many as five plays.

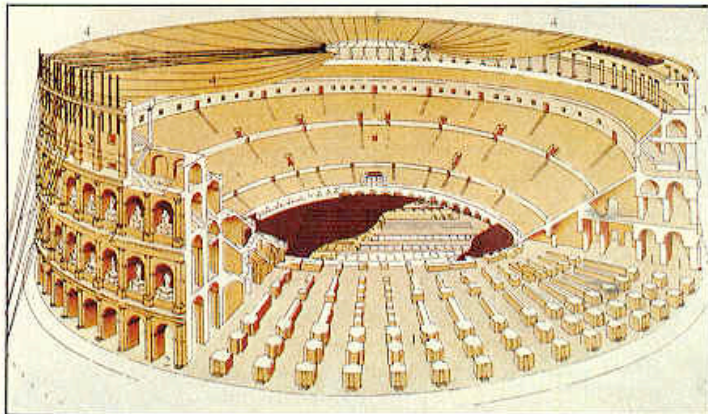


Figure 2: The Colosseum in Rome. Daylighting and glare is controlled by the adjustable roof shades (velarium, 4) (1st century AD)

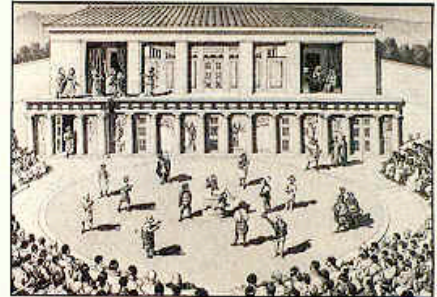


Figure 1: Open-air Greek theatre at Epidaurus (4th century BC)

Colosseum and Velarium, 1st century AD (Figure 2)

The Romans were responsible for the widespread introduction of the amphitheatre as at Pompeii, Nimes, Arles and in Rome where the Colosseum could easily hold 48000 people. Their size and height posed tremendous architectural problems and the Romans devised ingenious solutions to handle large audiences and provide for their comfort.

At the Colosseum, to control daylighting and provide shade, canvas awnings – the “velarium” – were hitched to masts in the manner of ships’ sails and could be stretched across the top of the arena by a squad of sailors.

The Romans were masters of hydraulics and water engineering and could flood the arena for mock sea battles and aquatic events.

Awnings at Aspendos, 2nd century AD (Figure 3)

Theatre design was revolutionised by the Romans. They transformed the prepared landscapes of the Greeks, designed to seat large audiences and ensure good acoustics, into works of architecture. Seating areas were provided on vaulted ramps, with passages and stairs behind to provide access. Vitruvius gave detailed descriptions of “several acoustic calculations and contrivances” and “prescriptions as to the size and proportions of the stage and the plan for spectators”.

The stage was roofed over while here also the spectators were protected from the glare and heat of the sun by canvas awnings. On hot days, slaves would sprinkle the audience with showers of perfumed water.





Figure 3: Reconstruction of Roman Theatre at Aspendos (2nd century AD)



Exultet Roll and Candle, 11th century AD (Figure 4)

In the Dark Ages, following the decline and fall of the Roman Empire, it was the Christian Church which adopted a theatrical approach to make its liturgy more vivid. One interesting device was the Exultet Roll, developed in Italy, from which a priest chanted the text, unrolling it over the back of the pulpit as he read his way through it. At intervals in the roll there were pictures illustrating the subject of his Latin words. To be the right way up for the congregation standing below, the pictures had to be upside down in the text. The

Figure 5: Medieval feast and entertainment (15th century)



ELECTRICAL DESIGN March 1992

Figure 4: Exultet Roll (11th century)

picture is from an actual roll in the Vatican and shows lighting provided by the candle on the left. This is one of the earliest known pictures of a candle.

Troubadours and Torches, 15th century (Figure 5)

During the Middle Ages drama was largely confined to religious theatre. This was often taken around the towns and villages by bands of strolling players. The priests made efforts to secure a place for short plays (urging repentance and reform of life) among the entertainments on offer indoors at night in the banquet halls of the nobility. The hall, or refectory, in palace, castle and monastery alike was the common place of assembly for all residents and guests. For here was the food and drink. And here the musician, juggler, jester or player performed. In this case, the scene is illuminated by firelight, by the candlesticks on the tables and by the flaming torches held by the entertainers.

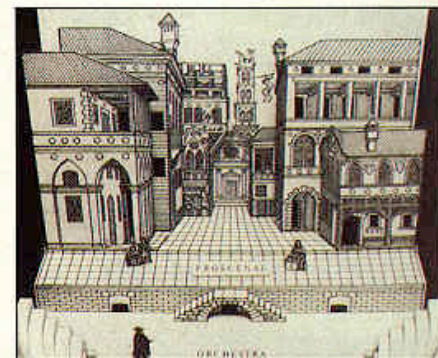


Figure 6: Italian stage ["Comic Scene" by Serlio, 1545]

Renaissance Razzle-Dazzle, 16th century (Figure 6)

Meanwhile, a new style of theatre was appearing in Italy. The Commediadell'Arte gave Europe its first fully professional actors in trained companies, while its architects developed the indoor theatre with the proscenium arch, painted scenery and elaborate curtain – typical of later theatre buildings all over the world. In 1513, Girolamo Genga built a set which "had houses made of stucco relief, glowing with jewel-like lights and with alabaster panes in the windows". Later, in 1545, Sebastiano Serlio wrote about theatre architecture and scenic design, describing



how lights (possibly small glass oil lamps) could be made to sparkle in windows. Palladio designed the fully enclosed Teatro Olimpico at Vicenza (1580-84) which had a long narrow stage, backed by an extravagant facade with perspective vistas of city streets. Lighting was a problem. It is recorded that lamps were placed behind rows of red and white wine bottles in an attempt to compensate for the loss of natural light.

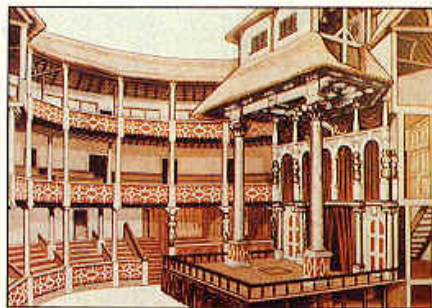
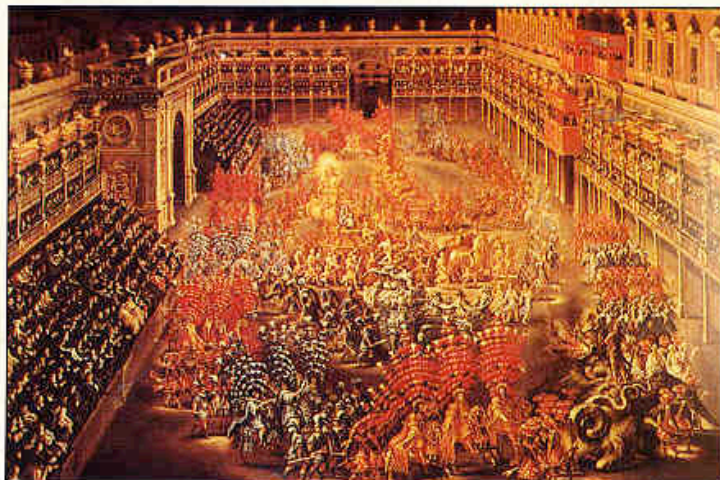


Figure 7: The second Globe theatre (1614)

#### Elizabethan Extravaganzas, Late 16th century (Figure 7)

The first permanent theatre in London was built in 1576 by James Burbage, a carpenter and part-time actor. It was known simply as "The Theatre". Others followed: the Curtain, the Rose, the Swan, the Fortune, the Globe and the Hope. A trumpet-call from the machinery tower announced the opening of a play. A flag was flown during the performance which

Figure 9: Night festivities in Rome (oil painting by Lauro and Gagliardi, 1656)



usually took place in the early afternoon; the stage was thus lit by daylighting from above. There were no footlights.

#### Burbage's Blackfriars Theatre, 1597 (Figure 8)

By the turn of the century many plays were being written for the indoor or private theatres set up in Blackfriars and elsewhere. These were roofed and could be used in bad weather. Lighting was provided by candles. In a reconstruction of the second Blackfriars Theatre (built by James Burbage) the drawing shows lighting over the stage provided by candle chandeliers. It also shows candle foot lights though there is no evidence for their use at this time.

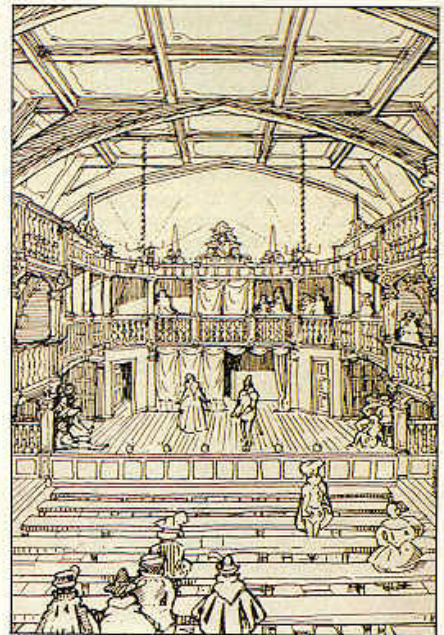


Figure 8: A reconstruction of the second Blackfriars Theatre (1597)

#### Rome's Royal Revels, 1656 (Figure 9)

Queen Christina of Sweden abdicated her throne, embraced Catholicism and took up residence in Rome where, soon after her arrival, this spectacular night-time entertainment was mounted in her honour. It featured a mock battle between Cavaliers and Amazons in the courtyard of the Palazzo Barberini, illuminated by flaming urns on the roofed galleries.



# FOOTLIGHT PARADE

Brian Roberts continues his pictorial history of lighting for the stage. As time goes by, candles are used to illuminate those that "want to be seen" at the theatre and are also suspects in the demise of a venue.  
Act II: 1650-1825



Figure 10: The Comedie Francaise (1670)

## French Farce, 1670 (Figure 10)

This is part of a painting of the Comedie Francaise in a Moliere farce. In the full version there are six candle chandeliers over the stage and a row of 34 candles, acting as footlights, may be counted. A 1673 print of a Moliere play at Versailles shows five elaborate chandelier fittings but no footlights.

A drawing of a German stage around the same period again has chandeliers but no footlights. The first illustration of footlights in use on an English stage is that to be found in the frontispiece to "The Wits; or, Sport upon Sport", by Francis Kirkman, published in 1673.

## Smoking Candles at Drury Lane, 1674 (Figure 11)

This drawing shows the auditorium and the stage lit by candles. The audience came as much to be seen as to see and the "house lights" were not dimmed. Gentlemen of quality were permitted to sit on the stage (which gave them direct access to the actresses' dressing rooms). The smoke from the candle chandeliers over the stage was a nuisance, but considered less so than from oil lamps. Samuel Pepys noted in his

diary that the actresses made quite a show by candlelight. He also complained that the candlelight gave him a headache. Footlights can be seen in the drawing and were now in general use, allegedly to enable the dancers' legs to be fully appreciated. With all these open flames exposed, fire was a major hazard. Oil wicks were often floated on water to reduce the risk – hence the theatrical term "floats" for footlights. (The first Drury Lane was gutted by fire in 1672. Rebuilt and expanded in 1794, the third version was also destroyed by fire in spite of four large "sprinkler tanks" in the roof).

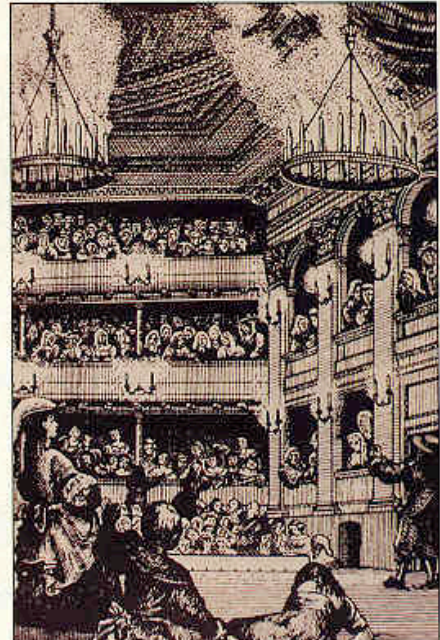


Figure 11: Interior Drury Lane (1674)

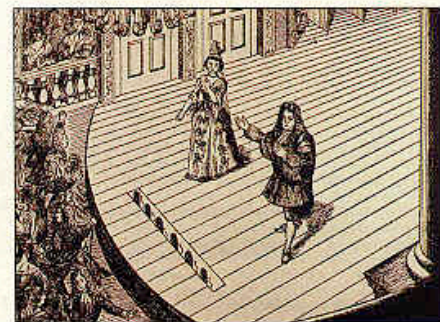


Figure 12: Duke's Theatre (c1680)



**Drama at the Dukes, c1680 (Figure 12)**

Between 1642 and 1660 all plays were banned by the Puritan Parliament, but with the Restoration a new theatre was built at Dorset Gardens. The Duke's Theatre, as it was called, had general lighting from great circular fittings which held many candles and were hung above the stage apron. These also illuminated the auditorium and there were probably further candles round the boxes and galleries. There also came into use a new form of footlights, consisting of oil lamps recessed into a trough at the front of the stage.



Figure 14: Vauxhall, detail (by Rowlandson 1785)



Figure 13: Laughing Audience, detail (by Hogarth 1733)

**Laughter in the House, 1733 (Figure 13)**

Hogarth gives a close-up view of a candlelit theatre interior of the period: "the dejected boredom of the orchestra, the delight of the people in the pit, the orange girls flirting with the elderly beaux in the boxes who are totally uninterested in the play. This was something of a convention".

**Night-time Pleasures, 1785 (Figure 14)**

For nearly 200 years the Pleasure Gardens at Vauxhall (1661-1859) provided a source of diverse pleasures for Royalty, the aristocracy, politicians and others. In this picture the entertainment is provided by Mrs Weischell, the singer. Mr Barthelemon is the leader of the orchestra, the conductor Mr Hook. "In this hey-day of the Gardens oil lamps were the only possible illumination other than candles, and each lamp had to be filled and its wick trimmed by hand, after which it had to be replaced on its hook. As many of the lamps were in positions only accessible by ladders, it could have been no easy task to arrange for the lighting of the whole 10 000 at approximately the same moment. Candles were of course provided for the supper tables, and charged for at the rate of two shillings a pair".

The complete drawing includes many famous people: Boswell, Dr Johnson and the Prince of Wales. The original of this cartoon was found in a junk shop in 1945 and bought for £1.



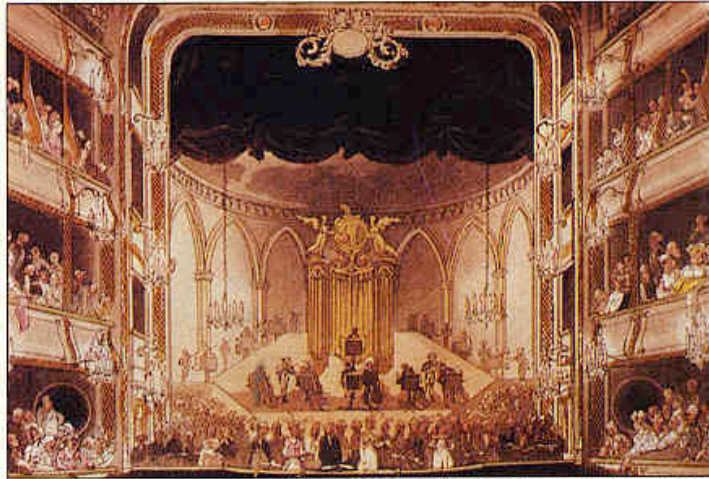


Figure 15: Covent Garden Theatre [by Rowlandson and Pugin 1792]

**Candles at Covent Garden, c1790 (Figure 15)**

The first theatre on this site (illustrated) was established by John Rich in 1732 as the Theatre Royal Covent Garden, under a Charter inherited from his father. The lighting by candles is clearly visible during this performance of an oratorio. Reconstructed in 1792 the theatre was destroyed by fire in 1808 (were the candles to blame?).

Seat prices were raised to pay for the rebuilding and led to the celebrated Old Price Riots when continual nightly disturbances finally forced the management to return to the old seat prices.



Figure 16: Lighting the footlights (c1800)

**Lighting the Footlights, c1800 (Figure 16)**  
This picture shows a tedious chore still necessary around the turn of the century, possibly at the Theatre Royal, Ipswich.

**Sadler's Wells Aquatic Entertainments, 1809 (Figure 17)**

This theatre dates from the 17th century when it was built by one Thomas Sadler in his pleasure gardens where there were medicinal springs and wells. Rebuilt in 1765, the footlights and auditorium candle chandeliers show the typical theatre illumination in use at this time.

Also to be seen is part of the new "aquatic entertainments" with Neptune and his horses sailing in from the wings in a tank fed from the nearby New River reservoir.

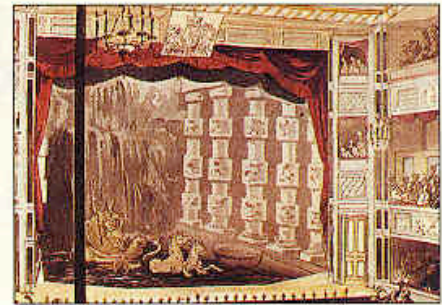


Figure 17: Sadler's Wells Theatre (by Rowlandson and Pugin 1809)

**The Violin Snuffer, c1810 (Figure 18)**

Rowlandson's satirical etching "Comedy in the Country" (and its companion piece "Tragedy in the Town") echo the convention of the boorish audience.

Both feature a candle-lit auditorium but the "Comedy" is particularly interesting, from our point of view, in that it shows a candle being snuffed by one of the violinists.



Figure 18: Comedy in the country [by Rowlandson, c1810]



# THE GASLIGHT ERA

Brian Roberts concludes his journey through the history of theatre lighting with a look at how engineers and technicians finally took over centre stage.  
Act III: 1820-1925

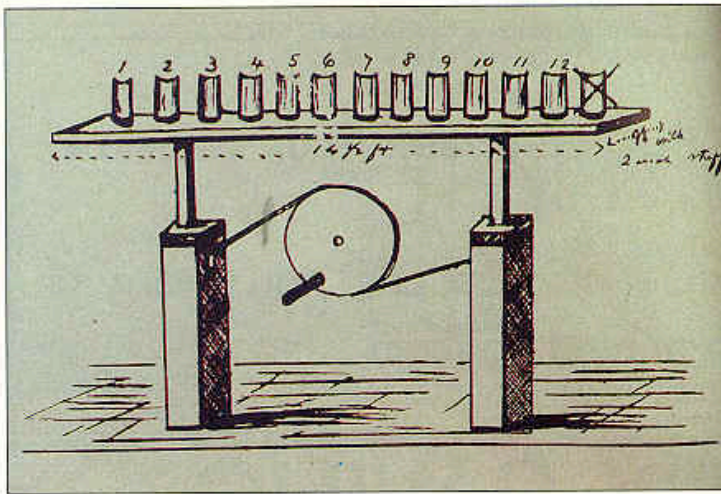


Figure 19: Movable footlights (c1825)

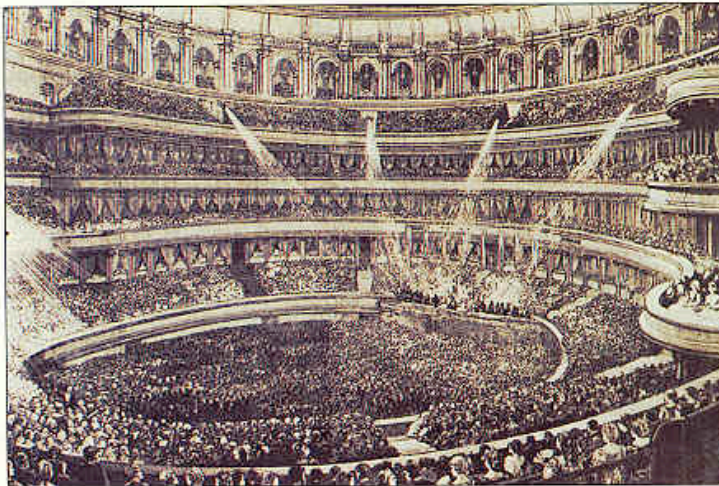


Figure 20: A State concert in the Albert Hall (1873)

According to Glynne Wickham, the first Professor of Drama in Britain: "It can be argued that most of the major changes that overtook the theatre during the nineteenth century owed more to engineers – civil, mechanical and optical – than to actors or dramatists."

He maintained that, "If such a claim is thought to be perverse, it has to be remembered that the candles and oil-lamps, which had provided the sole form of lighting in every theatre until the end of the eighteenth century, were banished first in favour of gas and limelight and then in favour of electricity".

#### Dimming the Footlights, c1825 (Figure 19)

Before the gas or electric light, ingenious devices were invented which made it possible to lighten or darken the stage: "Although each candle or lamp could be masked or snuffed out, this was obviously a slow and laborious process, but when numbers of lights were mounted together the whole fitting could be raised or lowered through a slot in the stage, or when mounted vertically behind each wing, they could be turned away or shuttered in a single movement.

It was not easy to darken the auditorium, although this was partially achieved in some instances by withdrawing the candelabra or chandeliers through the ceiling, as done at the Comedie Francaise and La Scala".

#### In the Limelight, 1873 (Figure 20)

The building of the Albert Hall commenced in 1867. It was a huge red circular building with a dome of glass and iron. This picture shows the lime or calcium light in use.

Two cylinders of compressed gas (one of hydrogen and one of oxygen) were directed against a column of lime, which was then heated to produce a great incandescence. Developed by Drummond in 1816 it produced a brilliant white light "of a quality so excellent for stage purposes that...we tend to associate it with the theatre and nothing else".

In *The Stage* magazine of 1883 it was reported "Limelight appears to be likely to hold its own in theatres with more favourable results against electric light than coal-gas".



Figure 21: Performance of Das Rheingold at Bayreuth (1876)



Figure 22: Aux Ambassadeurs, detail (Degas c1876)



Figure 23: La Parade de Cirque, detail (Seurat 1887/8)

**Rhine Maidens, 1876 (Figure 21)**  
This print shows, from backstage, a production of *Das Rheingold* at Bayreuth. Over the scenery is a gas batten encircled by a wire gauze screen (in some theatres coloured lighting effects were achieved by pulling coloured silks around the outside of the screen by a cord and pulley system). There is also a spotlight. Another painting from the audience side shows the floating maidens and the high rock – a Wagnerian fantasy.

**Cafe-Concert, 1876 (Figure 22)**

Degas is famous for his views of the ballet and the orchestra. In several pictures the lighting effects and styles are brilliantly observed. This particular illustration is of an open-air concert on a warm summers evening at the relatively smart and expensive *Cafe aux Ambassadeurs* on the Champs-Elysees, where up to 1200 people attended the performances. The lighting is by globular gas lamps suspended in the trees.

**Gas-Jets at the Circus, 1887 (Figure 23)**

The painter Seurat was interested in another form of theatre – the circus. This detail from his *Circus Parade* shows an overhead gaslight batten, possibly with batwing or fishtail burners, though at this date the flame shape could be the badly adjusted flame of a union-jet type of burner. There are also gas lamps on the far wall.

Figure 24: Lighting console at the Paris Opera (1893)

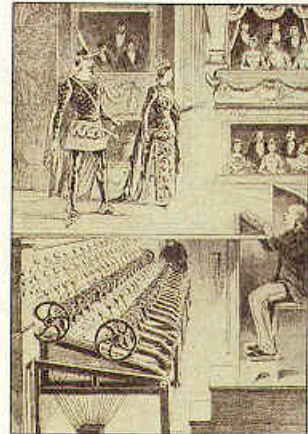


Figure 25: The Rehearsal (c1900)

**L'Opera Console, 1893 (Figure 24)**

"The Paris Opera possessed 10 gas meters, fed by six service pipes, off which six meters fed into 1000 burners each, and four into 800". The gas had to be regulated before it reached the various lights and this was carried out at the gas table (the *jeu d'orgue*) by a series of taps and stopcocks. This gas table, or console, at the Opera was over 10 m long and sat in front of and below the stage apron where the light man could see the effect of each cue clearly.

**Victorian Gaslight, c1900 (Figure 25)**

The rehearsal is taking place in a theatre with a 10-jet temporary gas batten on the front edge of the stage. There is also a row of footlights, which look like oil-wick "floats". On the front of the circle boxes is what appears to be the permanent gas house-lights, while at the left, behind the musicians, are some unlit gas (or oil?) lamps on stands.



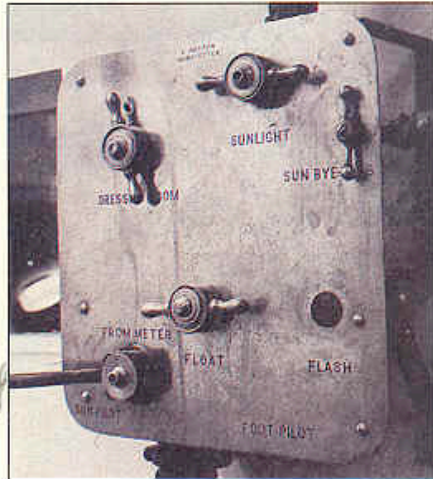


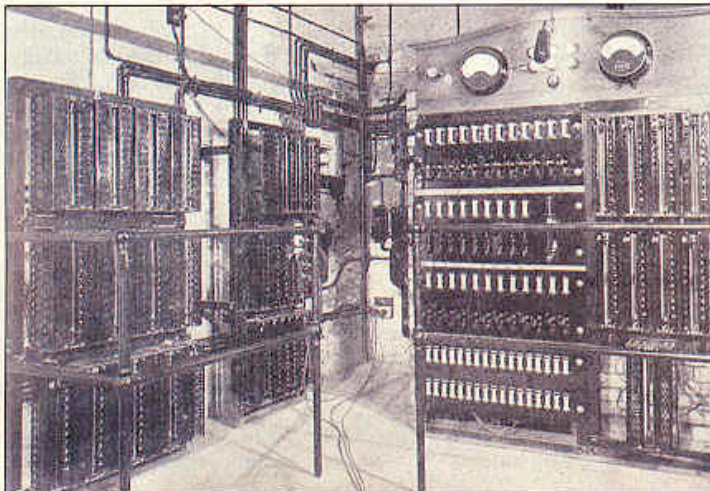
Figure 26: Gas Distributor at Buxton Opera House (1903)

#### Buxton Gas, 1903 (Figure 26)

Buxton Opera House was designed by the famous theatre architect Frank Matcham. Though wired for electric lighting it had a gas lighting system working in parallel. Gas footlights were retained in the building for atmosphere and the auditorium had a large ceiling-mounted combined gas light and ventilator known as a "sunburner".

The gas Distributor (illustrated) has controls labelled From Meter, Sun Pilot, Foot Pilot, Float (footlights), Flash, Sun-

Figure 27: Cambridge Festival Theatre Switchboard (c1925)



light (sunburner), Sun Bye-pass and Dressing Room.

"The Float was on the most sophisticated triple system: pilot, flash and main supply. The pilot lit the flash, the flash the whole of the footlights, a system first patented in 1883 at the Alhambra. This three tier system provided safe and gentle ignition that was not possible with the inevitably explosive leap from single pilot to full length footlights".

#### Electric Festival, c1925 (Figure 27)

This photograph is of a special board installed at the Festival Theatre in Cambridge by Reandco. The switch panel and dimmer panels are separate and there is no mechanical interlocking. There are 33 single-pole knife switches and fuses in three rows, and also a single-pole black-out switch.

The negative fuses are grouped at the bottom of the board. On the right of the panel is a bank of sliding contact dimmers controlling the front-of-house lights and decorative illumination. On the left is a panel of cyclorama lighting controls and next to it the resistances for the batten, spots and stage dips.

Today's stunning lighting effects are another story for here the curtain falls and the house lights come on. Our tale has ended.

EurIng Brian Roberts CEng FCIBSE MASHRAE MIP MASPE is Technical Director of Colt HH Airpower Ltd and Chairman of the CIBSE Heritage Group.

Photography by Zoe Roberts

Picture sources:

Figures 1,3,6,16,19 Leacroft, Theatre & Playhouse (Methuen 1984): Figure 2 World Atlas of Architecture (Mitchell-Beazley 1984): Figures 4,18,21 Gascoigne, World Theatre (Ebury 1968): Figure 5 Holme, Princely Feasts & Festivals (Thames & Hudson 1988): Figure 7 The Entertainers (Pitman 1980): Figure 8 Hartnoll, The Theatre (T&H 1968): Figures 9,24 Wickham, A History of the Theatre (Phaidon 1985): Figure 10 Harwood, All the World's a Stage (Methuen 1984): Figure 11 Leacroft, The Development of the English Playhouse (Methuen 1988): Figure 12 Cleaver, The Theatre through the Ages (Harrap 1946): Figures 13,14 George, Hogarth to Cruikshank (Viking 1987): Figures 15,17 St Aubyn, Ackermanns Illustrated London (Wordsworth 1985): Figure 20 Hibbert, London (Penguin 1980): Figure 22 Bade, Degas (Studio 1991): Figure 23 Russell, Seurat (T&H 1965): Figure 25 Mander/Mitchenson Collection: Figure 26 Buxton Opera House brochure (1990): Figure 27 Ridge, Stage Lighting (Heffer 1928)