



*The daylight interior of the Pantheon in Rome illuminated by a great 8.5 m diameter "eye" symbolic of the sun, built in AD 126, painted by Pannini c.1750.
[Roman Art and Architecture, Mortimer Wheeler, 1964]*



*The Great Western (City) Arcade, Corporation Street to Colmore Row, Birmingham, built 1902.
[The Story of Typhoo, Ken Williams, 1990]*

DAYLIGHTING

For thousands of years man arose with the sun, went about his daily tasks during the hours of daylight and retired to his dwelling place as darkness fell. Scientists and illuminating engineers have come to understand the nature of daylight, painters and photographers have tried to capture its various moods; but man's primary concern can be seen in the design of his buildings.

At Newgrange, a Neolithic "passage grave (c.3100 BC), 50 km north of Dublin, once a year, on the shortest day (the winter solstice), the dawn or sunlight shines along a passage to illuminate the burial chamber. At the temple of Karnak in ancient Egypt (1990-1786 BC) the dark interior of shadowy columns is lit by roof light holes and clerestory openings. Santa Sophia in Istanbul (AD 537) has forty small windows at the base of the giant dome, providing a circle of diffused light, so that the dome has been described as "suspended by a chain from heaven." In Elizabethan England, great houses like Wollaton, Longleat and Hardwick Hall ("more glass than wall") were designed to take advantage of natural daylight. In Victorian times, bay windows became popular in English homes, increasing the amount of daylight admitted to rooms. The mid-19th century saw the rise of the great glass and iron buildings such as the Crystal Palace in London, Les Halles Centrales (covered market) in Paris, and the Galleria Vittorio Emanuele (arcade) in Milan. The turn of the century saw the development of great glass-fronted department stores in Germany, Belgium, Switzerland and the USA. After World War II, the curtain wall office block, with large area of glass, found favour for twenty years or so. Now with the call for "green buildings" and energy conservation, controlled daylighting has re-emerged as one the cornerstones of modern building design.



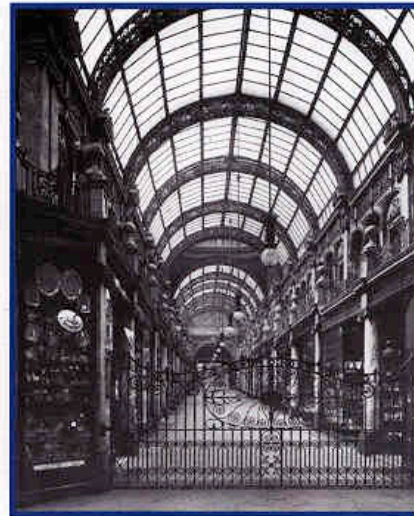
*A Christie's auction, 125 Pall Mall, London
Drawing: Augustus Pugin & Thomas Rowlandson
[Ackerman's Illustrated London, 1810]*



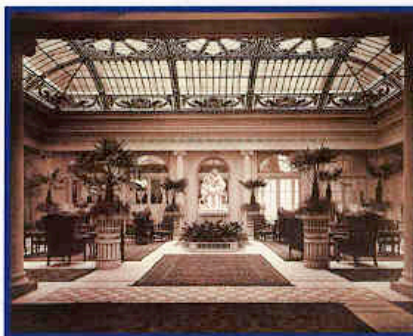
*Advertisement for outside blinds,
R Lowther & Co Ltd, London, 1886
[The English Terraced House, S Muthesius, 1982]*



*Leicestershire Banking Co, Granby Street,
Leicester, A Cathedral of Banking, 1874
Architect: Joseph Goddard [Banking, 1989]*



*County Arcade, Leeds, 1900
By famous theatre architect Frank Matcham
[Architecture of the 19th Century,
Claude Mignot, 1983]*



*Palm Court of the Hôtel Bellevue, Berne, 1913
Architect: Hoffman [Grand Hotel, 1984]*



*Loxwood Baptist Meeting House, Devon, 17C
[West Country, Michael Jenner, 1990]*



*The largely transparent Van Nelle factory, Rotterdam, 1931
Architects: J A Brinkman & L C van der Vlugt*



*Atrium of Guggenheim Museum, Bilbao, 1997
Architect Frank O Gehry*



*Perspex roof, Olympic Stadium,
Munich. Günter Behnisch
& Frei Otto, 1972*

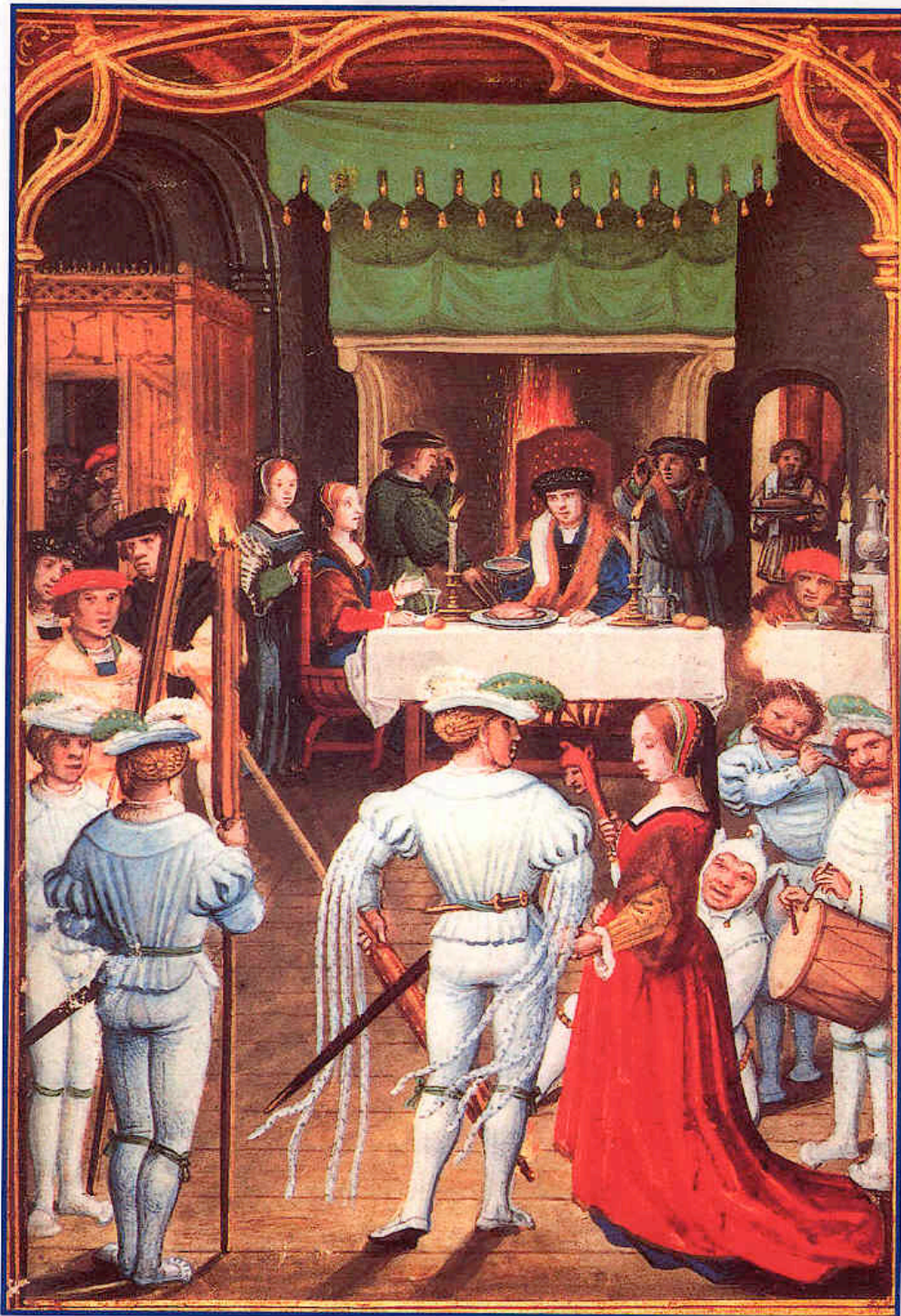


*San Fermin School, Madrid,
1985. Alberto C Baeza
[Architecture in the 20th Century,
P Gössel & G Leuthäuser]*



*Pyramide, Le Grand Louvre,
Paris. I M Pei, 1993*

*[Icons of Architecture:
The 20th Century, 1998]*



A Flemish Nobleman Entertains by Candlelight, c.1500
Princely Feasts and Festivals, Bryan Holme, 1988



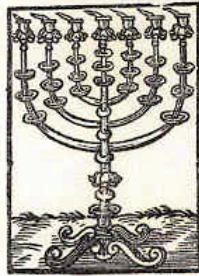
Advertisement for Clarke's Pyramid & Fairy night lights, manufactured by Price's Patent Candle Company Ltd, London, founded in 1830.

CANDLE LIGHTING

Rushlights are probably older than candles, being made by dipping the pith of the soft rush in melted fat. Candles are believed to date from the 1st century AD, being used by the Romans and in Byzantium, but the oldest picture of a candle dates from the 7th century. Tallow candles became fairly common in England about the end of the 12th century and together with "candle ends" played an important part in the domestic economy of Henry II, being part of the payment in kind made to his retinue. However, tallow candles demanded frequent attention, melted rapidly and smoked horribly. Beeswax candles were harder, cleaner and longer lasting, but more expensive, being used by the rich and in churches.

In 1663, Samuel Pepys, then Secretary to the Admiralty Board, experimented with wax candles. About this time it is believed that footlights (candles) were first used on the English stage. In 1838 Count Rumford carried out experiments on the comparative brilliancy of different lights. He found that a tallow candle initially gave a light equal to 100; 11 minutes afterwards it was but 39; in 19 minutes, 23; in 29 minutes, 16. Upon being re-snuffed (the charred part of the wick being cut away), it regained its former brilliancy of 100. From around 1840 the much improved stearine candle became available in commercial quantities. Over this period it was realised that candelabra and the use of reflectors or prismatic glass adornments could enhance illuminations levels. In fact, it was realised as long ago as the 16th century that certain tasks demanded a higher level of illumination than commonly obtained from a simple candle or candles. A spherical flask, filled with water and placed in front of the candle flame, acted as a condenser lens, producing a small area of relatively bright illumination, and was adopted, by lacemakers, cobblers and by scholars to aid reading.

THE CANDLESTICKE.



Menorah synagogue candlestick
[Geneva Bible, 1587]



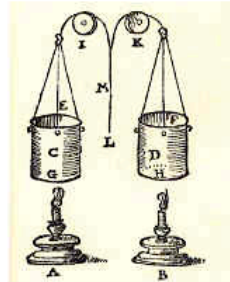
Evening party by candlelight, possibly Viennese, 1640
[The Italian Renaissance Interior, 1991]



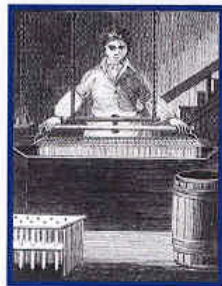
Candle & lens, a water-filled globe, 16th century



The artist in his studio, painting (detail) by R M Paye, 1783
[Eighteenth-Century Decoration, The National Trust, 1993]



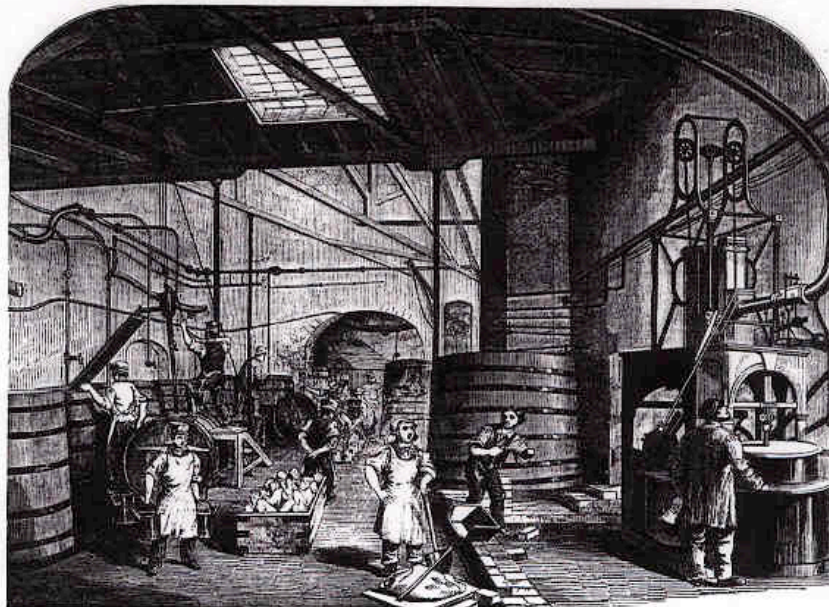
Dimming mechanism for theatre lights
[Sabbatini, Ravenna, 1638]



Tallow chandler, 1806



Lighting the footlights, early 19th century
[Theatre and Playhouse, 1984]



Price's candle manufactory. London: steam boiling and engine house, 1849



Coconut oil & stearine candle produced for Queen Victoria's wedding, 1840 [postcard]



*Palmitine Candles & Night Lights, 1882.
The scene is of Grenadier Guards during the Egyptian War [advertisement]*



*Poster for Lighting Oil for Lamps, Italian Distillery, Milan, Italy, probably c.1910
Brian Roberts Collection*



*A selection of early oil lamps, probably Dutch.
[website of de Luikerwaal]*

OIL LIGHTING

The earliest lamps are some 20,000 years old, were made of stone and employed a vegetable fibre wick floating on grease. Then came pottery or earthenware lamps and for Royalty, lamps of alabaster and gold. From ancient Greece and Rome came pottery lamps and lamps of bronze. The use of oil lamps, burning olive oil, colza (rape seed) oil and whale oil, continued into the 18th century when paraffin (kerosene) proved superior.

Improvements to the lamp itself followed, one of the most notable being the tubular wick introduced by Argand in 1782. He added a glass chimney in 1784, which permitted a higher flame temperature without smoking. Many other improvements followed, including the French Carcel lamp of 1800 that utilised a spring-driven pump to deliver oil to the burner. The paraffin lamp was relatively clean, the oil was stable and had only a slight but not unpleasant smell, the flame was of good colour and almost smokeless. The double-wick burner of Hinks gave a still brighter flame. (It was Benjamin Franklin who had pointed out that a lamp with two wick tubes provides more light than two lamps with single burners).