



Let There Be Light

By Hanne Thomsen

Gas use dates back millennia with seepages of natural gas providing the fuel for the “eternal fires” of the Zoroastrians. But the credit for starting the gas industry goes to the Scottish engineer and inventor William Murdoch (1754-1839), who developed gas lighting in 1792. Most inventors in the early days of the industrial revolution tried to use coal as motive power for steam machines. Murdoch was the first to see the potential in producing gas with the particular purpose of using it for lighting instead of the traditionally used whale oil.

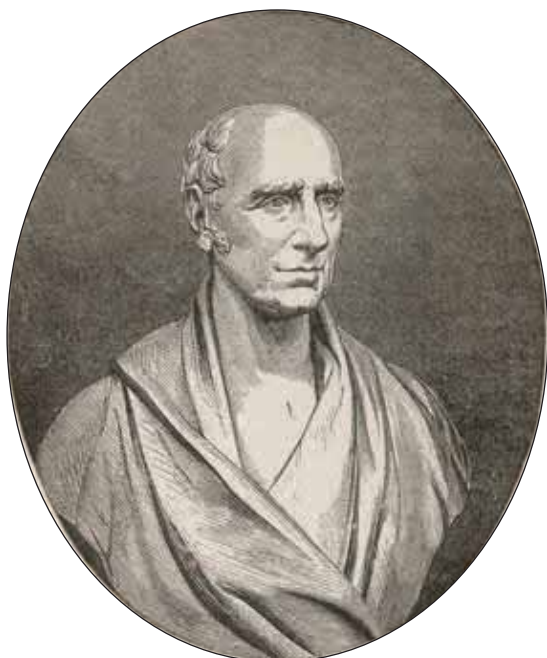
William Murdoch moved to England in 1777 to work in the innovative environment of Birmingham, where he joined the firm of Boulton & Watt which later transferred him to Cornwall.

Murdoch spent a lot of time experimenting both at his employers and at home. He worked at developing steam pumping engines, he invented a steam-powered vehicle, and he obtained patents for a process to produce coal tar dyes and for extracting paint from coal. Then in 1792 he heated coal in a closed iron retort connected with a hollow pipe. The gas which he produced from the heated coal ran from the retort through the pipe to the end where it burned with a steady flame.

Murdoch lit his home in Redruth, Cornwall with gas in 1794, supplying it from a small gasworks in his garden. It was the first practical system of gas



Philippe Lebon worked in Paris on the problems of carbonisation.



William Murdoch pioneered the modern gas industry.

lighting in the world. In a possibly apocryphal story he is also said to have astounded the locals by crossing the moors at night in a gas-lit carriage.

In 1798 Murdoch moved to Smethwick to manage Boulton & Watt's Soho Foundry, where he built a gas plant and storage facilities sufficient to provide regular lighting for several of the offices. In 1802 Murdoch installed two gas lamps outside the Soho Factory and on one occasion that year the whole plant was illuminated by gas.

It did not take long before all large factories were using gaslights. While Murdoch was interested in illuminating individual buildings, each with its own gas production, others saw the possibilities of lighting many buildings, whole streets or even towns by gas mains, fed with gas from large gasworks.

● Lebon and Winzler

It was not only in England that ideas had been developed for using gas for lighting. Philippe Lebon worked in Paris on the problems of carbonisation and by 1799 he had made sufficient progress to

obtain a patent for his work on producing fuel for heating and lighting. In 1801 Lebon demonstrated gas lighting publicly in Paris. Lebon was interested in producing gas from wood, and with this he wanted to light Paris, but he did not gain much support from his compatriots.

The results that Murdoch and Lebon had achieved were spread far and wide in Europe. In 1802 the Czech Friedrich Winzler read a French summary of a lecture given by Lebon about gas lighting in Paris. Winzler went to see Lebon and he managed to absorb sufficient knowledge of Lebon's process of producing gas; afterwards he



Natural gas provided the fuel for the "eternal fires" of the Zoroastrians.



THE DEVELOPMENT OF THE GAS METER

In the very early days of the gas industry customers paid for a specified period of use rather than the actual quantity of gas supplied. It was Samuel Clegg, Chief Engineer at the Gas Light and Coke Company in London, who invented the first efficient gas meter. Clegg's initial experiments with dry meters failed, but he was much more successful with the wet meter he patented in 1816.

When wet gas meters were introduced some of the less honest consumers soon found out that by punching a hole in the case so as to let out some of the water they could obtain a more generous supply of gas, without increasing the size of the bill. This became so widespread a practice that meter inspectors had to be employed. Another problem with the wet gas meter was that in very cold weather the water would freeze.

The first satisfactory dry meter was developed by Nathan Defries in 1840 and the prepayment meter, which helped to expand the residential market for gas to poorer sections of society, was patented by T. S. Lacey in 1870.

RIGHT
A range of meters on display in the UK's National Gas Museum.



set himself up as an authority on gas and, realising that there was no more to be gained in Paris, he left for England.

In 1803 Winzler arrived in London where he anglicised his name to Winsor. He obtained a patent for a gas lighting system and soon afterwards began to flood the capital with pamphlets advocating gas lighting. In 1807 he demonstrated the use of gas, and later on he lit parts of Pall Mall with lamps connected by lead pipes to his gas-works. The experiment was a complete success, nothing like it had ever been seen before. However, the indoor lectures were not very successful

on account of the violent headaches which afflicted the audience due to the use of unpurified gas. Moreover, there were still several difficulties with the production of gas. Despite these problems Winsor's practical work began to receive serious attention.

In 1807 Winsor announced the formation of a National Light and Heat Company, making extravagant claims and seeking a Royal Charter. This proved to be more difficult than he had imagined, and in 1809 a new application was made to Parliament for lighting only in London, Westminster and Southwark.

GAS BURNERS

Originally gas was lit directly from the open end of a pipe with no form of burner. The introduction of burners consisting of iron caps pierced with one or more holes improved the efficiency of gas lighting, but the cap corroded quickly and the luminosity varied greatly. These burners were known by the shape of the flame – made – rat-tail, cockspur, dovetail and batwing.

In 1858 William Sugg invented the steatite (soapstone) burner which would not corrode and let less heat escape from the flame. Despite this and other developments, the second half of the 19th century saw lamps burning mineral oil and early electric lighting challenging gas lighting until the invention of the gas mantle.

Gas mantles appeared on the scene in 1887 after Carl Auer, a chemist at Bunsen's laboratory in Heidelberg, discovered by accident that asbestos soaked in "rare earth" compounds gave an intense glow when heated by a gas flame.



A dovetail burner.

The early gas mantles were expensive, not very efficient and extremely fragile. The whole burner had to be sent back to the manufacturer if a new mantle was needed. However, the quality of gas mantles improved over the years and they were used in street lighting in London for the first time in 1895.

Even the revised project met with a great deal of opposition and it was not until 1812 that Winsor was successful in obtaining a Royal Charter. In 1812 he founded the first gas company in the world, the Gas Light and Coke Company and the company built the first gasworks in London. The company's Chief Engineer was Samuel Clegg, who was a former Boulton & Watt man and invented the first gas meter (see box *The Development of the Gas Meter*).

● Gas lights the world

Within a few years many other cities in the UK, the

rest of Europe and the United States had followed suit. Gas lights were lit in Paris in 1815 and in Baltimore – the first US city – in 1816. The expansion continued around the globe reaching Latin America (Buenos Aires) in 1823, Asia-Pacific (Sydney) in 1841 and Africa (Cairo) in 1863.

Hanne Thomsen is the Director of the Danish Gas Museum (www.gasmuseet.dk). Maurice Martin, Curator of the British National Gas Museum (www.gasmuseum.co.uk), kindly helped with information and pictures.



TOP
Gas lighting came to Sydney, Australia, in 1841. The picture shows a gas lamp at the corner of Dowling Street and Reid Avenue in the Woolloomooloo district in 1912.

ABOVE AND RIGHT
London was the first city to be lit by gas and still boasts gas lighting in certain heritage areas.





GAS IN THE KITCHEN

The earliest recorded use of gas for cooking was in 1802 when a Moravian chemical manufacturer Zachaus Winzler (no relation to Friedrich Winzler as far as is known) gave dinner parties at which the food was prepared on a gas cooker consisting of four burners and a small oven.

In 1826 James Sharp, Assistant Manager of the Northampton Gas Company, installed an

experimental gas cooker in his home and in 1834, under the patronage of Earl Spencer, began producing cookers commercially. Gas cooking became popular in the 1880s when rental schemes were introduced.

The development of domestic appliances continued with gas water heaters, irons, washing machines and refrigerators.



ABOVE
Enamelling and the automatic oven thermostat were introduced in the 1920s.

ABOVE RIGHT AND RIGHT
Gas irons and washing machines on display in the UK's National Gas Museum.





GAS HISTORY WEBSITE AND EXHIBITION

At this time of liberalisation and restructuring in the industry it is important to preserve the history of gas, including collections and archives, for the future. This is the aim of a project to integrate gas museums and collections worldwide into a virtual network and provide information to the general public. The website www.gashistory.org has been set up and there will be a small exhibition about the history of gas at the World Gas Conference in Amsterdam in June.



ABOVE RIGHT
www.gashistory.org

RIGHT
This gasholder house was built by the Troy Gas Light Company in New York state in 1873.



US AND NORWEGIAN MUSEUMS

In 1859 Edwin L. Drake, partly financed by Peter Wilson, drilled the oil well that launched the modern petroleum industry. (See picture in the US feature page 139, which was taken at the well in 1866. Drake is on the right and Wilson on the left).

Drake Well Museum in Titusville, Pennsylvania, USA, tells the story of the beginning of the modern oil industry with orientation videos, exhibits, operating oil field

machinery and historic buildings in a park setting (www.drakewell.org).

The Norwegian Petroleum Museum in Stavanger was opened in May 1999 and houses exhibits related to all aspects of oil and gas exploration and production (www.norskolje.museum.no). It was partly financed through IGU's fellow energy organisation, World Petroleum Congress, which donated surplus funds from the 14th WPC (Stavanger, 1994).