

# Oil Gas Manufacture and the Bristol & Clifton Oil Gas Company

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## Introduction

If we were able to transport ourselves back to a winter's evening in Bristol two hundred years ago, I think with some certainty that the first thing that would strike us (as long as the tide was in) would be how dark it was. It takes a rare event like a power cut or in an extreme case, the Blitz, to realise what this aspect of life was like in a city without electrical power. Two hundred years ago street lighting was a high profile area of public life and was close to the top of any agenda on the improvement of any city's infrastructure. Dark city streets were dangerous places to be for the more genteel residents.

Street lighting does not sound a cutting edge area of technology today, but it was in the period 1810 to 1830. The oil lamp was the only economic option until experiments with flammable gas began to be developed from curiosities into a practical solution to the universal requirement for efficient lighting.

The story of the development of gas lighting is one full of stereotypical characters; the diligent engineer; the opportunist businessman; the gullible investor. The new oil gas lighting technology brought these characters together in public meetings across the country. Wealthy citizens subscribed for shares in new companies promising good returns on invested capital by bringing light to streets and homes of British towns and cities. In 1816 the Bristol Gas Light Company had been formed and had its difficulties in early years. It was manufacturing gas from coal. By 1823, when the benefits of gas lighting were more apparent The Bristol and Clifton Oil Gas Company was launched like many, in a mood of optimism and excitement, perhaps exaggerated by the proponents of the new oil gas technology.

Oil gas was held up as the answer to all of the problems of coal gas lighting. The gas burnt so much brighter that, despite its higher cost to produce compared to coal gas, it was actually cheaper to use. The gas manufacturing works could be smaller and



**Plate 1** The original domed gas-holder of the oil-gas works on Canon's Marsh is shown here in a in detail taken from William Muller's painting of Bristol viewed from Clifton Wood, 1835. The retort house and chimney is partly hidden behind the cone of the Limekiln Lane glassworks, and in front of both are the masts of a ship berthed in Lime-kiln Dock. Bristol Museum and Art Gallery



Fig. 1 Canon's Marsh showing the oil gas works and, on the west side, Lime Kiln Dock (see BIAS Journal 33) and glass cone Donne's map of 1826

expensive as the decade progressed. It did burn brighter than coal gas, but not to the extent that was claimed. Once the coal gas producers had mastered the ability to purify their gas of sulphur and ammonia, their cheaper production saw oil gas squeezed out of existence. Oil gas lighting came and went in such a short period that it is now all but unknown; that Bristol streets were once lit using gas produced from whale oil seems unbelievable. In fact at the time, the West Country was well served by oil gas works at Bristol, Taunton and Plymouth.

**Short Technical history of Oil Gas Production**

Oil gas manufacture, as a large-scale commercial activity, was undertaken in the UK between 1821 and 1835, with most activity occurring between 1822 and 1827. The background to the erection of oil gas works around the country in the first half of the 1820s, and the fierce competition with coal gas companies, is not within the scope of this work; others have outlined these (Nabb; Nabb, 1987; Seal, 1975; Manco, 1995).

gas mains could be of smaller diameter. It burnt cleanly and did not smell or corrode the gaslight fittings as coal gas did. It was the future of gas lighting and, in the 1820s, at least 11 oil gas companies were formed in Great Britain.

The reality was of course slightly different. The gas was more expensive to produce, and became more

Oil gas was the term used to describe gas produced from any substance that could be first rendered into a free-flowing oil, such that it could be poured into a retort, where it was effectively carbonised. The sub-

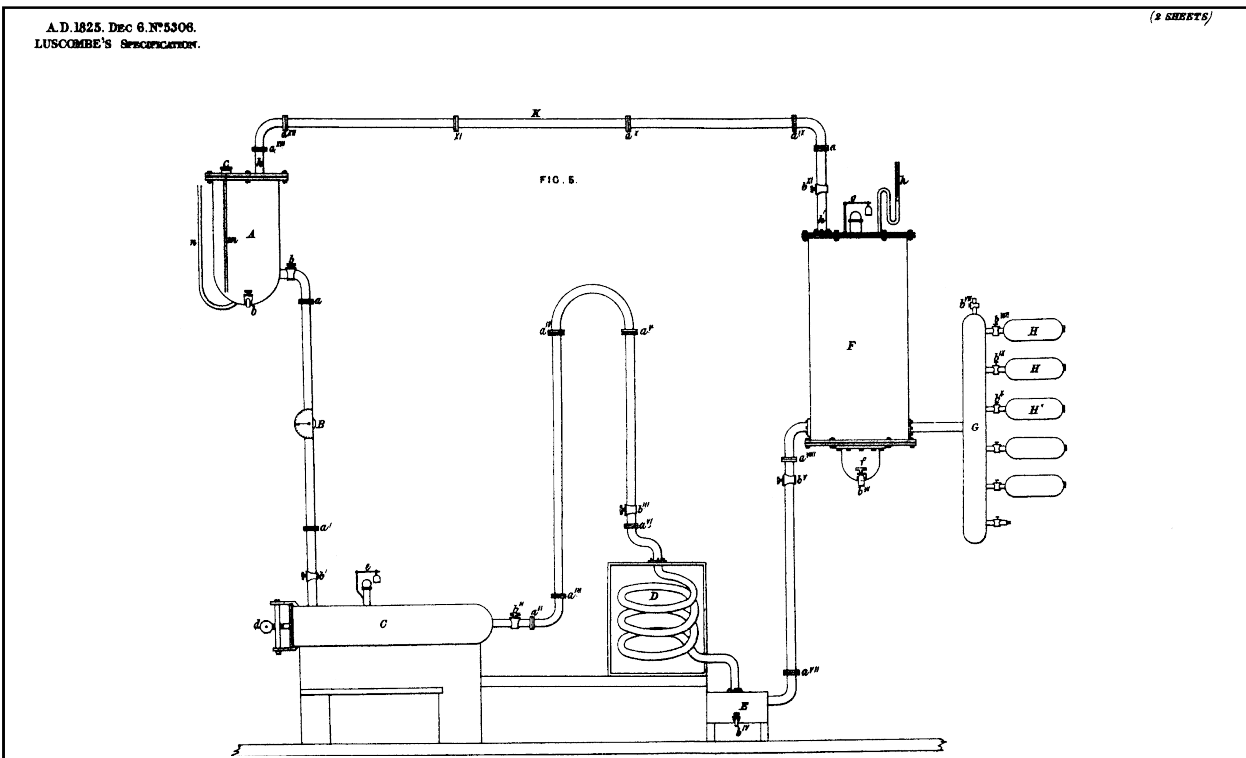


Fig. 2 Taylor's vertical retort

Patent Specification No. 4975, 15 June 1824

stances commonly used in practice were whale oil and later rosin and turpentine (extracts of pinewood).

Two entrepreneurs who to a great extent pushed forward the oil gas businesses were Philip Taylor and a Mr. Martineau. They claimed title to the oil gas manufacturing patent and appeared to tour the country wherever there was a potential to promote 'their' patent.

The patent (J. Taylor, 1815), to which P. Taylor and Martineau gained title, addressed only the use of volatile gas produced during the distillation of bones and other animal matter for the purposes of lighting. The 1815 patent equipment underwent considerable development before the commercial production of oil gas commenced. In 1824, P. Taylor registered a vertical retort design (Fig. 2) and further patents relating to oil gas (Luscombe, 1825; and Daniell, 1827) show cylindrical horizontal retorts (Figs 3 & 4). These later patents refer to the use of horizontal oil gas retorts and their settings as being well established and Daniell's patent reproduces detailed drawings of the 'usual' oil gas retort bench (Fig. 4). *A Compendium*

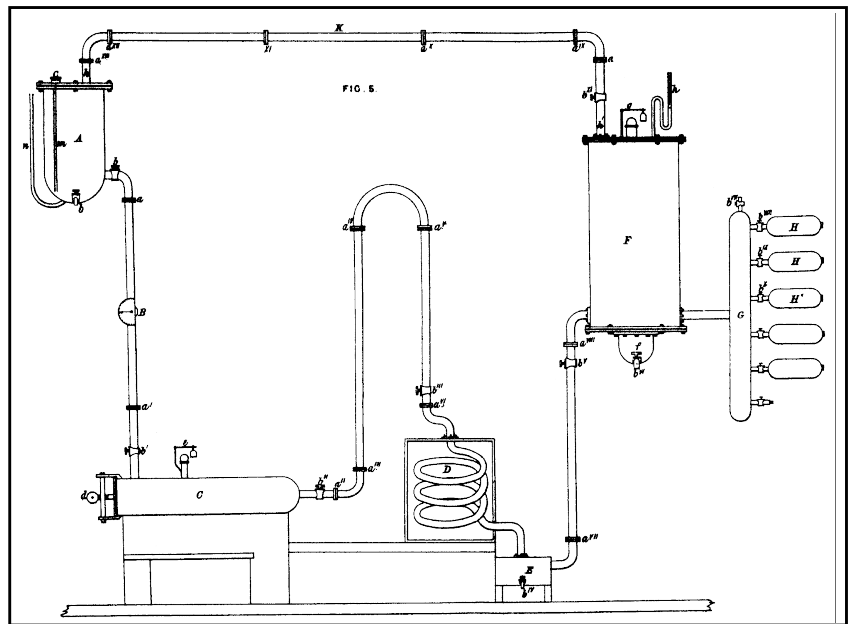


Fig. 3 Luscombe's horizontal retort

Patent Specification No. 5306, 6 Dec. 1825

*of Gas Lighting* written by William Mathew in 1827 also includes a drawing and description of apparatus for making oil gas, which also shows an horizontal cylindrical retort (Fig. 5).

The horizontal oil gas retorts and their settings show a clear similarity to the early coal gas retorts of the period and it is likely that the experience gained in coal gas retort setting was applied to oil gas retorts. The oil gas making process was distinctly different from that of coal gas. Oil gas works required less space than an equivalent coal gas works as there were

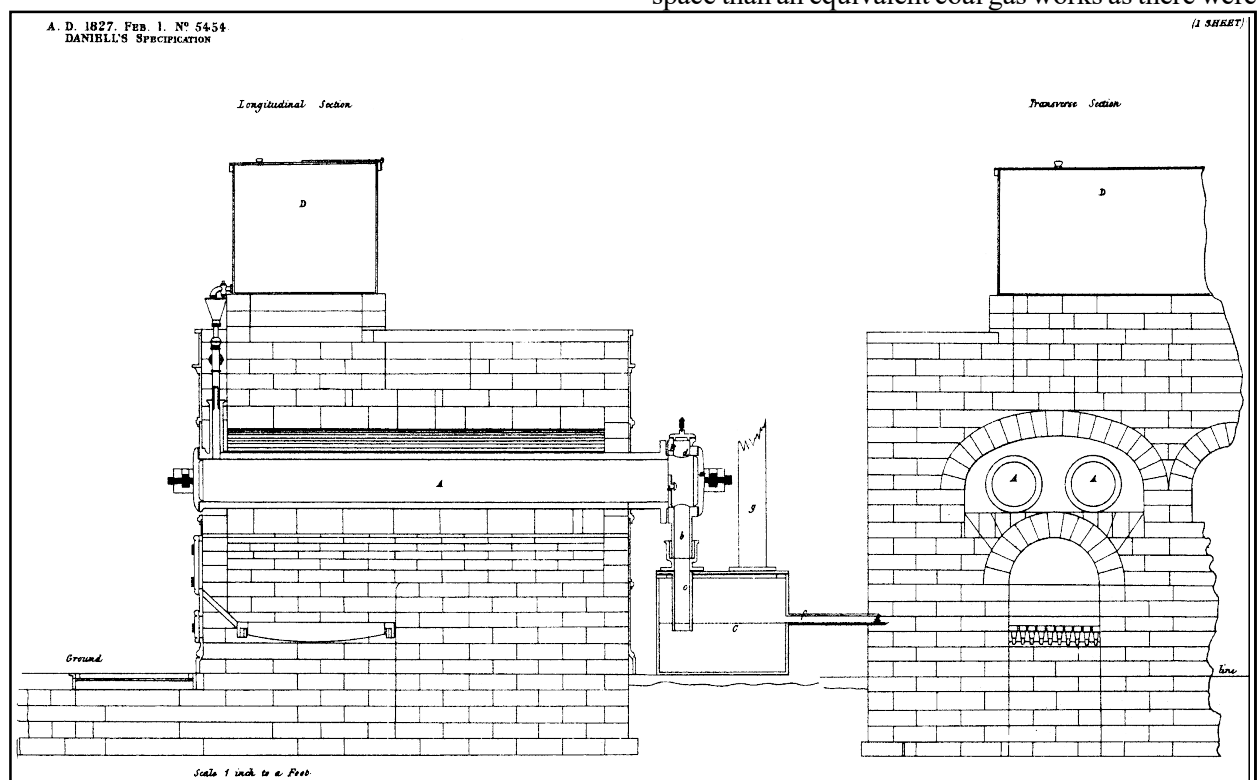


Fig. 4 Daniell's horizontal retort

Patent Specification No. 5454, 1 Feb. 1827

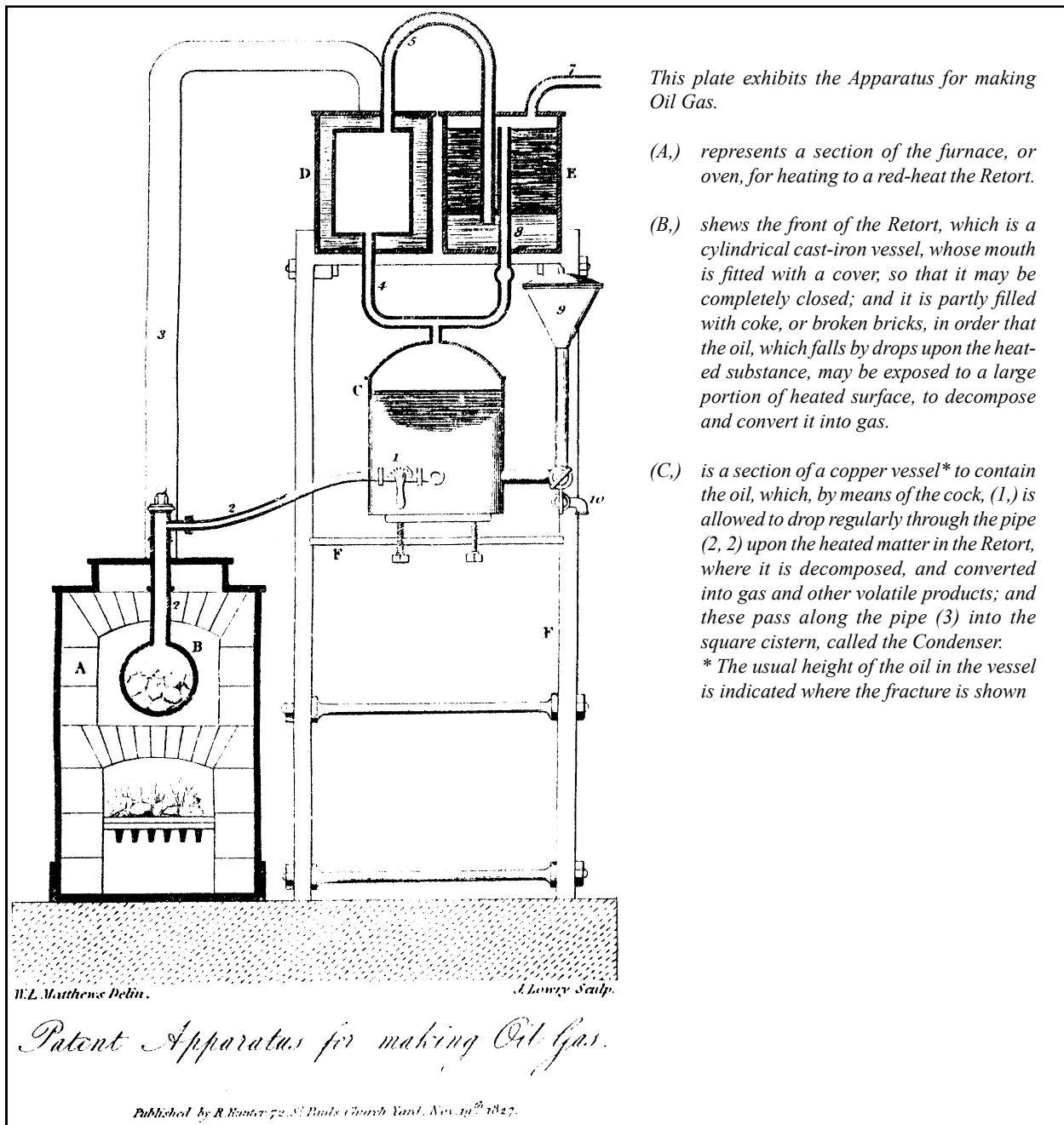


Fig. 5 Matthew's horizontal retort

Matthews, W., *A Compendium of Gas Lighting*, 1827

no by-products from oil gas works, purification of the gas was simple, and as the gas had a greater illuminating power (about 2.2 to 1 according to King, 1871), the gasholder and associated distribution equipment could be smaller.

The difficulty in operating the oil gas works came from the escalating cost of oils, particularly whale oil, which the early oil gas works used. After the whale fisheries failed in 1825, other sources of oil were sought (fish oils, palm oil etc) (Nabb 1985, TGLC), some oil gas companies initially converted to using rosin as their feed stock, but by 1835 all the large concerns had converted to coal or had been superseded by other coal gas works. From the existing records it appears that the Bristol and Clifton Oil Gas Company was one of the last to abandon oil gas manufacture.

### The Bristol and Clifton Oil Gas Works

The Bristol and Clifton Oil Gas Company works at Canon's Marsh were designed by Taylor and Martineau and constructed in 1824. It is not known what form of oil gas retorts were initially installed, but it is possible that Taylor's vertical retorts were used. The original building included a gasholder house, of which at least one other was built as part of the oil gas works in Liverpool.

The Taunton Gas Light Company minute books (TGLC) give an insight into the oil gas works in Bristol during a minuted discussion on alternative feedstocks for oil gas production. They state that the Canon's Marsh works went on to use Luscombe's

process (for liquifying rosin) and made gas in Daniell's retorts (possibly after Daniell's patent of 1827). These are shown in Figure 2 and 3. This may explain how the Bristol and Clifton Oil Gas Company managed to survive until 1835 before converting to coal gas manufacture.

With reference to the Figures 1, 2, 3, and 4, it can be seen that the apparatus was normally mounted above ground level. The description of Daniell's process mentions the location of a below ground tank into which the 'foul main' could drain any condensing oil. This oil was not a waste product, but was recycled back into the primary oil reservoir or used to help in dissolving further rosin during the oil preparation stage. A below ground tank is therefore possible and the mention, in the Bristol and Clifton Gas Company minute books (BCGC) of the 1840's, of an old wrought iron tank below the retort house floor, may be a survival of the earlier oil gas process. From the surviving plan of the oil gas works (Dean and Chapter, 1825?) it appears that there are steps leading up to the retort house from ground level. There are three steps visible, which may mean that the retort house floor level was 0.5 to 0.6 metres above ground level. This wrought iron tank was removed in the 1840's (BCGC) and it is likely that the void was filled in. The gasholder was enclosed entirely within its own purpose built gasholder house with a relatively elaborate domed roof.

### Oil Gas Retort House Layout

Based on the known design of the apparatus used at Canon's Marsh in the year 1829, and the plan showing the layout of the works in 1836 (BGAP), a conjectural reconstruction of the oil gas works can be attempted. The space available allows for a maximum of five settings, each of two Daniell pattern retorts, making ten in total. Space for five Luscombe pattern oil preparation retort vessels exists adjacent to the south wall of the retort house. This arrangement would have allowed the flue gases from the Daniell oil gas retorts to heat the Luscombe retorts (which operated at a much lower temperature than the oil gas retorts) before they passed up the chimney located in the south west corner of the retort house. Between this equipment lies the condensed oil holding tank, below the level of the retort house floor, which itself was probably raised 0.6m above ground level. A plan

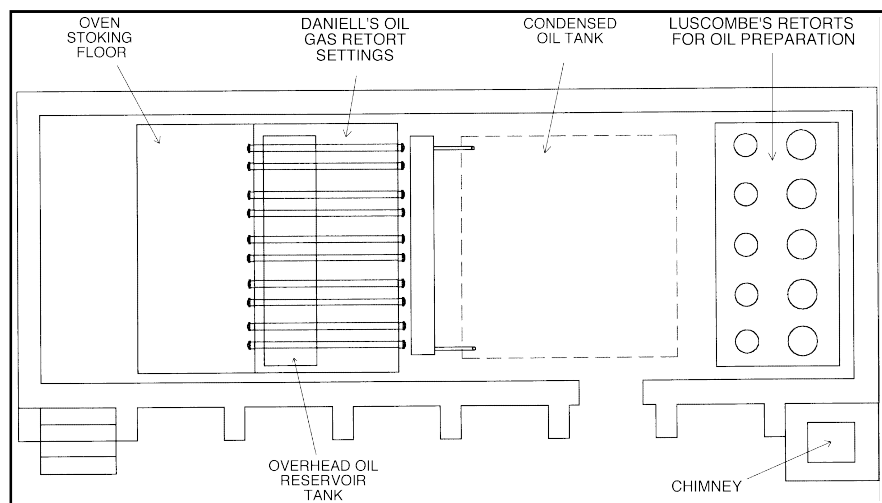


Fig. 6 Reconstruction of the Oil Gas Retort House Layout at The Bristol and Clifton Oil Gas Company Works at the present day Canon's Marsh

of the reconstructed oil gas retort house is presented in Figure 5.

### Oil Gas Works Elsewhere in the United Kingdom and Ireland

An attempt was made to trace some of the former oil gas works sites in the UK and discover the condition of them today (RemedX 1998).

Nabb (Nabb) indicates other oil gas works at the following places; Hull; Norwich; Colchester; Dublin; Liverpool; Plymouth; Taunton; Cambridge; Northampton; and Edinburgh; to which we added Preston (Harris 1956).

The present day site conditions were investigated in 1998 at Taunton, Plymouth and Liverpool, and enquiries made as to the site at Hull. In these four cases the original oil gas works buildings no longer survive above ground level, although some walls survive in Taunton.

### Taunton Oil Gas Works

The Taunton Gas Light Company was formed in 1822 and adopted oil gas to light the town. Taylor and Martineau supplied the oil gas equipment and the works were located in what is now South Street. We have a delightful view of the works portrayed on a company share certificate from 1825 (Figure 6).

A brief inspection of the site revealed that some of the original boundary walls of the works might survive. These walls still delineate part of the site occupied until 1833 by the oil gas works. The site was sold shortly after this date when coal gas had commenced production. Half of the site is now occupied by the Eagle Public House and the other half lies beneath a recently constructed housing estate access road. As the works were not developed beyond the 1830s it

is likely that any foundations/footings and gasholder tanks from the oil gas period survive. The level of the ground over the earliest half of the works site does appear to have been raised above surrounding ground level, which may further indicate possible survival of subsurface features.

In addition Taunton Gas Light Company records are remarkably intact and are held at the Somerset Records Office, Taunton. The Board minute books all survive for the oil gas period.

### **Plymouth Oil Gas Works**

The Plymouth Oil Gas Company was formed in 1822 and an oil works was erected in Exeter Street, near Sutton Pool in the parish of Charles, Plymouth.

The site of the oil gas works in Exeter Street is now at least partly beneath the Exeter Street dual carriageway. The immediate area bears little resemblance to its appearance in the 1820s. Only one or two buildings in the area pre-date the 1940s, as a result of German bombing during the Second World War and later town planning. The boundaries of the site are also no longer evident within the current development.

Depending upon the method of demolition, it is possible that below ground structures survive at the Plymouth oil gas works site. The site of the oil gas works was sold when gas production ceased in the late 1820s and was thus probably saved from extensive below ground disturbance in late years.

### **Liverpool Oil Gas Works**

The Liverpool Oil Gas Company was formed in 1823 and constructed a works in Rose Hill. A plan of the works survives (LRO 1). The gas making equipment was supplied and installed by Taylor and Martineau and they also undertook to lay the gas mains. The works continued in operation until 1834 and were

sold in 1836 (Harris 1956). The site was occupied by the Rose Hill Police Station in 1948 but it is not known if the original buildings were retained. (There is no reason why they should not have been if they survived German bombing during the Second World War). The site was redeveloped during the last five years as domestic housing. The site boundaries are still preserved in the current development, although no trace of the original structures or boundary walls are present.

The chances of below ground structures surviving at the site are good. The documentary records of the gas companies in Liverpool are possibly held in the Liverpool Records Office, but they are not catalogued and as such unavailable.

### **Hull Oil Gas Works**

The Kingston-upon-Hull Gas Light company was formed in 1821 and adopted oil gas to light Hull. The oil gas works operated until 1828 when it was sold to the Kingston-upon-Hull Corporation which levelled the site and built a new Guildhall upon it. The Guildhall still stands and thus any survival of the oil gas works has been sealed beneath it since the late 1820s.

### **Dublin**

It is believed that the oil gas works in Dublin were located on Sir John Rogerson's Quay on the southern bank of the Liffey within Dublin Docklands. The oil gas site is believed to have become part of a major coal gas manufacturing works which was left derelict up to 2000. This site is now believed to be currently under development. It is not known if there was any archaeological assessment of the site prior to this development.

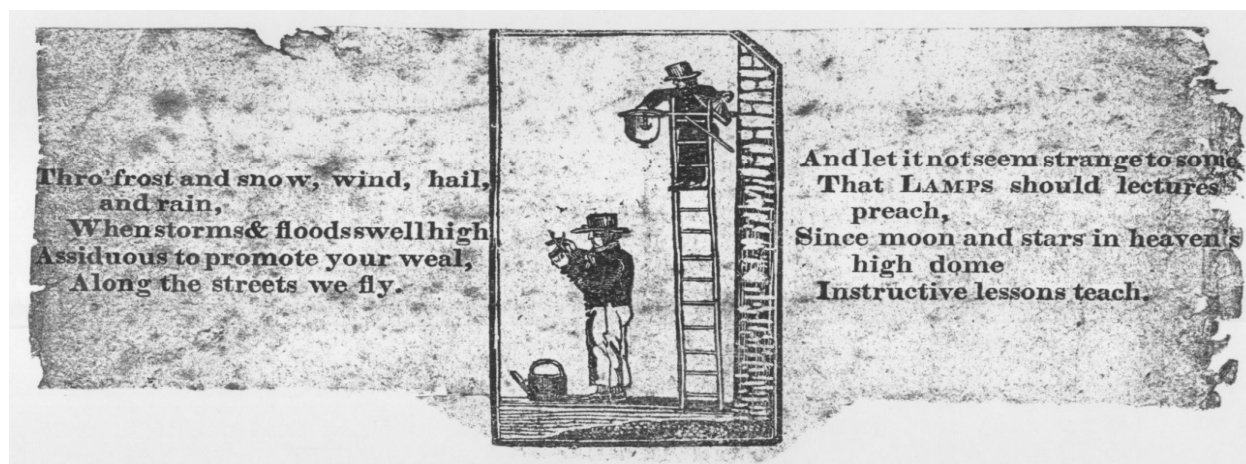


Plate 2 Taken from a broadsheet entitled 'The Oil and Gas Lamplighters Address - to the Inhabitants of Liverpool', December 1822 in anticipation of Christmas 'donations' to the Gas Lighter, Owen Moses.



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Plate 3 Lithograph after W.J. Muller's painting '*Bristol from Clifton Wood*'