

BRISTOL BRANCH OF THE
HISTORICAL ASSOCIATION
THE UNIVERSITY, BRISTOL

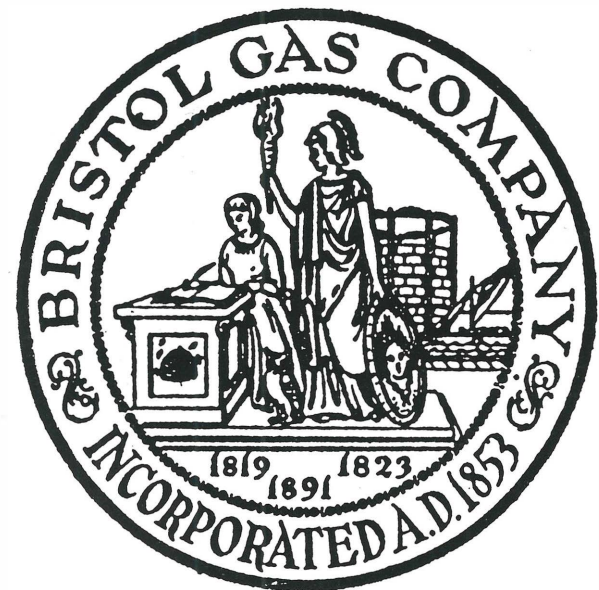
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THE BRISTOL GAS INDUSTRY

1815-1949

HAROLD NABB



BRISTOL BRANCH OF THE HISTORICAL ASSOCIATION

LOCAL HISTORY PAMPHLETS

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The Bristol Gas Industry 1815 - 1949 is the sixty-seventh pamphlet to be published by the Bristol Branch of the Historical Association. Its author, Dr. H. Nabb, is a Senior Manager with British Gas plc South Western. Trained as an economic statistician, he was employed initially in the Chief Accountant's department of the then South Western Gas Board, and subsequently, held various posts in secretarial, corporate planning and sales. His interest in the history of the gas industry was encouraged by the Regional Chairman, Mr. A. I. D. Frith, to such effect that it led to the granting of a Ph.D. degree by the University of Bath and the Sugg Heritage Award of the Institution of Gas Engineers. Dr. Nabb wishes to acknowledge the generous assistance he has received from past and present members of the Industry and from the staff of the Bristol Reference Library, the Bristol Record Office and the University of Bristol.

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The next pamphlet in the series will be by the Rev. Peter Cobb dealing with the Oxford Movement in nineteenth century Bristol.

The Pamphlet Appeal Fund, which is designed to put the series on a sound financial basis, is still open, and readers are invited to contribute. Donations should be sent to Peter Harris, 74 Bell Barn Road, Stoke Bishop, Bristol BS9 2DG. Cheques should be made payable to the Bristol Branch of the Historical Association.

A list of pamphlets still in print is given on the inside back cover. Copies can be obtained from most Bristol booksellers, from the Porter's Lodge in the Wills Memorial Building, or direct from Peter Harris.

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The illustration on the cover is of the seal used after 1891 by the British Gas Company. Minerva, the Goddess of Wisdom (with the Owl, the Gorgon Shield, and Helmet) holds aloft a lighted Torch, whilst Industry with the "Busy Bees", notes down the Treasures which the Light of Science has revealed. A Gasholder and Coal-Vessel appear in the background. The dates within the border point out the Years in which the dissolved Companies had their origin.

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THE BRISTOL GAS INDUSTRY 1815-1949

Although the first Gas Company in Bristol was not formed until 1815, some attempts had been made to interest Bristolians in the use of gas for lighting before that date. John Champion, the Quaker copper smelter of Bristol, had written to Matthew Boulton on 15 June 1790 saying:-

I have from an inflammable matter in Pitt Coal made a light fitt for Light Houses . . . It appears to make a much better, more steady, and much cheaper (light) than the Oyl Lights now used, and by the Calculation I made it will be two thirds cheaper or more.¹

but, Boulton was not interested.

The manufactured gas industry, however, was started by William Murdoch (1754-1839) the resident agent in Cornwall for Matthew Boulton and James Watt. He produced gas from coal and used it to light his house and office at Redruth in 1792. After news of a demonstration of gas lighting by Phillippe Lebon in Paris, Murdoch lit the Soho works of Boulton and Watt.

A German, Frederick Albert Winsor, was so impressed by the Paris display that he came to London to try to popularize the idea. His assistant Edward Heard was eventually dismissed and came to Bristol where he tried to interest local people, but without success. London, however, took the lead and in 1812 the London and Westminster Chartered Gas Light and Coke Company was established — the first gaslighting company in the world. The success of this venture was in doubt for a time due to a lack of technical expertise until this was remedied by the appointment of Samuel Clegg,² a former assistant of Murdoch, as chief engineer.

1. Letter from John Champion to Matthew Boulton, 15 June 1790, Assay Office Collection, Birmingham Reference Library. Arthur Raistrick, *Quakers in Science and Industry* (1950) p. 196 claims Champion tried also to interest Trinity House in the use of gas in light-houses.
2. Samuel Clegg (1781-1861) was born in Manchester and apprenticed in 1798 to Boulton and Watt of Birmingham. He left this firm in 1805 to become an engineering contractor for private gasworks. Most of his early installations were in factories and mills around Manchester but in 1812 he lit the house, shops and workrooms of Rudolph Ackerman, publisher and bookseller, the Strand, London. A number of important patents to do with gas were taken out by Clegg.

COALS and CANDLES SAVED.

PROFIT! INFORMATION! AMUSEMENT!

— *Ex fumo dare lucem.* — **HOR.**

PHILOSOPHICAL LIGHTS!

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A New and Valuable Discovery adapted for Illuminating all Theatres, Public Gardens, Churches, Public Offices, Streets, Dwelling-houses, Shops, &c. &c. and of the first importance in all Manufactories, where Heat and Lig't are required.

The Proprietor of the Philosophical Lights, anxious to accommodate all classes, begs leave to inform the Public, that he has lowered the price of admission to One Shilling, and as the exhibition will finally close in the course of a fortnight, it is earnestly recommended to those who may be desirous of gratifying their curiosity at a trifling expence, to avail themselves of the present opportunity, to witness their astonishing effects, and ascertain the reality of those advantages it is calculated to insure.

The fullest information given at the Exhibition, which is open at the last House on the right hand side, in Taylors'-court, Broad-street, every Evening from Six to Nine o'Clock.

***.* Admittance, ONE SHILLING.**

One of Edward Heard's Advertisements 1805 — These appeared in the *Bristol Mirror* between 9 February and 9 March. As the entrance fee was reduced progressively, the exhibition would not seem to have been successful. *Avon County Reference Library, Bristol.*

In Bristol the real pioneer of gas lighting was John Breillat (1770/1-1856), a silk dyer and calender (cloth finisher), who had been born in London. At some time he appears to have made the acquaintance of Murdoch. The *Bristol Gazette* in 1811 published the following notice:-

Lecture and Exhibition of the Gas Lights

J Breillat respectfully informs the Nobility, Gentry and Public, that he intends for a short time to exhibit, every evening at his own house, a Specimen of the above interesting discovery, accompanied with a Descriptive Lecture, **THIS PRESENT THURSDAY**, September 5, at Seven o'clock in the evening — For particulars see hand bills — No. 56 Broadmead.

After having lighted his shop, Breillat set up a few lamps in the street, and Bristol consequently was among the pioneers of the use of gas for lighting thoroughfares.

John Latimer in his *Annals of Bristol in the 19th Century* wrote:-

It seems strange that the Bristolians who witnessed Breillat's success should have been so reluctant to abandon their flickering malodorous tallow candles; but for some time the Broadmead Dyer passed amongst the vulgar as a man having unholy dealings with an infernal power, while the upper classes treated the innovation with contemptuous indifference.³

Early gas burners were small apertures at the ends of pipes from which the gas issued, being lit to provide clear and steady flame. Improvements meant that a better and cheaper system of illumination could be provided than by alternatives, such as rushes, candles and oil lamps. Progress in Bristol was very slow. On 30 November 1814, one G. Cumberland wrote to the press in favour of a plan for adopting gas lights. He proposed an experiment "to light either Brunswick, Berkeley, or St James' Square — where there are no statues to hinder the operation — from a free-stone laboratory." The following week, Breillat had a reply published in the *Bristol Gazette*. Arguing that an experiment to light a single square was unnecessary, he proposed an Apparatus sufficiently large to light the principal streets in the centre of the city. He considered "this might be done by the Commissioners under the Act for Cleansing, Lighting and Paving the City. From the same apparatus such shopkeepers as chuse (sic), might be supplied with a superior light at less rate per annum than they now sustain, and yet afford a source of profit which would greatly lessen, if not entirely cover the expenses of the Street lamps."

3. J. Latimer, *Annals of Bristol in the Nineteenth Century* (Bristol 1887) p.42.

A meeting was held in the Commercial Rooms on 15 December 1815 for those wishing to subscribe to a plan "for lighting the streets, shops other buildings of the City of Bristol with gas." It resolved that a Bristol Gas Light Company be formed with a capital of £5,000 in £20 shares. The Company's general affairs were to be conducted by a Committee of twelve, of whom five would constitute a quorum. The viability of the enterprise was doubtful, partly as a consequence of legislation arising out of the South Sea Bubble affair a hundred years earlier. "Unincorporated companies had no legal existence; they could not sue or be sued, and they were hardly able even to enforce contracts or recover debts."⁴ Moreover, the Bristol Gas Light Company did not have compulsory powers to open up the highway and could only function by specific permission of the paving authorities. Many of these aspects were considered at the first meeting of the controlling committee held at the White Hart Inn, Broad Street, on 19 December 1815.⁵ Members agreed to send a deputation to the Mayor of Bristol to secure his support. Also, a letter was drafted to the Commissioners for Paving, Pitching, Cleansing and Lighting, requesting permission to take up the pitching in the streets, in order to lay pipes.

The deputation to the Mayor was successful in that he personally decided to subscribe to the scheme and to recommend the gas-lighting of public buildings. By 5 January 1816 some 34 shareholders had paid £1 deposit on 46 shares. Consequently, the syndicate wrote to Samuel Clegg in London who was prepared to discuss matters further once the number and lay-out of the lights had been determined. In his letter of reply, Clegg cautioned against "ignorant pretenders", noting that "it is easy to make gas, but to make it in such a way that it shall answer a company service is a different thing." Breillat procured £5 worth of fancy burners for display in the most conspicuous part of his shop and 200 prospectuses were printed. It was agreed that the company should advertise in the local newspapers with a view of attracting additional shareholders and also to inform potential customers.

Breillat was sent to London to confer with Clegg and meet John Gostling of Long Acre, Strand, a "gas Contractor". Gostling provided estimates for machinery and apparatus and Clegg compiled a set of drawings on which the work could be based.

Early in March 1816 the Commissioners of Paving stated the terms on which the company would be allowed to proceed. Written notice had to be given to the Commissioners for proposed work, holes were to be filled in within 24 hours and guarded whilst open, pitching to be replaced

satisfactorily and maintained for three months and pipes to be made of metal. Further, it was required that public lamps would be lit and maintained by the gas company at a price to be agreed before the commencement of operations and that if the supply were interrupted, alternative means of lighting would be provided at the Company's expense. Failure to meet these conditions would be penalized.

A general meeting of the Company was called on 27 March 1816, largely to boost subscriptions. At that time little more than half the shares had been issued, many of which were still not fully paid up. Estimates of the cost of works were about £3,500. Further advertising was approved and by 6 April 1816 a total of £3,600 had been subscribed. The committee agreed to divide the outstanding £1,400 amongst themselves. However, two months later a special general meeting created an additional £2,000 of capital. This arose because the choice of Temple Backs as works site increased the costs, since it was six hundred yards further from the city centre than the alternatives which had been considered at Lewin's Mead and Counterslip. The plot of leasehold land bounded by the Floating Harbour was bought in June 1816 for £700, but it caused other problems as well as additional expense. The Bristol Court of Aldermen "considered it their bounden duty to withhold permission for the erection of a Gasholder because it would endanger the City Powder Magazine at Temple Harritz nearby". Clegg's advice had been sought earlier on this matter and he had not been very encouraging, pointing out that an explosion in the gunpowder store could blow up the gas works. However, the Temple Church Vestry, whose area of jurisdiction included the gunpowder store, had a survey conducted which revealed the building to be "insecure". As a result they prepared a memorial to the Government requesting the removal of the store. This was fortunate as the Paving Commissioners had already granted permission to the Company to lay mains.

Meanwhile, John Breillat had been appointed superintendent to the Company at a salary of £150 per annum plus accommodation (when it was built). By the end of 1816 a sum of £2,876 had been spent on the works. Mains had been laid in Water Lane, Temple Street, Bath Street, Bath Parade, Bristol Bridge, High Street, Broad Street, Wine Street, Corn Street and Clare Street. Early in March 1817 the retort house was inspected, the first employee (George Hill)⁶ engaged, and on 15 March

4. A. Redford, *The Economic History of England (1760-1860)*, (1947) p. 167.

5. Now part of the Grand Hotel complex.

6. George Hill b.1793 lit the first fire and charged the first retort in May 1817. The post of honour was given to him to carry the banner at the head of the company's procession in June 1838, in memory of the Queen's coronation, and again in 1848, at the Free Port procession. He was still in the company's employment in 1867.

the gas holder tank was water tested. It was found to leak and had to be puddled down to the foundation. In May 1817 a few shops were lighted up and in July public lighting began in High Street. Even so, it was not until December that all the principal streets were provided with gas lamps. In that same month Lewin's Mead Chapel – the first public building in Bristol in which the new illuminant found favour – was opened for evening services.

The number of customers grew rapidly to such an extent that in October 1817 the lamps went out because of lack of gas. By 31 December 1817 there were 142 customers paying at the rate of £1,800 per annum, while one month later the total had risen to 200 producing an annual income of £2,500. At the second Annual General Meeting in January 1818 Dr Kentish⁷ indicated they could not supply more customers until extra capacity had been provided at the works. Accordingly, it was proposed that the capital be increased to £20,000. Also, a member of the Committee of Management gave notice that at the next General Meeting he would move the following resolution:-

That in the opinion of this meeting the affairs of this Society are now become of so much importance that it is proper and requisite they should be placed under the protection of an Act of Parliament.

This was duly approved and by October the outlines of a Bill had been drafted by the Company Secretary. Clauses relating to the laying of mains and erection of lamp-standards conflicted with the interests of the Paving Commissioners. Both parties sent deputations to London to watch the progress of the Bill which received the Royal Assent on 23 March 1819. The preamble included the names of 164 subscribers. The purposes of the company were defined as the production of Inflammable Air or Gas for lighting the City of Bristol and the adjacent parishes of Clifton, Westbury-on-Trym, St Paul, SS. Philip and Jacob, and Bedminster, and for producing Coke, Oil, Tar, Pitch, Asphaltum, Ammoniacal Licquor and Essential Oil from Coal and from other materials. Power was given to the Company, subject to the consent of the Commissioners for Paving or Trustees for the Roads, or owners of private property, to open pavements, roads etc., for laying pipes to the Public Lamps and to private buildings. The Company was required, if called upon so to do, to contract with the Commissioners for Public Lighting for a term of 21 years from 29 September 1819, at the rate of £5 per

lamp per annum. The capital of the Company was limited to £50,000 in shares of £20 each. Dividends were restricted to 10% per annum and after provision of a Reserve Fund of £10,000, any surplus, on the average of the three previous years, was payable to the Commissioners for Paving etc., in aid of the Rates. Power was granted for the purchase of land not exceeding in the whole five acres, but the erection of Gas Works or Gasholders was prohibited within certain parts of the City without the consent of the Justices of the Peace at General Quarter Sessions.

In fixing the terms for private consumers, the undertaking first followed the practices of the London companies by taking account of the size of burner and expected hours of usage. Eventually the price was fixed at 15/- per thousand cubic feet. All customers were to take gas for the period of one year minimum and pay each half year in advance. Customers who contracted for gas in the intervening periods were to pay agreed proportions of the annual rate e.g. those connected between 25 March and 24 June would pay 1/8th of the annual price of each burner. The minimum rental was 40/- per annum. Meters were not used generally since although the "dry" gas meter had been invented by Samuel Clegg in 1815 it did not come into general use for many years. Consequently, in order to prevent gas being used during hours not covered by the contract, the Bristol Company employed inspectors to prowl the streets throughout the hours of darkness. To assist the work of these inspectors it was the practice in the early days to fit burners only in the front rooms of houses. If a householder was discovered using gas half an hour after his stipulated time, he had to pay the rate appropriate to the following hour. The other common infringement with which the Company had to contend was that of enlarging the holes in the burners and for this offence the penalty was to cut off the supply.

The Company experienced considerable difficulty in dealings with Gostling and finally discharged him despite having to settle a claim for compensation. Hugh McIntosh, again from London, was brought in to do mainlaying. He had worked with Clegg at the Gas Light and Coke Company having for a short period sole charge of mainlaying until that company appointed one of their own men as supervisor. Samuel Clegg's services also were dispensed with by the Bristol Gas Light Company about the same time.⁸

The driving force behind the enterprise in its early years would seem to have been Dr Edward Kentish, who habitually took the Chair at

7. Edward Kentish was a surgeon at St. Peter's Hospital who lived at 27 Park Street, Bristol.

8. A contributory factor was the failure of Clegg's patent rotary retort which jeopardized the gas making capacity of the works.

meetings. At a General Meeting of Proprietors on 21 April 1819 it was "Resolved unanimously that the cordial thanks of this Company be given to Dr Kentish not only for his able conduct in the chair this evening but for his undefatigable zeal and unwaivered exertions in forwarding and establishing the Bristol Gas Light Company and that a Piece of Plate of the value of Fifty Guineas be presented to him with an appropriate inscription."

An alternative process to making gas from oil began to be canvassed extensively by its patentees, Taylor and Martineau of London. On 22 January 1821 a Mr T. H. Parker of Bow Common, Limehouse, had tried unsuccessfully to induce the Bristol company to use oil instead of coal. In September of the next year, following complaints about the offensive odour of coal gas and its poor illuminating power, attempts were made to promote an Oil Gas Company in Bristol.

A controversy soon began to rage in the Bristol press between the proposers of the new scheme and supporters of the existing coal gas company. The former stressed the "brilliancy, comfort, inoffensiveness and economy" of oil gas, and their prospectus maintained that one cubic foot of coal gas had the same illuminating power as four cubic feet of coal gas. This proposition was denied by the Bristol Gas Light Company which stated that as a result of experiments made by their Engineer "ONE FOOT OF OIL GAS IS EQUAL TO TWO OF COAL GAS, AND NO MORE."⁹

Other claims made in favour of oil gas related to better coke being produced without unprofitable by-products, the avoidance of tarnished fittings and the reduction in heat given off by the gas. The greater illuminating power would require a smaller works and a reduced amount of capital. However, one writer noted that the price of oil had increased from £19 10s 0d a ton in 1820 to £22 a ton in 1822 and wondered if an oil gas company could prosper in a city surrounded by coal fields where the price of coal was one-third of that in London.

A counter-blast stated that the oil-gas advocates had not based their economies on low prices of Whale Oil, but on a fair average. Moreover, one of the largest oil gas works did not use Greenland Oil, but "very inferior and cheap Fish Oils obtained on our own shores". Vegetable Oils were alleged to have been used with perfect success and "it is well known that an unlimited supply of Cocoa Nut and Palm Oil may be obtained from our own Colonies at a moderate price".

Another correspondent "Q",¹⁰ argued that coal gas was good for

9. *Bristol Gas Light Company*, Coal Gas No. 2, 30 October 1822.

10. This nom-de-plume would seem to have concealed the identity of the Clerk to the coal gas company.

health because "Sulphur and Tar are highly beneficial to persons labouring under diseases of the Chest and Lungs, the introduction of Coal Gas must be of essential service to such".

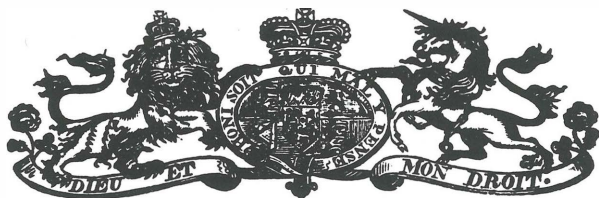
The Clerk to the Gas Light Company thought it desirable to inform his fellow-citizens that under their Act "they possess full powers for lighting with Oil Gas, and the question was seriously considered by them previous to adopting Coal Gas, but the expenses of the one very far exceeded the other".¹¹ Despite such reassurance, a "BOTHERED COAL-GAS PROPRIETOR" thought it fit to address an appeal to the Committee of the Coal Gas Company on the subject of "this monstrous evil" oil gas which was spreading all over the kingdom. If "it is not speedily put a stop to, it will involve so much capital as must in the end bring on a national bankruptcy".¹² A challenge was made to the Bristol Coal Gas Company to run a service to the works of J. and H. C. Price in Clare Street — where an oil gas plant had been installed — so that comparative experiments could be made by Scientific Gentlemen to determine the contested point of illuminating power. The Coal Gas Company put forward a number of propositions of its own regarding the experiments. Also, they opposed the choice of Samuel Crossley as one of the "Scientific Gentlemen" since as a gas meter manufacturer he was an "interested party". In January 1823, however, a series of experiments were made by William Herapath¹³ and Samuel Rootsey which proved that one cubic foot of oil gas equalled to 2.24 cubic feet of coal gas.

A public meeting was held at the Taylors' Hall in Broad Street in February 1823 under the chairmanship of C. A. Elton for "Subscribers and others desirous of establishing an Oil Gas Company." After hearing contributions from Mr Taylor, one of the patentees of the oil gas process, and Dr Wilkinson of Bath, the formation of an Oil Gas Company was proposed. A Bill was submitted to Parliament where the Coal Gas Company mobilized opposition. As the trend of the day was against monopolies and in favour of competition, the matter was referred to arbitration by a Commons Committee. An arrangement was made whereby opposition would be withdrawn subject to the new Company

11. *Bristol Gas Light Company*, 10 October 1822.

12. Letter dated 6 December 1822 in *Felix Farley's Bristol Journal* of the following date. Hull, Norwich, Colchester, Dublin, Liverpool, Plymouth, Taunton, Cambridge, Northampton and many parts of London were cited as being supplied with oil gas. The next issue of the paper included another letter querying the bona fides of "A Bothered Coal-Gas Proprietor".

13. William Herapath (1796-1868) analytical chemist born in Bristol. He was one of the founders of the Chemical Society of London and of the Bristol Medical School (*Dictionary of National Biography*).



ANNO QUARTO

GEORGIIV. REGIS.

Cap. cii.

An Act for lighting with Oil Gas the City of *Bristol*, and the Parish of *Clifton* in the County of *Gloucester*, and certain Parishes adjacent thereto.
[17th June 1823.]

WHEREAS the City of *Bristol*, and the Parishes adjacent thereto, that is to say, the Parishes of *Clifton*, *Saint James*, *Westbury-upon-Trym*, *Saint Paul*, and *Saint Philip and Jacob*, in the County of *Gloucester*, and the Parish of *Bedminster* in the County of *Somerset*, are large and populous, and the said Parish of *Clifton* is wholly without, and considerable Parts of the said other Parishes are either wholly without, or have insufficient public Lamps or Lights in the Streets, Highways, and other public Passages and Places therein, and it would be of great public Advantage to the Citizens and Inhabitants thereof respectively, if the same were better lighted, and of great Advantage to the Inhabitants of the said City and Parishes adjacent, if they had the Means of obtaining Gas made from other Materials than Coal, for lighting their Houses and Shops: And whereas Inflammable Air or Gas may be procured from Oil and other Materials besides Coal, and the same Air or Gas, being conveyed by means of Pipes and Tubes, may be beneficially applied and used in lighting the said Streets, Highways, public Passages, and Places, and also Churches, Chapels, Shops, Warehouses, Manufactories, Buildings, Private Houses, and Places, in the said City and Parishes: And whereas the several Persons herein-after named, together with other Persons, are

[Local.] 26 U willing

Bristol and Clifton Oil Gas Company — Act of Incorporation.

bearing a proportion of the annual loss sustained by the Coal Gas Company in lighting the public lamps. One newspaper noted that a “still further arrangement is said to be contemplated in a union of the two Companies, which united Company would then manufacture Gas from both substances and service the Citizens with either. In this case the City would be benefited, and those who have adventured their money for the public good, receive, as they deserve, a reasonable profit”.

The Bristol and Clifton Oil Gas Company’s Act received the Royal Assent on 17 June 1823. Under the terms of the Act the Bristol and Clifton Company was forbidden to use coal for making gas and was to pay a penalty of £5 per day whenever coal was carbonized. Coke, however, could be burned as long as it was restricted to being used in the retorts to assist in the gasification of oil. Powers to open the streets were also granted, subject to notification being given to the Bristol Gas Light Company. Moreover, all pipes and mains laid by the new undertaking had to be marked with a groove on the upper surface for purpose of identification and to be at the greatest practicable distance — not less than 3’ 6” if possible — from any other water or gas pipe. Also, if the Bristol and Clifton Company contracted to supply public lamps, the gas provided had to be of such quality as would provide a cheaper and better light than that obtainable from oil lamps. The capital was limited in the first instance to £30,000 in shares of £25. Dividends were to be restricted to 10% per annum. After the creation of a reserve fund of £7,500, any excess profits, on the average of the three previous years, were payable to the City Commissioners in aid of rates.

Following the passing of the Act, the oil gas company erected works at Limekiln Lane, Canons’ Marsh, adjoining the Glasshouse. Pipelaying began in the late spring of 1824, the distribution system extending up Park Street into Clifton and via College Green and the Stone Bridge into the City Centre. In the summer of 1824, the Clifton Paving Commissioners had advertised for tenders for gas lighting and that of the oil gas company was accepted. Public lighting commenced in Clifton in December 1824. The price of oil gas was 40/- per thousand cubic feet. By February 1825 the Bristol Gas Light Company had lost 70 consumers and £500 to £600 annual rent, but soon it was noted that others intending to change companies were having second thoughts. Reference was made to the “extraordinary means” used by the Clifton undertaking to obtain customers, although the only specific complaints concerned the failure of the new company to notify in advance its intentions to open pavements and its reluctance to use mains with a distinguishing mark.

The Clifton Company paid a dividend of 4% by January 1827 but times were hard for oil gas producers. There were problems with the availability and cost of whale and seal oil together with considerable

variations in the quality of the gas produced. The Edinburgh Oil Gas Company sought parliamentary approval to use coal, while the Liverpool Oil Gas Company experimented with palm, linseed, herring, pilchard, cod and coconut oils.

The Gas Light Company had begun to make plans for expansion before the appearance of the rival oil gas undertaking. One result of the public lighting contract negotiated in 1819 had been to make the management realize that the capacity at Temple Back would be inadequate for the demand. After inspecting various sites, it was decided to construct a new works at Avon Street, in an area which already had been industrialized. The site was bought for £2,100 and the foundation stone of the new station laid on 6 March 1821. The order of the ceremony was:

Band of Musick consisting of the Workmen
in their working dress
The Engineer and Clerk of the Works
The Architect bearing a memorial plate
The Master Mason
The Committee of Management two and two
accompanied by several of the Proprietors
and the Contractors.

Having reached the ground, which they perambulated, the company then repaired to the spot appointed for the Foundation. Coins deposited comprised two Half Crowns of George IV (1820); a Bristol shilling and sixpenny token issued by Messrs Garratt & Co; a tenpenny piece and a copper twopenny piece. The Chairman, Mr D. Ward, "performed the ceremony amidst the acclamation of the assembly; after an address and four times four (cheers) the band led off with "God Save the King", the company returning to the "Duke of Marlborough" where the whole partook of a cold collation and drank with enthusiasm "Success to the Bristol Gas Light Institution".

To finance the necessary expenditure, an Act was obtained in 1821 authorizing the issue of a further £50,000 capital in shares of £20 each. By May 1821 it was possible to take on the summer load at Avon Street, and by July it was decided to close completely Temple Backs, the freehold and leasehold of this site being sold off at various times between 1821 and 1826 at a loss of £3,466 10s 6d. Before the summer of 1822 nine miles of pipe had been laid. For houses situated beyond the mains, gas was compressed into small iron cylinders, 18 inches long by 6 inches diameter, and delivered for use on special occasions. One year later, in 1823, there were 30 miles of main and 1050 lamps in use. In spite of the appearance of the Bristol and Clifton Oil Gas Company, the coal gas company decided to extend its mains into Totterdown (1825) and

AEROSTATION.

MR. GRAHAM'S



TENTH ASCENT.

Mr. GRAHAM, the Aeronaut, who first ascended with his Balloon from the Premises of Mr. Snewin, Berwick-Street, Oxford-Street, London, and descended on the Estate of Lord Darnley, near Rochester, has the honour of announcing to the Nobility, Gentry, and Inhabitants of Bristol; Clifton, and the Vicinity, that he intends to ascend with his MAGNIFICENT

BALLOON,

Far exceeding in Splendour any Aerostatic Machine ever witnessed in this or any other Kingdom,

FROM THE

GAS-WORKS, ST. PHILIP'S,

On THURSDAY, July 29, 1824, at Four o'clock precisely.

In the construction of this Splendid Balloon and its necessary Appendages, neither labour nor expense has been spared to render it complete; and it is constructed on a particular principle for Philosophical and Experimental Purposes, never before attempted by any other Person. Mr. G. flatters himself that he does not exaggerate, when he announces the whole to be perfectly unequalled in the annals of Science.

The dimensions of this costly Machine is 37 feet in diameter; its capacity, 29,522 cubic feet; it is formed of gores of Silk only 18 inches wide, and upwards of 60 feet long, in alternate colours of Crimson and White, manufactured in a peculiar way, solely for this purpose, and of which material upwards of 1077 yards have been consumed; and the Hemispheres are connected by a **SUPERB CAR**, covered and lined with Crimson Silk Velvet, bearing on one side the Arms of England, on the reverse those of the City of London, surrounded by Gold Rays and supported by Doves, with the Olive-Branch on each side, encircled also with Rays of Gold. At the bottom is represented *Eolus* calming the fury of the Winds, with his numerous Attendants. At either end are the figures Fame and Victory, in carved work, richly gilt and burnished, the whole entwined by the Rose, the Shamrock, and Thistle, and decorated with weighty gold fringe and tassels.—Over the Car, supported by gilt Pillars, is a grand Canopy, round which are represented the Zodiacal Signs, hung with a beautiful festooned Drapery of rich Crimson Satin, edged likewise with gold fringe and tassels.

Mr. G. has the pleasure of stating that arrangements have been entered into with the Bristol Gas-Company for a plentiful supply of Gas, so as to insure the Ascent taking place as nearly as possible to the time lived upon; and, in order to afford every possible view of the interesting Process of Inflation, a Stage will be erected, from which the Inflation will be performed, and so prevent risk and personal Inconvenience; a circumstance which, he trusts, will remove any doubt from the minds of those disposed to honour the Exhibition with their presence and support.

DURING THE INFLATION, THE CELEBRATED

French Hercules,

Mons. CLYNE, Balance-Master, from Paris,

Will go through his wonderful and astonishing Feats of **AGILITY, BALANCING, and STRENGTH**; wherein he will balance a Ladder, Thirteen Feet high, on his Chin, with a Boy on the Top; also a Pyramid of Thirteen Glasses filled with Wine, all illuminated, and Ten Feet high, with which he will lie down and rise again, beat a Drum to the Tune then playing, &c. &c.

ADMISSION to the Inflation, Ascent, and Hercules, THREE SHILLINGS.

Mr. G. begs leave to state, that he has manufactured the present Balloon of Silk, but at the same time claims permission to contradict the Misrepresentations of some Persons, who have affirmed that Lawn would not answer the purpose of Aerostation. To such Persons, the best answer he can make is to refer them to his previous *Mis Ascents*—particularly the Eighth and Ninth, from Sydney-Gardens, Bath, the sole management of which resting entirely with himself, was without failure.

In the course of the Season, Mr. G. hopes to afford a convincing proof that there is a real utility in Aerostatic Machines.

The **BALLOON** will, previous to the day of Ascent, be **EXHIBITED in the ASSEMBLY-ROOM, PRINCE'S STREET.** Admittance, One Shilling each Person.

Tickets may be had of Mr. Moscrop, Bookseller, opposite the Commercial Room; of Mr. Vickrey, Brush-Maker, Wine-Street, opposite the entrance to the Printing Office; of Mr. Burrows, Bookseller, Broad-Street; at the Bar of the Bush Tavern; and of Mr. Graham, at Mr. Murrow's Spirit-Warehouse, next the Irish Packet-Office, Quay.

Printed at "The Bristol Observer" Office, by John Evans.

Balloon Ascent 1824. Avon County Reference Library, Bristol.

Stapleton Road (1829). Half-yearly dividends had been declared in August 1821 at the rate of 10% per annum and in February 1822 at 8½% per annum. This dropped gradually to 6¼% in 1824, after which time there was a recovery until the 10% maximum was regained in 1831.

Ebenezer Breillat had joined the Bristol undertaking in 1817 and was receiving £75 per annum as assistant engineer to his father by 1819. However, the closure of Temple Backs and the possible need for economies in the face of competition led to Ebenezer's dismissal in 1824 when he secured a post at Manchester. Moreover, Emanuel Wait, who had succeeded J. C. Harris as Clerk in 1823, had a salary which was made to vary with the rate of dividend – £200 per annum when 6% was paid, £300 per annum for 10%. The men also had reduced wages at this period since overtime was cut down.

Generally gas workers were regarded as unskilled labour. As Professor Hobsbawm points out, "Coal was brought to the works in carts or barges, and moved from wharf or yard to the retort house in wheel-barrow or small trucks. Carbonisation itself – the work of making and stoking fires, filling the retorts with coal and spreading it and drawing the coke – was still essentially unmechanised."¹⁴ The hand shovel persisted in the smallest works as a means of charging the retorts, but elsewhere scoops became fashionable, being operated by teams of three men.¹⁵ These were slightly shorter than the retorts and were loaded with coal evenly throughout their length. On being inserted in the retorts they were inverted so that the coal could be deposited more effectively than with hand shovelling. In relatively large works, like that at Avon Street, Bristol, some division of labour took place at an early date. Retort men were occupied in charging the retorts with coal, and after the gas had been driven off, removing the coke which remained. Firemen ensured the retorts were adequately and equally heated which required constant attention. Porters were engaged in wheeling the coal to the retorts and there were maintenance and odd job men. Teams of stokers and firemen, as at Bristol, would work 12 hour shifts (eighteen hours at the weekend changeover) due to the continuous nature of the production process. The Bath Gas Company, however, favoured eight-hour shifts. The Clifton company alternated its men between firemen's and retort men's duties.

Apart from a first instalment paid in June 1825, the oil gas company was unable to reimburse the coal gas company £600 per annum attri-

butable to loss on public lighting. This was due to further increases in the cost of whale oil. In 1832 deputations from both companies met to consider the matter and inconclusive discussions continued for three years. At the end of 1835 the Clifton Commissioners gave notice of their intention to discontinue the public lighting contract with the oil gas company. The only way in which the Bristol and Clifton company could continue to operate was to abandon oil gasification and to go over to making coal gas. Discussions again were held with the Bristol Gas Light Company which waived its objections to the proposals, provided the amount of gas to be supplied in its area of operations was limited to 5.5 million cubic feet per annum. (This figure actually was higher than that supplied by the oil gas company before 1836). The matter of the £600 per annum was to be deferred for later consideration.

As a result of this agreement, the Bristol and Clifton Oil Gas Company successfully petitioned Parliament for a repeal of the restrictions on producing coal gas. During the summer of 1836 the changeover was completed and the price of gas reduced substantially – to 12/- per thousand cubic feet – although with a marked diminution in illuminating power. The coal gas company brought its own charges into line in December 1836 with a further reduction to 9/- in June 1838. During that same year 1838 the Gas Light Company made an unsuccessful attempt to obtain the compensation due to it. The oil gas company was pressed also to meter the gas going into Gaslight territory as required by the 1836 agreement. In 1841 the coal gas undertaking made another attempt to obtain payment of the outstanding debt. Advice obtained from Sir W. W. Tollett indicated that the liability still remained. Although Bristol and Clifton proposed a settlement of £3,000, this represented only one-third of the money due, and not surprisingly it was rejected. The Bristol Company then announced it would accept £7,000 in settlement which was later reduced to £6,000. Payments of £2,000 on 1 January 1841, 1842 and 1843 were obtained – the latter two instalments including interest at 5% – which were invested in Exchequer Bills.

George Barlow wrote to the Bristol Gas Light Company from London on 16 November 1836 emphasizing the advantages of gas cooking. He argued that the use of his apparatus would increase the revenue from gas sales. It was agreed to order a cooker and a gas stove. Evidence of increasing usage of gas other than for lighting was provided by a notice in the papers in October 1842 that gas was available at all times, not just during the hours of darkness.

In the late 1830s and early 1840s, the rival companies began to

14. E. J. Hobsbawm, *Labouring Men: Studies in the History of Labour* (London 1964) pp. 159-160.

15. A description of the operation of the scoop can be found in S. Clegg, Jun., *A Practical Treatise on the Manufacture and Distribution of Coal Gas* (4th edition 1866) pp. 106-107.

Bristol Gas Light Company.

At the ANNUAL GENERAL MEETING OF PROPRIETORS held at the COMPANY'S
STATION, Avon-Street, St. Philip's, on THURSDAY, the 14th day of February,
1833, at Twelve o'Clock at Noon,

HUMPHREY JEFFREYS, Esq., in the Chair,

The Committee presented the following Report which was read by the Clerk—

In presenting the following Statement of the Company's Accounts, the Committee have the pleasure of communicating to the Proprietors that, in the course of the last Six Months, they have entered into a Contract with the Commissioners of the United Parishes of St. James and St. Paul, to light that District with Gas, and have already laid two miles of Main Pipes towards carrying the same into effect; affording thereby an additional opportunity of ascertaining that the more the advantages of Gas are known, the more they will be sought, not only in the great convenience of private Lights, but in the more extended view of public lamps.

The following Statement of the Profit and Loss Account for the Year ending 31st December, 1832, was then read.

Dr.		PROFIT AND LOSS.	Cr.	
1832.	£ s. d.	1832.	£ s. d.	
Dec. 31, To Dividends, per order of } General Meetings, in Febru- ary and August last	8500 0 0	Dec. 31, By Balance 31st Dec. 1831,	4422 2 5	
To Coal	2030 0 10	By Gas Light Rents	10548 11 0	
To Salaries, Wages, &c. ..	2364 8 0	By Paving Commissioners ..	3907 17 7	
To Gas Factory Repairs....	1216 15 6	By Rents of Freehold Premises	105 0 0	
To lighting, &c. public lamps	866 15 6	By Coke	826 4 9	
To Incidental Expenses, includ- ing Printing, Advertising, &c. &c.	321 17 11	By Tar	556 12 2	
To Taxes	185 14 10	By Ammoniacal Liquor	148 15 0	
To Doubtful Debts	250 0 0	By Dividends on Gas Shares	75 0 0	
To Balance (Profit)	4354 10 4			
	£ 20590 2 11	Examined and found correct, SAMUEL NEWELL, } SILAS DIBSDALL, } AUDITORS.		
		February 13, 1833.	£ 20590 2 11	

The above Profit will enable the Proprietors to divide One Pound per Share, for the Half-Year ending 31st December, 1832.

Bristol Gas Light Company — Profit and Loss Account 1832. *British Gas plc, South Western Archives.*

change their marketing policies by instituting discounts for large consumers. The first agreement made by the Bristol undertaking was with the Great Western Cotton Works which by 1841 consumed 1.4 million cubic feet per annum. In 1839 an offer to supply the Company at 7/- per 1000 cubic feet for consumption over 1 million cubic feet per annum was bettered by the Clifton offer of 7/- per 1000 cubic feet in excess of 600,000 cubic feet plus a 5% cash discount. (A main was laid across the Floating Harbour). This led to the two concerns agreeing to operate a common scale of discounts. Nevertheless, the Clifton company continued to achieve success by acquiring amongst other loads those of the Victoria Rooms, the Steam Navigation Company, and, above all, the Great Western Railway Company station at Temple Meads. The terms offered in 1840 were similar to those for the Steamship Company, but in 1843 the discount was increased from 5% to 15%. A Preliminary Inquiry undertaken in 1847 revealed that the annual demand by the Great Western Railway Station of 3.6 million cubic feet per annum accounted for 11% of the total gas sold by the Clifton company.¹⁶ There would appear to have been problems in satisfactorily meeting such a large load some distance from the supplying works and one writer in *The Journal of Gas Lighting* referred to his great difficulty in deciphering a leading article of the *Times* within a space of from 10 to 12 feet of a burner on the station platform, which consumed 7 or 8 cubic feet of gas per hour.¹⁷

In 1847 the Bristol and Clifton Oil Gas Company changed its name by Act of Parliament to the Bristol and Clifton Gaslight Company. The provisions of the Companies Clauses Consolidation Act 1845 and the Gasworks Clauses Act 1847¹⁸ were included in the legislation. Power was obtained to increase the authorised capital to £80,000 and to borrow on mortgage or bond a sum not to exceed £26,600. The following year, 1848, another Act (11 Vict. c.13) repealed the restriction which had required the Bristol and Clifton company to notify Bristol Gaslight of its intentions to open ground. The latter originally objected to the new proposals but withdrew its opposition. Henceforth the two companies were able to compete on equal terms.

Street lighting by gas was slow in being extended away from the central areas. A municipal committee had been formed in 1836 to con-

16. Local Acts — Preliminary Inquiries 9 and 10 Vict. c. 106. Report to the Commissioners of Her Majesty's Woods, Forests, Land Revenues, Works and Buildings on the Bristol and Clifton Oil Gas Bill. Office of Woods etc. 27 February 1847.

17. *The Journal of Gas Lighting*, 11 April 1853, p. 95.

18. Gasworks Clauses Act 1847 codified the rights and obligations of gas undertakings and regulated dividends and prices.

sider illuminating the out-parishes, but nothing happened. Then, in 1846, it was resolved "on the motion of John Lunell, a Liberal in the vanguard of public health reform", that the entire City be lit with gas, though a suggestion for municipally-manufactured gas was rejected.¹⁹

A Public Health Inspector's report in 1850 criticised the street lighting in Bristol, stressing an insufficient number of lamps, irregular distances between them, deficient pressure and high prices. These remarks stung the Bristol company into sending a memorial to the General Board of Health about the undue prominence attached by the Inspector to the opinions of one Charles Thomas Hill. Allegedly this individual was inexperienced in gas lighting or gas making, an officer in the Navy on half pay, dissatisfied with that Service and at one time under medical treatment for some disease not far short of lunacy. The views of Samuel Clegg who had inspected both the Bristol and Clifton works in 1847, finding them to be well conducted and embracing all modern improvements, were ignored. Nevertheless, in August of the following year, the City Council, acting as the Local Board of Health, decided to appoint a Sanitary Committee which sought tenders for lighting Westbury, Bedminster, St James and St Paul, St Philips and St Jacob. As by this time the Bristol and Clifton companies had achieved agreement on prices, meter policy and debtors, it was to be expected that the two Companies would confer upon the need to extend their mains networks. It was agreed that the Clifton company would tender to supply Westbury and the Bristol undertaking contract for the others, at a common price of £4 4s 0d per lamp.

The Clifton company alone had to lay 5 miles of additional main and erect a new gasholder. Meetings between the deputations from each company in time came to consider the benefits which might result from outright amalgamation, notably a reduction in operating costs. Since the Bristol Gaslight Company would soon be faced with promoting a Bill to raise more capital if the jurisdiction of the Local Board of Health continued to extend, it was decided to draw up two bills. The first of these would be for amalgamation, the second to increase the capital and enlarge the powers of the Bristol company. Alfred King of Liverpool and Charles Burt Robinson of Leicester were appointed Referees to value the two undertakings.

Bristol Corporation objected to the proposed amalgamation. It asked that the price should be lowered to 4/- per thousand cubic feet, thereby reducing the cost of public lighting, for a definition of the quality of light and a scale of penalties for supplying inferior gas. The Act of 8 July

1853 incorporated the Bristol United Gaslight Company. The maximum price of gas was fixed at 4/6d and a minimum lighting power of 10 candles was prescribed.²⁰ Its area of supply was defined as the City and County of Bristol and the Electoral District within 7 miles from the Boundary and any parish part only of which was in the Electoral District. It was not obligatory to supply any of the parishes or districts beyond the then existing boundaries of the City. Under the Act, power was given for the issue of general capital stock (subject to a maximum dividend of 10 percent) amounting to £346,250. Of this amount £125,000 was allocated to shareholders of the Bristol Gas Light Company and £54,800 to the Clifton company. The number of Directors was fixed at 15, but the power was given to reduce the total to not less than 9. Bristol Gas Light provided 10 members of the new Board with George Thomas assuming the Chair.²¹

Instructions were given in October 1853 for the main in Castle Street and Old Market Street from Canons' Marsh works to be taken up and the services connected to the main from Avon Street. Subsequently, the removal of duplicate mains in other streets was carried out when opportune. At this time, 75% of the daily winter output of gas was delivered between 4 p.m. and 10 p.m. To ease the distribution problems Alfred King recommended that an independent (trunk) main be laid between the two works and also that a gasholder be erected to improve the supply in Kingsdown and Cotham. Grosvenor House was acquired in Maudlin Street and a telescopic holder of 300 thousand cubic feet capacity erected and brought into action in December 1857. Later, district holders were built at Barton Hill (1 million cubic feet capacity completed in 1874), a second holder of 5½ millions (opened in 1894), Bedminster (1897) Warmley (1896) and Horfield (1899).

The chief offices of the United company were transferred from Avon Street to 6, Bridge Parade, Bristol Bridge in September 1854. Three

19. *Bristol and its Municipal Government 1820-1851*, edit. Graham Bush, Bristol Record Society, vol. XXIX, p.177.

20. No standards were established for gas supplied to consumers in the formative years of the industry. Eventually, the illuminating power of gas came to be expressed in terms of standard spermaceti candles containing about three per cent wax with a rate of consumption fixed at 120 grains per hour. Calculation of candle power was based on photometric techniques devised by Count Rumford.

21. George Thomas (1791-1869), the well-known philanthropist, was the fifth son of John Thomas, Quaker, a grocer who founded the wholesale house of Thomas and Sons in Bristol. George was relieved of business responsibilities by other members of his family so that he could devote himself to public activities with the Chamber of Commerce, the Bristol General Hospital and Sidcot School. He became a Director of the Bristol Water Works Company and was Chairman when he died. Three other members of the Bristol Gas Light Company elected to the Board of the United undertaking also belonged to the Religious Society of Friends.

years later these premises were vacated and the administration moved to Canons' Marsh.

No steps were taken at this time to secure uniformity of wage rates at the two works. At Canons' Marsh in 1855, wages averaged just under £1 for a full week, stokers earning 3/3½d or 3/- a day, wheelers and coke men 2/6d and repair men from 3/- to 5/-. In July 1857 the labourers' rate at Avon Street was increased from 2/- to 2/6d per day, with adjustments for other workers. Requests by the workers for a further rise and reduced hours in 1860 were refused and the beer allowance at Canons' Marsh was discontinued because there was nothing comparable at Avon Street.

Some of the dissatisfaction with gas undertakings at this period was fermented by "gas reformers" such as George Flintoff. At an early stage in his career he was a publisher, and in 1850 a scholastic agent before promoting a consumers' gas company in Sheffield and then becoming Secretary to a gas company in Liverpool. In 1856 during the progress through Parliament of a Gas Bill promoted by the Bath Company, he was involved in an abortive attempt to establish a rival consumers' Gas Company in that city. On 23 June that same year he was announced to lecture at the Broadmead Rooms, Bristol, "on the science of gas lighting, with a view of showing to the public of Bristol how they were imposed upon by inferior gas and fraudulent meters".²² Flintoff alleged that gas could be supplied in Bristol for 2/8½d per 1000 cubic feet and in Bath for 3/6d, compared with the actual prices of 4/- and 4/6d respectively. He based his conclusions in part on being able to obtain 9000 cubic feet of gas from a ton of coal against 7,500 achieved on average in Bristol. In answering a questioner he inferred that an air pump used by the Bristol Company could affect the registration of meters. On the following evening he "demonstrated" how additional water in a wet gas meter could lead to an apparent excess of gas being consumed. This lecture was brought to an end by some interesting experiments with gas-cooking apparatus. At the conclusion a Mr Brice of St Philip's, Bristol, referred to attempts being made to alter the situation by forming a new company.

After further ventures into the field of consumerism in Dublin, Glasgow and Cardiff, Flintoff re-appeared in Bristol to promote a gas consumers association. He intended to hold a series of lectures to provide free information, stressing the great services he had rendered already to gas consumers in 200 towns in England, Scotland and Ireland. He advocated free trade in gas, speaking favourably of the low price in Plymouth which was far from any coal field. Gas managers, he contended,

22. *Journal of Gas Lighting, Water Supply and Sanitary Improvement*, 8 July 1856 p.413.

were ignorant of the manufacturing process though a child could understand it after attending one of his (Flintoff's) lectures.²³ At a public meeting on 5 March 1863 it was suggested that the consumers' association would be prepared to consider an alternative to going ahead with a new company. This required the Bristol Directors to reduce the price of gas to 3/- per 1000 cubic feet, refer disputes to the Council's inspector of meters or the Board of Health and assent to suggestions on meter inspection. These were not accepted. Eventually the efforts to establish a competing company failed, especially after the United company lowered the price of gas from 3/9d to 3/6d per 1000 cubic feet from 1 January 1864. Flintoff closed his office in Bristol.²⁴

Disputes about the public lighting contract continued for some years. The suggestion was made in 1860 that the law officers to the Council should take the earliest opportunity of making the 120th Section of The Towns Improvement Clauses Act, 1847, applicable to Bristol. By this means the Local Board of Health could have the price paid for gas settled by arbitration where agreement could not be reached between the Local Board of Health and the Gas Company. Especial concern was expressed in August 1860 regarding the treatment meted out to the Council's gas inspector, Benjamin Kitt. Following an earlier resolution that the inspector should at all times and seasons as he may think proper, test any public lamp, experiments had begun at Christmas Street and the bottom of Park Row. During the operations the inspector was taken into custody by the Police and dragged through the streets as a Common Felon, notwithstanding that he had shown the authority for his action.²⁵

It may not be entirely coincidental that the lighting contract which had come up for renewal was agreed at a somewhat lower price per annum. By 1869 relations with the Board of Health had become more amicable. At the half-yearly meeting on 18 March 1869 the Chairman of the Gas Company, W. Naish, stated that the renewal of the public lighting contract had been achieved at a slightly reduced rate. They had done so "without any collision" with the Board "and in perfect understanding and unanimity with one another".²⁶ On the other hand some of the private consumers had become more critical of the gas company's operations. In 1864 an application for a reduction in the price of gas at Kingswood was declined. Consequently a Committee of the inhabitants proposed to erect a gas works and were prepared to consider purchasing

23. *Ibid*, 10 March 1863, pp. 120-121.

24. *Ibid*, 6 December 1863, p.735.

25. *Ibid*, 28 August 1860, p. 584 and p. 588. Information about Kitt's intention to test the public lamps had not been received by the gas company in time for all their lamplighters to be informed. The company had power to prosecute anybody found tampering with the public lamps and the practice was to give such a person into the custody of the police.

26. *Ibid*, 30 March 1869, p. 234.

Shares or Stock

OF THE

BRISTOL UNITED GAS LIGHT COMPANY.

TO BE SOLD BY AUCTION.

BY

MR. H. R. FARGUS,

*In Pursuance and under the Provisions of "The Bristol United
Gas Light Company's Act, 1853,"*

On THURSDAY, Nov. 21, 1861,

At One for Two o'Clock precisely, at the

COMMERCIAL ROOMS,

In the CITY of BRISTOL,

500 SHARES,

Of Twenty Pounds each, of and in the said Company,
issued by them under the authority of the 22nd Section of
the above Act.

The SHARES will be Sold in Lots of Five each,
and will be converted as early as possible into the General
Stock of the Company.

For CONDITIONS OF SALE and any further Particulars, apply to the AUCTIONEER,
Clare Street, Bristol; to the SECRETARY of the Company, Canon's Marsh, Bristol; to
LIONEL OLIVER BIGG, Esq., Solicitor, Stephen Street, Bristol; and to Messrs. M.
BRITTAN & SONS, Solicitors, Albion Chambers, Bristol.

Notice of Sale of Shares, *British Gas plc South Western Archives.*

the company's mains from St George's Church to Warmley. It was decided not to negotiate the sale of the pipes. Later, after interviewing a deputation, the price of gas at Kingswood was reduced from 4/9d to 4/2d per 1000 cubic feet from 25 March 1865.²⁷

A communication was considered in 1867 proposing the formation of the Kingswood and Hanham Gas Light Company to supply gas at not more than 4/- per 1000 cubic feet with an illuminating power of not less than 12 candles. Again it was suggested that the Company's mains in the district should be taken over: evidently the inhabitants considered there was insufficient supply at Kingswood. However, the proposal was not entertained. In 1867 a mains extension to the Bristol and Portishead Railway Company's Station at Clifton Down was sanctioned. The Railway Company agreed to contribute £150 towards the cost which would be spread over seven years on the basis of 5% interest.²⁸

During the 1840's the Directors of the Bristol company had been alarmed by newspaper reports relating to demonstrations of electric arc lamps in other parts of the country. These were carried out by William Edwards Staite but did not prove economic because of the reliance on batteries.²⁹ A Mr Phillips from Weston-super-Mare undertook public displays of electric lighting in Bristol in 1863 and 1864, although again the success proved to be limited.³⁰ At the W.D. and H.O. Wills factory in Redcliffe Street a Wallace-Farmer generator was established in 1878 under the supervision of Dr Thompson of Bristol University College. This was of considerable help in the sorting of tobacco leaf which required a good light — gas distorted the colours.³¹ The Chairman of the gas company did not appear unduly worried, quoting many authorities who believed electricity to be most useful for lighting large open spaces but impossible to manipulate in private houses. Consequently, gas shareholders could remain tolerably happy.³²

Nevertheless, further experiments in electric street lighting continued to take place in Bristol. In March 1879 lamps were placed at Bathurst Wharf and Prince Street Bridge, and a little later at Avonmouth Dock. The Brash Electrical Company undertook a month's trial in lighting the city centre in January 1881: seven street lamps were connected by overhead wires to a 12hp gas engine installed at the bottom of Broad Street.³³ However, the gas company hit back and in September 1881 the

27. Bristol United Gas Light Company MB 1 March 1864, p. 289.
28. Bristol United Gas Light Company Lighting Committee, 17 June 1867, p. 229 and 15 July 1867, p. 234.
29. William Edwards Staite obtained a series of patents relating to electric lighting between 1846 and 1853.
30. Peter G. Lamb, *Electricity in Bristol 1863-1948* (1981), p. 1.
31. B. W. E. Alford *W. D. and H. O. Wills and the Development of the UK Tobacco Industry* (1981) p. 129.
32. *Journal of Gas Lighting etc.*, 24 September 1878, p. 156.
33. Peter G. Lamb, *op. cit.*, p. 3.



Bristol Gas Light Company — New works at Avon Street, St. Philip's.
Avon County Reference Library, Bristol.

Western Daily Press could refer to improved gas public lighting using Sugg's patent burners. "A lamp of 150-candle power is erected at the Neptune Statue; and, at St Nicholas Church, a grand group of five lamps throws out a splendid light of 500-candle power . . . At the Victoria Rooms there is a group of three lamps representing 300-candle power, and a similar group at the fountain near the Triangle, the rest of the lamps between the Victoria Rooms and the top of Park Street being of 60-candle power. It would be interesting now to know what is the cost for gas in these lamps, and what would be the cost of lighting the same area with electric light, either by the Brush system – which has already been shown in Bristol by Mr Kitt, under the instructions of the Sanitary Authority – or by Swan's incandescent system".

Despite threats of new competition, the Bristol company needed to meet additional gas requirements and in 1875 the Directors decided to consult Thomas Hawksley regarding possible extensions at Avon Street and Canons' Marsh. The area of land occupied by the company's works had increased from 7¼ acres in 1853 to 18 acres and Hawksley reported that there was no possibility of adding any large manufacturing or distributing power worth the cost at either station. He agreed with the Company's engineer, Walter Fiddes, that an additional works was "immediately and indispensably necessary". As a 34 acre site had been found at Stapleton, it was recommended to apply to Parliament for permission to purchase the land. The estimated purchase price of £24,250 was increased subsequently by the cost of buying out the Mines and Minerals rights under the land. The drawings and specifications for the new works were prepared by Fiddes and the contract for their execution awarded to John Aird and Sons of London.³⁴ Thomas Hawksley had urged the Board in January 1879 to put in hand immediately the first section of the works. This was done, production of gas commencing on 21 October 1879. Ten years later the daily manufacturing capacity at Stapleton Road exceeded that for Canons' Marsh but was still below Avon Street.³⁵ Yet the growth of business could not conceal deep-rooted problems.

Differences within the Board hindered attempts being made to improve administration. Early in 1887 it was decided that the Secretary, H. H. Townsend, who had just entered his 79th year, should formally

34. This firm of contractors had built the great Beckton works of the Gas Light and Coke Company of London.

35. Capacity (000 cubic feet) in 1889:-

	Daily Production	Storage
Avon Street	3,500	2,250
Canons' Marsh	2,250	2,500
Stapleton Road	2,500	2,000
	<u>8,250</u>	<u>6,750</u>

The peak day consumption during the previous winter had been 6,795 thousand cubic feet.

tender his resignation. From 245 applicants the position was offered to James V. Green of the Manchester Corporation Gas Department, several local applicants being disregarded because of their lack of practical experience. Better prices for coke and improved revenue from ammoniacal liquor contributed to dividends being paid without calling on reserves – the first time this had been possible for years. Even so, a major weakness remained in respect of manufacturing costs. Green's duties were expected to include a general supervision of the whole undertaking, thus effectively ending the situation whereby the engineer and secretary had equal status and controlled autonomous departments. (This was in keeping with changes made by the Gas Light and Coke Company of London where the secretary had become general manager as well in 1885).³⁶ Investigations revealed that the engineer, Walter Fiddes, had been using the company's men and materials for his own purposes and keeping a manservant whose pay of 19/- per week was borne also by the undertaking. Moreover, the payment of "Commissions" to favour particular suppliers prompted the new secretary to favour a tendering system for materials used. Resolutions on these matters were passed by the Directors in March 1888 when it was decided that the company's contractors and tradesmen be issued with a circular on the subject of commissions and gratuities. At a special Board meeting on 14 March 1888, Walter Fiddes was invited to resign on a pension of £500 (half his salary, whereas Townsend had received two thirds). His son, William Fiddes, was appointed to undertake the entire responsibility of the engineer's department until further notice but there was speculation that the superintendents of the three stations might report to a general manager.³⁷ Eventually, in July 1888, William Fiddes accepted the position of engineer to the company and superintendent of the Canons' Marsh Works.

Even so, the problems were still not ended. During 1888 there had been trouble amongst gas workers in Lancashire and the Midlands and an eight-hour day movement was revived amongst London stokers early the following year. Bristol already worked 8-hour shifts but on 11 May 1889 a meeting was held to form the Bristol United Gaslight Company's Labour Union, 200 men enrolling as members. The cause for complaint was a change in the method of wages payments introduced by J. V. Green. Previously, wages were made up to and paid on Saturdays: in future, they would be made up to Wednesday night and paid on Friday at 5.30 p.m. This led the men to "protest against the over-bearing and unjust attempt of the Directors to keep back a portion of their wages, thereby depriving their wives and families of their means of subsistence, especially seeing that nothing of the sort has ever been attempted for the

36. S. Everard, *History of the Gas Light and Coke Company 1812-1949* (1949), p. 276.

37. *Journal of Gas Lighting etc.*, 22 May 1888, p. 915.

THE LAMPLIGHTERS' ADDRESS FOR



CHRISTMAS 1895.

Welcome Merry Christmas, welcome once again,
Season blest for aiding our Lamplighting men,
They have had much labour in the passing year,
And are now desiring Merry Christmas Cheer.

They have been on duty, this you may rely,
Plodding to their labour in the wet or dry,
Lamps had their attention, and no time was lost
Though they had to battle with the biting frost.

With these thoughts within them they went toiling
on,
Until work at lighting all the lamps were done,
Pleasure sweetened labour in those darkest nights
Till they travelled homeward mid the lamps alight.

Till this was done, dense darkness reigned,
Through courts and alleys, streets and lanes,
Which oftentimes brought about dismay
To Citizens who did go that way.

For when good folk were safe in bed,
Secure from varied blighting damps,
The brave Lamplighting men had sped
To light with brilliant gas "The Lamps."

They know that no electric light
Can with the welcome Gas compare,
And they have done their best each night
To make it shine throughout the year.

Oft they've had to struggle through the rain,
Wishing on their journeys they were home again
But the Lamps were waiting for the needful light
And the men kept toiling through the stormy
night.

Their duties have been done and well,
Throughout the swiftly passing year,
And here I will and truly tell,
These men should have some Christmas Cheer.

Let them this Christmas have household joys,
With wives and children (bless the girls and boys)
I know they are waiting with anxious mind,
For Christmas Boxes people find.

Their wives and children will delight
In joining them I know and well,
And though they give them up each night,
Their Christmas joy no tongue can tell.

They know they will not be pleading in vain,
And ask you to read this new Address over again
That Lamplighters and loved ones dear
May have some Merry Christmas Cheer.

Then aid our brave Lamplighting men,
With Christmas Box for Christmas Cheer,
And they will gladly all unite
To wish you all a Grand New Year.

Facsimile (reduced) of a lamplighter's address for Christmas boxes, a tradition which begun when Bristol was lit by oil lamps. *Avon County Reference Library, Bristol.*

past 40 years".³⁸ Detailed documents by the workers were submitted to the Board without success, culminating in a decision to call a strike on 9 October 1889.

Gas supplies ran low. At a Special Board Meeting at the Chairman's house on 10 October 1889, sufficient concessions were made to induce the men to return to work. The cost to the company was about £5000 per annum, equivalent to 2d per 1000 cubic feet of gas. The men informed the Board that the dispute need not have taken place if they had been allowed to follow their customary practice of negotiating with the station engineers. Apparently, the latter were never consulted during the whole course of the strike, nor informed as to the arrangements for carrying on once the old hands stopped work.³⁹

The defeat of the Bristol company was regarded in the technical press as an important factor leading to concessions being made to gas workers elsewhere. Locally, 10,000 people took part in a victory demonstration organised by the Trades Council, the gasworkers and socialists.⁴⁰ Vicary, the gasworkers' leader, expounded their duty: "With the combination of the workers, capital must give way. Anything and everything they saw around them was produced by the workers, and if they produced all they ought to have a share in all . . . The few were rich and getting richer, and the many poor and getting still poorer; and that must be altered."⁴¹ A considerable number of small agitations swept the city during the last week of October and continued into November 1889. The dislocation of trade was not terminated until the end of the following January.⁴²

After a series of short-lived Chairmanships, John W. F. Dix took over in March 1890 until his death in 1913. The Secretary, Green, had not impressed with his handling of the strike of 1889, and in 1892, despite having been given an opportunity to resign, he was dismissed on account of disobedience and misconduct. His successor was John Phillips, a long-time servant of the company. Some consequences of the strike continued to be suffered after its settlement. At Avon Street the men complained of the way in which Union members were being discharged and replaced by non-unionists. The Directors replied that they could not recognise the right of the men to interfere, but that the matter would be con-

38. *Ibid*, 14 May 1889, p. 915.

39. *Gas World*, 12 October 1889, p. 425.

40. Brian Atkinson, *Trade Unions in Bristol* (1982), p. 9.

41. *Western Daily Press* 14 October 1889, quoted in B. Atkinson, *op. cit.*, p. 9. The Bristol Gasworkers had become part of Will Thorne's National Union of Gasworkers and General Labourers in the summer of 1889.

42. John Latimer, *The Annals of Bristol in the Nineteenth Century (Concluded 1887-1900)*, (1902) p. 14.

sidered. On 7 May 1890 the Engineer of Avon Street, E. J. Lloyd, tendered his resignation whilst the foreman was discharged, receiving wages in lieu of notice. *The Gas World* was prompted to comment that Lloyd was "immolated to appease the demands of an ignorant and unreasonable rabble" causing the concern to lose the services of an able engineer.⁴³ A former Director, R. W. Giles, continued for a while to criticize the Board at the ordinary general meetings. He alleged that Lloyd had been called upon to resign solely for carrying out the instructions of the Board. Giles contended that the Union had become the master of the company but failed to secure support to have investigated over 66 pages of allegations against the conduct of the business. Nevertheless, the affairs of the company began to improve under a new Chairman, Secretary and Chief Engineer.

Further evidence of a new approach appeared in the Act of 1891 changing the name of the undertaking to The Bristol Gas Company. Authorised capital of £511,250 of 10% maximum stock was converted into £1,022,500 of 5% maximum stock whilst £124,875 of new debenture stock could be offered for sale by public auction in Bristol. The illuminating power was increased to 14½ candles at the works – an additional 1 candle. Even so, not everybody appears to have been pleased. One "Lesser Columbus" considered that his opinion of the Bristolian as being somewhat sleepy was "directly traceable to the somnolent influence of the local gas supply upon his too susceptible nature."⁴⁴ The anonymous author suggested that the "gassy" powers of Bristol were in league with the local opticians by ensuring that it was the worst lighted city in the three kingdoms. Gas meter accuracy was another matter brought into question, consumers arguably being fleeced by the company. However, it does seem that such assertions arose, at least in part, from the writer's support for municipal control of public utilities.

The traditional way of making gas from coal in hand-charged horizontal retort was seriously questioned at this period. An experimental coal-charging machine designed by William Fiddes appeared at Avon Street in 1893.⁴⁵ Fiddes-Aldridge stoking machines were ordered for Canons' Marsh and Stapleton Road in 1905.⁴⁶ At Avon Street an initial setting of inclined retorts was approved in 1901. These were designed to take advantage of gravity in their operation: on a lever being pulled, coal from an overhead hopper slid down into the retort, and, after the gas was

BEFORE DECIDING to HIRE or PURCHASE a GAS COOKER be sure to see **HILL'S PATENT "ACME" GAS RANGE.**

THE most convenient and economical Gas Cooking Stove made.
It has several grand Improvements—a new powerful Grilling Burner, also a Patent arrangement for Utilising the Waste Heat from Oven, which was awarded a Special Medal at the Edinburgh International Exhibition, and a Patent Automatic Flue Damper, that enables the Oven to be Kept Hot with less Gas than any other Cooker.

CAN BE SEEN AT THE
BRISTOL GAS COMPANY'S SHOWROOMS,
CANON'S MARSH, BRISTOL.



Our Patent arrangement for Grilling and Toasting is acknowledged to be the most RAPID, SIMPLEST and PERFECT known. Chops and Steaks are cooked, and Bread toasted, by pure radiant heat from incandescent iron points.

A most unjust claim was set up by Messrs. Thomas Fletcher & Co., of Warrington (October, 1887), to this Patent Grilling arrangement, and after seven days' trial in the High Court of Chancery, costing upwards of one thousand pounds, the verdict was given in our favour on all points, with costs against Messrs. Fletcher & Co. The VICE-CHANCELLOR, SIR HENRY FOX BRISTOWE, in course of the trial, remarked, "That if he were offered the choice of two chops, one cooked under Incandescent Iron points by RADIANT HEAT (as in Arden Hill & Co's Griller), and the other cooked by deflected gas flames (as Fletcher's, Warrington), he would infinitely prefer the one cooked by pure radiant heat from incandescent iron."

SOLE MAKERS— ARDEN HILL & CO., BIRMINGHAM.

Bristol United Gas Light Company – Extract from Catalogue of Gas Exhibition 1888. *Avon County Reference Library, Bristol.*

43. *Gas World*, 17 May 1890, p. 538.

44. Lesser Columbus, *Greater Bristol* (1893) p. 52.

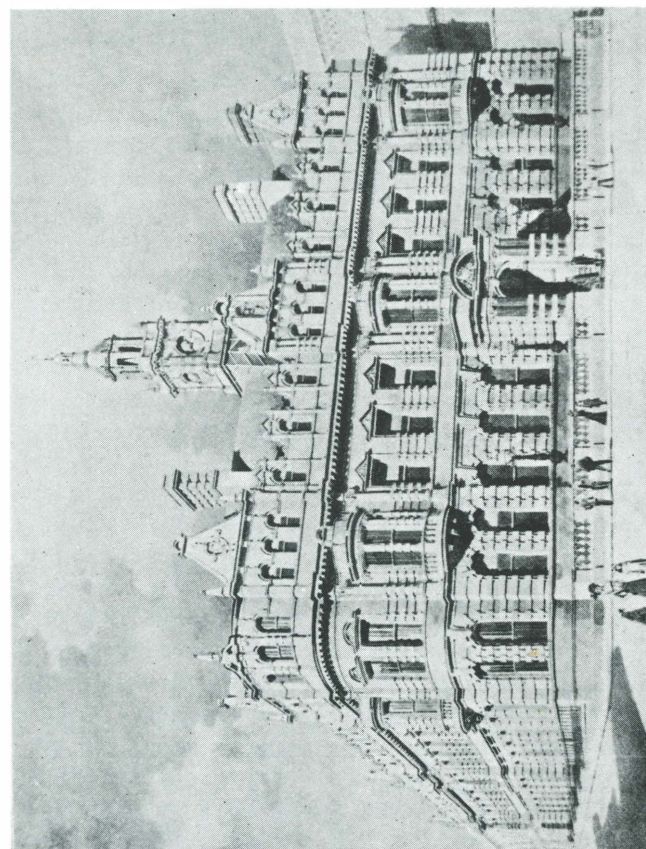
45. Bristol Gas Company MB, 1 November 1893, p. 172.

46. Bristol Gas Company MB, 12 January 1905, p. 274.

obtained, the coke residue fell out at the bottom. Vertical retorts carried the utilisation of gravity one stage further, a tender from Woodall Duckham Company being accepted by the company for Stapleton Road in 1912.⁴⁷ There the coke was removed by an electric crane and gantry. To provide added flexibility in meeting peak demands G. C. Trewby, Chief Engineer of the Gas Light and Coke Company of London, recommended the installation in 1891 of a water gas plant at Avon Street. However, the Directors did not agree. A carburetted water gas plant was approved for Canons' Marsh in 1911. Such measures enabled the undertaking to meet with rising demands for gas, the peak day of 5½ million cubic feet in 1882 having risen to 12 million cubic feet by 1912.

From its inception the gas industry in Bristol had relied on independent firms to supply fixtures and fittings to consumers. Wasborough and Company were appointed by the Bristol Gas Light Company to undertake this work although the arrangements lasted only until 1818.⁴⁸ In the 1880's many gas companies began to promote the sale and hire of cooking appliances in order to develop an alternative to the lighting load which was threatened by electricity. The Bristol undertaking followed suit in 1888. A memorial from 41 local gas fitters requested that this business should be conducted by them at list prices, but the gas company disagreed. One consequence was that the gas company began to employ its own stove fitters. By 1892 nearly 2200 cookers had been installed, but progress was too slow for some appliance manufacturers who set up agencies among local ironmongers and other traders to sell direct to the public. One local barber displayed a cooker in his salon and made use of his son to follow furniture removal vans, evidently believing that a change of address was a suitable occasion for the installation of a cooker.⁴⁹

The invention of the incandescent gas mantle by Carl Auer von Welsbach about 1884 provided a much-needed stimulus to gas lighting. A better and more economical form of illumination could be provided. The Incandescent Gas Light Company of London was granted a free supply of gas when staging a two-day exhibition in Bristol during 1893. Moreover, new prepayment meters provided an opportunity to develop gas sales amongst the working classes, an initial order for 24 being placed by



Bristol Gas Company – Office and Showroom, Colston Street.
From F. G. Warne, *Bristol 1913. Its History. Its Commerce. Its Citizens.*

47. Bristol Gas Company MB, 18 July 1912, p. 427.

48. The arrangements were rescinded on 11 November 1818 as the Bristol Gas Light Company was unhappy with the quality of some of the fitting work. Its later policy was to allow consumers to choose their own fitter but have the work inspected by a Company employee.

49. Noel S. Smith, *Distribution and Sales Organisation*, Communication No. 209 of the Institution of Gas Engineers, Translations 1939, p. 1099.

the Bristol company in 1890.⁵⁰ Although a showroom had been set up at Canons' Marsh works this was not a satisfactory solution. In 1903 a site at St Augustine's Place, Colston Street, was acquired for new offices and the proper display of appliances and fittings. Between 1890 and 1914 the number of consumers trebled to reach 65,000 of whom nearly one half had prepayment meters.

A Somerset and Gloucester Gas Light and Coke Company had been registered on 22 September 1913 to supply gas to the parishes of Northstoke, Kelston, Swineford, Upton Cheney, Beach, Willsbridge, Longwell Green, Oldland Common and Bridgegate.⁵¹ The Niagara Mills, Northstoke was to have been the centre of operations. Apart from Kelston, the entire district was in the area of supply of the Bristol undertaking, being stipulated in its Act of 1910. After receiving threats of an injunction, the promoters dropped the scheme and refunded the money which had been received.

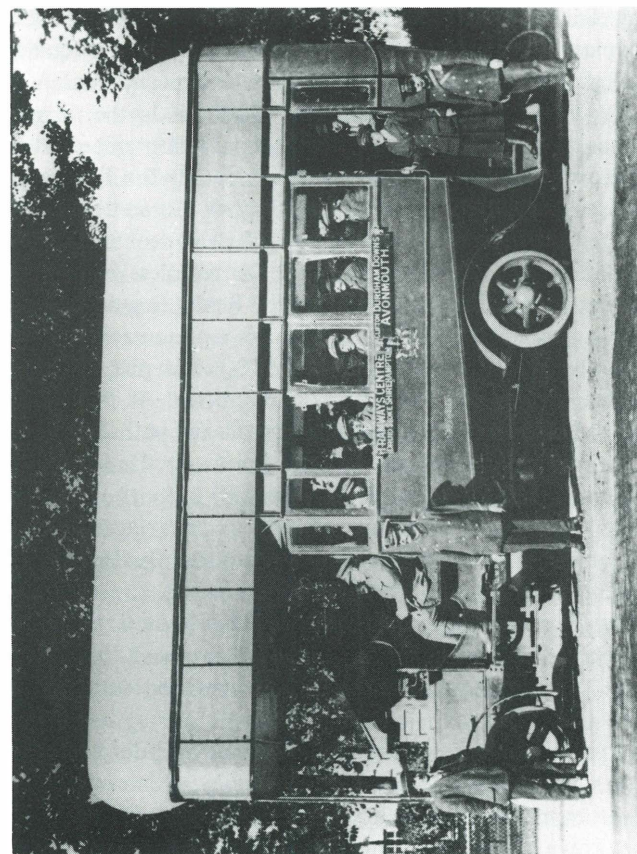
First World War requirements for explosives necessitated greater output of certain materials e.g. toluene, phenol and sulphuric acid. Suitable plant to recover these by washing the gas were installed, the Government making a contribution to the cost incurred. Lack of raw materials and labour caused particular problems despite women being employed on the gasworks. Dr Lily N. Baker was appointed to examine and certify each woman employed for a fee of 5/- per examination. Even so, in 1917 the *Western Daily Press* observed:-

There are two retort houses standing heated ready for action, but the necessary labour cannot be obtained. Application has been made to the Ministry of Munitions for German prisoners or for military assistance — men capable of hand-charging — but they cannot be procured. Between thirty and forty women workers have been engaged, and some of these are employed in wheeling coal. Owing to the severe weather there has been a considerable increase in the gas supply during the last few days. The increase has exceeded 24,000,000 cubic feet, or practically 25 percent, and in order to cope with it the men have been working a shift and a half, but that pressure cannot be maintained, and under these circumstances it is desirable that consumers shall economize, wherever possible, while the war lasts.⁵²

50. Bristol United Gas Company MB, 3 December 1890, p. 62.

51. *Gas World*, 27 September 1913, p. 399.

52. *Western Daily Press*, 2 February 1917.



A Scene in Colston Avenue: Bristol Gas Bus 1917. 12 m.p.h. is printed on the body.
Reece Winstone.

The Engineer and Secretary were authorized in July 1917 to see the Coal Controller with reference to the effects of the Coal Transport Reorganisation Scheme upon existing contracts. The Coal Controller's representatives at Whitehall stated that 161,000 tons purchased from Nottingham, Derby, Durham and North Wales would not be available after 8 September but that Yorkshire coal would be supplied to replace this quantity. On 6 September the Secretary reported on interview with the South and West Yorkshire Committees, the Bristol Committee and the Coal Controller's department in London, which indicated that allocations to replace the cancelled contract quantities were inadequate. It was decided to purchase 25,000 tons of Durham Unscreened Coal.

Later that September arrangements were made with the Bristol Tramways Company for a supply of gas for motor traction as bus trials had been satisfactory. A gas filling station was provided by the Tramways Company at Colston Avenue and Canons' Marsh gasworks was equipped to fill gas containers. The charges were 4d per 100 cubic feet and 6d per container. Restrictions on the use of coal gas for vehicles were introduced the following year under the Defence of the Realm Regulations.

The Secretary was nominated as the Company's representative on the Bristol Fuel and Lighting Committee in July 1918, whilst the Assistant Secretary was named for the Warmley Fuel Committee. At the Board Meeting on 25 July it was decided to communicate with the local Members of Parliament in respect of the Statutory Undertakings (Temporary Increase of Charges) Bill, requesting their support of amendments for more equitable treatment of gas undertakings. During September the Secretary reported on the position under the Household Fuel and Lighting Order 1918. Owing to uncertainty in obtaining adequate supplies of coal, it was deemed inadvisable to undertake new supplies of gas, particularly to large consumers, except upon the understanding that, in case of necessity, the supply would be curtailed or discontinued.

After the war a joint report was prepared by the Secretary and the Engineer, which dealt with reconstruction policy, the return of employees and other matters. Another sign of returning normality was a letter from the Town Clerk enquiring whether, in view of the termination of the contract with the Ministry of Munitions on the supply of the constituents of explosives, the standard of illuminating power prescribed by the Act of 1910 would be resumed.

Industrial relations continued to remain difficult following the end of hostilities, despite a National Joint Industrial Council having been established in 1919. There was a dispute about manning levels at Stapleton Road in April 1920 which went to arbitration while in July of the same year there was an unauthorised strike due to dissatisfaction

about a national wages agreement. Staff employees kept the retort furnaces going but public supplies had to be discontinued. The men returned to work after a week.⁵³ Miners' strikes also caused problems, an Emergency Order in 1920 restricting the quality and pressure of the gas distributed. Imported coal was used, as was the case six years later during another national strike. Many of the smaller undertakings such as that at Keynsham experienced particular difficulties in keeping going. This led to a decision by the Bristol Board in 1927 to acquire the Keynsham Gas Company Limited: a direct supply was provided from Avon Street.⁵⁴

As evidence of changing circumstances in the industry, the Gas Regulation Act of 1920 favoured the abandonment of lighting standards and a policy of selling gas on its heating content. The Bristol company obtained an Order under this Act in 1922,⁵⁵ the price being fixed at 9.2d per therm (equal to 3/8.16d per thousand cubic feet). In 1926, the stoves, meters and fittings activities were moved from Colston Street to new premises at Barton Street, while two years later the mains department was moved from Canons' Marsh to Maudlin Street.

The Directors considered the question of purchasing the Portishead Gas Company on 31 May 1928. This arose out of an enquiry from Lt. Col. J. B. Butler, Chairman of the Portishead concern. However, it was decided that the estimates of costs did not favour the proposition. In September 1929 a letter was received from the Yatton Gas Consumers Company Limited suggesting an amalgamation. This idea also was not supported.

A considerable number of mains extensions to new housing sites were undertaken between the wars. Sir George E. Davis, Chairman of the company, opened an all-gas demonstration house at King's Drive, Bishopston on 19 January 1931. It was equipped with the latest labour saving gas appliances and was offered for sale, as exhibited, at £1250 including garage and garden. So many people wanted to visit the dwelling that the opening period was extended another week from 7 to 14 February.

At the end of 1930, gas consumers exceeded 101,600 in total, with over 3,700 having been added in that year. Most new consumers chose

53. At a Board Meeting on 22 July 1920 a sum of £500 was voted for distribution amongst staff employees who had worked through the strike.
54. Bristol Gas Company MB, 15 December 1927, p. 5 approved the purchase terms. The outstanding loan of £2,000 was to be repaid at par; 350 Ordinary £10 shares and 450 Preference £10 shares to be purchased for £9,000 cash.
55. Bristol Gas (Charges) Order dated 20 April 1922 which fixed the maximum price of gas at 15d. per therm. The calorific value was declared at 480 British Thermal Units per cubic foot of gas. 1 therm = 100,000 British Thermal Units.

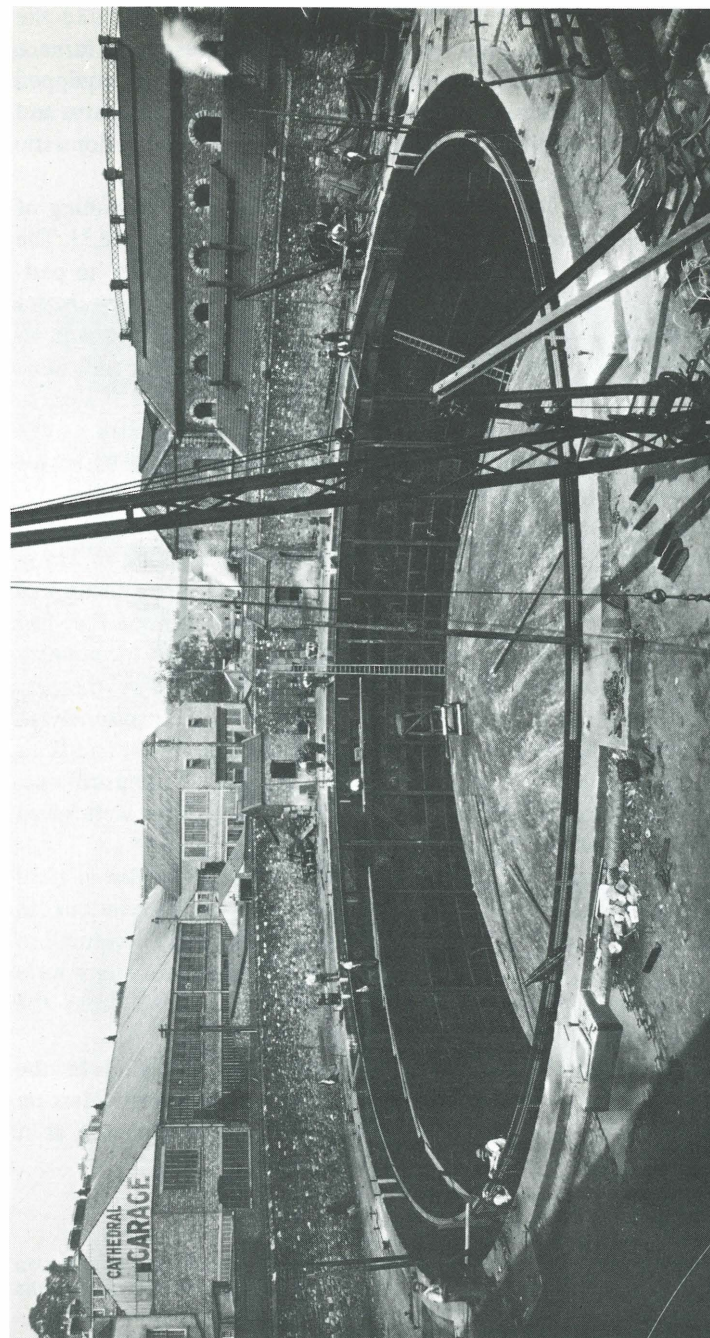
gas for cooking and it was estimated that over 90% of cooking in the city relied on gas. Sales continued to grow and consideration was given to obtaining another grant under the Development Act in respect of Gas-holders. The Treasury would not recommend approval but nevertheless it was decided to erect a spirally-guided holder at Bedminster.

A joint report by the Secretary and the Engineer on the reorganisation of the Distribution and Sales Departments was approved in June 1931. A Distribution Engineer and Sales Manager was appointed to co-ordinate these activities.⁵⁶ Questions affecting financial and public policy were submitted to the Secretary while engineering and technical matters continued to be referred to the Engineer. In 1939 the death of the Secretary facilitated the adoption of a new organisation under a General Manager responsible for the entire business.⁵⁷

To encourage Bristolians to become more "gas-minded", a series of weekly cookery demonstrations in the Little Theatre of the Colston Hall was begun in 1930. The average attendance throughout the winter months was about 300. Lectures were arranged with official marketing organisations, such as the Milk Marketing Board and Empire Fruits. In 1935, a Women's Advisory Section was established to obtain and maintain a close contact with housewives. The personnel were the chief demonstrator, six qualified staff and a lady organising Secretary with her assistant.⁵⁸ This section was affiliated to the Women's Gas Council and achieved considerable success in making contact with Women's associations in Bristol. Its activities included demonstrations, lectures, the supply of recipes and complete menus, contact with the Board of Education regarding domestic service matters, advice on kitchen planning and providing guided tours of the showrooms and gasworks. Demonstrators carried out cookery tests on all new cooking apparatus before it was offered for sale and followed up by a personal visit to ensure consumer satisfaction. Bristol was divided into 6 districts with a demonstrator allocated to each one. To some extent this activity was a necessary counter to the Electrical Association for Women⁵⁹ whose local section gained national publicity by being the first branch to erect its own all-electric house.

After a number of large industrial consumers had reduced their demand during 1932, owing to competition from oil, an Industrial and

56. Bristol Gas Company MB, 11 June 1931, p. 80. The commencing salary was £900 p.a.
57. The position of General Manager was awarded to the Engineer, Robert Robertson, who was made a Director in 1943.
58. Noel S. Smith, *op. cit.*, p. 1105.
59. Peter G. Lamb, *op. cit.*, p. 29.



Bristol Gas Light Company – Brandon Yard Holder, Canons' Marsh, under construction 1932.
British Gas plc South Western Archives.

Commercial Section was created to arrest the decline.⁶⁰ By 1938 the personnel comprised six fully qualified representatives, two furnace erectors, two assistants and two maintenance fitters. A well-equipped physical and chemical laboratory was provided for testing apparatus and the investigation of combustion problems. In five years the non-domestic load increased by 50%.

Postal delivery of accounts was introduced from the beginning of 1934, several collectors being retired and others were re-deployed.⁶¹ The job progression established was ordinary (credit) meter reader to part-time collector and then to permanent collector.⁶² Ordinary meter readers attended to about 150 meters per day during the winter and 46 during the remainder of the year. (Extra pay was allowed for additional meters). Normal hours of work were: Monday to Friday, 8.0 a.m. to 5.30 p.m.; Saturdays, 8.0 a.m. to 12.30 p.m. Collectors were liable to be called upon after hours to deal with "coin fixed" complaints in their own locality, for which each was granted four days additional holiday.

Sir George Davies died on 7 January 1932 and was succeeded as Chairman by Mr George H. Boucher. At the annual meeting of shareholders in February, the new Chairman said that "no one living had experienced a more difficult and depressing year than the one that had just passed".⁶³ Taxation had been increased and finances of the country had been brought to the verge of disaster. Yet despite mild weather, gas sales at Bristol had created a record. The increase of 3,937 consumers in the year was another record. However, depressed industrial conditions had made the sale of coke and by-products difficult and less profitable. To popularise coke, bags containing enough for two fires were given away at the annual exhibition later in the year.

Despite the general economic conditions it had been decided in 1930 to reconstruct the offices and showrooms. During excavations in Trenchard Street, a mediaeval tile pavement was found and presented to the Bristol Museum and Art Gallery. Several human skeletons were unearthed as well.⁶⁴ Temporary showrooms were rented from the YMCA headquarters in Colston Street for two years.

The following year the Company contemplated applying to the Board of Trade for an Order to acquire powers to erect gasholders on land at West Town, Avonmouth. Bristol Corporation objected as it



Bristol Gas Company – Offices and Showrooms After Reconstruction. Gas was still used for internal illumination and outside spot-lighting. *British Gas plc South Western Archives.*

60. Noel S. Smith, *op. cit.*, p. 1091.

61. Bristol Gas Company MB, 12 October 1933, p. 421.

62. Until 1873 the collectors were not paid a salary but received poundage on the monies collected. The accounts of certain large consumers e.g. the railway companies, were excluded from this system.

63. *Gas World*, 5 March 1932, p. 233.

64. Bristol Gas Company MB, 24 November 1932, p. 305.

considered the proposals would prejudice the leasing of adjoining municipal land for industrial purposes. The Company agreed to sell the land to the Corporation providing there was no objection by the latter to the acquisition of a suitable alternative site. Tenders were accepted to erect a new holder at Horfield in 1934.

The reconstructed offices and showrooms in Colston Street were opened officially on 29 March 1935. General heating was provided by a low pressure hot water installation, using coke: the latest type of column radiator was provided for most rooms, but the board and other principal rooms were warmed by flat wall panels. Atmospheric conditions were dealt with by an air conditioning plant. At the same time large extensions were completed to the workshops at Barton Street. When these had been opened in 1926, 199 men and boys were employed there. This number had risen to 472 so that additional space was essential. The three storeys could now be reached by mechanical lifts, whilst two loading docks would accommodate eight large lorries at the same time. Provision was made for 130 cycles and motor-cycles.

The Board decided to reject a proposal to purchase the Clevedon, Yatton and Portishead Gas Companies in October 1935.⁶⁵ The Bristol Gas Company had calculated that £77,239 worth of stock would have been needed for issue in exchange for the shares of the other companies, although Clevedon and Portishead disagreed with their respective valuations. Another £2,500 would have been necessary to promote a Parliamentary Bill. The numbers of consumers involved (1934 figures) were Clevedon 2,394, Portishead 1,341 and Yatton 402. Twelve months later Clevedon was involved with negotiations to acquire Yatton and had to obtain approval from the Bristol Board. The reason was that Claverham and Cleeve had been included in the Bristol Company's Act of 1910 determining the limits of supply. Claverham was a hamlet in the Civil Parish of Yatton and Cleeve an Ecclesiastical Parish carved out of the same Civil Parish.

Unsettled international relations during the 1930's had repercussions both on local affairs in general and the gas company in particular. Early in April 1936 the Bristol City Engineer convened a meeting of the Principal Officers of the Public Utilities to discuss emergency measures such as Rescue Work, Demolition of Dangerous Buildings and Road and Service Repairs. It was recommended later that an Executive Committee be set up with headquarters at the Central Police Station. Then in 1938 the Home Office invited the gas industry to carry out specified classes of work to ensure continuity of supply during a war, the Government

65. *Ibid*, 24 October 1935, p. 288.



Bristol Gas Company Van — 21 November 1939. A Bedford lorry adapted to gas propulsion seen in Barton Street. 15 miles was possible with this gas bag inflated with 250 cu. ft. *Reece Winstone*.

providing financial assistance on condition that the industry spent an equal amount. This offer applied only to selected areas of which Bristol was one and the Directors therefore agreed to spend £12,900.⁶⁶

To qualify for a grant, undertakings had to satisfy the Home Office that they were prepared to train a fair percentage of employees in first aid, fire fighting and decontamination, provide equipment for such services and arrange adequate air raid shelters. The Board also decided to photograph selected street plans, which gave the position of mains, and works plans and deposit them in a safe place in case of emergency. Following a number of minor practices, July 8/9 1939 was chosen for a major A.R.P. night exercise. This was Bristol's first black-out, the public lamps being extinguished shortly before the exercise began at midnight. Because of the late hour chosen, very few of the general public were inconvenienced, but several weaknesses were revealed in the emergency organisation. Consequent upon the German attack upon Poland the Central Control was manned on 1 September. That evening the public lamps were not lit – "black-out" had begun. Later a restricted form of lighting known as "star lights" was approved by the Government.

Large-scale air raids did not begin until summer of 1940 and these tended to concentrate on major industrial centres. At 18 minutes after midnight on 25 June 1940, staff on duty in the Bristol control room received their first air raid message "Red". Almost simultaneously the sirens sounded, followed by the noise of a loud explosion. The gas company was affected in some 30 incidents; a 14 inch main was broken at Bath Road, Brislington, and a number of services had to be cut off as a result of houses being demolished. The large gas holder at Barton Hill had a remarkable escape, a bomb exploding in the soft subsoil nearby. Further raids occurred in July and August, damage being caused to mains and services. "Star lighting" was discontinued on 30 August. Raids on the Bristol Aeroplane Works at Filton in September resulted in several hundred consumers being deprived of gas. On 15 October damage to adjacent gas and water mains at the bottom of Parry's Lane led to water carrying a large quantity of silt into the open ends of the gas main.

Sunday 24 November was memorable for the destruction of much of Bristol's centre. A gasholder at Bedminster was totally destroyed, the escaping water from the tank flooding the surrounding area. High explosive bombs did extensive damage to the original Board Room at Canons' Marsh and the workshops at Barton Street. The stables and out-buildings at Avon Street were damaged by fire from incendiaries. Over 5 million cubic feet of gas were lost during the night. Thousands of con-

sumers were entirely without gas. A request for extra labour to the neighbouring gas undertakings resulted in gangs being sent from Bath, Weston-super-Mare, Swindon and Clevedon. On December 2/3, the city experienced another big raid. All the inter-station mains were fractured as well as the supply mains to Staple Hill, Brislington, Knowle, Bedminster, Bedminster Down, Long Ashton, Clifton and Avonmouth. A few days later, on 7 December, production was held up at Avon Street pending the removal of an unexploded bomb in the coal yard. Four days afterwards one of the gasholders at Barton Hill was set on fire by an incendiary bomb.

Raids resumed at Bristol during 1941. One of the gas holders at Stapleton was destroyed and its neighbour pierced with shrapnel on 16 March. Canons' Marsh lost a holder on 11 April – Good Friday – and more mains and services were affected. Subsequently, three months freedom from raids probably influenced the Corporation to resume "star lighting" from 1 October. Isolated raids caused further damage in 1942 and 1943.

Many acts of bravery by employees occurred during the air raids. George Daniel Jones of Avon Street received the George Medal for attacking a fire at one of the Barton Hill holders and Arthur Brady was awarded the British Empire Medal (Civil Division) for gallant action at Stapleton Road.⁶⁷

The Clerk to Thornbury Parish Council wrote in 1944 complaining of inadequate gas supply in the parish. He asked whether the Bristol Gas Company would consider extending its service to Thornbury after the War. It was agreed to consider the position with the Directors of the Thornbury Gas Company but the latter decided no useful purpose could be served by a discussion at that time.⁶⁸

During the war the gas industry itself devoted time and effort to possible future reorganisation. The Heyworth Committee was set up in 1944 to enquire into the industry, recommending the establishment of 10 autonomous Regional Boards. A Labour government elected in 1945 was committed to public ownership of basic industries.

At a Directors' Meeting on 27 June 1946, the General Manager of the company was empowered to attend a meeting of the South Western

66. *Ibid*, 1 December 1938, p. 343.

67. Details about Air Raids taken from an abridged Bristol Gas Company report by the Distribution Manager (A.R.P. Officer) covering the period 2 October 1935 – 14 September 1944.

68. Bristol Gas Company MB, 25 January 1945, p. 158. A supply to Thornbury from Bristol was provided from April 1955.



G. H. Boucher — Chairman Bristol Gas Company 1932 - 1949. A partner in Bevan, Hancock and Company, solicitors. He was prominent in local business affairs, serving on the Boards of J. S. Fry and Bristol United Breweries amongst others. Appointed a Director of the Gas Company in 1926. Well-remembered for his habit of arriving on a bicycle to attend meetings. *Roy Boucher.*

District of the British Gas Council to vote in favour of two resolutions viz:-

- (a) that the meeting is not in favour of the nationalization of the gas industry
- (b) that the meeting is prepared, if nationalization is to be effected, to co-operate so as to ensure maintenance of an efficient and economic gas service to the public.

Both these resolutions were carried subsequently, together with a request for the British Gas Council to do its utmost to secure the carrying out of the principle of evolution from within the industry.

On 7 September 1946 the Ministry of Fuel and Power approved the installation of a new continuous vertical retort unit — capacity 9/10 million cubic feet per day — at Stapleton Road. The sealing of the final contract with Wests Gas Improvement Company Limited took place on 21 October 1948.⁶⁹ Strachan and Henshaw Limited of Bristol were responsible for coal handling and storage equipment. Provision was made for a projected high pressure main to Downend to be continued at a suitable date to Chipping Sodbury which was still supplied by its own company.⁷⁰

It was intimated in the King's Speech of October 1947 that the government intended to bring gas into public ownership in completion of a plan to co-ordinate the fuel and power industries. At the last Ordinary General Meeting of the Company held on 3 March 1949, the Chairman, Mr G. H. Boucher, regretted that nationalization should have come about. He stated that the Board had done its very utmost to prevent it because it believed it was not in the interests of the stockholders, the employees or the consumers. The accounts showed that the year just ended was the best ever. He concluded sadly "We go out of existence after over 130 years of continuous service and we can only hope that the progress which has taken place during the last 50 years will not only be maintained but increased".⁷¹

The final meeting of the Company was held on 30 April 1949 when only formal business was transacted.

69. The scale of development would have made Stapleton Road the largest gasworks south of Birmingham and west of London.

70. A bulk supply to Chipping Sodbury from Bristol began in 1952.

71. Extract from speech by G. H. Boucher circulated to employees.

BIBLIOGRAPHICAL NOTE

The principal sources are the records of the Bristol gas companies, most of which have been deposited with the Bristol Record Office. The technical press, including *The Journal of Gas Lighting* and *Gas World*, provide additional references.

A copy of an undergraduate dissertation by Helen Seal, *The Gas Industry in Bristol 1815-53* (University of Bristol 1975) held in the Bristol Reference Library provides a more detailed account of early developments. In 1979 Michael Painting submitted a thesis on *The Development of the Gas Industry in the Bristol Region 1810-1950* to the University of Bath. A later study by Harold Nabb for the same University, *A History of the Gas Industry in South West England Before 1949*, enables developments in Bristol to be seen against a regional background.

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- 67 *The Bristol Gas Industry 1815-1949* by H. Nabb. £1.00.

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THE BRISTOL GAS INDUSTRY 1815 – 1949

CORRIGENDA

Inside front cover — last paragraph, first line — substitute Bristol for British.

P.17 line 4 — insert "Steamship" before Company.

P.23 line 33 — substitute Brush for Brash.

P.39 Caption — delete Light to read Bristol Gas Company.