

THE SCOTTISH GAS INDUSTRY UP TO 1914

by

MICHAEL STUART COTTERILL

1976

The Department of History

The University of Strathclyde

Thesis Submitted For The Degree of Doctor of Philosophy

In Four Volumes

VOLUME 4

The Scottish Gas Industry Up To 1914

CONTENTS

Page	
(i)	Acknowledgements
(iv)	Tables, Figures and Illustrations
(xxiii)	Appendices - Index
(xxxiii)	Abbreviations
1	Chapter I The Origins of the Scottish Gas Industry
103	Chapter II Company Development, Location and Ownership
231	Chapter III Production:
231	1 Technological Evolution
406	2 Special Gases - Animal, Oil, Water, Tar, Mineral Oil, Petroleum, Portable, Acetylene and Suction Gases
408	(i) Animal Oil Gas
428	(ii) Portable Gas
438	(iii) Tar and Mineral Oil Gases
459	(iv) Water Gas
468	(v) Producer, Suction and Acetylene Gases
478	3 Coal and By-Products
478	(i) Coal
530	(ii) By-Products
595	4 Management and Labour
595	(i) Managers and Consultant Engineers
662	(ii) Directors
672	(iii) Clerical Officers
681	(iv) Labour
728	Chapter IV Finance
895	Chapter V Organization
895	1 Gas Companies Without Limited Liability
946	2 Chartered Gas Companies
1004	3 Municipal Control
1111	Chapter VI The Cheap Gas Movement, Consumer Relations, and Markets
1111	1 The Consumers Cheap Gas Movement
1206	2 Markets for Gas
1316	Conclusion
1338	Appendices
1899	Index

APPENDIX I

Documents Relating to the Origins of the Scottish Gas Industry

- (1) Early Observations on Gas Lighting
- (2) Chronology of Private Gasworks Development by Boulton and Watt, and Others, and the Financial Advantages of Gas-light.
 - (A) Murdoch's Installations and Extant Evidence on his Earliest Experiments.
 - (B) Cost of Gas Apparatus from Soho - Scottish Plant compared with other Installations.
 - (C) Financial Benefits of Gas Lighting (1808)
 - (D) Transmission of Knowledge - William and Henry Creighton
 - (E) Installations by Samuel Clegg (1781-1861)
 - (F) Josiah Pemberton's Installations
 - (G) Publicity of Financial Advantages of Gas-light
- (3) Candle Production in Scotland (1800 - 1820), and Chandlers with Excise Licences (1826 - 1837)

(1) Early Observations on Gas Lighting

After Murdoch's development of coal-gas manufacture, several authors reviewed the origins of gas-chemistry; others described natural-gas sources in an attempt to belittle his work.

"Air", meaning hydrogen, produced from iron and sulphuric acid, was first noted by Paracelsus (1493-1541).

Vide, T.Thomson, The History of Chemistry, 1830, ch. V

C.Hunt, Gas Lighting, 1907, op cit, p. 5

Von Helmont's chemistry was based upon earlier observations of "exhalations in mines" e.g. by A.Libavius in Commentat. Metallic Francof. and Moen, 1597. A bibliography on data used by Von Helmont is given by J.F.Gmelin: "On the Chemical Knowledge which the Philosophers of the 16th and 17th Centuries had of the Different Gases" translated from Gottingsches Journal der Naturwissenschaften for The Philosophical Magazine, 1801-2, vol XI. A bibliography on Von Helmont himself is given by E.Faber Ed. Great Chemists, (1961, New York).

Natural-gas had long been used in the Orient, e.g. for cooking in temples at Chittagong, Bengal and at Thsee-Lieon-Tsing in China. However, this is unlikely to have inspired Murdoch's work since descriptions were not widely publicised for a further 20 years e.g.

"Natural Fire Temples of the Guebras, formed by Burning Springs of Naphtha", Edinburgh Philosophical Journal, 1821, vol 5, p.21

"Salt Wells and Springs of Inflammable Gas in China", Edinburgh New Philosophical Journal, 1830, vol 8

"Neither Lighting nor Heating by Gas of Modern Origin", Mechanics Magazine, 1831-2, vol 16

"Natural Gas Wells in China", Journal of the Society of Arts, 1887-8, vol 36

Natural-gas in Europe was not utilized. The largest quantities were at the salt-mines at Gottesgabe, Rhein, where gas was available from the 1770's; some authors claimed it was used for cooking and lighting before 1790, but it was first used for those purposes in 1825 by M.Raeders.

Vide, Edinburgh New Philosophical Journal, 1827-8, vol 4, p.402

Mechanics Magazine, 1828, vol 9, p.128

Mechanics Magazine, 1831-2, vol 16, p.303

The closest place to Britain where gas was regularly used for economic purposes in the eighteenth century was on the Caspian Sea at Baka near Erbens (Armenia) where the inhabitants of Fragan used it for cooking food; but again there is no evidence that this inspired British experiments.

Vide, M.J.A.Chaptal, Chemistry Applied to Arts and Manufacturers, 1807, vol II, p.344

(2) Chronology of Private Gasworks Development by Boulton and Watt, and Others, with the Early Financial Advantages of Gaslight

(A) Murdoch's Installations

- * Early 1770's distilled shale in iron pot at Lugar, Ayrshire.
- 1792 Retort and gas light at house and office, in Redruth, Cornwall.
- 1795-6 Gas light experiments at Neath Abbey Iron Works.
- * 1797 Experiments at his foundry in New Cumnock, Ayrshire
- 1799 Experimental apparatus at Soho.
- 1801 Experiments resumed at Soho as a result of Gregory Watt's report on Lebon's work in Paris.
- 1802 One Bengal light, supplied by individual retorts at both ends of Soho Works facade, in illuminations for Peace of Amiens.
- 1803 Gas in regular use for lighting part of Soho Foundry.
- 1805 Supplied plant to Messrs. Phillips and Lee, Manchester.

Later Installations Supplied For -

- 1806 Messrs. Strutt, Milford Mills, Derbyshire.
- 1808 Messrs. H. Birley & Co., Manchester.
- 1808 James Kennedy, Manchester.
- 1808 Messrs. Wormald, Gott & Wormald, Park Mill, Leeds.
- * 1809 Messrs. Richard Gillespie & Co., Glasgow.
- * 1809 Messrs. Neilson & Co., Kirkland, Wemyss.
- 1809 Benjamin Gott, Armley Mills, Yorkshire.
- 1809 Marshall Hives & Co., Leeds.
- 1810 Messrs. Lister Ellis & Co., Burley, Otley, Yorkshire.
- 1810 Messrs. T. Coupland & Sons, Leeds.
- 1810 Messrs. John Thomas and Edward Lewis, Manchester.
- 1811 Messrs. Marshall Hutton & Co., Shrewsbury.
- 1811 Messrs. Benyon, Benyon & Bage, near Shrewsbury.
- 1811 Messrs. Huddart & Co., Rope Manufactory, Limehouse.
- 1814 Messrs. Williams, Jones & Co.
- * 1814 Messrs. Maberley, Broadford Mill, Aberdeen.

Note - * Scottish Installations

The date given for Phillips & Lee (1805) is that when their order was placed, not when it was installed.

Source - Birmingham Ref. Lib., Boulton and Watt Soho Manuscripts Collection.

Extant Evidence on Murdoch's Earliest Experiments

- (a) Document written by Thomas Wilson, at Truro, 29/1/1808, reproduced here (including corrections):

"Further particulars of what certificates can be given respecting the new Light - Apps.

I received this Morning a Letter from Capt Phillips, stating that his Son perfectly recollects Mr Murdoch making experiments at Polgooth in 1794, & describes the apparatus to be the same we saw at Neath, but has no recollections of Mr M having said he tried other substances than Coal, or even different coals, or any thing than coal, or any thing respecting savings - Having Yesturday drawn up such a paper as I thought Mr Williams would not object to Sign, I went with it this Morning & found him at Comfort with Mr Jas Coule, he objected to the Date, Viz that he saw it in 1792 or the 2 succeeding years, his objections were more to the wording than the fact, I left it with ^{him} _^ to get it re-drawn to suit his own Ideas, & he has promised on Monday next when done to see Boase, & get him to sign it - I saw Boase afterwards & explained to him what I hade wrote & he promised to sign if his conscience would let him, but he can saw nothing to the Tube being bent, it is strange how all who has seen it disagree in one point or other, Phillips, Mr Gould ~~all~~ ^{myself} _^ agree, in the bent part being immersed in Water, Tregelles says he can not sign that, tho no doubt he did, ^{see it} _^ but remembers the Tube was bent, Phillips & Gould agree in part of the stem of a Tobacco pipe being used, I do not, though I have no doubt it was so. It appears to me Mr Williams & Boase being the first who saw it will be the best, & a doubt has arisen whether Gould & me will be of service as we neither of us saw Mr M exhibit it, unless C. Vivian will certify what he saw Mr M do, & that he had learnt it from Murdoch, on the whole I am afraid we shall be able to do little satisfactory, but of this you will be best able to judge"

[an included loose page may be missing]

- (b) Verbatim undated sheet of notepaper (Soho M.S.S., Box 30):

"Wm. Murdock's first Expts made at Redruth in 1792 with Iron Retorts, tinned Iron & Copper tubes: burnt through holes of different diameter & form to see what would be best, among others argand lamps, which upon the whole seemed to answer best. Made Expets upon

various kinds of Coal viz Swansea [?], Haverford West, Newcastle, Shropshire, Wednesbury, & Scotch coal. Made also Expets with Peat, wood & vegetables[^] of different sorts - in the state of sawdust, leaves of trees - air conveyed through pipes 70 feet ong, also carried about in bags of leather, bladder & silk varnished & air holders of tinned Iron. Mr Murdock made also Expets at Old Cumnock with Peat & Coal in 1797"

An extant memorandum of unknown authorship but dated 28th January, 1808, showed that detailed gas production experiments commenced on 2nd March 1805; were conducted at Soho in September of that year by both H.Creighton and Wm. Murdoch; and continued up to 1807.

A letter of April, 1805 recorded "Dates of Mr. Murdoch's expts. upon the light obtained from coal, gas, etc."

"Date of Small Retort in Soho Laboratory:

Pattern made by W. & J. Middleton	5th December, 1798
Casting charged from foundry	12th December, 1798
Wm. Wills & Son.	Dates missing.
Wm. Murdoch, in fitting it	12th December, 1798

Date of Retort made for lighting the Foundry:

Pattern of cover made by Jas. Middleton.	17th February, 1802
Fitted and first lighted about	20th February, 1802"

These data were probably gathered in 1808 to substantiate Murdoch's claim to priority over Winsor as inventor of gas lighting.

Recent historians have accepted Clegg's statement that only two gas lights were used in the 1802 Soho Public Illuminations, rather than Wm. Matthew's view that many gas lights were involved. An independent observer with scientific knowledge, J.P.N., saw "numerous experiments demonstrating the practibility of extensive application" of gas¹ and also the "grand exhibition" of 1802.

Murdoch was intensely secretive about his experiments, and Clegg² may have under-estimated the quantity of gaslights shown,

1. J.P.N. of Birmingham, Mechanics Magazine 1833 vol.XIX p.87

2. L.L. Mechanics Magazine 1835 vol.XXII p.470

Clegg was only employed for the cupola crown during the 1802 display and stated that most of the lamps used were oil-fired.

A.W. Matthews A Biography of Wm. Matthews (1899) op cit pp.114-5

Others also claimed to have rivalled Murdoch:-

T.Hatchard claimed to have experimented with gas for lighting in 1789.

Philip Stall was said to have lit the Lyceum with gaslight before Winsor's demonstration there. Vide A.W. Matthews A Biography of Wm. Matthews (1899) op cit pp.59, 93, 103, who quoted Mirror vol. XI p.340, 419, and Morning Advertizer, October and November, 1828.

particularly since he was subsequently a rival of Boulton and Watt in supplying gas equipment.

Boulton and Watt were reluctant to complete the gas installation for Phillips & Lee in Manchester, where in 1805 Mr. Clegg, Murdoch, and a second Murdoch had been installing a 14 h.p. steam engine for Mr. Lee. Wm. Murdoch wrote angrily to Soho on 23rd December, 1805:

"As none of Mr. Lees lighting apparatus is yet arrived, I sent Wm. Murdoch off on Sunday on the course of the canal with orders not return till he received information concerning them. Please to let me know if the second receiver is sent off by land or by water, if material cannot be forwarded in a more expeditious way than they have hitherto been done it is of no use thinking of taking orders here for your old servant Clegg is manufacturing them in a more speedy manner than it appears can be done at Soho"

On 14th August, 1806, detailed pipe statistics for gas at Phillips and Lees Mill were prepared by Creighton, and a letter from Henry Creighton on 9th August, 1809, shows him to have also been in charge of installing the gas apparatus at ^{Mc}Connel and Kennedy's mill in Manchester.

(B) Cost of Gas Apparatus from Soho - Scottish Plant compared to other installations.

The following verbatim statement of costs is extant in the Soho records, although it is an incomplete list:

"Amount of Lighting Apps made in different years

	Foundry Charge			Soho Charge		
	£	s	d	£	s	d
30 Sept. 1805 to 30 Sept. 1806						
Phillips & Lee. Part of apps. charged in the next year.	2,137	17	0			
1806 to 1807						
Phillips & Lee do	<u>923</u>	8	2			
GAIN £612 14s 10d	3,061	5	2	274	0	0
1807 to 1808						
Phillips & Lee addn.	44	5	10	49	0	0
GAIN £4 14s 2d						

	Foundry Charge			Soho Charge		
	£	s	d	£	s	d
1808 to 1809						
H.H.Birley & Co.	552	17	0	700	0	0
do addn.	72	8	6	79	10	0
Jas. Kennedy	447	19	1	537	0	0
Wormw _{ld} , Gott & Co., Birley Mill	544	6	2	650	0	0
do do addns.	27	6	2	35	0	0
McConnel & Kennedy Part of apps.	718	17	7½	862	0	0
* R.Gillespie & Co.	307	0	0	378	0	0
* Neilson & Co.	420	14	7	503	0	0
Benjn. Gott Esq., Armley Mill	397	7	11	496	2	5
do addns.	<u>23</u>	<u>17</u>	<u>7</u>	<u>23</u>	<u>17</u>	<u>7</u>
GAIN £751 7s 3½d	3,513	2	8½	4,264	10	0
1809 to 1810						
McConnel & Kennedy addns.	855	18	5	1,038	0	0
* R.Gillespie & Co. do	2	12	11	2	19	4
* Neilson & Co. do	24	10	11	28	10	0
Marshall Hives & Co., Leeds	717	18	10	890	0	0
Wormw _{ld} , Gott & Co., Birley Mill addn.	3	8	5	4	10	0
* Gillespie & Co.	50	17	1	51	8	0
Birley & Hornby, Chorlton Mill	567	9	7	690	0	0
Lister Ellis & Co.	521	16	11	610	0	0
Phillips & Lee addns	56	3	0	68	0	0
do do	261	9	4½	313	0	0
McConnel & Kennedy do (charged in the following year)	77	3	5	77	3	5
James Kennedy do (additions)	76	14	11½	87	0	0
J.T. & E. Lewis	661	10	11	620	0	0
T.Coupland & Sons	448	14	7	500	0	0
Wormw _{ld} , Gott & Co., Park Mill, part of apps.	<u>408</u>	<u>4</u>	<u>1</u>	<u>490</u>	<u>0</u>	<u>0</u>
	4,808	10	2	5,563	10	9
1810 to 1811						
McConnel & Kennedy part of apps.	568	7	9	667	0	0
H.H.Birley & Co. additions	38	16	0	38	16	0
T.Coupland & Sons do	<u>207</u>	<u>2</u>	<u>10½</u>	<u>249</u>	<u>0</u>	<u>0</u>
CARRIED FORWARD	862	7	7½	1,014	16	0

	Foundry Charge			Soho Charge		
	£	s	d	£	s	d
BROT. FORWARD	862	7	7½	1,014	16	0
* R.Gillespie & Co. addn.	32	7	0	37	10	0
Birley & Hornby, Chorlton addn.	280	6	6	335	10	0
Lister Ellis & Co. do	charged in the previous year					
Wormwold, Gott & Co., Park Mill, addn.	186	12	6	224	0	0
Marshall Hutton & Co., Shrewsbury	844	6	9	1,150	0	0
Huddart & Co. Part of apps.	162	5	3	195	0	0
Benyon, Benyon & Bage	714	5	3½	970	0	0
do addn.	<u>43</u>	<u>19</u>	<u>8</u>	<u>50</u>	<u>10</u>	<u>0</u>
GAIN £850 15s 5d 27%	3,126	10	7	3,977	6	0

Note - * Scottish Installations

Source - Birmingham Ref. Lib. Soho Collection Box 30.

(C) Financial Benefits of Gas Lighting

Estimate based on Phillips and Lee's Gasworks (1808):

Total light produced equal to 250 mould candles of 6 in 1 lb., each consuming 175 grains (4/10 oz.) tallow per hour.

250 Argand burners, each equal to 4 candles	}	2,500
633 Cockspur burners, each equal to 2¼ candles		candlepower

Burners used on average 2 hours per day per year, and consumed 1,250 cu. ft. per hour.

2 hours = 2,500 cu.ft. requiring 7 cwt. Wigan cannel at 13½d per cwt. (22s 6d per ton) = 8s.

313 working days per year = { 110 tons cannel for retorts
40 tons common coal as fuel

100 tons cannel produced 70 tons coke selling as 1s 4d per cwt.

1 ton cannel gave 11 or 12 gallons tar (1,250 gallons per year) but no market available for sales.

Expenses per year:	100 tons cannel	125
	40 tons common coal (10s per ton)	<u>20</u>
		145
	Deduct value of 70 tons "coak"	93
	Coal expenses after deducting coal income	50
	Interest of Capital and Maintenance costs	<u>550</u>
	Total cost per year	£600

The candles required to give equivalent light would have cost £2,000.

If used for an average of three hours per day, annual gasworks cost would have been £650 compared to candles at £3,000. Hence "the greater the number of hours the gas is burnt, the greater will be its comparative economy"

Source - W. Murdoch "An Account of the Application of Coal to Economical Purposes" 25/12/1808 p.124 Royal Society of London Philosophical Transactions 1808

(D) Transmission of Knowledge

Henry and William Creighton were the engineers on Murdoch's team who did much to assist the spread of gaslight technology. William probably had the greatest chance apart from Murdoch himself of informing Glasgow and other Scottish mechanics about early progress on gaslight apparatus. However no confirmation of his influence upon the Glasgow gas experiments is possible from correspondence with Boulton and Watt. In 1796 he worked in the Soho Engine Yard¹ but subsequently had a roving commission and worked² in Manchester, Preston, Chester, Newcastle-on-Tyne and Glasgow in 1800; and in Manchester, Liverpool, Preston, Bath, Glasgow, Edinburgh, Catrine and Saltcoats³ in 1801. That included work with Murdoch in Glasgow⁴ and with Clegg in Manchester in 1801. In 1802 he went to Manchester, Bath and Glasgow⁵ where he met Mr. Monteith. In 1803 he visited Aberdeen, Leadhills and Edinburgh⁶; again Glasgow⁷ in 1804; and Nottingham and Derby⁸ in 1805. In 1815 William was employed in Manchester where he was well acquainted with gasworks like that of Messrs. Birely & Hornby⁹. Henry Creighton was also actively concerned with Manchester gasworks in

1. Soho M.S.S. Loose Letters

8/12/1796, 4/7/1799

2. Manchester 3/12/1800, 25/6/1800, 15/5/1800, 10/4/1800, 1/4/1800, 21/3/1800, 14/3/1800, 9/3/1800, 24/2/1800

3. Preston 4/3/1800, 27/2/1800; Chester 6/6/1800; Newcastle-on-Tyne 23/12/1800; Glasgow 29/11/1800. Vide "Memorandum for Mr. Creighton, July, 1800" on his work in Scotland. Manchester 10/1/1801 to 24/5/1801, 5/8/1801 to 21/10/1801; Bath 19/12/1801; Glasgow 11/6/1801, 22/6/1801

4. Glasgow 30/5/1801; Manchester 12/9/1801

5. Manchester 14/2/1802 to 17/10/1802; Bath 5/1/1802; Glasgow 11/11/1802

6. Glasgow 14/1/1803, 15/2/1803 to 13/8/1803, 15/10/1803 to 29/12/1803; Aberdeen 3/2/1803; Leadhills 6/10/1803; Edinburgh 13/12/1803

1806-9, and helped to design the original Glasgow gasworks of 1817. Henry wrote the Encyclopedia Britannica (1824) article on gaslighting¹ and appears on a document² of 1/1/1819 concerning Glasgow gasworks. William remained with Boulton and Watt by whom he was employed³ in 1826 with 'Murdoch' on pumps for London dockyards.

Source - Birmingham Ref. Lib. Soho Loose Letters (Box 19)

(E) Installations by Samuel Clegg (1781-1861)

- 1805 Left Soho and built experimental gas plant in Manchester at private house.
- 1806 Erected gas plant for own manufactory at Deans gate, Manchester.
- 1806 Supplied apparatus to:
- Henry Lodge's cotton mill near Halifax (forestalling Murdoch's success at Manchester by two weeks)
 - Mr. Potter's cotton factory, Bury, Lancashire
 - Mr. Barton's dyehouse, Manchester
 - Mr. Thornton's drawing academy, Manchester
 - Messrs. Gullymore's print works, near Bury, Lancashire
- Offered to supply Manchester street lamps from the Dean Gate plant, but the town council refused, apart from lamps in King's Street.
- 1807 Lit residence of Henry Lodge at Willow Hall, Halifax. Supplied plant to Messrs. T. & S. Knight, Longsight, Manchester
- 1808 Stony^ehurst Roman Catholic College, near Clithero (first use of a lime purifier)
- 1809 Harris's factory at Coventry (first agitator used in purifier)
- 1811 Factory at Dolphinholme, near Lancaster
- 1811-2 Messrs. Greenways' large cotton Mills, Manchester (invented hydraulic main)
- 1812 Mr. Ackermann's house, shop and showrooms in the Strand, London (first lime-water machine?)
- 1812 Samuel Ashton & Bros. cotton mills, Hyde, Stockport

7. Glasgow 6/1/1804 to 10/8/1804

8. Nottingham 19/4/1805; Derby 27/6/1805

9. Vide supra p. 1346

1. Glasgow City Archives (D.G.E.4)

2. Soho M.S.S. 19/6/1815

3. *ibid* 19/11/1826, 17/11/1826, 16/3/1829

1817 Gasworks for the Royal Mint

Note - The Stoneyhurst installation is dated 1811 by W. Matthews, but 1808 by D. Chandler.

Sources - "Materials for a Memoir of Mr. Samuel Clegg, and Authentic History of the Art of Gas Lighting"
Mechanics Magazine 1834-5 vol.22 p.470
Mechanics Magazine 1835 vol.23 p.59
 W. Matthews Historical Sketch (1832) op cit pp.328-9
 D. Chandler Rise of the Gas Industry in Britain (1949) p.47

(F) Installations by Josiah Pemberton (1768-1832)

1806 Pemberton's plant for his own factory at Bull Street, Birmingham

1806 Mark Saunders Button Factory, Birmingham

1807 Golden Lane Brewery, London

1807 Several Birmingham factories, including I. Spooner & Co.

1808 B. Cook's brass tube and 'toys' factory

Note - Pemberton's brother, Thomas, was a wealthy Birmingham brass-founder.

Sources - A.W. Matthews Biography of Wm. Matthews (1899) op cit p.112
 T.S. Peckston Theory and Practice (1819) op cit pp.40-2
 E.G. Stewart Town Gas (1958) p.8

Up to 1809 these three manufacturers of gas apparatus were the principal ones in Britain. Watt told a Commons Committee in 1809 "I believe ours is the only extensive manufactory at present engaged in the manufacture of this apparatus" and he knew of only two other manufacturers "one upon a small scale at Manchester, and another at Birmingham". This suggests that the private Scottish gasworks of this period were built by local craftsmen to individual specifications and not by a specialist contractor, other than Boulton and Watt.

Sources - Evidence of James Watt. B.P.P. 1809 (220) 111(315) Minutes of Evidence of the Select Committee on the Gas Light and Coal Company Bill pp.54 (368), 59 (373)

(G) Publicity of Financial Advantages of Private Gasworks

Small-scale private gasworks in Scotland were inspired directly by the well publicised achievements of Clegg, Cook and Messrs. Lloyd R. Ackermann of the Strand, London, from 1812 lit his works, his public library, warehouse, printing offices, workshops and dwelling houses entirely from two retorts installed by Clegg and charged

with 240 lbs. of coal (half of Newcastle coal, and half cannel coal at double the cost), which gave 1,000 cu.ft. gas.

The furnace fuel for that output was 100 lbs. of common coal if the retort commenced cold; or 25 lbs. if maintained at red heat. The gas was used in 40 large Argands for four hours per night in winter, plus eight normal Argands and 22 single cockspur burners for three hours per night. The printers used sixteen cockspur burners for ten hours a day to heat their printing plates, in place of charcoal fires. Although both retorts were used in winter, the yearly average was one retort per day, a total of 10 chaldrons of Newcastle and 8 of cannel coal. The printers welcomed the light, and the absence of charcoal and oil fumes; while £50 per year was saved because oil and tallow was no longer spilt on prints, drawings, or books. Ackermann supplied the following statistics, published in 1815 by Accum:

Cost Benefit Analysis of Private Gasworks by R.Ackermann (1815)

	£	s	d	£	s	d
10 chaldrons Newcastle coal at 65s	32	10	0			
8 tons cannel coal at 100s per ton	40	0	0			
7 chaldrons furnace coal at 55s	19	5	0			
Wages	30	0	0			
"Interest" on capital cost	30	0	0			
(Wear and tear considered equal to that of oil lamps and candlesticks formerly used, and not included)						
						151 15 0
Deduct:						
23 chaldrons coke at 60s	69	0	0			
Ammoniacal liquor	5	0	0			
Tar	6	0	0			
Saving made on charcoal previously used to heat copper plates for printing	25	0	0			
2 chaldrons of coal still required for warming the building	6	10	0			
						111 10 0
Nett expenses of gas light						40 5 0
Previous cost of oil/candle lighting per year	160	0	0			
Annual cost of gas lighting	40	5	0			
Annual advantage of gas lights:						119 15 0

Source - F.Accum Practical Treatise on Gas Light (1815) op cit pp.70-2

Cook produced 962.5 cu.ft. from 20 to 25 lbs. coal, and reduced his factory lighting costs from 3s to 4d per day. Candles had been used for lighting only 15 weeks a year, but gas was cheap enough to use for 20 weeks and the annual lighting bill was still reduced from £50 to £20. Gas flares used for soldering saved a further £30 in place of oil.

Messrs. Lloyd, thimble makers and Whitesmiths of Southwark first used gas in 1809, and also developed it for soldering. 69 lbs. (4 pecks) coal costing 1s at that date gave coke worth 1s 4d; 6 lbs. tar which they used in the works thereby saving 1s; and gas to supply 42 lights for 7 hours (for which 7 lbs. candles costing 7s was previously necessary). The total saving was 8s on each 4 pecks of coal.

Source - T.S.Peckston Theory and Practice (1819) op cit pp.107-8

Note - Rudolph Ackermann (1764-1834) was a German inventor and publisher, who opened a print shop on the Strand in 1795. Vide Encyclopaedia Britannica (1929) 14th Edn. Vol. I p.126

E.G. Stewart Historical Index of Gasworks Past and Present in the Area Now Covered by the North Thames Gas Board 1806 - 1957 (1957) p.123

(3) Candle Production in Scotland

(A) Output

Date	Tallow lbs	Wax lbs	Date	Tallow lbs	Wax lbs
1800	3,897,594	-	1815	5,076,487	-
1801	3,548,602	-	1816	4,850,832	-
1802	3,587,345	-	1817	4,943,422	-
1803	4,425,519	-	1818	4,809,136	-
1804	4,135,016	-	1819	4,793,438	-
1805	4,664,969	-	1820	4,681,513	-
1806	4,502,299	98	1821	4,864,720	-
1807	4,859,696	36	1822	4,819,340	-
1808	4,370,996	224	1823	4,898,908	456
1809	3,556,274	-	1824	5,445,656	258
1810	4,645,437	-	1825	6,250,856	624
1811	4,737,025	-	1826	6,258,280	-
1812	4,316,928	-	1827	6,005,550	-
1813	4,226,739	-	1828	5,959,857	912
1814	4,774,331	-	1829	5,731,299	1,516

Source - B.P.P. 1830 (468) XXV 281

(B) Scottish Chandlers Holding Excise Licences

Date	Number	Date	Number	Date	Number
1826	188	1830	214	1834	214
1827	-	1831	219	1835	203
1828	288	1832	219	1836	180
1829	218	1833	200	1837	177

Source - B.P.P. 1837-8 (396) XLV 455

Candle production is not, alone, a comprehensive measure of the demand for illumination before gaslighting, and the number of chandlers in some towns like Paisley (in 1812) declined because oil-lamps were used. Vide J.Wilson General View of the Agriculture of Renfrewshire (1812) p.263

APPENDIX I I

Documents Relating to Gas Company Development

- (1) F.A. Winsor and Scottish Investment in the First Joint Stock Gas Company.
- (2) The Marketing of Shares by Nascent Companies
- (3) Early Directors of Scottish Gas Companies

(1) - F.A.Winsor and Scottish Investment in the First Joint-Stock Gas Company

In 1802 at Brunswick, F.A.Winsor demonstrated a prototype gas "stove" or retort plagiarised from M.Lebon of Paris. In 1803 his experiments resumed at Grosvenor Square, London, followed by a patent in 1804 (Pat. 2764) and public demonstrations at the Lyceum Theatre. In 1805 Winsor proposed a joint-stock gas company to supply premises in London, and he obtained influential help from the Prince of Wales, the Duke of Atholl, and Ludovic Grant. The Grant family of Scottish lairds may have subsequently assisted the promotion of several Scottish gasworks, like Edinburgh, but little detail is extant upon their precise role.

With the assistance of Frederick Christian Accum (1769-1838; lecturer at the Surrey Institute in London, later member of Chartered Gas Co., and author on the industry) Winsor lit Pall Mall in December 1807-1808, the first public road lit after G.^{A.}Lee used gaslight for 300 yards of private road in Manchester in 1807.^A The original retorts were designed to produce by-products like "Oil, Pitch, Tar and Acids" and coke, as much as illuminating gas. Retorts were to use the surplus heat of breweries, metal-smelters and steam engines, and the gas and coke produced could be burned to supplement those furnaces. Alternatively, "inflammable air from raw and refined smoke" could light and heat buildings and streets, and be used for "telegraphs and making signals".

J.Ludovic Grant organised the businessmen who raised £15,000 to cover the Parliamentary expenses of Winsor's New Patriotic Imperial and National Light and Heat Company with £1 million capital stock which aimed to provide supplies throughout Britain. The Company desired a national monopoly and a tax of 10/6d per chaldron on raw coal to force all industries to consume gas-coke. Chimney climbing-boys would no longer ^{have} be required, and the nation would ^{have} saved £128 million per year by preventing the import of foreign tallow and lamp oil. Potential annual profits were estimated at £115 million, or £500 per £5 share. Coal consumption in the United Kingdom was estimated at 10.5 million chaldrons per year, and the Company expected to spend £13 million per year on coal, and obtain £242.6 million revenue, of which £114.5 million would be spent on working costs.

Opposition from Boulton and Watt prevented the Imperial and National Company from obtaining a Parliamentary charter in 1809, but a more modest project by Winsor, the London and Westminster Chartered Gas Light and Coke Company (capital £20,000) succeeded with its Bill in June 1810. In this, the first joint-stock gas company, Captain Charles Thomas Grant of Musselburgh was a leading investor. He did not invest in the Edinburgh gas company of 1817, but may well have provided guidance to other promoters of that company. The Chartered Company's Bill of 1809 provided the first detailed estimate of gasworks capital costs, based on the idea of several inter-linked sub-stations producing gas -

Estimated Expenditure by the Chartered Gas Company (1809)

	£	s	d
Erecting six stoves (£0.30 each) } at each station	1,030	0	0
Buildings £500 at each station	3,000	0	0
Trenching and re-filling for pipes	165	5	0
Ditto Roadways	1,962	0	0
Ditto Footpaths	1,050	0	0
Iron-Tube Mains pipes (65,500 ft at 3/- per foot)	9,825	0	0
Plugs, stop-cocks, etc.	500	0	0
Lamps, burners, service pipes	4,000	0	0
		22,285	5 0
Labour £3/3/- per station per week	982	16	0
£25% Wear/Tear on stoves.	170	0	0
£2.5% ditto on Buildings	75	0	0
£2.5% ditto on Pipes	245	12	6
£2.5% ditto on Burners etc.	100	0	0
Rent of 6 stations (£60 each/year)	360	0	0
		2,033	8 6
		26,546	2 0

Note - Winsor's Patents 1804 Pat. 2764; 1808 Pat. 3113; 1809 Pat. 3200

Sources - F.Accum, Gasworks in London (1820) Preface
 S.Everard, History of the Gas, Light and Coke Co.(1949)
B.P.P. 1809 (220) III pp. 423(356); 38(352)
Mechanics Magazine 1837 vol. 27 p.338
The Repertory of Arts, Manufactures and Agriculture II
 Series vol. V p.172
 E.G.Stewart Town Gas (1958)
 "Beginnings of Gas Lighting" J.G.L. 10/5/1855 p.91
In Parliament - Gas Light Bill (Grounds Upon Which this
Bill is Opposed). (1809)

Despite early technical problems in the Chartered Company, the assistance given to Winsor by F.C. Accum was considerable. Accum was educated at the gymnasium of Buckebury, his birthplace, near Hanover, and became a chemist of high standing. In 1793 he was employed in London by Mr Brande, pharmacist to George III, and father of Wm. T. Brande, the famous chemist. Accum opened his own pharmacy in 1800, and began to give private lectures besides supplying chemical apparatus to the Royal Institution. His System of Theoretical and Practical Chemistry (1803) was followed by a series of textbooks including Elements of Crystallography (1813), Dictionary of Apparatus (1821) and Treatise on the Adulteration of Food (1820). Accum was a friend of R. Ackermann. He removed to Berlin in 1822, as Prof. Technical Chemistry at the Royal Industrial Institute, and Prof. Physics, Chemistry and Minerology at the Royal Academy of Construction.

Source - C.A. Browne "The Life and Chemical Services of Frederick Christian Accum" Journal of Chemical Education (Pub. Oct, 1925 American Chemical Society, Easton, P.A.) pp. 829-51, 1140-49
 National Reference Library of Science and Invention, London.

(2) The Marketing of Shares by Nascent Companies

The vetting of applicants was practised by early gas companies, and by consumers' companies, which excluded non-resident applicants even in large towns. Marketing was generally performed by the Interim Committee of Promoters, but newspaper evidence from large towns shows that the receipt of applications was increasingly devolved upon company officials instead of Promoters.

1817 Edinburgh Gas Light Company

Applications for shares to Promoters, listed with their address in the prospectus.

(S.R.O. Unextracted Process S.Reid v Gas Light Co. 1822)

1824 Inverness

Subscription papers lodged at Banking Office, with A.Anderson, Banker and the Secretary, and with members of Interim Committee.

(Inverness Journal 17/12/1824)

1825 Stirling

Subscription list and draft articles lodged at Town Clerk's office.

(Stirling Journal 16/6/1825)

1825 Portable Oil-Gas Company in Dundee

Subscriptions to R.Pierson, Merchant, Dundee; Saunders & Galletly, writers, Dundee, W.Roberts, Dundee New Bank; and, for a few days only, G.Gardiner, writer in Perth, (because Company hoped to serve Perth area also).

(Perthshire Courier 29/4/1825)

1828 Edinburgh 'New Gas Company'

Subscription papers lodged with member of Provisional Committee, listed in prospectus.

(Edinburgh Evening Courant 19/4/1828)

1836 Aberdeen New Gas Company

Subscription lists 'lay for signiture' with A.Stronach, J.Nicol, and J.Muir advocate in Aberdeen.

(Aberdeen Journal 8/6/1836)

1839 Edinburgh 'New Joint-Stock Gas Company'

Application for shares to made to member of Provisional Committee, listed in prospectus.

(The Scotsman 20/3/1839)

1842 Glasgow City and Suburban

Application to Messrs. MacEwan & Auld, Accountants or J.C.Faulds, Accountant, Glasgow.

(Glasgow Chronicle 7/10/1842)

1844 Edinburgh 'New Gaslight Company'

Application to members of Provisional Committee, or to Ainslie, MacAllan & Graham, W.S., Agents of the Company.

(The Scotsman 14/2/1844)

1844 Perth Consumers

Application to J.L.Hill, W.S. of Perth; Messrs Pillans & Home, Sharebrokers, Edinburgh; or J.C.Faulds, Sharebroker, Glasgow.

(Perthshire Courier 29/2/1844)

1845 Greenock and Suburban Gas Association

Applications to H.Dempster, writer, Interim Secretary; Messrs. Lang & Brown, Stockbrokers of Glasgow; Wm. Muir of Prices Street, Edinburgh.

(Greenock Advertizer 22/4/1845)

1844 Portobello

Application to Company Secretary, or Mr. Fox, bookseller of Portobello, or W.Bell, Sharebroker, Edinburgh.

(The Scotsman 14/5/1845)

1844 Dundee New Gas Company

Applications to Messrs. J.Robertson & Co., Stockbroker, Edinburgh; J.C.Faulds, Stockbroker, Glasgow; D.B.Niven, Stockbroker, Dundee; Shiell & Small, writers, Dundee (Interim Secretaries).

(Dundee, Perth and Coupar Advertizer 23/3/1844)

1845 Edinburgh New Gas Light Company

Applications to Provisional Committee; or to E. & A. McMillan, W.S.,

Interim Secretaries.

(Edinburgh Evening Courant 13/3/1845)

1845 City of Edinburgh Gaslight Association

Applications only to Messrs. Arnott & Malcolm, W.S., Interim Secretaries; Messrs. Reid & Nicolson, Sharebrokers, Edinburgh; Mr. A. Moffat, Sharebroker, Edinburgh.

(The Scotsman 19/3/1845)

1845 Glasgow and Suburban Consumers' Gas Company

Applications to Company Solicitor, A. Monteith, Glasgow; Messrs. Jackson & McCowan, Stockbrokers, Glasgow; Messrs. Dowling & Howden, Stockbrokers, Edinburgh.

(Glasgow Herald 18/10/1845)

1845 Stirling and Suburban Gas Company

Applications to Interim Secretary, J. Chrystal jr., writer in Stirling. J.C. Faulds, Sharebroker, Glasgow.

(Stirling Journal 21/2/1845)

1857 Glasgow Consumers' Gas Company

Prospectus from Interim Secretary, W.L. McPhun, Glasgow. Applications to J.C. Faulds, Accountant, Glasgow; Messrs. T.G. Buchanan & L.M. Kerr, Sharebrokers, Glasgow.

(Glasgow Herald 4/5/1857)

1861 Perth Gas Consumers' Company

Data and applications to Secretary/Treasurer, H. Skeete, Solicitor.

(Perthshire Courier 15/10/1861)

Note - J.C. Faulds, Accountant/Stockbroker of Glasgow, was associated with the 1842 Glasgow C. & S.; 1844 Perth; 1845 Stirling; and 1857 Glasgow Consumers' Companies.

(3) Early Directors of Gas Companies

All directors reside in same town as Company, unless otherwise stated.

GLASGOW

(1) List in Act of Incorporation (1817)

Lord Provost of Glasgow;

James Buchannan of Dorrhill - probably member of James Finlay & Co., Textile Firm.

Walter Ferguson, Merchant;	Wm. Dunn,	Cotton Spinner
John Dunning, Writer;	James Ewing,	Merchant
James Hamilton, Grocer;	Henry Houldsworth,	Cotton Spinner
Robert Jarvie, Merchant;	Henry Monteith,	Merchant
John Robi _u son from Hydrabad;	Andrew Templeton,	Banker

(2) List on By-Products contract of 27/4/1819, with pencil amendments believed to date from alterations of the contract in favour of C.Macintosh, in December, 1819.

(Glasgow City Archives D.G.E.4)

(A) Company Directors (in ink) on 27/4/1819

James Ewing, Merchant; Walter Ferguson, Merchant; Henry Monteith, Lord Provost; James Hamilton, Grocer; Robert Jarvie, Merchant; John Robi_uson; Andrew Templeton, Banker; Thomas Dunlop Douglas, Merchant; William McGavin, Merchant; Alexander Finlay, Carver & Guilder; Charles Macintosh, Merchant; John Dunning, Writer.

(B) Company Directors (pencil alterations) in December 1819

D. Dannatyne; John Maxwell of Dingwall.

Other Directors as before, except C.Macintosh and J.Dunning who were omitted.

Note - Other partners named in 1817 Act were Andrew Mitchell writer; Robert Lindsay merchant (possibly yarn merchant, of Messrs Lindsay and Adam); Joseph Bain writer (or Mail Coach officer); John McIlwhram manufacturer; Wm. Monteith; Robert McCall merchant; Thomas Grahame writer; James Hunter (possibly a manufacturer); George Thorburn; Robert Berrie writer; James Black (possibly a merchant of J.Black & Co.); George Burn of the Bull Inn and Coach Office (where early gas company meetings were held); Robert Humphrey cotton spinner; and John Henderson chandler.

EDINBURGH - List from Act of Incorporation (1818)

Governor - Lord Provost Kincaid MacKenzie;

Deputy Governor - Sir John Marjoribanks of Lees;

Ordinary Directors -

Wm. Arbuthnot of Charlotte Sq.; John Young of George St;

A.Henderson, Lord Dean of Guild; Alex. Gordon of Kings' St.

Wm. Trotter, Upholsterer; Wm. Inglis, W.S.

J.Manderson, Druggist; J.Pillans of S. Bridge St.

James Innes of Prices St; Paul Baxter of N. Bridge St.

J.Denholm, Treasurer of Heriot's Hospital

Extraordinary Directors -

Lord Gray; William Dundas

Sir George MacKenzie of Coul; Sir Patrick Walker

Henry Jardine; Robert Dundas

James Simpson; Robert Johnstone of N. Bridge St.

Robert Downie of Appin; John Leslie, Professor of Mathematics

Dr. Thomas Browne, Prof. of Moral Philosophy

LEITH - List from Act of Incorporation (1822)

Chairman - John Macfie, Magistrate;

Deputy Chairman - Abram Newton, Magistrate;

Directors -

A.Park, Master of Incorporation of Maltmen, Leith;

W.Thornburn, Master of the Merchant Company in Leith;

James Reoch, Magistrate; R.Menzies, Shipbuilder

P.Wood, Merchant; J.Wyld, Merchant

W.Mowbray, Merchant; Wm. Auld, Soap-boiler

J.Russell, Builder; J.Gavin, Shipbuilder

Note - Other promoters named in the Act, included Wm. Arbuthnot (Lord Provost of Edinburgh and a member of the Edinburgh Gas Company); A.Henderson (First Baillie of Edinburgh); Adam and Charles White, P.Lindsay and R.Coldstream, all merchants in Leith; H.Veitch, Town Clerk of Leith; Wm. Creelman, resident in Portobello.

PERTH - List from Perthshire Courier 27/12/1822

Directors -

P.G.Stewart, Lord Provost; Robert Russ of Oakbank;

J.M.Patton, Sheriff Clerk; David Beaston of

Robert Peddie, City Clerk; Adam Anderson, Rector of Academy
 Francis Robertson; Robert Hepburn; Robert Stirling
 Robert Buist; John Douglas; John Ross, jnr
 Robert Robertson

PAISLEY - List from Act of Incorporation (1823)

Governor - Ludovic Houston of Johnstone, Esq.

Deputy Governor - Robert Farquharson

Directors -

William Waterson; William Gilmour; Alexander Fullarton
 John Orr, jnr; James Wylie; James Buchanan
 Joseph Twigg; George Miller; James Jackson; John Bell

Extraordinary Directors -

John Blackburn; James Stewart; Campbell Snodgrass
 John Maxwell; Andrew Mitchell; James Thomas Murray
 William Fulton; Robert Cochran; Robert McKechnie; William Lowndes
 Note - J.Buchanan and A.Mitchell may have also been leading members
 of the Glasgow Gas Company. G.Miller later became an important
 coal-tar manufacturer. Other proprietors also listed in 1823 were
 Matthew Boyd, James Carlisle, James Lamb, Alex. Gardner, John Scott,
 John Wylie, Robert Muir and David Wallace.

DUMFRIES - (1824) List from S.R.O. (B.T.2/22)

President - Wm. Thomson, Provost

Vice President - James McWhir, Merchant

Directors -

John Kerr, Writer; W.McGowan, Builder; W.Newall, Architect
 J.Brown, Writer; W.Carson, Printer; J.W.Hinchcliffe, Jeweller
 J.Thomson, Merchant; J.Sinclair, Stationer; J.McDiarmid, Printer
 W.McKie, Manufacturer; W.Gordon jnr, Writer;
 J.Barker, Baker; R.Kilpatrick, Collector of Land Tax;

EDINBURGH OIL GAS COMPANY - List from Act of Incorporation (1824)

Chairman - Sir Walter Scott

Deputy Chairman - James Dundas of Dundas

Directors -

J.W.Brougham, Wine Merchant; P.Brown, Merchant
 J.G.Craig of Ricarton; J.McDonald, Merchant
 Wm. Muir, Merchant; D.Ramsay, W.S.

R.Aytown, W.S.;
 W.Clerk, Advocate;
 Alex. Wood, Advocate;
 Alex. Craig, Merchant;
 T.Ponton, Builder;
 James Robinson, Coates Cres.;
 J.C.Scot of Sinton;
 John Bonnar, Banker; Wm. Hozier of Newlands and Barrowfield

M.A.Fletcher, Advocate
 George Dunlop, W.S.
 James Skene of Rubislaw
 Colin Mackenzie of Portmore
 Wm. Anderson of Charlotte St.
 Wm. McKenzie, W.S. of Crackaig
 Alex Greenhill, Advocate

Note - Other proprietors included Henry Cockburn, Advocate and Chronicler; J.H.Mackenzie, Senator of the College of Justice; A. Young, J.Gordon, J.Mowbray and D.Horne, all writers to the Signet; G.Cranstoun, Dean of the Faculty of Advocates; R.Jameson, Advocate; J.Ferrier, Principal Clerk of Session, and Thomas Allan, Banker.

INVERNESS - List from Act of Incorporation (1826)

Chairman - James Robertson of Aultnashiach, Provost of Inverness

Directors -

James Grant of Bught;	Alexander Anderson, Banker
Alexander Shepperd, Solicitor;	John MacAndrew, Solicitor
Roderick Reach, Solicitor;	Wm. Hughes, Civil Engineer
Niel Maclean, Land Surveyor;	John Inglis Nicol, Surgeon
Robert Smith of Dellmore;	James Gray, Merchant
John Ferguson, Wine Merchant;	Wm. Clark, Merchant

Note - Twenty other proprietors were also named in the Act.

DUNFERMLINE - (1829) List from S.R.O. (B.T.2/2245) with number of shares held.

J.Husband, Merchant	(2)	J.Kerr, Manufacturer	(10)
H.Inglis	(10)	A.Rutherford, Merchant	(10)
D.Inglis, Merchant	(5)	D.Reid	(5)
C.Lennox, Slator	(1)	J.Wilson, Merchant	(5)
H.Russell, Merchant	(2)		

INVERNESS - (1836) List from The Edinburgh Almanac (1836) Supplement p.27

Chairman - John Ferguson

Directors -

J.Fraser, jnr, Painter;	T.Ross, General Agent
Wm. Simpson, Merchant;	D.Rose, Baker

J.Fraser, Merchant; R.Wilson, Innkeeper
 A.Forbes, Chemist; W.Keith, Watchmaker
 J.Mitchell, Civil Engineer; N.Maclean, Land Surveyor
 Wm. Mackintosh of Plainfield

DUNDEE - List from Act of Incorporation (1830)

Directors -

James Scott; John Sturrock; David Miln
 Alexander Balfour; John Guthrie; George Symers
 David Baxter; Patrick Scott; Archibald Crichton
 John Sim; David Martin; John Baxter

TOLCROSS - List from Act of Incorporation (1836)

Proprietors -

Colin Dunlop, Ironmaster; John Wilson, Ironmaster, Clyde Ironworks
 Andrew Bannatyne, Solicitor; Dugald J. Bannatyne, jnr, Solicitor
 George Dunlop, W.S., Edinburgh; John McIlquham, 'Agent'
 John Tait, Coal Agent, Glasgow; Colin Robert Wilson, Ironmaster
 David Ralston, Iron Merchant; Colin M. Frew, Merchant, Glasgow
 Note - C.Dunlop and J.Wilson were partners with J.B.Neilson in the
 patent 'Hot Blast' iron process of 1828 but Neilson's employers for-
 bad his participation in other gas-company managements.

CUPAR - (1830) List from S.R.O. (B.T.2/3117)

J.Gray, Writer; T.Dryburgh, Writer; J.Robertson
 J.Russell, Draper; A.Hain, Draper; W.Pagan, Writer
 J.Coutts, Baker; J.Wilson, Merchant; G.Bogie, Draper
 Auditors - W.Walker, Grocer; J.Shaw, Draper
 J.Mackenzie, Accountant in Commercial Bank

LEITH - (1830) List from S.R.O. (R.S.27/1287) Sasine Vol. 1287

Chairman - James Reoch, Merchant

Deputy Chairman - H.Johnston of British Linen Bank

Directors -

Wm. Purves, Merchant Tailor; John Glover, Wright
 John Cockburn, Wine Merchant; J.B.Scott, Brewer
 W.Alexander, Wine Merchant; T.H.Weir, Baker
 W.W.Duffin, Resident in Edinburgh; J.Clapperton, Merchant
 Note - Company commenced 1822.

PAISLEY - (1831) List from Fowler's Commercial Directory of Ren-
frewshire 1831-2 (1831, Paisley)

Governor - Dr. Robert McKechnie

Deputy Governor - Alex Fullerton

Directors -

J.Bell, Merchant; Alex. Peacock, Beamer; James Dunn, Manufacturer

Wm. Taylor, Merchant (or writer)

John Orr, Cotton Spinner (or shawl manufacturer)

James Scott, Cashier at Union Bank (or bookseller)

Robert Farquharson, Manufacturer

Wm. Fulton, Merchant (or manufacturer)

Wm. Brown, Commission agent (or manufacturer, or baker, or grocer)

James Buchanan, Cotton twister (or wine merchant, or wright)

Note - Several persons with the same name prevent greater accuracy
of employment identification.

FALKIRK - (1834) List from S.R.O. (Stirling Sheriff Court Book,
Vol. 19, Folio 31)

H.Salmon, Banker; R.Russell, Merchant; W.Simpson, Resident

James Russel, Writer; J.Aitken, Brewer; A.Nimmo, Farmer

R.Melville, Wood Merchant;

Note - Falkirk Company commenced in 1829.

BATHGATE - (1834) List from S.R.O. (G.B.1/8/1)

A.Finlay, Baker; A.Angus, Merchant; J.Ferguson, Merchant

J.Black, Innkeeper; A.Forrester, Ironmonger

Treasurer - J.Dick, Merchant Secretary - T.Dick, Writer

DALRY - (1834) List from S.R.O. (G.B.1/23/1)

T.Barr, Portioner; P.Christie, Surgeon; J.Stirrat, Draper

T.Biggart, Woolspinner; F.Colligan, Innkeeper; W.Parker, Saddler

J.Orr, Teacher; H.Roger, Spirit Dealer;

A.Craig, Gentleman of Kirkland and Dalry

Clerk and Treasurer - J.McCosh, Writer

DUNSE - (1835) List form S.R.O. (G.B.1/27/1)

A.Darling, Surgeon; J.Wilson, Draper; J.Waite, Schoolmaster

J.Johnstone, Writer; G.White, Brewer; J.Mercer, Schoolmaster

J.Thomson, Draper; R.Brown, Grocer; J.Brown, R.S., Tadlow

KIRKCALDY - (1835) List from S.R.O.(B.T.2/1200)

(Company formed 1829)

Directors (Up to 1835) -

Provost Malcolm	James Hendry
James Aytoun	Edward Lang
Ninian Lockhart, sen.	William Hendry
William Skinner	James Henderson
Thomas Renold	William Kirk

Trustees for Company rights, securities and property -

John Fergus	Ninian Lockhart, jr.
Patrick Don Swan	James Loundin, cooper
David Gibson	Charles Mitchell Alexander

HADDINGTON - (1836) List from The Edinburgh Almanac (1836)

Robert Riddell (Chairman)

H.M.Davidson	Thomas Lea
John Martine	Robert Richardson

Officials -

George Dods, Secretary and Treasurer

George Spears, Manager

KIRRIEMUIR - (1836) List from S.R.O. (B.T.2/987)

D.Jamieson, Ironmonger; J.Lowden, Manufacturer; R.Finlay, Draper
 A.Milne, Wright; T.Patterson, Grocer; F.Tosh, Saddler
 D.Milne, Mason; J.Watson, Watchmaker; W.Stivens, Feuer

ANNAN - (1837) List from S.R.O. (G.B.1/1/1)

Provost Nelson; J.Montgomery, Draper
 Bailie Richardson; J.Nicholson, Merchant
 J.Little, Writer; John Sawyer of the Cotton Factory

VALE OF LEVEN - (1839) List from S.R.O. (G.B.1/82/1)

President - G.Kinloch, Banker

Vice President - John Orr Ewing, Turkey-red dyer

Directors -

J.McKinlay, Banker; D.Maxwell, Draper; John McFarlane, Engineer
 Lewis Guthrie, Grocer; Gilbert Long, Printfield owner

EDINBURGH & LEITH COMPANY - List from Act of Incorporation (1840)

Chairman - Sir James Forrest of Comieston, Lord Provost of Edinburgh

Deputy Chairman - John Learmouth of Dean

Directors -

J.Hill, Merchant; Ralph Richardson, Tobacconist
 Wm. Johnstone, Engineer; R.Alexander, Wine Merchant
 Alex. Jamieson, Merchant; John Jardine, Advocate
 Wm. Tait, Bookseller; Andrew Millar, Merchant
 George Grant, Advocate; James Smith, Architect
 E.Henderson, Seedsman; T.Liddell, Merchant of Abernethy

"All of the City of Edinburgh"

EDINBURGH & LEITH - (1843) List from The Scotsman 12/7/1843

Chairman - J.Learmouth

Deputy Chairman - Sir F.W.Drummond of Hawthorden

Directors -

R.Hunter, Esq; J.Smith, Architect; A.Jamieson, Merchant
 R.Clark, Merchant; W.Tait, Bookseller; A.Miller, Merchant
 T.H.Weir, Banker; R.Liddell, Merchant; R.Richardson, Merchant
 W.Alexander, Wine Merchant; Sir J.Forrest, Lord Provost
 J.Cornwall, Receiver General of Excise

GLASGOW, CITY & SUBURBAN - List from Act of Incorporation (1843)

Alex. Baird, Ironmaster; Alex. Hastie of R.Haskie & Co.
 James Dunlop, Ironmaster; James Merry, Iron and Coalmaster
 Robert Fleming; Mark Sprott, Advocate of Garnkirk
 James Lumsden, Stationer; Wm. Mutrie (possibly silk manufacturer)
 John Mitchell; Geo. Douglas, Lead Merchant
 Wm. Balfour, (possibly agent of Glasgow & Ship Bank)
 Note - J.Dunlop was the cousin of C.Dunlop who invested in Tolcross gas company.

COATBRIDGE - (1843) List from S.R.O. (B.T.2/191) with number of shares held.

J.Lusk, Baker (106); J.Baillie of High Cross (30)
 M.H.Adam, Flesher (52); Wm. Baillie of Greenhill (65)
 J.Murray, Joiner (31); R.Weir, Spirit Dealer (54)
 J.Weir of Dunbeath (65); J.Miller, Manager of Rosehall Colliery (89)
 T.Johnston, Clerk at Dundryvan Ironworks (31)

MAXWELLTOWN & DUMFRIES - (1845) - List from S.R.O. (B.T.2/112)

J.Burnie, Plasterer; J.Caldow, Ironfounder; R.Montgomery, Mason
 W.Geddes, Builder; D.Beveridge, Flour Dealer

Maxwelltown Residents

F.Nicholson, Merchant; D.W.Stewart, Stamp Distributor
 J.Appleck, Shoemaker; W.Clarke of Commercial Inn
 W.Primrose, Farmer; J.Hammond, Manufacturer
 J.McKay, Merchant; J.Hairsteus, Gentleman

Dumfries Residents

FALKIRK JOINT STOCK - (1845) List from S.R.O. (B.T.2/6)

A.MacFarlane, Banker of Thornhill
 T.Kier, Grocer; J.Jones, Flesher
 R.Henderson, Writer; J.Hosie, Grocer
 J.Rankine, Grocer; T.Stark, Draper
 A.S.Jaffray, Writer; J.Gartshore, Grain Merchant

PORTOBELLO - (1845) List from The Scotsman 14/5/1845

Thomas Craig, Paper Maker; John Smith, Builder (Baillie)
 W.Proudfoot, Baker; W.Douglas, House-factor (Baillie)
 Alex. Brown, Town Councillor; Wm. Mackie, Merchant (Town Councillor)
 W.Bailey, of Mid Lothian Glass Works

A. Robertson, Corn Merchant of Joppa
 Samuel Rathbone, Earthenware Manufacturer
 Henry Calder, Merchant (Town Councillor)
 J. Thomson, Resident (Town Councillor)
 J. Speirs, resident at Jock's Lodge

BANCHORY - (1845) List from S.R.O. (G.B.1/5/1)

J. Grant, Innkeeper; A. Thom, Surgeon
 A. Paul, Merchant; W. Sim, Merchant
 Provost Blaikie of Aberdeen

J. Ogg, Surgeon and Bank of Scotland Agent
 I. Machray, Coach Proprietor of Aberdeen

c.f. 1853 Banchory

Captain Ramsey, Banchory;
 A. Thom, Surgeon; W. McLean, Shoemaker; J. Grant, Innkeeper
 J. Watson, Feuar; W. Sim, Merchant; P. Davidson of Inchmarlo
 Note - Resident in Banchory unless otherwise stated.

DUNNING - (1846) List from S.R.O. (G.B.1/87/1)

Captain A.W. Wallace; R. Campbell, Teacher; A. Oswald, Weaver
 J. Young, Surgeon; R. Hastie, Merchant; R. Martin, Merchant
 P. Chalmers, Valuer; Wm. Clunie, Baker; R. Peddie, Teacher
 J. Martin, Manufacturer; * T. Miln, Farmer of Binzian Hill
 * Co. Treasurer. (P.H. Graham, weaver, Co. Clerk)

DUNDEE NEW COMPANY - List from Act of Incorporation (1846)

James Whitton; Joseph Doctor; Geo. Fyfe
 Wm. Crockatt jnr; Alex. Balfour; John H. Blakey

HAMILTON NEW COMPANY - List from Act of Incorporation (1846)

James Pile; James Granger; John Tainish
 Thomas Cuthill; Robert Chalmers; Alex. Anderson
 Wm. Hamilton; Wm. Henderson; James Hamilton
 Wm. Mowbray; Thomas Allan; Walter Black

Note - Other partners named were Wm. Aikman and Douglas Hamilton
 Robertson.

INNERLEITHEN - (1846) List from S.R.O. (B.T.2/3998)

Rev. P. Booth, Minister; G. Brydon, resident of Haughhead
 W. Renwick, Merchant; A. Dobson, Manufacturer
 G. Learmont, Land Surveyor of Uraquir

BRIDGE OF EARN - (1859) List from S.R.O. (B.T.2/46)

Lord Rollo; Sir Thomas Moncrieff; John Grant of Kilgraston;
 John Chalmers gent.; Thomas Thomson of Elcho; John Stevens; John Cowans

* Supporter of Scottish Central Railway. Vide Transport History 1970 p.228

INVERNESS COMPANY - Reconstituted - List from Act of Incorporation
(1847)

Alexander Forbes;	Roderick Macleod;	Joseph Mitchell
David Rose;	Niel Maclean;	Edward Shaw
David Prophet;	Robert Black;	Wm. Simpson
Duncan Macpherson;	William Munro;	Chas. Waterston
Joseph Lery		

STORNOWAY - (1847) List from S.R.O. (G.B.1/77/1)

J.Matheson, M.P., esquire of Lewes and Archary
 J.Scobie, Chamberlain of Lewes; A.MacIver
 R.Morison, Ropemaker at Bayhead; A.L.Macdonald
 J.R.Mackenzie, Merchant of Stornoway; M.Macaulay
 J.Macaulay; D.Munro, Writer; A.Morrison, Ropemaker
 J.Mackenzie; R.Millar, Surgeon; J.Smith, esquire of Deanston

GOUROCK - (1849) List from S.R.O. (B.T.2/878)

W.Scott, Ropespinner	}	Group of 5-10 shares
P.Fletcher, Feuar		
H.Young, Grocer	}	Group of 10-20 shares
J.Alexander, Feuar		
J.Thomson, Wright		
J.Kilpatrick, Flesher	}	Group of above 10 shares
C.Wright, Stationer		
G.Turner, Feuar		
H.T.Pattern, Writer of Greenock		

LOCKERBIE - (1855) List from S.R.O. (B.T.2/269)

W.Dobie, Draper; D.Halliday, Bookseller; J.T.Wilson, Surgeon
 J.Pagon, Draper; W.Bayden, Ironmonger; J.P.Douglas, Druggist

ARMADALE - (1866) List from S.R.O. (B.T.2/143) with number of shares held.

J.Beveridge, Spirit Dealer (20); W.Motherwell, Portioner (250)
 M.Wilson, Grocer (100), Resident in Armadale
 J.Thomson, Water Manager (40), of Airdrie

ERROL - (1866) List from S.R.O. (B.T.2/241) with number of shares held.

J.McAsh, Manufacturer (20); A.Moodie, Shoemaker (5)
 W.Watson, Millwright (60); J.Watson, Innkeeper (15)

J.Rollo, Innkeeper (10); G.Bruce, Tailor/Clothier (34)

INNELLAN - (1870) List from S.R.O. (B.T.2/323) with number of shares held.

J.Hunter, Feuar (50); J.Gibb, Joiner (10); A.Tolmie, Feuar (100)
J.Millar, Feuar (50); C.Irvine, Feuar (10);
Auditor - W.Robertson, Feuar (25)

COVE & KILCREGGAN - (1872) List from S.R.O. (B.T.2/394) with number of shares held.

W.Lang, Gentleman (10); R.L.Dymock of Edinburgh (30)
R.W.Robertson, Gentleman (40), of Kilcreggan
A.Abercrombie, Merchant (40)
J.Cruickshank, Property Valuator (20)
A.Donaldson, Iron Merchant (20)
G.T.Hendry, Iron Merchant (10)
W.Hunter, Manufacturer (20)
G.B.Miller, Warehouseman (20)
A.McLean, Banker (20)
D.Richardson, Merchant (150)

} of Glasgow

INVERGORDON - (1872) List from S.R.O. (B.T.2/404) showing number of £1 shares held.

R.B.E.Macleod of Cadboll (50); G.R.Hall, Shipowner (30)
H.Munro, Draper (200); W.Fraser, Cornfactor (30)
H.Graham, Publisher (20); J.Joss, Merchant (20)
A.Munro, Bank Agent (50);

STANE & DYKEHEAD - (1903) List from S.R.O. (B.T.2/5451) with number of shares held.

J.Nimmo, Writer (20)
A.Hinshelwood, Master of Coltness Works (40)
J.Sommerville, Ironmaster (20)
C.W.Walker, Works Manager at Coatbridge (40)
J.Pettigrew, Butcher (40); A.Fraser, Builder (40)

} of Wishaw

FAULDHOUSE - (1909) List from S.R.O. (B.T.2/7046) with number of shares held.

S.Ogilvy, Doctor of Medicine (50); T.Stark, Spirit Merchant (100)
J.Brownlee, Merchant (50) W.Chalmers, Draper (50)
W.Prentice, Draper (200); H.Fulton, Shoemaker (50)

APPENDIX I I I

Nominal Capital Formation - Statistics and Calculations

- (1) All Companies Formed Up To 1830 .
- (2) Later Companies Where Original Capital Known.
- (3) Companies Where Original Capital Unknown.
- (4) Nominal Capital Stock per 100 Persons in Market-town (1853)
- (5) Categories of Nominal Capital per 100 Residents in Market-town :
Pre-1850 ; 1853
- (6) Estimated Total Nominal Stock in Towns where Journal of Gas Lighting statistics Not Extant for 1853.
- (7) Companies of Unknown Initial Nominal Capital Stock and Unknown Date of Formation :
 - (i) Companies Existing by 1849 - Population Estimates for 1851, and total Estimated Nominal Capital Stock in 1853.
 - (ii) Companies Existing by 1883 - Population Estimates for 1881, and total Estimated Nominal Capital Stock in 1883.
- (8) Annual Total Nominal Capital in New Companies (Including Estimates) 1817 - 1914
- (9) Nominal Share Values.
 - (i) Share Values in Sample of New Scottish Limited Gas Companies at Five Year Intervals.
 - (ii) Share Values in Companies Recorded by the Journal of Gas Lighting in 1853, 1861, 1871
- (10) Shares Not Fully Called Up - Total Anomalies noted by J.G.L.
- (11) Ownership of Scottish Gas Companies.

Appendix III Nominal Capital Formation - Statistics and Calculations

(1) All Companies Formed Up to 1830

Date	Town	Estimated Population	Initial Nominal Capital £	Capital per 100 Pop. £	Data Source
1817	Glasgow	131,741	40,000	30.363	A
1817	Edinburgh	124,136	20,000	16.111	P
1822	Leith	(26,000)	15,000	(57.692)	A
1822	Kilmarnock	11,418	4,000	35.032	1
1822	Perth	19,068	19,000	99.643	N.S.A.
1823	Paisley	c. 37,472	16,000	42.6985	A
1823	Johnstone	c. 4,254	2,676?*	- ⁺	
1824	Dundee	34,438	20,000	58.075	S.R.O.
1824	Aberdeen	47,679	70,000	146.815	
1824	Dumfries	10,042	8,000	79.657	B.T.2
1824	Edinburgh (Oil)	145,337	80,000	51.835 ^{†**}	A
1825	Arbroath	4,512	6,000	108.558	
1825	Ayr (British G.Co.)	7,666	6,281	81.933	C.B.G.Co.
1825	Stirling	6,602	6,000	90.882	2
1826	Inverness	7,382	12,000	162.549	A
1826	Dalkeith	4,327	3,000	69.322	G.B.1
1827	Montrose	11,062	7,922?*	- ⁺	
1827	Ellon	(2,242)	850?*	- ⁺	
1828	Dunfermline	6,172	4,450	72.100	G.B.1
1829	Kirkcaldy	4,289	4,000	105.451	B.T.2
1829	Alloa	4,213	3,000	71.198	T.S.A.
1829	Falkirk	7,356	1,646	22.374	T.S.A.
1829	Peebles	1,858	1,131?*	- ⁺	
1829	Greenock	25,946	8,371	32.263	A
1830	Campbeltown	4,869	3,487?*	- ⁺	
1830	Port Glasgow	5,166	3-4,000	67.740	3
1830	Hamilton	7,327	3,000	40.942	
1830	Hawick	4,257	1,575	36.992	4
1830	Elgin	4,493	2,500	55.642	T.S.A.
1830	Banff	2,935	2,500	85.179	G.B.1
1830	Airdrie	6,594	2,500	37.913	B.T.2
1830	Cupar	3,273	2,500	76.382	G.B.1

Date	Town	Estimated Population	Initial Nominal Capital £	Capital per 100 Pop. £	Data Source
1830	Kelso	4,193	3,003?*	- ⁺	
1830	Penicuik	1,179	844?*	- ⁺	

Notes - Population calculated from Census. ⁺ Statistics not used in calculation of averages. * Capital estimated only. ** Second company in town. Brackets show Parish population statistics available only. Pop. - population.

A - Act of Parliament; P - Prospectus, N.S.A. - New Statistical Account; B.T.2 - S.R.O. (Board of Trade Records); G.B.1 - S.R.O. (Gas company minute book); T.S.A. - Third Statistical Account; C.B.G.Co. - Centenary of the British Gaslight Co.; 1 - J.G.L. 22/3/1884; 2 - Industries of Stirling (1909), 3 - Renfrew Directory (1836), 4 - J.G.L. 10/7/1836

Capital per 100 Residents	Average to 1825	£62.8985	(9 statistics)
	Average 1825-30	£71.6129	(17 statistics)
	Average 1817-30	£68.5964	(26 statistics)

(2) Later Companies Where Original Capital Known

Date	Town	Estimated Population	Capital £	Capital per 100 Pop. £	Data Source
1831	Strathaven	3,434	1,000	29.120	
1831	Musselburgh	4,841	2,500	51.642	
1833	Peterhead	5,007	3,000	59.919	B.T.2
1833	Barrhead	4,243	1,000	23.569	B.T.2
1833	Macduff	2,039	1,800	88.249	N.S.A.
1834	St. Andrews	5,737	2,500	43.580	1
1834	Brechin	3,720	1,800	48.382	B.T.2
1834	Galashiels	3,369	1,755	52.094	G.B.1
1834	Bathgate	2,653	1,000	37.696	G.B.1
1834	Dalry	1,238	950	76.761	B.T.2
1835	Grangemouth	-	1,000	-	B.T.2
1835	Dunse	2,521	1,000	39.665	G.B.1
1835	Kirriemuir	2,744	2,000	72.892	B.T.2
1835	Kinross/M.	1,928	2,500	129.668	B.T.2
1835	Haddington	2,625	2,000	76.196	2
1836	Selkirk	1,798	1,100	61.179	G.B.1
1836	Carluke	1,832	1,500	81.896	
1836	Pollok shaws	4,955	2,300	46.418	3
1836	Stranraer	5,469	2,000	36.570	G.B.1

Date	Town	Estimated Population	Capital £	Capital per 100 Pop. £	Data Source
1836	Dunbar	3,206	1,955	60.985	4
1836	Annan	4,193	3,000	71.550	G.B.1
1837	Moffat	1,400	2,000	142.857	B.T.2
1838	Turriff	1,257	912.50	72.593	B.T.2
1839	Vale of Leven	2,438	2,500	102.543	G.B.1
1839	Inverurie	1,494	2,000	133.869	B.T.2
1839	Kirkintilloch	6,233	1,600	25.669	N.S.A.: 5

Average Capital per 100 persons 1830-9 £66.622 (25 statistics)

1840	Edinburgh/Leith*	c.194,718	150,000	77.034	A
1840	Girvan	6,327	1,600	25.289	B.T.2
1840	Ardrossan	1,836	1,000	54.466	6
1842	Coatbridge	8,000?	3,999	49.988?	7
1843	Castle Douglas	1,862	1,000	53.720	T.S.A.
1843	Dysart	1,858	1,200	64.603	B.T.2
1843	Glasgow C. & S.*	329,097	150,000	45.579	
1843	Boness	1,961	1,000	50.994	
1844	Aberdeen New*	65,875	50,000	75.901	
1844	Lochgilphead	1,700	1,200	85.714	B.T.2
1845	Ayr	9,448	10,000	105.843	G.B.1
1845	Gourock	2,842	4,000	140.770	8
1845	Eyemouth	(1,435)	600	-	
1845	Portobello	3,499	3,000	85.739	
1845	Banchory	(2,329)	2,400	-	
1845	Falkirk J.S.*	8,426	4,500	53.406	B.T.2
1845	Maxwelltown*	3,466	5,000	144.259	B.T.2
1846	Innerleithen	795	800	100.629	B.T.2
1846	Bridge of Weir	1,492	800	53.619 ⁺	B.T.2
1846	Hamilton*	9,253	80,000	864.584	
1846	Dundee New*	60,902	40,000	65.679	
1846	Perth New*	20,763	15,000	72.244	
1848	Stornoway	2,080	1,500	72.115	

Average Capital per 100 persons 1840-9 (excluding towns with two companies) £71.3589 (15 towns)

Notes - * Second company in town, ⁺ Bridge of Weir shown as £1,000

in Third Statistical Account. 1 - J.G.L. 12/3/1889, 2 - J. Miller Dunbar, 3 - A. McCallum Pollockshaws, 4 - J. Miller Dunbar, 5 - J. Horn, 6 - Burgh Centenary, 7 - A. Miller Coatbridge, 8 - Greenock Advertiser, 2/5/1845. Other abbreviations as previously stated.

In cases where Parliamentary Burgh population is greatly in excess of Burgh and Parish population (e.g. 1851 Ayr with 17,624 and 9,110 respectively), the latter statistics have been adopted.

Date	Town	Estimated Population	Capital £	Capital per 100 Pop. £	Data Source
1850	Newmilns	2,211	1,056	47.761	9
1850	Rutherglen	6,947	2,000	28.789	9
1850	Douglas	1,525	500	32.787	9
1850	Fochabers	1,101	600	54.495	9
1851	Comrie	792	1,733	218.813	10
1851	Denny	2,446	1,500	61.325	10
1852	Dunoon	2,229	2,000	89.726	9
1855	Lockerbie	1,590	800	50.314	B.T.2
1856	Newport	700?	1,300	185.714	B.T.2
1857	Cumbernauld New	1,500?	700	-	10
1858	Lochmaben	1,255	800	63.745	B.T.2
1858	Dalbeattie	1,698	900	53.004	B.T.2
1858	Bothwell/Uddingston	990?	2,500	252.525	B.T.2
1858	Carnwath	895	1,200	134.078	B.T.2
1859	Aberlour	(1,447)	650	-	
1859	Bridge of Earn	348	900	234.375	B.T.2
1859	Muirkirk	2,245	1,000	44.543	G.B.1

{ Average Capital per 100 persons 1850-9 £103.46626 (15 towns)

{ Notes - 9 - J.G.L. 1853, 10 - J.G.L. 1861, other abbreviations as previously stated.

1860	Ecclefechan	884	750	84.842	B.T.2
1860	Lanark Consumers*	5,384	2,500	46.434	B.T.2
1861	Meigle	600?	700	-	11
1861	Gorebridge	446	600	134.529	B.T.2
1861	Denny Consumers*	2,428	1,500	61.779	B.T.2
1862	Stonehaven Consumers*	3,009	2,000	66.467	
1862	Blantyre	1,317	1,500	113.895	B.T.2
1862	Stow	397	1,000	251.889	B.T.2
1862	Kirkwall Consumers*	2,442	2,000	81.900	B.T.2

Date	Town	Estimated Population	Capital £	Capital per 100 Pop. £	Data Source
1862	Kamesburgh	504	1,000	198.127	12
1862	Baillieston	1,832	1,200	65.502	B.T.2
1863	Armadale	2,545	1,000	39.293	B.T.2
1864	Grantown	1,330	700	52.632	B.T.2
1865	W. Kilpatrick	898	4,000	445.434	B.T.2
1866	Errol	1,002	3,000	299.401	B.T.2
1867	Aberlady	478	700	146.444	B.T.2
1867	Slamannan	680?	1,000	147.059	B.T.2
1867	Tillicoultry New*	3,721	6,900	185.434	B.T.2
1868	Sanguhar New*	1,453	936	64.418	B.T.2
1868	Langbank	320?	1,200	375.0	B.T.2
1869	Fortrose	917	600	65.431	B.T.2
1869	Buckie	2,076	1,000	48.170	B.T.2
1869	Inverkip	651	800	122.888	B.T.2

Average Capital per 100 persons 1860-9 (excluding second companies)
£161.9085 (16 towns)

Notes - 11 - Parish 700?, 12 - Port Bannatyne. Other abbreviations as previously stated.

1870	Buckpool	-	1,000	-	B.T.2
1870	Innellan	605	1,000	165.289	B.T.2
1871	Newton Mearns	776	1,200	154.639	B.T.2
1871	Kilmalcolm	395	1,000	253.164	B.T.2
1871	Partick/Hillhead/ Maryhill	21,425	50,000	233.372	B.T.2
1872	Invergordon	1,157	1,500	129.646	B.T.2
1872	Cove/Kilcreggan	434	5,000	1152.074	B.T.2
1872	Strichen	1,184	700	59.122	B.T.2
1873	Newmilns	3,029	2,000	66.028	B.T.2
1875	Stromness	1,659	2,000	120.555	B.T.2
1879	Costorphine	898	1,700	189.310	B.T.2
1880	Buckhaven	-	2,500	-	B.T.2
1884	Letham New*	859	500	58.207	B.T.2
1886	Cambuslang	6,930	12,000	173.160	B.T.2
1887	Earlston	1,040	2,500	240.385	B.T.2
1888	Busby	2,047	5,000	244.260	B.T.2
1891?	Kinghorn	2,036	12,000	589.391	B.T.2

Date	Town	Estimated Population	Capital £	Capital per 100 Pop. £	Data Source
1891	Cowdenbeath	4,249	2,000	47.070	B.T.2
1894?	Eaglesham	756	400	52.910	B.T.2
1896	Edzell	c.400	1,000	250.0	B.T.2
1896	Loanhead	c.3,000	5,000	166.666	B.T.2
1898	Monifieth	c.2,000	5,000	250.0	B.T.2
1900	Doune	929	1,000	107.643	B.T.2
1903	Stane/Dykehead		3,500		B.T.2
1905	Kelty		7,000		B.T.2
1906?	Harthill		700		B.T.2
1907?	Crail	1,067	1,000	93.721	B.T.2
1908	Dundonald	(13,097)	3,000	-	B.T.2
1909	Cardenden (Kinglassie)	(1,944)	20,000	-	B.T.2
1909	Fauldhouse	c.3,000	6,000	200.0	B.T.2
1911	Abernethy	593	1,000	168.634	B.T.2

Note - Abbreviations as previously stated.

(3) Companies Where Original Capital Unknown

Date	Town	Estimated Population	Total Population	Estimated Capital £
1831	Beith	3,195	7,594	5,368.35
1831	Linlithgow	3,187		
1831	Pittenweem	1,212		
1832	Dumbarton	3,612	8,266	5,843.40
1832	Sanquhar	1,538		
1832	Stewarton	3,116		
1833	Lanark	4,266	4,266	3,015.72
1834	Froickham	824	7,466	5,277.86
1834	Jedburgh	3,341		
1834	Maybole	3,301		
1835	Blairgowrie	1,976	6,061	4,284.64
1835	Kilsyth	4,085		
1836	Coupar Angus	1,807	13,165	9,306.60
1836	Kilwinning	2,316		
1836	Lochwinnoch	2,524		
1836	Melrose	818		
1836	Newburgh	2,309		
1836	Saltcoats	3,391		
1837	Buckhaven	1,461		
1837	Forres	3,076	14,794	10,458.17
1837	Huntly	3,674		
1837	Leven, Fife	1,703		
1837	Stonehaven	3,100		
1837	Old Cumnock	1,780		
1838	Catrine	-	7,567	5,349.26
1838	Kirkwall	2,463		
1838	Largs	2,801		
1838	Auchtermuchty	2,303		
1839	Biggar	1,370	9,679	6,842.75
1839	Kirkcudbright	2,692		
1839	Nairn	2,666		
1839	Inverary	1,243		
1839	Portsoy	1,708		

Date	Town	Estimated Population	Total Population	Estimated Capital £
1840	Broughty Ferry	2,255	16,412	11,601.96
1840	Coldstream	1,951		
1840	Keith	1,878		
1840	Strathmiglo	692		
1840	Wick	1,333		
1840	Fraserburgh	2,514		
1840	Rothesay	5,789	c.13,891	9,819.82
1841	Anstruther/Cell.	1,526		
1841	Auchterarder	2,080		
1841	Bridge of Allan	(1,187)		
1841	Collinsburgh	263		
1841	Crieff	3,679		
1841	Cullen	2,671	3,658	2,585.91
1841	Dunblane	1,911		
1841	Leslie	1,207		
1842	Lauder	1,148		
1842	Thurso	2,510		
1843	Elie/Earlsferry	800		
1843	Galston	2,508		
1844	Larkhall	2,248	12,618	8,919.91
1844	Thornhill	1,508		
1844	Tranent	1,818		
1844	Helensburgh	2,915		
1844	New Pitsligo	1,529		
1844	Wishaw	2,600		
1845	Ayr Newton	(4,615)	c.5,554	3,926.23
1845	Ferryport on Craig	1,596		
1845	Prestonpans	1,651		
1846	Gatehouse	1,791	10,879	7,690.58
1846	Kilbarchan	2,494		
1846	Lesmahagow	(7,324)		
1846	Wigtown	2,102		
1846	Buckhaven/E. Wemyss	830		
1847	Alyth	1,896	1,896	1,340.32
1848	Oban	1,639	1,639	1,158.64

Date	Town	Estimated Population	Total Population	Estimated Capital £
1849	Kettle/Freuchie /Ladybank	623	5,846	4,132.65
1849	Motherwell	1,183		
1849	New Cumnock	2,000?		
1849	Stonehouse	2,040		
1849	Kingskettle	-	7,023	4,964.70
1850	Milngavie	1,728		
1850	Rotham	1,346		
1850	Dornoch	599		
1850	Maryhill	(6,700)	2,735	1,933.43
1851	Dunkeld	1,104		
1851	Dunshalt	518		
1851	E. Kilbride	1,113		
1851	Grahamston	-	3,108	2,197.11
1852	Lennoxton	3,108		
1853	Darvel	1,519		
1853	Dunkinfield	-		
1854	Dufftown	998	7,019	4,961.87
1854	Latham	1,127		
1854	Lerwick	2,951		
1854	W. Linton	456		
1854	Old Meldrum	1,487	c.1,798	1,271.04
1855	Carnoustie	1,400?		
1855	Insch New	398	2,400	1,696.61
1856	Stevenston	2,400		
1857	Aberuthven	500?	c.1,500	1,060.38
1857	Holytown	1,000?		
1858	W. Kilbride	1,063	1,063	751.46
1859	Kilmaurs	2,066	2,946	2,082.59
1859	Callander	880		
1860	Renton	2,891	5,432	3,839.99
1860	Beauly	917		
1860	Lochgelly	1,624		
1862	Golspie	876	8,595	6,075.97
1862	Kirkintilloch New*	6,096		
1862	Whitehorn	1,623		

Date	Town	Estimated Population	Total Population	Estimated Capital £
1863	Ballater	428	3,231	2,284.06
1863	Bellshill	2,803		
1864	Auchtergaven	2,000?	c.2,000	1,413.84
1865	Castle Bar	-	-	-
1870	Aberlady	-	-	-
1871	W. Calder	2,432	3,955	2,795.86
1871	Millport	1,523		
1877	Dullator	-		
1878	Dreghorn	896	896	633.46
1884	Nitshill/Hurlet	2,140	3,462	2,448.77
1884	Aberfeldy	1,322		
1890	Newton Grange	957	957	676.52
1904	Newton Mearns	3,349	3,349	2,367.47
1911	Kirkconnel	(1,460)	c. 730	516.05

Notes - * Second company in town

Brackets indicate Parish population only available. (Half of this used as "town" population).

Conversion Multiplier: 70.691964%

(4) Nominal Capital Stock per 100 Persons in Town Population (1853)

Town	Nominal £	1851 Population	Capital per 100 Persons £	Town	Nominal £	1851 Population	Capital per 100 Persons £
Aberdeen	6,500	53,808	12.1	Galashiels	2,500	5,918	42.2
Airdrie	4,200	14,435	29.1	Girvan	2,250	7,319	30.7
Anstruther	1,300	1,526	85.2	Glasgow G.L.	150,000	329,097	91.2
Ardrrossan	2,000	2,071	96.6	Glasgow C. & S.	150,000		
Arbroath	1,100	8,302	13.3	Hamilton	80,000	9,630	830.7*
Auchterarder	1,905	2,520	75.6	Hawick	2,200	6,683	32.9
Auchtermuchty	1,500	2,673	56.1	Helenburgh	1,500	2,841	52.8
Ayr	13,330	17,624	75.6	Huntly	1,312	3,131	41.9
Ayr Newton	5,000	(4,814)	-	Inverary	1,250	1,164	107.4
Banff	2,500	3,557	70.3	Inverkeithing	425	1,497	28.4
Bervie	1,000	878	113.9	Inverness	24,000	9,969	240.7
Blairgowrie	3,695	2,914	126.8	Irvine	3,100	4,790	64.7
Boness	2,400	2,645	90.7	Kincardine	1,695	2,697	62.8
Brechin	2,700	4,515	59.8	Kirkcaldy	6,000	10,475	57.3
Broughty Ferry	4,500	2,772	162.3	Kirkcudbright	1,600	2,687	59.5
Coatbridge	3,999	8,564	46.7	Kirkintilloch	3,000	6,342	47.3
Crieff	2,744	3,824	71.8	Kirkwall	1,135	3,451	32.9
Cullen	600	3,165	19.0	Kirriemuir	2,590	3,518	73.6
Cumnock	1,200	2,395	50.1	Largs	1,400	2,824	49.6
Coupar Angus	3,000	2,004	149.7	Lauder	885	1,105	80.1
Coupar Pife	2,500	4,005	62.4	Leslie	1,879	1,342	139.7
Denny	1,500	2,446	61.3	Lesmahagow	614	(7,746)	-
Douglas	500	1,525	32.8	Linlithgow	1,000	4,071	24.6
Dumfries	8,000	11,107	72.0	Lochgilphead	1,200	1,703	70.5
Dunblane	1,400	1,816	77.1	Markinch	1,200	1,256	95.5
Dundee Old	29,687	61,449	113.4	Vauchline	846	(2,470)	-
Dundee New	40,000			Maybole	2,115	3,862	54.8
Dunfermline	8,600	8,577	100.3	Melrose	746	966	77.2
Dunoon	2,000	2,229	89.7	Mid/E. Calder	1,436	(3,104)	-
Dysart	1,250	1,610	77.6	Moffat	1,000	c.1,400	71.4
Edinburgh G.L.	150,000	160,302	179.0	Montrose	8,000	14,328	55.8
Edinburgh/ Leith	137,000			Nairn	618	3,401	18.2
Elgin	5,232.50	5,383	97.2	Newmills	1,056	2,211	47.8
Fochabers	600	c.1,100	-	Newton Stewart	1,551.50	2,599	59.7
Forfar	7,200	9,311	77.3	Oban	1,225	1,742	70.3
Fraserburgh	1,600	3,093	51.7	Peebles	970	1,982	48.9

1853 (continued)

Town	Nominal £	1851 Population	Capital per 100 Persons £	Town	Nominal £	1851 Population	Capital per 100 Persons £
Perth Old	20,000	23,835	146.8	Stewarton	1,600	3,164	50.6
Perth New				15,000	12,837	114.2	
Pollokshaws	2,416	6,086	39.7	Stonhaven	2,500	3,240	77.2
Prestonpans	1,000	1,640	61.0	Stornoway	1,500	2,391	62.7
Rutherglen	1,999.90	6,947	28.8	Stranraer	2,100	5,738	36.6
Sanguhar	951	1,884	50.5	Strathaven	1,208	4,274	28.3
St. Andrews	5,376	4,730	113.7	Thurso	1,607.50	2,908	55.3
				Tranent	800	2,096	38.2

Average Nominal Capital Stock per 100 Persons in 78 Towns = 70.691964

Note - Brackets indicate Parish population only was recorded.

* Hamilton with a Nominal Capital of £80,000 had a paid-up capital of £8,000 only. The 1830.7% is therefore replaced by 83.07% in calculating the average, because the anomaly is so great.

(5)

Categories of Nominal Capital per 100 Residents in Market Town

Capital £	Pre-1850	1853	Capital £	Pre-1850	1853
Under 20	2	4	111-115	0	4
21-25	4	1	116-120	0	0
26-30	2	5	121-125	0	0
31-35	2	3	126-130	1	1
36-40	6	3	131-135	1	0
41-45	3	2	136-140	1	1
46-50	4	8	141-145	2	0
51-55	8	5	146-150	1	2
56-60	4	5	151-155	0	0
61-65	3	6	156-160	0	0
66-70	2	3	161-165	1	1
71-75	8	6	166-170	0	0
76-80	5	6	171-175	0	0
81-85	5	2	176-180	0	1
86-90	2	2	181-185	0	0
91-95	0	2	186-190	1	0
96-100	2	3			
101-105	3	0	240-245	0	1
106-110	1	1			
			Totals	74	78

Method of Estimating Village Populations

Census statistics on urban population used wherever possible. Town population one year each side of Census assumed constant e.g. towns in 1830-2 given 1831 figures. Where gas supply began in other inter-censal years, population calculated thus :

$$\text{e.g. 1836 population} = 1831 \text{ pop.} + \left[\frac{(1841 \text{ pop.} - 1831 \text{ pop.})}{10} \times 5 \right]$$

The main problem is the absence of town/village data in many cases where only parish population was recorded. Often it is possible to use later Census records to find a ratio between the population of the town and that of the parish as a whole. Viz :

$$\left(\frac{1841 \text{ town population}}{1841 \text{ parish population}} \right) \times 1831 \text{ parish pop.} = 1831 \text{ town population}$$

The town population may have been smaller than such estimates when gas light commenced, but it would not in all likelihood have been larger, and the extrapolated statistics show how small villages were when they commenced gas lighting; any error would operate against the theory of small size.

Greater problems occur where the Census recorded only parish statistics at the relevant date, and later stated town but not parish population. To discover the Town/Parish ratio in such cases, it is necessary to project forwards a "Presumed Parish Population" for comparison with the town figures. Linear growth of population (even growth during inter-censal periods) has been assumed for parish statistics :

e.g. Musselburgh :

$$\left[(1841 \text{ Parish pop.}) - (1831 \text{ Parish pop.}) \right] + (1841 \text{ Parish pop.}) = 1851 \text{ Presumed Parish pop.}$$

Because population growth in the mid nineteenth century was often more rapid than such linear growth,¹ the estimate shows a smaller parish population compared to the town than probably occurred. This would tend to maximise the estimated town population at the earlier date, when extrapolated backwards.

$$\left(\frac{\text{Town Population 1851}}{\text{Presumed Parish 1851}} \right) \times (\text{Parish pop. 1831}) + = 1831 \text{ Estimated Town pop.}$$

All calculations of town population at the time when gas lighting was introduced, therefore tend to maximise the size of urban communities.

1. c.f. T.Malthus projected a much faster exponential or geometric potential growth rate for population.

(6) Estimated Total Nominal Capital Stock in Towns Where J.G.L.

Statistics are not Extant for 1853

To estimate Nominal Capital Stock in other towns, the population of each in 1851 is estimated, summed, and multiplied by the Average Nominal Capital Stock per 100 persons derived from extant figures for 1853.

Town	Pop	Town	Pop	Town	Pop
Johnstone	5,872	Newburgh	2,638	Alyth	1,956
Kilmarnock	21,443	Saltcoats	4,338	Bridge of Weir	1,478
Ellon	c. 850	Wishaw	3,373	Gourock	2,395
Alloa/Cambus	8,211	Buckhaven	1,769	Kettle/Freuchie	
Falkirk	8,752	Forres	3,339	/Ladybank	638
Greenock	36,689	Leven (Fife)	2,083	Motherwell	2,262
Campbeltown	6,880	Annan	4,570	New Cumnock	c.1,000
Kelso	4,783	Catrine	c.2,000	Stonehouse	2,086
Kirkcaldy	10,475	Tarrif	1,693	Kingskettle	-
Penicuik	c.1,400	Biggar	1,530	Beith	4,012
Port Glasgow	6,986	Inverurie	2,084	Burntisland	2,329
Musselburgh	7,092	Portsoy	2,062	Clackmannan	1,535
Pittenweem/		Coldstream	2,238	Crail	1,247
St. Monance	c.2,200	Keith	2,101	Cumbernauld	1,930
Dumbarton	5,445	Strathmiglo	c.890	Dingwall	1,990
Alva	3,058	Wick	1,514	Dunkeld	1,104
Lanark	5,304	Rothesay	7,104	Falkland	8,752
Macduff	2,527	Bridge of Allan	c.1,000	Fort William	1,041
Peterhead	7,298	Collinsburgh	c.400	Kinghorn	1,377
Barrhead	6,069	Castle Douglas	1,992	Largo	(2,800)
Dalry	2,706	Elie/Earlsferry	c.1,000	Lasswade	627
Froickhan	c.1,100	Galston	2,538	W. Linton	c.500
Grangemouth	c.1,500	Larkhall	2,427	Muirkirk	c.2,000
Blairgowrie	2,914	Thornhill	1,658	Neilston	2,075
Dunse	2,567	New Pitsligo	1,605	N. Berwick	498
Haddington	2,887	Eyemouth	c.1,500	N. Queensferry	c.700
Kilsyth	3,949	Maxwelltown	3,820	S. Queensferry	-
Kinross/		Ferryport	2,051	Renfrew	2,977
Milnathort	2,590	Portobello	3,497	New Keith	2,101
Carluke	2,845	Gatehouse	1,700	Troon	2,404
Dunbar	2,965	Kilbarchan	2,467	Tillicoultry	3,217
Kilwinning	3,265	Wigtown	2,232	Torryburn	(1,341)
Lochwinnoch	2,271	Innerleithen	906	Wemyss	1,013

Note - Brackets where Parish population data available only.

Sum Total c. 315,756 ; Conversion Factor 70.691964% ;

Nominal Capital Stock £223,214 ; Total Fixed Capital Investment in the Scottish Gas Industry (including £892,809.50 in recorded companies) - c. £1,208,565.50

(7) Companies of Unknown Initial Nominal Capital Stock

Companies Where the Date of Formation is Unknown

(i) Companies Existing By 1849, and population in their market community estimated for 1851

Town	Pop	Town	Pop	Town	Pop
Beith	4,012	Kincardine	2,697	Newton Stewart	2,599
Burntisland	2,329	Kinghorn	1,377	N. Berwick	498
Clackmannan	1,535	Largo	421	N. Queensferry	500?
Crail	1,247	Lasswade	627	S. Queensferry	-
Cumbernauld	1,931	W. Linton	479	Renfrew	2,722
Dingwall	1,990	Markinch	1,256	Troon	2,404
Dunkeld	1,104	Mauchline	900?	Tillicoultry	3,217
Falkland	1,330	Mid/E. Calder	(3,104)	Torryburn	(1,341)
Fort William	1,041	Muirkirk	2,098		
Inverkeithing	1,497	Neilston	2,075		

Note - Brackets indicate Parish statistics only available.

Total population c. 44,108 Multiplier 70.691964%

Total estimated Nominal Capital Stock in 1853 £31,180.81

(ii) Companies Existing by 1883, and population in their market community estimated for 1881

Town	Pop	Town	Pop	Town	Pop
Clippens	674	Fettercairn	398	Langholm	4,209
Deanston	679	Harthill	1,441	Laurencekirk	1,454
Dollar	2,014	Johnshaven	1,041	Skelmorlie	404
Doune	996	Kennoway	770	Tain	1,742
Dunning	1,048	Kilbirnie	3,405	Tullibody	694
E. Linton	1,042	Kirkliston	474	Whitburn	1,200

Total population c. 23,685 Multiplier 70.691964%

Total estimated Nominal Capital Stock in 1883 £16,743.39

(8)

Annual Total Nominal Capital in New Companies (Including Estimates)

Date	Capital £	Number of Companies	Date	Capital £	Number of Companies	Date	Capital £	Number of Companies
1817	60,000	2	1850	9,121	8	1883	0	0
1818	0	0	1851	5,166	6	1884	2,949	3
1819	0	0	1852	4,198	2	1885	0	0
1820	0	0	1853	1,074	2	1886	12,000	1
1821	0	0	1854	4,962	5	1887	2,500	1
1822	38,000	3	1855	2,071	3	1888	5,000	1
1823	18,676	2	1856	2,997	2	1889	0	0
1824	178,000	4	1857	1,760	3	1890	677	1
1825	18,281	3	1858	6,151	5	1891	14,000	2
1826	15,000	2	1859	4,633	5	1892	0	0
1827	8,772	2	1860	7,090	5	1893	0	0
1828	4,450	1	1861	2,800	3	1894	400	1
1829	18,148	5	1862	14,776	9	1895	0	0
1830	25,909	10	1863	3,284	3	1896	6,000	2
1831	8,868	5	1864	2,114	2	1897	0	0
1832	5,843	3	1865	4,000	2	1898	5,000	1
1833	8,816	4	1866	3,000	1	1899	0	0
1834	13,283	8	1867	8,600	3	1900	1,000	1
1835	12,785	7	1868	2,136	2	1901	0	0
1836	21,162	12	1869	2,400	3	1902	0	0
1837	12,459	7	1870	2,000	3	1903	3,500	1
1838	6,262	5	1871	54,996	5	1904	2,367	1
1839	12,942	8	1872	7,200	3	1905	7,000	1
1840	164,202	10	1873	2,000	1	1906	700	1
1841	9,820	8	1874	0	0	1907	1,000	1
1842	6,585	3	1875	2,000	1	1908	3,000	1
1843	155,538	6	1876	0	0	1909	26,000	2
1844	60,120	8	1877	?	1	1910	0	0
1845	33,426	10	1878	633	1	1911	1,516	1
1846	144,291	10	1879	1,700	1	1912	0	0
1847	1,340	1	1880	2,500	1	1913	0	0
1848	2,659	2	1881	0	0	1914	0	0
1849	4,133	4	1882	0	0			

(9) Nominal Share Valuesi. Shares in Sample of Scottish Limited Gas Companies

Shares £.p	1858-9	60-4	65-9	70-4	75-9	80-4	85-9	90-4	95-9	1900 -4	05-9	10-14
0.50	-	1	1	1	1	1	1	1	1	-	-	-
1.00	6	10	14	18	19	20	21	30	32	35	35	42
1.25	-	-	-	-	-	-	-	-	-	-	-	1
1.50	-	-	-	-	-	1	1	1	2	2	3	3
2.00	1	2	3	4	3	4	4	3	2	3	4	3
2.50	2	2	1	2	2	2	2	1	1	-	1	1
3.00	-	-	1	2	2	1	1	1	1	1	1	1
3.75	-	1	1	1	1	1	1	1	1	1	1	-
5.00	1	1	3	5	5	8	8	9	9	10	8	7
6.00	-	-	1	1	1	1	-	-	-	-	-	-
10.00	-	-	1	1	2	3	5	4	5	5	5	4
12.00	-	-	-	-	-	-	1	1	1	1	1	1
20.00	-	-	-	-	-	-	1	1	1	1	-	-

Source - S.R.O. Board of Trade Records

ii. Shares in Companies Recorded by the Journal of Gaslighting.

Shares £.p	1853	1861	1871
0.80	1	0	0
1.00	17	30	40
1.33	1	1	1
2.00	9	11	14
2.50	4	8	8
3.00	3	3	2
4.00	0	1	1
5.00	30	39	44
6.00	2	0	1
6.25	0	1	0
7.00	0	0	1
8.00	1	1	2
8.75	0	0	1
10.00	8	9	9
11.50	1	0	0
12.00	1	2	2
14.00	0	1	1
14.50	1	1	1
20.00	4	4	4
23.75	1	0	0
25.00	4	6	4

Companies in			
Samples	88	118	132

Note - 5 companies in 1861, and 6 in 1872, are recorded twice, because new shares had a lower nominal value than old shares .

Source - J.G.L.

(10)

Shares not Fully Called Up - Total Anomalies noted by Journal of Gas Lighting

Company	1853		1861		1871	
	Nominal £.s	Called Up £.s	Nominal £.s	Called Up £.s	Nominal £.s	Called Up £.s
Aberdeen	5	3.11	2.10	2.10	2.10	2.10
Dumfries	?	?	20	14	20	14
Dundee (New)	5	5	25	23.15	-	-
Edinburgh & Leith	25	25	25	25	25	25
Forfar:						
Old Stock	5	5	5	5	5	5
New Stock	0	0	0	0	5	2.10
Fraserburgh	0.16	0.16	1	0.16	1	0.16
Inverkip	0	0	0	0	1	0.10
Inverness:						
Old Stock	10	10	10	10	10	10
New Stock	5	1.5	5	1.5	5	5
Kilmarnock:						
Old Stock	?	?	25	25	25	25
New Stock	?	?	25	7	25	7.10

Source - J.G.L. various issues

(11) Ownership of Scottish Gas Companies

Co:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
i.	172	135	100	79	89	75	76	61	70	42	111	69	37	57	74
ii.	1	2	1	0	0	1	0	2	?	0	0	0	0	?	0
iii.	5	20	2	0	0	4	0	4	?	0	0	0	0	?	0
iv.	1	4	6	17	6	35	17	16	-	10	17	16	2	?	2
v.	5	70	26	104	42	137	113	52	?	77	49	191	7	?	5
vi.	20	10	10	10	5	5	1			5	5	5	10		5

Co:	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	c	d
i.	44	50	134	134	121	138	58	66	56	58	93	34	68	36	63
ii.	0	0	0	1	1	0	0	?	0	2	3	1	0	0	0
iii.	0	0	0	15	5	0	0	?	0	8	11	25	0	0	0
iv.	17	12	47	8	1	22	36	?	14	7	49	14	3	2	21
v.	70	790	765	67	5	527	297	?	186	29	832	89	6	8	506
vi.	5	1	1	5	5	2	2		2	20	1	5	5	2.50	1

- Note - Total Capital Stock recorded elsewhere.
- i. Total number of shareholders
 - ii. Number of shareholders resident in England.
 - iii. Number of shares held by English shareholders.
 - iv. Number of Scots living outside company town.
 - v. Number of shares held by non-resident Scots
 - vi. Nominal Value of Shares

Town	Date	Town	Date
A Dundee	1824	P Dysart	1844
B Dunfermline	1829	Q Banchory	1845
C Cupar	1830	R Dunning	1845
D Kirkcaldy	1830	S Ayr	1845
E Musselburgh	1831	T Maxwelltown	1845
F Bathgate	1834	U Falkirk J.S.	1845
G Peterhead	1834	V Innerleithen	1846
H Dunse	1835	W Stornoway	1846
I Stranraer	1836	X Dunoon	1852
J Selkirk	1836	Y Dumfries	1857
K Kirriemuir	1836	Z Newport	1856
L Annan	1837	a Lochgilphead	1857
M Grangemouth	1837	b Lochmaben	1859
N Vale of Leven	1839	c Cumbernauld	1858
O Biggar	1839	d Lasswade/Bonnyrigg	1858

Ownership of Scottish Gas Companies

Co:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
i.	47	38	40	85	74	93	63	36	274	58	233	17	22	44	28	67
ii.	1	1	0	0	0	0	0	0	0	6	0	0	1	0	1	?
iii.	50	3	0	0	0	0	0	0	0	87	0	0	10	0	50	?
iv.	17	2	9	31	17	21	13	16	14	19	7	12	9	9	9	?
v.	425	5	78	1090	210	466	51	315	842	209	38	460	135	520	98	?
vi.	1	5	1	1	1		1	1	1	1	1		1	1	2	3

Co:	Q	R	S	T	U	V	W	X	Y	Z	a	b	c	d	e	f
i.	56	57	67	51	17	21	24	32	101	37	101	50	41	23	27	257
ii.	1	0	0	0	1	0	0	0	0	0	2	0	1	0	0	0
iii.	10	0	0	0	10	0	0	0	0	0	35	0	5	0	0	0
iv.	12	19	35	10	1	14	10	1	15	12	35	13	11	4	7	17
v.	191	470	1244	181	20	335	220	50	148	310	337	385	81	58	315	470
vi.	1	1	1	10	5	10	1	2	1	1	5	1	2.50	2	1	

- Note - i. Total Number of Shareholders
 ii. number of shareholders resident in England
 iii. Number of Shares held by English shareholders
 iv. Number of non-local Scots
 v. Number of Shares held by non-local Scots
 vi. Nominal value of shares.

Town	Date	Town	Date
A Carnwath	1859	Q Grantown	1865
B Dalbeattie	1859	R Errol	1866
C Bridge of Earn	1859	S Armadale	1866
D Bothwell/Uddingston	1859	T Airdrie	1866
E Muirkirk	1859	U Lockerbie	1867
F Leslie	1860	V West Kilpatrick	1867
G Aberlour	1860	W Aberlady	1868
H Gorebridge	1861	X Slamannon	1868
I Lanark Consumers	1861	Y Inverkeithing	1868
J Ecclefechan	1861	Z Inverkip	1869
K Denny Consumers	1862	a Kirkintilloch	1869
L Baillieston	1862	b Buckie	1869
M Kamesburgh	1863	c Fortrose	1870
N Stow	1863	d Innellan	1870
O Meigle	1863	e Langbank	1871
P Coatbridge	1865	f Partick/Hillhead/Maryhill	1872

Number of shareholders in Lanark Consumers company (I) includes 40 people who forfeited 104 shares and 27 who sold 91 shares in 1861. Bowling and Dalmuir are considered as being the same 'town' as W. Kilpatrick (V) for this analysis.

Ownership of Scottish Gas Companies

Co :	A	B	C	D	E	F	G	H	I	J	K	L
i.	65	106	93	42	21	12	267	57	20	11	15	52
ii.	0	0	2	0	0	0	1	2	0	0	0	0
iii.	0	0	45	0	0	0	16	102	0	0	0	0
iv.	48	31	42	5	14	1	16	15	6	4	3	2
v.	870	266	243	90	900	10	142	217	1040	45	213	8
vi.	5	2	1	1		5	1	1	1	1		

Co :	M	N	O	P	Q
i.	82	32	41	123	52
ii.	1	1	0	0	0
iii.	60 Pref.	20	0	0	0
iv.	24	5	22	20	6
v.	1832 390 Pref.	150	3580	1715	1150
vi.	1	5	1	1	1

- Note -
- i. Total number of shareholders
 - ii. Number of shareholders resident in London
 - iii. Number of shares held by English shareholders
 - iv. Number of non-local Scots
 - v. Number of shares held by non-local Scots.
 - vi. Nominal value of shares (£)

	Town	Date		Town	Date
A	Cove/Kilcreggan	1872	J	Eaglesham	1895
B	Gourock	1873	K	Melrose	1895
C	Strichen	1873	L	Earlston	1896
D	Invergordon	1873	M	Monifieth	1898
E	Kilmalcolm	1873	N	Stane/Dykehead	1903
F	Mearns	1873	O	Kelty	1905
G	Newmilns	1874	P	Cardenden	1909
H	New Pitsligo	1876	Q	Fauldhouse	1909
I	Tranent	1885			

(12)

Numbers of Shareholders with Size of Share 'Lots' in Scottish
Gas Companies

'Lot' size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
(1)	15	3	48	10	34	14	15	-	18	15	-	-	1	30	9	-	29	6	19	-	-
(2)	30	25	32	32	20	16	19	34	48	18	11	4	8	27	9	-	34	14	16	-	-
(3)	26	5	4	3	1	21	1	1	5	6	4	1	3	4	3	-	1	6	5	1	7
(4)	7	3	4	8	9	3	5	-	26	14	3	6	4	3	7	-	2	-	5	-	-
(5)	72	24	4	16	5	12	21	1	2	3	5	24	25	11	7	9	48	14	14	7	27
(6)	-	1	1	2	-	-	-	-	3	1	2	1	1	-	2	-	1	-	2	6	1
(7)	1	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-
(8)	-	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
(9)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
(10)	21	15	5	9	6	10	-	-	5	7	12	22	10	-	4	11	4	13	12	19	10
(12)	-	-	-	-	-	-	-	-	-	6	1	-	-	-	-	-	-	-	1	-	-
(13)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
(14)	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
(15)	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	2	3
(18)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
(20)	-	1	-	8	-	-	-	-	3	-	-	8	1	-	1	6	-	2	-	8	-
(23)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
(25)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
(30)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
(40)	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
(50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	1	-	4	-

Irregular 'Lots' : M (60) 2 ; P (100) 12, (250) 1; S (305) 1 ;
T (2.5) 1 ; U (2.5) 2, (7.5) 1, (15.5) 1.

'Lots' omitted where no shareholders possessed those sizes.

Companies-

A Dunfermline (1829)	B Kirkcaldy (1830)	C Cupar (1831)
D Musselburgh (1831)	E Bathgate (1834)	F Peterhead(1834)
G Dunse (1835)	H Grangemouth(1835)	I Kirriemuir(1836)
J Stranraer (1836)	K Selkirk (1836)	L Annan (1837)
M V.of Leven (1839)	N Biggar (1839)	O Dysart (1844)
P Banchory (1845)	Q Dumfries (1845)	R Innerleithen(1846)
S Stornoway (1847)	T Dunoon (1852)	U Dumfries (1857)

Source - S.R.O. Board of Trade Records

Numbers of Shareholders with Size of Share 'Lots'

'Lot' sizes	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
(1)	1	16	-	1	-	-	34	1	-	2	-	5	3	-	54	2	51	-	-	7	-
(2)	2	28	3	6	-	-	17	12	1	1	-	8	8	2	60	7	63	-	-	1	2
(3)	1	8	1	-	-	-	4	4	1	1	-	3	8	-	12	2	17	-	-	-	3
(4)	1	2	4	8	-	-	4	6	-	-	-	2	-	-	2	1	3	-	1	-	-
(5)	3	27	25	2	11	8	5	4	13	12	17	22	27	-	51	11	60	1	5	19	9
(6)	2	5	-	1	-	-	1	3	-	-	-	3	-	-	1	3	4	-	-	-	-
(7)	-	-	1	-	-	-	-	3	-	-	-	1	-	-	8	-	1	-	-	-	-
(8)	11	-	1	1	-	-	-	3	-	-	-	3	-	-	-	-	1	-	-	-	1
(9)	-	-	-	-	-	-	-	-	-	-	-	-	-	9	1	1	-	-	-	-	-
(10)	53	14	27	-	28	18	2	1	6	27	41	16	10	14	50	18	22	1	8	7	6
(11)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
(12)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	1	-	-	-	-	1
(13)	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1
(15)	35	1	5	-	3	1	-	-	1	1	2	4	-	-	-	-	-	-	2	-	-
(16)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
(19)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
(20)	25	9	15	6	14	5	-	-	6	10	8	5	3	5	12	4	4	1	4	3	-
(21)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
(24)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
(25)	-	19	4	-	2	5	-	-	2	9	-	2	-	2	2	1	1	5	-	1	3
(30)	-	3	2	-	-	3	-	1	2	4	2	1	-	-	3	1	3	-	-	-	-

Irregular 'Lots' :

B	(40) 1, (55) 1, (35) 1, (38) 1 ;
C	(50) 1 ;
D	(50) 1 ;
E	(65) 1, (40) 1, (31) 1, (100) 1 ;
F	(40) 2, (50) 1, (60) 1, (65) 1, (150) 1 ;
I	(45) 1, (50) 4, (100) 3 ;
J	(40) 1, (50) 11, (100) 3, (150) 1, (200) 1 ;
K	(100) 1, (50) 3 ;
L	(38) 1, (39) 1, (40) 1, (48) 1, (60) 1, (75) 1, (67) 1, (80) 2, (100) 3, (102) 1, (138) 1, (160) 1 ;
N	(40) 1, (50) 3 ;
O	(35) 1, (43) 1, (55) 1, (140) 1, (500) 2, (40) 1, (50) 1, (200) 1 ;
P	(50) 6 ;
Q	(50) 3 ;
R	(50) 9 ;
S	(50) 5, (100) 1 ;
T	(50) 2, (100) 2, (200) 1 ;
U	(50) 2.

A	Ayr (1845)	B	Falkirk J.S. (1845)	C	Newport (1856)
D	Cumbernauld (1858)	E	Lasswade/Bonnyrigg (1858)	F	Carnwath (1859)
G	Lochmaben (1859)	H	Dalbeattie (1859)	I	Bdg. of Earn (1859)
J	Bothwell/Uddingston (1859)	K	Muirkirk (1859)	N	Gorebridge (1860)
L	Leslie (1860)	M	Aberlour (1860)	P	Ecclefechan (1861)
O	Lanark Consumers (1861)	R	Baillieston (1862)	U	Meigle (1863)
Q	Denny Consumers (1862)	T	Stow (1863)		
S	Kamesburgh (1863)				

Source - S.R.O. Board of Trade Records.

Numbers of Shareholders with Size of Share 'Lots'

'Lot' size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
(1)	-	3	-	-	-	-	-	9	-	-	-	-	1	6	11	10	-	-	91	9	-
(2)	2	4	-	1	1	-	-	13	1	15	1	-	3	5	11	13	1	-	45	14	-
(3)	1	2	-	1	1	-	-	12	4	2	2	-	-	-	10	10	-	-	20	3	-
(4)	2	1	-	1	-	-	-	9	-	3	-	-	5	2	2	2	-	-	5	4	-
(5)	1	28	12	3	4	13	5	22	20	11	4	-	15	11	25	33	12	1	44	13	-
(6)	1	1	5	-	-	-	-	3	-	-	-	-	1	1	-	-	1	-	2	3	1
(7)	-	1	-	-	-	-	-	1	1	1	-	-	-	-	9	-	-	-	1	-	-
(8)	1	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
(10)	6	9	6	22	6	13	1	21	18	4	7	7	42	21	18	16	9	3	59	7	7
(11)	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	1	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-
(13)	1	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-
(14)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	2	1	5	-	-	-	2	1	1	-	-	-	2	1	3	1	5	-	-	-	-
(16)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(18)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(19)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(20)	1	2	3	19	5	5	-	5	1	4	2	6	73	11	3	3	8	4	-	-	4
(21)	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(25)	1	1	-	-	-	1	11	1	-	-	2	2	10	-	10	3	-	7	-	2	-
(30)	4	-	-	2	-	-	-	1	1	-	-	-	6	1	-	-	3	-	-	1	-
(40)	1	-	2	11	-	-	-	-	1	-	-	-	9	3	-	1	-	-	-	-	1
(50)	1	1	-	-	2	1	2	1	2	-	4	1	45	-	1	-	2	1	-	1	2
(100)	-	2	-	3	-	-	1	-	-	-	1	2	25	-	-	-	-	3	-	-	-
(150)	-	-	-	-	-	-	1	-	1	-	-	1	1	1	-	-	-	-	-	-	-
(200)	-	-	-	-	-	-	-	2	-	-	-	-	9	-	-	-	1	-	-	-	2

Irregular 'Lots' -

A (27) 1, (29) 2, (31) 2, (37) 3, (38) 2, (54) 1, (52) 1, (61) 1,
(57) 1, (65) 3, (83) 1, (87) 1, (70) 1, (89) 1, (106) 1, (143) 1, (157) 1;

C (22) 1, (23) 1, (31) 1, (34) 1, (36) 1, (35) 1, (39) 1, (41) 1,
(45) 4, (53) 1, (58) 1, (55) 2, (60) 1, (62) 1;

D (60) 1, (69) 1, (250) 1, (135) 1; U (80) 1, (500) 1;

E (45) 1, (60) 1; H (120) 1; I (22) 1; J (24) 1;

L (60) 1, (80) 1, (125) 1; M (45) 1, (60) 3, (65) 1, (70) 1,
(80) 2, (120) 1; N (60) 1, (90) 1; R (60) 1, (300) 1.

Companies - A Coatbridge (1865) B Grantown (1865)
C Errol (1866) D Armadale (1866) E West Kilbride (1867)
F Inverkip (1869) G Aberlady (1868) H Inverkeithing (1869)
I Buckie (1869) J Fortrose (1870) K Innellan (1870)
L Langbank (1871) M Partick/Hillhead/Maryhill (1872)
N Cove/Kilcreggan (1872) O Gourock (1873) P Strichen (1873)
Q Invergordon (1873) R Kilmalcolm (1873) S Newmilns
T New Pitsligo (1876) U Tranent (1885)

Note - 'Lots' defined as total set of shares owned by individual shareholders.

Other companies - Eaglesham (1895): (3) 1, (5) 2, (10) 2, (20) 6;
Stane/Dykehead (1903): (5) 1, (8) 2, (9) 1, (10) 3, (20) 18, (40) 7;
Kelty (1905): (4) 1, (5) 3, (10) 1, (20) 18, (25) 1, (30) 1, (40) 1, (50) 6,
(56) 1, (100) 16, (110) 1, (120) 1, (150) 2, (200) 1, (250) 1, (1950) 2;
Cardenden (1909): (3) 1, (5) 4, (8) 1, (10) 9, (15) 1, (16) 1, (20) 22,
(25) 5, (40) 3, (50) 30, (32) 2, (60) 1, (80) 2, (100) 25, (160) 1, (200) 4,
(300) 1, (400) 2, (500) 2;
Fauldhouse (1909): (25) 30, (50) 16, (100) 3, (200) 2, (750) 1.

Total Numbers of Shareholders with various 'Lots' at Decade Intervals

	1829-39	1840-9	1850-9	1860-9	1870-1909
(1)	203	70	38	134	128
(2)	324	103	40	173	108
(3)	85	24	19	66	49
(4)	95	17	22	22	24
(5)	225	122	131	313	179
(6)	12	12	12	21	9
(7)	2	2	4	13	11
(8)	4	11	6	8	4
(9)	1	-	-	11	1
(10)	122	111	179	254	215
(11)	-	-	-	5	-
(12)	7	1	1	6	2
(13)	1	-	1	5	1
(14)	2	-	-	2	-
(15)	3	37	18	20	13
(16)	-	-	-	6	1
(17)	-	-	-	-	-
(18)	-	-	3	1	-
(19)	-	-	-	3	-
(20)	21	43	72	82	166
(21)	-	-	-	6	-
(22)	-	-	-	1	1
(23)	-	1	-	1	-
(24)	-	-	-	2	1
(25)	-	22	22	32	72

Irregular 'Lots' :

1829-39 (40)2, (60) 2;

1840-9 (30) 10, (35) 1, (38) 3, (40) 1, (50) 10, (55) 1,
(100) 12, (250) 1, (305) 1 ;

1850-9 (2.5) 3, (7.5) 1, (15.5) 1, (30)21, (31) 1, (40) 4,
(45) 1, (50) 27, (60) 1, (65) 2, (100) 9, (150) 2, (200) 1;

1860-9 (30) 15, (31) 3, (34) 2, (35) 1, (36) 1, (37) 3, (38) 3,
(39) 2, (40) 18, (41) 1, (43) 1, (45) 5, (48) 1, (50) 38,
(52) 1, (53) 1, (54) 1, (55) 3, (57) 1, (58) 1, (60) 4,
(61) 1, (62) 1, (65) 3, (67) 1, (69) 1, (70) 1, (75) 1,
(80) 2, (83) 1, (87) 1, (89) 1, (100) 12, (102) 1,
(106) 2, (120) 1, (135) 1, (138) 1, (140) 1, (143) 1,
(150) 2, (157) 1, (160) 1, (200) 5, (250) 1, (500) 1;

1870-1909 (30) 12, (32) 2, (40) 25, (45) 1, (50) 109, (56) 1,
(60) 7, (65) 1, (70) 1, (80) 6, (90) 1, (100) 75,
(110) 1, (120) 2, (125) 1, (150) 5, (200) 19, (250) 1,
(160) 1, (300) 2, (400) 2, (750) 1, (500) 3,
(1950) 2.

APPENDIX I V

Capital Investment in Scottish Gas Companies - Extant Statistics

- (1) Extant Capital Statistics for 1853
- (2) Extant Capital Statistics for 1861
- (3) Extant Capital Statistics for 1871
- (4) Capital, Capital per Resident, and Dividends in 1883
- (5) Capital and Gas Output in :
 - (A) 1903
 - (B) 1913

Appendix IV

CAPITAL INVESTMENT IN SCOTTISH GAS COMPANIES

(1)

1853

Company	No. Shares Issued	Share	Paid-Up	Share Dividend	Market Value Shares	Nominal Issued	Paid-Up Capital	Annual Dividends
		£.p	£ s d	£ s d	£ s d	£	£	£
Aberdeen	13000	5	3 11 0	6 0 0	4 11 6	65000	46150	3900
Airdrie	420	10	10 0 0	7 10 0	12 10 0	4200	4200	315
Anstruther	1300	1	1 0 0	7 10 0	1 2 0	1300	1300	97.50
Ardrossan	100	20	20 0 0	4 0 0	20 0 0	2000	2000	80
Arbroath	550	20	20 0 0	7 10 0	30 0 0	1100	1100	82.50
Auchterarder	381	5	5 0 0	7 10 0	7 0 0	1905	1905	142.88
Auchtermuchty	750	2	2 0 0	6 0 0	2 10 0	1500	1500	90
Ayr Old	2666	5	5 0 0	6 0 0	6 0 0	13330	13330	799.80
Ayr New	2500	2	2 0 0	6 0 0	2 0 0	5000	5000	300
Banff	250	10	10 0 0	9 10 0	10 12 6	2500	2500	237.50
Bervie	1000	1	1 0 0	-	1 0 0	1000	1000	-
Blairgowrie	739	5	5 0 0	8 0 0	7 0 0	3695	3695	295.60
Boness	400	6	6 0 0	5 0 0	8 0 0	2400	2400	120
Brechin	540	5	5 0 0	8 10 0	9 0 0	2700	2700	229.50
Broughty Ferry	2250	2	2 0 0	5 0 0	2 0 0	4500	4500	225
Coatbridge	1333	3	3 0 0	10 0 0	4 0 0	3999	3999	399.90
Crieff	2744	1	1 0 0	-	1 0 0	2744	2744	-
Cullen	600	1	1 0 0	5 0 0	0 15 0	600	600	30
Cumnock	200	6	6 0 0	5 0 0	6 0 0	1200	1200	60
Cupar Argus	600	5	5 0 0	7 0 0	7 3 0	3000	3000	210
Cupar Fife	250	10	10 0 0	7 10 0	15 0 0	2500	2500	187.50
Denny	750	2	-	-	-	1500	-	-
Douglas	500	1	1 0 0	6 0 0	1 1 0	500	500	30
Dumfries	400	20	14 0 0	5 0 0	20 0 0	8000	5600	280
Dunblane	560	2.50	2 10 0	4 0 0	2 10 0	1400	1400	56
Dundee Old	-	23.75	23 15 0	8 8 0	30 10 0	29687	29687	2493.71
Dundee New	8000	5	5 0 0	4 6 0	4 17 6	40000	40000	1720
Dunfermline	860	10	10 0 0	7 10 0	15 0 0	8600	8600	645
Dunoon	1000	2	2 0 0	-	2 0 0	2000	2000	-
Dysart	250	5	5 0 0	7 10 0	6 0 0	1250	1250	93.75
Edinburgh G. L.	6000	25	25 0 0	10 0 0	56½-57E	150000	150000	15000
Edinburgh/Leth	5480	25	18 0 0	7 10 0	27 13 6	137000	98640	7398
Elgin	455	11.50	11 10 0	6 0 0	11 10 0	5232.5	5232.5	313.90
Fochabers	600	1	1 0 0	-	1 0 0	600	600	-
Forfar	1440	5	5 0 0	7 10 0	7 15 0	7200	7200	-
Fraserburgh	2000	0.80	0 16 0	5 0 0	0 16 0	1600	1600	80
Galashiels	500	5	5 0 0	10 0 0	9 10 0	2500	2500	250
Girvan	900	2.50	2 10 0	6 0 0	2 10 0	2250	2250	135
Glasgow G. L.	6000	25	25 0 0	10 0 0	54 0 0	150000	150000	15000

1853 Continued.

Company	No. Shares Issued	Share	Paid-Up	Share Dividend	Market Value Shares	Nominal Issued	Paid-Up Capital	Annual Dividends
		£.p	£ s d	£ s d	£ s d	£	£	£
Glasgow City/Sub	15000	10	10 0 0	9 0 0	19 10 0	150000	150000	13500
Hamilton	1600	5	5 0 0	10 0 0	8 3 0	8000	8000	800
Hawick	440	5	5 0 0	7 10 0	7 10 0	2200	2200	165
Helensburgh	300	5	5 0 0	7 10 0	7 10 0	1500	1500	112.50
Huntly	1312	1	1 0 0	7 10 0	7 1 0	1312	1312	98.40
Inverary	250	5	5 0 0	10 0 0	6 12 6	1250	1250	125
Inverkeithing	425	1	1 0 0	5 0 0	1 0 0	425	425	21.25
Inverness G/W	1200	10	10 0 0	7 10 0	15 0 0	12000	12000	900
Inverness New Shares	2400	5	1 5 0	7 10 0	2 5 0	12000	3360	252
Irvine	310	10	10 0 0	10 0 0	15 0 0	3100	3100	310
Kelso	-	-	-	10 0 0	-	-	-	-
Kincardine	339	5	5 0 0	2 10 0	4 5 6	1695	1695	42.38
Kirkcaldy	120	5	5 0 0	10 0 0	8 10 0	600	600	60
Kirkcaldbright	320	5	5 0 0	5 0 0	5 0 0	1600	1600	80
Kirkintilloch	1000	3	3 0 0	5 0 0	3 0 0	3000	3000	150
Kirkwall	227	5	5 0 0	5 0 0	4 10 0	1135	1135	56.75
Kirriemuir	518	5	5 0 0	6 0 0	-	2590	2590	155.40
Largs	280	5	5 0 0	7 10 0	7-8£	1400	1400	105
Lauder	177	5	5 0 0	5 0 0	5 0 0	885	885	44.25
Leslie	1879	1	1 0 0	7 10 0	1 8 0	1879	1879	140.93
Leamahagow	614	1	1 0 0	6 0 0	1 0 0	614	614	38.84
Linnithgow	100	10	10 0 0	7 10 0	15 0 0	1000	1000	75
Lochgilthead	240	5	5 0 0	7 10 0	5 5 0	1200	1200	90
Markinch	1200	1	1 0 0	7 10 0	1 5 0	1200	1200	90
Mauchline	282	3	3 0 0	5 0 0	3 0 0	846	846	42.30
Maybole	423	5	5 0 0	4 10 0	5 0 0	2115	2115	95.18
Melrose	373	2	2 0 0	7 10 0	2 0 0	746	746	55.95
Mid & E. Calder	718	2	2 0 0	-	2 0 0	1436	1436	-
Moffat	200	5	5 0 0	5 0 0	5 0 0	1000	1000	50
Montrose	400	20	20 0 0	10 0 0	35 0 0	8000	8000	800
Nairn	618	1	1 0 0	5 0 0	1 0 0	618	618	30.90
Newmilns	1056	1	1 0 0	5 0 0	1 0 0	1056	1056	52.80
Newton Stewart	107	14.50	14 10 0	5 0 0	14 10 0	1551.5	1551.5	77.58
Okna	245	5	5 0 0	7 10 0	5 0 0	1225	1225	91.88
Peebles	194	5	5 0 0	5 0 0	5 0 0	970	970	48.50
Perth	800	25	25 0 0	4 16 0	22 10 0	20000	20000	960
Perth New	-	5	5 0 0	2 10 0	4 2 6	-	-	-
Poll o kshaws	2416	1	1 0 0	7 10 0	1 5 0	2416	2416	181.20
Prestonpans	200	5	5 0 0	6 0 0	5 0 0	1000	1000	75
Rutherglen	1500	1.33	1 6 8	5 0 0	1 6 8	2000	2000	100
Sanquhar	951	1	1 0 0	5 0 0	1 0 0	951	951	47.55

1853 Continued

Company	No. Shares Issued	Share	Paid-Up	Share Dividend	Market Value		Nominal Issued	Paid-Up Capital	Annual Dividends
					£ s d	£ s d			
St. Andrews	448	12	12 0 0	6 0 0	14 0 0	5378	5378	322.56	
Stewarton	200	8	8 0 0	5 0 0	8 0 0	1600	1600	80	
Stirling	7330	2	2 0 0	8 0 0	2 12 0	14660	14660	1172.80	
Stonehaven	2500	1	1 0 0	6 5 0	1 6 0	2500	2500	160	
Stornoway	600	2.50	2 10 0	-	2 15 0	1500	1500	-	
Stranraer	420	5	5 0 0	7 10 0	5 to 5½	2100	2100	157.50	
Strathaven	604	2	2 0 0	8 0 0	2 15 0	1208	1208	96.64	
Thurso	643	2.50	2 10 0	4 0 0	2 10 0	1607.5	1607.5	64.30	
Tranent	800	1	1 0 0	5 0 0	1 0 0	800	800	40	
Wemyss & Buckhaven	-	-	4 10 0	-	-	-	-	-	

Total - 88 Companies in sample, with £892,809.50p paid-up capital recorded. Total dividends recorded £73,511.38p (8.2 per cent average).

Note - Categories: Number of shares issued; Nominal value of Shares; Annual dividend per share £. s. d. per cent; Market value of each share; Nominal capital issued; Total Paid-Up Capital; Total annual dividends payment.

Source - J.G.L. 1853 Various Issues.

1861 Continued

Company	No. Shares Issued	Share	Paid-Up		Share Dividend		Market Value Shares		Nominal Issued	Paid-Up Capital	Annual Dividends
			£ p	£ s d	£ s d	£ s d	£	£			
Hamilton New	-	5	5 0 0	4 10 0	6 0 0	-	-	-	-	-	
Hawick	440	5	5 0 0	7 10 0	7 10 0	2200	2200	165			
Helensburgh	300	5	5 0 0	7 10 0	7 10 0	1500	1500	112.50			
Huntly	1312	1	1 0 0	7 10 0	1 5 0	1312	1312	98.40			
Inverary	250	5	5 0 0	10 0 0	6 12 6	1250	1250	125			
Inverkeithing	425	1	1 0 0	5 0 0	1 0 0	425	425	21.25			
Inverness G/W	1200	10	10 0 0	7 0 0	14 0 0	12000	12000	840			
Inverness New Shares	2400	5	1 5 0	7 0 0	2 0 0	12000	3000	210			
Irvine	-	10	10 0 0	10 0 0	14 0 0	-	-	-			
Irvine	-	2.50	2 10 0	10 0 0	3 12 6	-	-	-			
Jedburgh	300	5	5 0 0	7 10 0	7 10 0	1500	1500	90			
Johnstone	-	-	-	-	-	-	-	-			
Keith	-	-	-	-	-	-	-	-			
Kelso	600	5	5 0 0	10 0 0	10 10 0	3000	3000	300			
Kilayth	620	2	2 0 0	5 0 0	2 0 0	1240	1240	62			
Kennoway	-	-	-	-	-	-	-	-			
Kilmarnock	600	25	25 0 0	7 10 0	30 0 0	15000	15000	1125			
Kilmarnock New Shares	600	25	7 10 0	7 10 0		15000	15000	337.50			
Kincardine	334	5	5 0 0	5 0 0	4 10 0	1670	1670	83.50			
Kinghorn	-	-	-	-	-	-	-	-			
Kingkettle	-	-	-	-	-	-	-	-			
Kinross	-	-	-	-	-	-	-	-			
Kirkcaldy	1200	5	5 0 0	10 0 0	10 10 0	6000	6000	600			
Kirkcubright	320	5	5 0 0	5 0 0	5 0 0	1600	1600	80			
Kirkintilloch	997	3	3 0 0	6 13 4	3 7 0	2991	2991	199.40			
Kirkwall	-	-	-	-	-	-	-	-			
Kirriemuir	-	-	-	-	-	-	-	-			
Lanark	-	-	-	-	-	-	-	-			
Largo	-	-	-	-	-	-	-	-			
Largs	280	8	8 0 0	7 10 0	8 10 0	2240	2240	168			
Lasswade	1300	1	1 0 0	-	-	1300	1300	-			
Lauder	177	5	5 0 0	5 0 0	5 0 0	585	585	29.25			
Leslie	2000	1	1 0 0	7 10 0	1 5 0	2000	2000	150			
Lesmahagow	618	1	1 0 0	6 0 0	1 0 0	618	618	37.08			
Leuchars	-	-	-	-	-	-	-	-			
Leven	1800	1	1 0 0	7 10 0	23s to 25s	1800	1800	135			
Linnithgow	100	10	10 0 0	10 0 0	19 0 0	1000	1000	100			
Linton	-	-	-	-	-	-	-	-			
Lochee	-	-	-	-	-	-	-	-			
Lochgilphead	434	5	5 0 0	7 0 0	5 10 0	2170	2170	151.90			
Lochwinnoch	380	5	5 0 0	3 10 0	4 0 0	1900	1900	66.50			

1861 Continued

Company	No. Shares Issued	Share	Paid-Up	Share Dividend	Market	Nominal Issued	Paid-Up Capital	Annual Dividends
					Value Shares			
		£.p	£ s d	£ s d	£ s d	£	£	£
Markinch	1200	1	1 0 0	8 0 0	1 5 0	1200	1200	96
Maryhill	-	-	-	-	-	-	-	-
Mauchline	282	3	3 0 0	5 0 0	3 0 0	846	846	42.30
Maxwelltown	-	-	-	-	-	-	-	-
Maybole	423	5	5 0 0	4 10 0	5 0 0	2115	2115	95.18
Melrose	373	2	2 0 0	7 10 0	2 10 0	746	746	55.95
Mid & E. Calder	718	2	2 0 0	-	2 0 0	1436	1436	-
Moffat	200	5	5 0 0	5 0 0	-	1000	1000	100
Moffat	120	2.50	2 10 0	5 0 0	-	300	300	15
Montrose	400	20	20 0 0	10 0 0	35 0 0	8000	8000	800
Musselburgh	800	5	5 0 0	10 0 0	9 10 0	4000	4000	400
Nairn	618	1	1 0 0	5 0 0	1 0 0	618	618	30.90
Neilston	-	-	-	-	-	-	-	-
Newburgh	300	5	5 0 0	8 0 0	7 0 0	1500	1500	120
Newburgh New Shares	300	1	1 0 0	8 0 0	-	300	300	24
Newmilns	1200	1	1 0 0	7 10 0	1 2 0	1200	1200	90
Newton-on-Ayr	-	-	-	-	-	-	-	-
Newton Stewart	107	14.50	14 10 0	5 0 0	14 10 0	1551.5	1551.5	77.58
North Berwick	300	5	5 0 0	5 0 0	7 10 0	1500	1500	75
N. Queensferry	-	-	-	-	-	-	-	-
Oban	245	5	5 0 0	7 10 0	5 7 6	1225	1225	91.88
Peebles	1000	5	5 0 0	6 0 0	5 0 0	5000	5000	300
Peebles	500	2.50	2 10 0	6 0 0	2 10 0	1250	1250	75
Perth	1000	25	25 0 0	6 10 0	30 0 0	25000	25000	1625
Perth New	3000	5	5 0 0	6 0 0	5 10 0	15000	15000	900
Peterhead	-	-	-	-	-	-	-	-
Pittenween	2000	1	1 0 0	6 0 0	1 1 0	2000	2000	120
Pollackshaws	2416	1	1 0 0	7 10 0	1 5 0	2416	2416	181.20
Port Glasgow	-	-	-	-	-	-	-	-
Portobello	-	-	-	-	-	-	-	-
Prestonpans	200	5	5 0 0	6 0 0	-	1000	1000	60
Rutherglen	1500	1.33	1 6 8	5 0 0	1 6 8	2000	2000	100
St. Andrews	250	12	12 0 0	6 5 0	16 0 0	3000	3000	187.50
St. Andrews New	193	12	12 0 0	6 5 0	16 0 0	2316	2316	144.75
Salcoats	400	5	5 0 0	7 10 0	6 0 0	2000	2000	150
Sanquhar	936	1	1 0 0	5 0 0	0 15 0	936	936	46.80
Sanquhar pref.	30	1	1 0 0	5 0 0	-	30	30	1.50
Selkirk	-	-	-	-	-	-	-	-
South Queensferry	-	-	-	-	-	-	-	-
Stewarton	200	5	5 0 0	10 0 0	6 to 6½	1000	1000	100
Stirling	7450	2	2 0 0	8 0 0	3 12 0	14900	14900	1192

1861 Continued

Company	No. Shares Issued	Share £.p	Paid-Up £ s d	Share Dividend		Market Value Shares		Nominal Issued £	Paid-Up Capital £	Annual Dividends £
				£ s d	£ s d	£ s d	£ s d			
Stonchaven	2500	1	1 0 0	6 5 0	1 5 0	2500	2500	2500	2500	156.25
Stonchouse	1110	1	1 0 0	7 10 0	13 to 15s	1110	1110	1110	1110	83.25
Stornoway	600	2.50	2 10 0	-	2 10 0	1500	1500	1500	1500	-
Stranraer	500	5	5 0 0	7 10 0	6 0 0	2500	2500	2500	2500	187.50
Strathaven	588	2	2 0 0	8 0 0	3 0 0	1176	1176	1176	1176	94.08
Thurso	643	2.50	2 10 0	-	2 10 0	1607.5	1607.5	1607.5	1607.5	-
Tillicoltry	-	-	-	-	-	-	-	-	-	-
Tranent	800	1	1 0 0	5 0 0	1 0 0	800	800	800	800	40
Troon	-	-	-	-	-	-	-	-	-	-
Tullibody	-	-	-	-	-	-	-	-	-	-
Wemyss/Duckhaven	2051	1	1 0 0	6 0 0	1 0 0	2051	2051	2051	2051	123.06
Wick	-	-	-	-	-	-	-	-	-	-
Wigtown	665	5	5 0 0	-	-	3325	3325	3325	3325	-

Total - 170 Companies in sample, with £1,091,615.80p paid-up capital recorded, on which £93909.32p dividends (8.6 per cent) were shown.

Source - J.G.L. 1861 Various issues.

(3)

1871

Company	No. Shares Issued	Share	Paid-Up	Share Dividend		Market Value Shares		Nominal Issued	Paid-Up Capital	Annual Dividends
				£ s d	£ s d	£ s d	£ s d			
Aberdeen	26000	2.50	2 10 0	10 0 0	5 1 0	65000	65000	6500		
Aberlady	700	1	-	-	-	700	700	-		
Aberlour	-	-	-	-	-	650	-	-		
Airdrie	500	10	10 0 0	9 0 0	14 10 0	5000	500	450		
Annan	600	7	7 0 0	6 0 0	7 0 0	4200	4200	252		
Anstruther/Cellardyke	1600	1	1 0 0	3 0 0	1 6 0	1600	1600	128		
Arbroath	825	20	20 0 0	7 10 0	30 0 0	16500	16500	1237.50		
Ardrossan	125	20	20 0 0	8 0 0	20 0 0	2500	2500	200		
Auchinleck	658	1	1 0 0	-	-	658	658	-		
Auchterarder	381	5	5 0 0	7 10 0	7 10 0	1905	1905	142.88		
Auchtermuchty	750	2	2 0 0	6 0 0	2 10 0	1500	1500	90		
Ayr	2932	5	5 0 0	6 0 0	6 8 0	-	-	-		
Ayr (Newton)	1250	2	2 0 0	6 0 0	2 2 0	-	-	-		
Banff	300	10	10 0 0	6 0 0	11 0 0	3000	3000	180		
Barrhead	2158	1	1 0 0	7 10 0	1 0 0	2158	2158	161.85		
Bathgate	200	5	5 0 0	5 0 0	5 0 0	1000	1000	50		
Bervie	976	1	1 0 0	5 0 0	-	976	976	48.80		
Bairgowrie	739	5	5 0 0	8 0 0	7 0 0	3695	3695	295.60		
Berrowslowness	400	5	6 0 0	5 0 0	6 0 0	2400	2400	120		
Brechin	540	5	5 0 0	11 0 0	12 0 0	2700	2700	297		
Broughty Ferry	8350	2	2 0 0	6 0 0	2 4 0	16700	16700	1002		
Carnoustie	250	4	4 0 0	7 10 0	4 0 0	1000	1000	75		
Castle Douglas	178	5	5 0 0	5 0 0	5 0 0	890	890	44.50		
Coatbridge	2530	3	3 0 0	10 0 0	5 0 0	6990	6990	69.90		
Coldstream	200	5	5 0 0	6 0 0	5 0 0	1000	1000	60		
Comrie	1000	1	1 14 8	4 10 0	1 14 8	1000	1733.33	78		
Crail	1200	1	1 0 0	5 0 0	1 0 0	1200	1200	60		
Crieff	2744	1	1 0 0	10 0 0	1 15 0	2744	2744	274.40		
Cullen	600	1	1 0 0	5 0 0	0 15 0	600	600	30		
Cumbernauld	280	2.50	2 10 0	5 0 0	2 10 0	700	700	35		
Cumnock	200	5	5 0 0	6 0 0	6 0 0	1000	1000	60		
Cupar Angus	600	5	5 0 0	7 0 0	6 10 0	3000	3000	210		
Cupar (Fife)	250	10	10 0 0	10 0 0	18 10 0	2500	2500	250		
Dalkeith	300	10	10 0 0	10 0 0	20 0 0	3000	3000	300		
Denny	750	2	2 0 0	6 5 0	2 5 0	1500	1500	93.75		
Dornoch	-	5	-	-	-	-	-	-		
Douglas	500	1	1 0 0	6 0 0	1 2 0	500	500	30		
Dumfries	400	20	14 0 0	7 2 10	14 10 0	8000	5600	399.93		
Dunbar	391	5	5 0 0	6 0 0	5 10 0	1955	1955	117.30		
Dunfermline	860	10	10 0 0	10 0 0	16 10 0	8600	8600	860		
Dunoon	1750	2	2 0 0	6 0 0	2 3 0	3500	3500	210		

1871 Continued

Company	No. Shares Issued	Share	Paid-Up	Share Dividend	Market Value Shares	Nominal Issued	Paid-Up Capital	Annual Dividends
		£.p	£ s d	£ s d	£ s d	£	£	£
Dysart	250	5	5 0 0	7 10 0	6 10 0	1250	1250	93.75
East Wemyss	2327	1	1 0 0	6 0 0	1 2 0	2327	2327	139.62
Ecclefechan	750	1	1 0 0	-	-	750	750	-
Edinburgh G.L.	6600	25	25 0 0	10 0 0	53 10 0	165000	165000	16500
Edinburgh/Leith	6000	25	23 0 0	8 0 0	35 0 0	150000	150000	12000
Elgin	621	12	12 0 0	6 0 0	13 0 0	7452	7452	447.12
Elgin/Earlsferry	1300	1	1 0 0	7 5 0	1 3 0	1300	1300	94.25
Falkirk	-	14	14 0 0	7 0 0	14 0 0	-	-	-
Falkland	632	2	2 0 0	5 0 0	2 0 0	1264	1264	63.20
Ferry Port on Craig	2000	1	1 0 0	6 5 0	1 8 0	2000	2000	125
Fochabers	581	1	1 0 0	5 0 0	1 2 0	581	581	29.05
Forfar	1440	5	5 0 0	7 10 0	7 12 6	7200	7200	540
Forfar New Shares	360	5	2 10 0	7 10 0	6 10 0	1800	900	67.50
Fraserburgh	2000	1	0 16 0	5 0 0	0 18 0	2000	1600	80
Galashiels	1800	5	5 0 0	10 0 0	8 0 0	9000	9000	900
Girvan	900	2.50	2 10 0	6 0 0	2 10 0	2250	2250	135
Grangemouth	190	10	10 0 0	5 0 0	10 0 0	1900	1900	95
Haddington	400	8.75	8 5 0	7 10 0	11 10 0	-	3300	247.50
Hamilton New	-	5	5 0 0	4 10 0	6 0 0	-	-	-
Hawick	1480	5	5 0 0	10 0 0	9 0 0	7400	7400	740
Helensburgh	300	5	5 0 0	7 10 0	7 10 0	1500	1500	112.50
Hollywood	2000	2	2 0 0	7 10 0	3 0 0	4000	4000	300
Huntly	1312	1	1 0 0	7 10 0	1 5 0	1312	1312	99
Innellan	268	2	-	-	-	536	-	-
Inverary	250	5	5 0 0	10 0 0	6 12 6	1250	1250	125
Inverkeithing	1500	1	1 0 0	5 0 0	1 0 0	1500	1500	75
Inverkip	800	1	0 10 0	-	-	800	400	-
Inverness G/W	1200	10	10 0 0	7 10 0	13 0 0	12000	12000	900
Inverness New Shares	2400	5	5 0 0	7 10 0	6 10 0	12000	12000	900
Irvine	-	10	10 0 0	10 0 0	14 0 0	-	-	-
Irvine	-	2.50	2 10 0	10 0 0	3 12 6	-	-	-
Jedburgh	300	5	5 0 0	7 10 0	7 10 0	1500	1500	112.50
Keith	1300	1	1 0 0	5 0 0	0 11 0	1300	1300	65
Kelso	600	5	5 0 0	10 0 0	11 0 0	3000	3000	300
Kilsyth	620	2	2 0 0	5 0 0	2 0 0	1240	1240	62
Kennoway	950	1	1 0 0	5 0 0	1 1 0	950	950	47.50
Kettle/Freuchie	1515	1	1 0 0	5 0 0	5 0 0	1515	1515	75.75
Kilmarnock	600	25	25 0 0	7 10 0	30 0 0	15000	15000	1125
Kilmarnock New Shares	600	25	7 10 0	7 10 0	-	15000	15000	337.50
Kincaidine	334	5	5 0 0	5 0 0	4 10 0	1670	1670	83.50
Kirkcaldy	1200	5	5 0 0	10 0 0	10 10 0	6000	6000	600
Kirkcubright	320	8	8 0 0	5 0 0	8 0 0	2560	2560	128
Kirkintilloch	997	5	5 0 0	6 13 4	3 7 0	4985	2991	199.34

1871 Continued

Company	No. Shares Issued	Share	Paid-Up	Share Dividend		Market Value Shares		Nominal Issued	Paid-Up Capital	Annual Dividends
				£ s d	£ s d	£ s d	£			
Lanark Consumers	3500	1	1 0 0	7 10 0	1 2 6	3500	3500	262.5		
Larys	280	8	8 0 0	7 10 0	8 10 0	2240	2240	168		
Lasswade	1309	1	1 0 0	-	-	1309	1309	-		
Lauder	177	5	5 0 0	5 0 0	5 0 0	2385	2385	119.25		
Leslie	1000?	1	1 0 0	7 10 0	1 5 0	1000	1000	75		
Lesmahagow	618	1	1 0 0	6 0 0	1 0 0	618	618	37.08		
Leven	906	5	5 0 0	10 0 0	7 0 0	4530	4530	453		
Linnithgow	100	10	10 0 0	10 0 0	19 0 0	1000	1000	100		
Lochgilthead	434	5	5 0 0	7 0 0	5 10 0	2170	2170	151.9		
Lochwinock	380	5	5 0 0	3 10 0	4 0 0	1900	1900	66.5		
Lockerbie	-	-	5 0 0	-	-	-	-	-		
Markinch	1200	1	1 0 0	8 0 0	1 5 0	1200	1200	96		
Mauchline	282	3	3 0 0	5 0 0	3 0 0	846	846	42.3		
Maxwelltown	667	5	5 0 0	5 0 0	3 to 3.25£	3335	3335	166.75		
Maybole	423	5	5 0 0	4 10 0	5 0 0	2115	2115	95.18		
Meigle	-	-	-	-	-	700	-	-		
Midrose	373	2	2 0 0	7 10 0	2 10 0	746	746	55.95		
Mid & E. Calder	718	2	2 0 0	-	2 0 0	1436	1436	-		
Moffat	200	5	5 0 0	5 0 0	-	1000	1000	50		
Moffat New Shares	120	2.50	2 10 0	5 0 0	-	300	300	15		
Montrose	400	20	20 0 0	10 0 0	35 0 0	8000	8000	800		
Muirkirk	-	-	-	-	-	1000	-	-		
Musselburgh	1000	5	5 0 0	8 0 0	9 9 0	5000	5000	400		
Nairn	618	1	1 0 0	5 0 0	1 0 0	618	618	30.9		
Newburgh	300	5	5 0 0	8 0 0	7 0 0	1500	1500	120		
Newburgh New Shares	300	1	1 0 0	8 0 0	-	300	300	24		
Newmilns	1200	1	1 0 0	7 10 0	1 2 0	1200	1200	90		
Newport (Fife)	1300	1	1 0 0	5 0 0	1 1 0	1300	1300	65		
Newton Stewart	107	14.50	14 10 0	5 0 0	14 10 0	1551.5	1551.5	77.58		
N. Berwick	300	5	5 0 0	5 0 0	7 10 0	1500	1500	75		
Oban	245	5	5 0 0	7 10 0	5 7 6	1225	1225	91.88		
Peebles	1000	5	5 0 0	6 0 0	5 0 0	5000	5000	300		
Peebles New Shares	500	2.50	2 10 0	6 0 0	2 10 0	1250	1250	75		
Perth A Shares	1000	25	25 0 0	8 0 0	30 0 0	25000	25000	2000		
Perth B Shares	1000	5	5 0 0	8 0 0	6 0 0	5000	5000	400		
Perth New	3000	5	5 0 0	-	0 3 0	15000	15000	-		
Pittonween	2000	1	1 0 0	6 0 0	1 1 0	2000	2000	120		
Pollackshaws	2416	1	1 0 0	7 10 0	1 5 0	2416	2416	181.2		
Prestonpana	200	5	5 0 0	6 0 0	-	1000	1000	60		
Renton	1594	1	1 0 0	7 10 0	1 1 6	1594	1594	119.55		
Rutherglen	1500	1.33	1 6 8	5 0 0	1 6 8	2000	2000	100		

1871 Continued

Company	No. Shares Issued	Share	Paid-Up	Share Dividend		Market Value Shares		Nominal Issued	Paid-Up Capital	Annual Dividends
				£ s d	£ s d	£ s d	£ s d			
St. Andrews	250	12	12 0 0	8 6 8	16 10 0	3000	3000	3000	249.99	
St. Andrews New Shares	193	12	12 0 0	8 6 8	16 10 0	2316	2316	2316	192.99	
Saltcoats	400	5	5 0 0	7 10 0	6 0 0	2000	2000	2000	150	
Sanquhar	936	1	1 0 0	5 0 0	0 15 0	936	936	936	46.80	
Sanquhar Preference	30	1	1 0 0	5 0 0	-	30	30	30	1.50	
Selkirk	507	5	5 0 0	10 0 0	10 0 0	2535	2535	2535	253.50	
Slamannan	-	2	-	-	-	-	-	-	-	
South Queensferry	508	1	1 0 0	5 0 0	1 0 0	508	508	508	25.40	
Stewarton	200	5	5 0 0	10 0 0	£6 to 6½	1000	1000	1000	100	
Stirling	7450	2	2 0 0	10 0 0	4 0 6	14900	14900	14900	490	
Stonehaven	2500	1	1 0 0	6 5 0	1 5 0	2500	2500	2500	156.25	
Stonehouse	1110	1	1 0 0	7 10 0	13s to 15s	1110	1110	1110	83.25	
Stornoway	600	2.50	2 10 0	8 0 0	3 10 0	1500	1500	1500	120	
Straaraer	500	5	5 0 0	10 0 0	6 13 6	2500	2500	2500	250	
Strathavea	588	2	2 0 0	8 0 0	3 0 0	1176	1176	1176	9408	
Thurso	643	2.50	2 10 0	-	2 10 0	1607.5	1607.5	1607.5	-	
Tranent	800	1	1 0 0	5 0 0	1 0 0	800	800	800	40	
Wemyss/Buckhaven	2651	1	1 0 0	6 0 0	1 0 0	2651	2651	2651	159.06	
Wigtown	665	5	5 0 0	-	-	3325	3325	3325	-	

Companies in sample 134 Paid-Up capital recorded £ 786,345.33
 Dividends total £ 72,169 (10.9% average)

Source - J. G. L. 1871 Various issues.

(4)

1883

Town	Capital £	Per Resident £	Dividend %	Town	Capital £	Per Resident £	Dividend %
Aberdeen	65,000	0.65	-	Carlisle	-	-	-
Aberfeldy	-	-	-	Carnoustie	5,000	-	-
Aberlady	700	1.47	-	Castle Bar	-	-	5
Aberlour	650	1.08	-	Castle Douglas	1,500	0.66	-
Airdrie	13,200	0.84	11	Catrine	1,050	0.4	5
Alexandria	-	-	-	Clippens	-	-	-
Alloa	23,250	2.33	-	Clydebank	-	-	-
Alva	-	-	-	Coatbridge	38,250	1.91	7 & 10
Alyth	2,500	0.83	6	Coldstream	1,000	1.0	8
Anna	3,000	0.91	-	Collinsburgh	536	1.34	5
Anstruther	2,000	0.5	8	Comrie	1,459	1.25	-
Arbroath	20,000	0.91	-	Corstorphine	850	0.85	5
Ardrossan G. & W.	9,750	2.44	10	Coupar Angus	3,000	1.50	7.5
Armadale	1,000	0.2	-	Craig	733	0.61	-
Auchterarder	2,381	0.92	8	Crieff	2,744	0.66	10
Auchtermuchty	1,500	-	-	Cullen	600	0.29	8
Ayr Newton	18,000	1.01	7.5	Cumbernauld	532	-	7
Ayr				Cupar Fife	6,250	1.21	-
Balliceston	-	-	-	Dalbeattie	1,200	0.31	8
Balfrae	-	-	-	Dalkeith	3,000	2.73	-
Ballator	-	-	-	Dalry(Ayr)	2,000	0.4	15
Banchory	1,544	1.57	-	Darvel	1,600	0.94	7.5
Banff	3,000	0.74	5	Deanston	-	-	-
Barrhead	10,000	0.83	6	Denny	2,500	0.54	10
Bathgate	3,000	0.6	10	Dingwall	-	-	-
Beaully	-	-	-	Dollar	-	-	-
Bellshill	-	-	-	Douglas	500	0.36	-
Belth	2,400	0.6	7	Doune	-	-	-
Bervie	976	0.96	-	Dreghorn	-	-	-
Biggar	-	-	-	Dufftown	-	-	5
Blairgowrie	9,390	1.34	6	Dumbarton	-	-	-
Blyth	3,500	0.5	-	Dumfries & Maxwelltown	22,500	1.13	-
Boness	3,000	0.5	5	Dunbar	1,955	0.61	-
Bothwell	9,000	1.61	10	Dunblane	-	-	-
Brechin	6,440	0.64	12.5	Dundee	133,080	0.83	-
Bridge of Allan	3,365	0.96	10	Dundonald	-	-	-
Bridge of Weir	950	0.68	7.5	Dunfermline	20,046	1.34	8.5
Broughty Ferry	-	-	-	Dunkeld	-	-	-
Burntisland	-	-	-	Dunning	-	-	-
Callander	-	-	-	Dunoon	6,000	0.6	-
Cambuslang	-	-	7.5	Dunse	-	-	-
Campbeltown	-	-	-	Dunshalt	-	-	-

1883 Continued

Town	Capital £	Per Resident £	Dividend %	Town	Capital £	Per Resident £	Dividend %
Dysart	1,250	0.14	-	Huntly	1,312	0.37	-
Eaglesham	-	-	-	Innellan	1,000	-	-
Earlston	-	-	-	Innerliehen	-	-	8
E. Kilbride	1,415	1.29	6	Inverary	1,085	1.16	10
E. Linton	-	-	-	Invergordon	1,500	1.30	-
E. Wemyss & Buckhaven	2,327	2.9	-	Inverkeithing	800	0.42	-
E. & W. Anstruther &) Cellardyke)	2,000	0.5	8	Inverkip	800	0.42	-
Easter Buckie	1,000	0.4	5	Inverness	39,000	1.95	-
Ecclefechan	750	0.89	-	Inverurie	-	-	-
Edinburgh	177,500	0.59	10	Irvine	-	-	10
Edinburgh/Leith	150,000	0.53	8	Jedburgh	3,600	1.08	7.5
Elgin	16,000	2.18	-	Johnstone	22,000	2.75	-
Elle/Earlsferry	1,300	2.08	-	Johnshaven	-	-	-
Ellon	800	0.89	-	Kamesburgh	-	-	-
Eyemouth	-	-	5	Keith	3,000	0.66	5
Falkirk L.	8,000	0.8	10	Kelso	6,000	1.2	10
Falkland	1,264	0.99	-	Kennoway	950	1.14	-
Ferryport	2,000	0.71	5	Kettle & c.	3,000	1.13	5
Fettercairn	-	-	-	Kilbarchan	1,800	0.67	6
Fochabers	581	0.47	-	Kilbrnie	-	-	-
Forfar	21,000	1.75	7	Kilmalcolm	3,000	3.0	6
Forres	-	-	-	Kilmarnock	39,500	1.58	-
Fortrose	622	0.68	-	Kilsyth	1,200	0.25	-
Fort William	-	-	-	Kilmaurs	1,000	0.77	-
Fraserburgh	1,600	0.27	7.5	Kilwinning	1,700	0.47	8
Frolicham	-	-	-	Kincardine	1,670	-	-
Galashiels	18,000	1.13	10	Kinghorn	-	-	-
Galston	1,578	0.26	7.5	Kingskettle	-	-	-
Gatehouse Fleet	1,320	0.88	5	Kinross & M.	-	-	-
Girvan	3,000	0.63	-	Kirkcaldy	24,500	1.07	7.5
Glasgow	462,009	0.62	-	Kirkcudbright	3,200	1.3	-
Golspie	-	-	-	Kirkintilloch	7,000	0.88	-
Gourock	4,200	1.05	7.5	Kirkwall	2,202	0.56	7.5
Grahamstown	-	-	-	Kirriemuir	2,000	0.48	-
Grangemouth	1,999	0.57	-	Lanark	5,480	0.93	6.5
Grantown	-	-	-	Langbank	-	-	-
Greenock	130,000	1.86	-	Langholm	2,500	0.54	12.5
Haddington	4,000	0.99	8	Largs	4,200	1.40	6
Hamilton	27,609	1.53	-	Larkhall	1,201	0.2	7.5
Harthill	-	-	-	Lasswade	1,365	1.09	-
Hawick	9,250	0.54	10	Latham	-	-	-
Helensburgh	14,000	1.75	-	Lauder	900	0.82	-

1883 Continued.

Town	Capital £	Per Resident £	Dividend %	Town	Capital £	Per Resident £	Dividend %
Laurencekirk	-	-	7.5	Old Cumnock	3,000	1.0	-
Lennoxton	1,200	0.4	10	Old Kirkpatrick	-	-	-
Lerwick	-	-	10	Old Meldrum	1,000	-	-
Leslie	1,879	-	-	Paisley	52,156	0.87	-
Lesmahagow	618	0.43	-	Peebles	5,800	1.35	9
Leuchars	-	-	-	Penicuik	8,000	1.33	7.5
Leven	1,800	0.72	10	Perth	51,000	1.7	-
Linnithgow	1,000	0.25	-	Peterhead	14,000	1.27	-
Linton (West)	-	-	-	Pittenween	2,000	0.5	8
Lochgelly (Fife)	-	-	-	Pollokshaws	4,200	0.47	-
Lochgilthead	2,600	1.58	5	Port Glasgow	20,000	1.43	-
Lochmaben	-	-	-	Portobello	10,000	1.82	8
Lochwinnoch	2,000	1.42	-	Portsoy	-	-	-
Lockerbie	1,440	0.72	7	Prestonpans	2,684	0.54	6
Macduff	2,000	0.57	5	Renfrew	-	-	-
Markinch	1,200	0.97	8	Renton	1,578	0.49	-
Maryhill, P. & H.	129,185	1.39	5.5	Rothies	-	-	-
Mauchline	846	0.54	-	Rothessay	-	-	-
Maybole	3,500	0.88	-	St. Andrews	6,000	0.92	12.5
Melgie	700	1.4	2.5	Saltcoats	2,000	0.39	10
Melrose	2,750	1.96	-	Sanquhar	936	0.53	-
Mid & E. Calder	1,436	1.16	4	Selkirk	4,535	0.65	10
Millport	-	-	-	Skelmorlie	-	-	-
Milngavie	4,500	1.8	4	S. Queensferry	518	0.34	-
Moffat	1,300	0.75	-	Stevenston	1,600	0.56	7.5
Montrose	20,000	1.25	7.5	Stewarton	1,200	0.29	-
Motherwell	11,500	0.82	7	Stirling	30,000	1.76	-
Muirkirk	2,000	0.84	10	Stonehaven	4,500	1.33	-
Musselburgh	5,000	0.56	-	Stonehouse	1,155	0.46	5
Nairn	3,500	0.7	5	Stornoway	1,460	0.58	-
Nelliston	-	-	-	Stow	-	-	-
Newburgh	2,000	0.77	-	Stranraer	2,000	0.34	-
New Cumnock	1,600	0.46	-	Strathaven	1,176	0.32	-
Newmilns	2,000	0.66	-	Strathmiglo	-	-	-
New Pittligo	-	-	-	Stromness	2,000	0.83	4
Newport	-	-	-	Tain	-	-	-
Newport (Fife)	1,300	-	-	Thornhill	-	-	-
Newton Stewart	1,551	0.54	-	Thurso	15,000	4.14	-
N. Derwick	1,500	0.5	-	Tilliecountry	6,900	1.3	-
N. Queensferry	-	-	-	Tranent	800	0.34	-
Oban	-	-	-	Troon	-	-	-

1883 Continued

Town	Capital	Per Resident	Dividend
	£	£	%
Tullibody	-	-	-
Turrif	1,218	0.28	-
W. Calder	2,000	-	-
W. Kilbride	1,500	1.25	-
W. Linton	327	0.77	-
W. Wemyss	-	-	-
Whitburn	1,000	-	7.5
Whithorn	800	0.49	-
Wick	-	-	-
Wigtown	1,180	0.67	5
Wishaw	7,000	0.66	-

Notes - Loan capital, additional to capital stated above, was recorded as £450 at Catrine; £7450 at Coatbridge; £300 Easter Buckle; £1000 at Langholm; £58,350 at Hillhead/Partick/Maryhill. Loan capital in municipal undertakings is included in the table. Fixed capital per person residing in the market area was a standard test to determine whether a company had excessive stock. Great variations in this amount, as shown above, were a result of two factors - (1) heavy reinvestment from profits without corresponding adjustment of nominal capital stock; (2) Greater consumption of gas per resident in towns with a large consumption by manufacturing industries. These factors cannot be disentangled.

Where municipal gasworks' capital is stated, the various manipulations of book-capital, earlier mentioned, make these figures unreliable.

Undertakings in Sample 261

Paid-Up capital (and municipal loans) recorded £ 2,216,348

Source - C. W. Hastings The Gas and Water Companies Directory (1883)

(5)

CAPITAL INVESTMENT AND GAS OUTPUT (A) 1903 AND (B) 1913

Town	(A) Output Thou. Cu. ft.	Capital £	Capital £ per Million Cu. ft.	(B) Output Thou. Cu. ft.	Capital £	Capital £ per Million Cu. ft.
Aberfeldy	1,838	-	-	3,835	-	-
Aberdeen	641,565	317,845	495.4	924,542	-	-
Aberlady	-	-	-	4,500	6,000	1333.3
Aberlour	526	650	1235.7	850	482	567.1
Abernethy	700	800	1142.9	1,698	800	471.1
Airdrie	64,900	27,840	429.0	111,296	100,059	899.0
Alexandria	40,100	-	-	68,257	30,000	439.5
Alloa	97,487	31,694	325.1	150,736	33,841	224.5
Alva	17,886	13,000	726.8	-	-	-
Alyth	4,000	3,000	750.0	6,500	3,000	461.5
Annau	13,278	10,000	753.1	20,828	13,250	636.2
Anstruther	11,330	5,000	441.3	15,600	7,600	487.2
Arbroath	70,768	66,317	937.1	120,492	53,242	441.9
Ardrossan	24,139	-	-	20,533	25,595	1246.5
Armadale	4,786	1,500	313.4	17,640	-	-
Auchincleek	2,500	1,600	640.0	-	-	-
Auchterarder	4,500	3,500	777.8	6,430	3,500	544.3
Auchtermuchty	1,040	1,500	1442.3	2,600	1,500	576.9
Ayr	74,368	36,000	484.0	67,618	36,000	532.4
Ayr Newton	50,010	20,000	399.9	86,399	55,000	636.6
Dalkeith	8,385	3,049	363.6	16,212	6,098	376.1
Dalfron	-	-	-	-	-	-
Dunfermline	1,700	2,400	1411.8	3,100	2,400	774.2
Bankfoot	700	-	-	-	-	-
Banff	7,934	4,500	567.2	11,852	5,100	430.3
Barrhead	35,972	22,500	625.5	50,082	22,500	449.3
Bathgate	17,000	8,000	470.6	42,000	12,000	285.7
Beauly	-	-	-	-	-	-
Belth	9,025	4,800	531.9	-	-	-
Bellshill	22,196	13,000	585.7	39,102	16,236	415.2
Bervie	550	-	-	800	-	-
Biggarr	2,235	1,730	774.0	3,477	1,730	497.6
Blackford	-	1,200	-	900	-	-
Blairgowrie	12,866	10,000	777.2	13,948	10,000	716.9
Blantyre	22,447	6,000	267.3	33,854	12,000	354.5
Boness	24,705	18,325	741.8	30,294	15,125	499.3
Bonnyrigg/Lasswade	8,000	3,000	375.0	-	-	-
Bothwell/Uddingston	98,600	23,000	233.3	91,100	33,000	350.7
Brechin	22,400	19,000	818.2	28,684	20,000	697.3
Bridge of Allan	24,990	6,600	264.1	26,541	24,000	904.3
Bridge of Weir	7,559	3,225	426.6	13,236	6,000	453.3

Town	(A) 1903			(B) 1913		
	Output Thou. Cu. ft.	Capital £	Capital £ per Million Cu. ft.	Output Thou. Cu. ft.	Capital £	Capital £ per Million Cu. ft.
Broughty Ferry	63,796	46,833	734.1	74,264	33,507	451.2
Burnt island	16,412	-	-	24,350	-	-
Buckle	4,080	2,000	490.2	9,805	4,670	476.3
Busby	6,000	-	-	5,860	-	-
Callander	4,025	3,000	745.3	5,400	4,000	740.7
Cambeslang	43,768	27,000	616.9	76,165	36,000	472.7
Campbeltown	22,281	11,500	516.1	26,556	17,580	662.0
Carfin	2,135	-	-	10,000	12,500	1250.0
Carlisle	14,206	7,000	492.7	23,594	10,400	440.8
Cardenden	-	-	-	12,123	12,500	1031.1
Carnoustie	16,666	6,000	360.0	28,409	22,000	774.4
Castle Douglas	8,049	-	-	12,640	4,500	356.0
Catrine	2,734	1,225	448.1	4,396	1,225	278.7
Coatbridge	140,835	82,331	584.6	228,228	90,842	398.0
Coldstream	4,600	1,000	217.4	7,250	1,000	137.9
Comrie	1,000	1,000	1000.0	1,250	1,000	800.0
Cove/Kilcreggan	-	-	-	-	-	-
Cowdenbeath	6,000	-	-	41,292	20,000	484.4
Coupar Angus	3,919	3,000	765.5	5,300	4,050	764.2
Crail	1,400	1,000	714.3	2,690	2,000	743.5
Crieff	20,900	-	-	26,900	-	-
Cullen	1,800	800	444.4	4,200	900	214.3
Cupar	22,350	11,000	492.2	25,400	-	-
Dalbeattie	3,000	1,500	500.0	6,200	1,500	241.9
Dalkeith	19,045	8,000	420.1	25,285	8,000	316.4
Dalmellington	1,180	1,100	932.2	2,000	1,400	700.0
Dalry	8,493	-	-	9,000	-	-
Darvel	9,000	4,000	444.4	14,000	10,600	757.1
Deanston	1,270	-	-	-	-	-
Denny	10,534	-	-	17,216	-	-
Dingwall	-	-	-	-	-	-
Dollar	2,700	2,020	748.1	2,856	2,511	879.2
Douglas	1,300	500	384.6	-	-	-
Doone	1,200	-	-	1,666	1,000	600.0
Dreghorn	1,765	-	-	-	-	-
Dufftown	-	-	-	-	-	-
Dumharton	78,600	-	-	95,466	22,990	240.8
Dumfries	95,030	58,700	617.7	123,560	75,829	613.7
Dunbar	11,000	8,400	763.6	16,171	7,331	453.3
Dunblane	9,000	-	-	-	-	-
Dundee	674,716	370,615	549.3	994,727	366,807	368.8
Dunfermline	98,100	112,315	1144.8	156,961	90,357	575.7

Town	(A) 1903			(B) 1913		
	Output Thou. Cu. ft.	Capital £	Capital £ per Million Cu. ft.	Output Thou. Cu. ft.	Capital £	Capital £ per Million Cu. ft.
Dunkeld	1,642	1,100	669.9	1,650	750	454.5
Dunblair	344	1,500	4360.5	800	1,500	1875.0
Dunoon	30,847	34,000	1102.2	44,665	30,883	691.4
Duns	8,500	-	-	6,275	-	-
Dunshalt	-	-	-	-	-	-
Dysart	7,229	2,810	388.7	-	-	-
Eaglesham	-	-	-	-	-	-
Earlston	1,839	900	489.4	2,888	900	311.6
East Kilbride	2,198	2,331	1060.5	4,250	2,331	548.5
East Linton	1,012	1,570	1551.4	-	-	-
East Wemyss	9,844	3,750	380.9	23,131	8,700	376.1
Ecclefechan	-	230	-	-	-	-
Edinburgh/Leith	1,613,000	-	-	2,096,346	1,860,778	887.6
Elgin	30,000	20,426	680.9	43,144	11,410	264.5
Elle	4,498	3,050	678.1	7,000	3,050	435.7
Ellon	-	500	-	-	-	-
Eyemouth	1,906	-	-	-	-	-
Falkirk	144,256	125,533	870.2	211,100	169,000	800.6
Falkland	800	1,260	1575.0	-	1,260	-
Fauldhouse	-	-	-	4,500	3,000	666.6
Fochabers	-	-	-	-	-	-
Forfar	35,764	-	-	48,893	13,047	266.8
Forres	11,548	6,840	292.3	12,483	6,840	547.9
Fortrose	-	-	-	-	-	-
Fort William	-	-	-	-	-	-
Fraserburgh	14,630	6,000	410.1	28,367	30,000	1057.6
Galashiels	57,800	21,000	363.3	81,366	21,000	258.1
Galston	10,000	8,000	800	15,000	8,000	533.3
Galehouse (Fleet)	900	1,400	1555.6	-	-	-
Girvan	7,424	3,500	471.4	16,730	11,000	657.5
Glasgow	6,431,878	2,127,460	330.8	7,732,914	2,361,822	305.4
Golspie	722	-	-	-	-	-
Gorebridge	1,743	1,000	573.7	1,750	524	299.4
Gourock	29,150	17,690	606.9	42,442	26,500	624.4
Grangemouth	23,523	8,600	365.6	36,432	31,850	874.2
Grantown	-	-	-	-	-	-
Greenock	305,856	190,536	623.0	395,074	79,513	201.3
Haddington	11,500	4,000	347.8	17,840	4,000	224.2
Hamilton	147,330	44,000	298.6	183,480	46,795	255.0
Hawick	78,486	15,750	200.7	96,031	31,500	328.0
Helensburgh	46,967	41,100	875.1	71,310	45,000	631.0

Town	(A) 1903			(B) 1913		
	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.
Holytown	4,109	1,200	292.0	10,390	5,000	481.2
Huntly	6,057	4,000	660.4	9,845	-	-
Inellan	1,272	1,000	786.2	-	-	-
Inverleithen	12,000	3,300	275.0	15,518	3,333	214.8
Inverary	1,057	850	804.2	-	800	-
Invergordon	-	900	-	1,327	800	602.9
Inverkeithing	1,600	1,100	687.5	5,750	5,000	869.6
Inverness	75,000	60,923	812.3	98,500	64,000	649.7
Inverurie	3,919	1,800	459.3	5,990	2,250	375.6
Irvine	29,112	-	-	41,267	20,669	500.9
Jedburgh	7,000	5,100	728.6	8,620	5,100	591.6
Johnstone	57,594	45,050	782.2	91,276	36,139	395.9
Keith	5,546	3,000	540.9	9,530	-	-
Kelso	19,112	3,000	157.0	29,260	10,000	341.8
Kelty	-	-	-	23,972	13,200	550.6
Kilbarchan	8,749	5,869	670.8	9,572	5,082	530.9
Kennoway	-	-	-	5,565	-	-
Kilbride	-	-	-	-	-	-
Kilmalcolm	10,924	7,578	693.7	14,457	7,578	524.2
Kilmarnock	152,160	50,000	328.6	204,728	72,167	352.5
Kilmaurs	750	-	-	-	-	-
Kilsyth	20,791	8,000	394.8	34,844	5,000	143.5
Kilwinning	12,075	3,500	289.9	15,027	6,000	399.3
Kincairdine	2,400	3,000	1250.0	-	-	-
Kingskettle	5,869	3,000	511.2	6,865	3,000	437.0
Kinross	7,000	3,100	442.9	9,900	3,100	313.1
Kirkcaldy	139,265	49,000	351.8	159,660	144,980	908.1
Kirkcudbright	3,250	5,000	1538.5	-	-	-
Kirkintilloch	42,000	10,000	238.1	75,000	32,050	427.3
Kirkwall	3,757	2,250	598.9	5,984	-	-
Kirriemuir	9,262	7,740	835.7	11,625	7,740	665.8
Lanark	17,007	6,000	352.8	28,100	8,150	290.0
Langbank	1,313	1,800	1370.9	1,107	1,800	1626.0
Langholm	6,075	3,500	576.1	6,613	3,500	529.3
Largo	-	-	-	4,836	-	-
Largs	14,930	12,000	803.8	19,388	30,000	1547.3
Larkhill	34,374	6,000	174.6	35,112	8,930	254.3
Lasswade	-	-	-	10,859	3,000	276.3
Lauder	500	250	500	1,089	885	812.7
Laurencekirk	1,710	1,000	584.8	3,888	2,500	643.0
Lennoxtown	-	-	-	6,700	-	-

Town	(A) 1903			(B) 1913		
	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.
Lerwick	4,000	3,000	750.0	5,992	3,000	500.7
Leslie	4,846	2,200	454.0	8,544	3,150	368.7
Lesmahagow	3,762	1,100	292.4	5,457	3,075	563.5
Leuchars	2,250	-	-	-	-	-
Leven	22,363	9,000	402.5	53,708	22,500	418.9
Linnithgow	10,900	-	-	14,312	-	-
Loanhead	2,859	3,000	1049.3	5,400	4,500	833.3
Lochgelly	5,705	6,000	1051.7	33,216	22,000	662.3
Lochgilthead	3,631	3,000	826.2	3,500	2,600	742.9
Lochmaben	930	1,100	1182.8	-	-	-
Lochwinnoch	2,600	2,000	769.2	3,261	2,000	613.3
Lockerbie	6,282	6,000	955.1	9,418	4,920	522.4
Macduff	1,854	2,000	1078.7	-	-	-
Markinch	4,466	1,800	403.0	7,605	4,000	526.0
Mauchline	4,232	1,528	361.1	5,260	1,528	290.5
Maybole	11,077	6,000	541.7	15,000	8,000	533.3
Melrose	7,401	3,000	405.4	11,273	4,974	441.2
Mid and E. Calder	1,000	510	510	955	514	538.2
Millport	5,606	6,000	1070.3	6,317	5,590	884.9
Moffat	8,857	3,500	395.2	12,650	4,500	355.7
Montfeth	4,500	5,000	1111.1	13,040	12,159	932.4
Montrose	30,000	18,000	600.0	37,159	18,000	484.4
Motherwell	80,517	35,000	434.7	122,137	56,307	461.0
Muirkirk	3,465	2,000	577.2	-	-	-
Musselburgh	37,029	24,500	661.6	56,453	-	-
Nairn	12,435	4,500	361.9	17,855	13,510	756.7
Neilston	5,240	2,000	381.7	6,766	4,400	650.3
Newburgh	1,250	1,800	1440.0	3,000	1,800	600.0
New Cumnock	1,650	1,351	818.8	8,817	6,000	680.5
Newmilns	-	-	-	17,267	-	-
Newton Grange	5,549	-	-	11,381	-	-
Newport(Fife)	13,297	-	-	24,968	17,525	701.9
Newton Stewart	4,000	5,000	1250.0	5,100	5,000	960.4
Nitshill	-	-	-	1,533	1,400	913.2
North Berwick	22,478	-	-	30,823	23,600	765.7
Oban	-	-	-	8,047	-	-
Old Cumnock	8,318	3,000	360.7	11,307	5,000	442.2
Old Meldrum	-	700	-	847	800	944.5
Paisley	431,519	156,168	361.9	523,893	200,432	382.6

Town	(A) 1903			(B) 1913		
	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.
Peebles	26,819	-	-	41,228	-	-
Penicuik	9,266	-	-	11,015	8,000	726.3
Perth	175,427	209,631	1195.0	245,646	180,339	734.1
Peterhead	31,187	19,522	626.0	65,347	27,498	420.8
Pitlochry	3,750	6,800	1813.3	5,500	6,500	1181.8
Pittenweem	6,202	2,000	322.5	8,592	2,000	232.8
Polmont	-	-	-	9,946	-	-
Port Glasgow	39,880	17,750	445.1	71,941	20,020	278.3
Prestonpans	-	-	-	-	-	-
Renfrew	33,806	-	-	52,076	57,703	1108.1
Renton	14,400	6,000	416.7	16,553	7,555	456.4
Rothes	-	-	-	-	-	-
Rosewell	2,400	-	-	-	-	-
Rothessay	61,121	26,000	425.4	83,320	20,000	240.0
St. Andrews	48,000	-	-	57,500	16,960	295.0
Saltcoats	23,823	16,000	671.6	31,879	16,000	501.9
Sanquhar	1,401	1,300	927.9	3,771	3,000	795.5
Shotts	-	-	-	13,500	8,000	592.6
Selkirk	30,311	4,535	149.6	43,540	18,140	416.6
Skelmorlie	-	-	-	4,897	-	-
Slamannan	1,323	1,000	755.9	-	-	-
S. Queensferry	1,004	-	-	6,400	6,096	952.5
Stevenston	5,661	4,000	706.6	11,361	7,000	616.1
Stewarton	-	3,200	-	13,963	3,500	250.7
Stirling	99,000	62,500	631.3	152,374	82,500	541.4
Stonehaven	13,038	3,750	287.6	22,013	10,100	458.8
Stonehouse	5,500	3,450	627.3	7,571	-	-
Stornoway	5,600	2,500	446.4	7,000	2,500	357.1
Stow	950	800	842.1	996	800	803.2
Stranraer	15,609	8,600	551.0	20,654	-	-
Strathaven	12,000	2,709	225.8	13,617	2,709	198.9
Strathmiglo	1,000	1,200	1,200	-	-	-
Stromness	-	-	-	-	-	-
Tain	3,298	3,310	1003.6	4,581	2,470	539.2
Tayport	3,940	2,000	507.6	11,438	6,700	585.8
Thornhill	1,600	1,300	812.5	2,145	1,300	606.1
Thornliebank	-	-	-	13,752	-	-
Thurso	3,667	5,000	1363.5	7,540	5,000	663.1

Town	(A) 1903			(B) 1913		
	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.	Output Thou. Cu. ft.	Capital £	Capital per Million Cu. ft.
Tilliecountry	13,560	6,900	508.8	20,000	6,900	345.0
Tranent	2,210	829	375.1	4,891	2,075	424.2
Troon	15,614	17,000	1088.8	37,937	17,820	469.7
Turriff	-	-	-	-	-	-
West Calder	2,500	2,000	800.0	4,005	2,000	499.4
West Kilbride	5,158	5,000	969.4	8,395	5,000	595.6
West Linton	-	-	-	-	-	-
West Wemyss	-	2,000	-	3,750	-	-
Whitburn	2,386	-	-	2,271	1,750	770.6
Whithorn	-	400	-	-	-	-
Wick	10,792	4,092?	379.2?	15,417	4,092	265.4
Wigtown	-	1,180?	-	1,222	1,180?	965.6
Wishaw	52,000	24,500	471.2	79,010	26,438	334.6

Undertakings in sample (A) 223; (B) 207.

Paid-Up Capital (and municipal loans) recorded £ 5,276,575 in 1903
£ 7,798,192 in 1913

Source - N. B. A. G. M. 1903, 1913

APPENDIX V

Company Finance Statistics - (A)
Capital and Profit / Loss Accounts from Extant (Scottish Record
Office) Scottish Gas Company Minute Books for -

Annan	Ayr	Banff
Bathgate	Boness	Cupar
Dalkeith	Dalry	Galashiels
Lesmahagow	Muirkirk	Selkirk
Stornoway	Stranraer	Vale of Leven

ANNAN COMPANY

(1) Profit/Loss Accounts

Date	Dividend %	Gas Price s d	Date	Dividend %	Gas Price s d	Date	Dividend %	Gas Price s d
1838	-	12 6	1855	5	6 6	1871	7	5 0
1839	5	12 6	1856	5	6 6	1872	-	5 0
1840	4	12 6	1857	5	6 6	1873	-	6 3
1841	4.5	12 6	1858	5	6 6	1874	7	6 3
1842	4	12 6	1859	5	5 10	1875	7	5 10
1843	3	11 0	1860	5	6 6	1876	7	5 4
1844	5	11 0	1861	6	5 10	1877	7	5 4
1845	5	10 0	1862	6	5 10	1878	7	5 0
1846	5	9 0	1863	6	5 10	1879	8.6	4 8
1847	4	9 0	1864	6	5 10	1880	9.3	4 8
1848	4.5	9 0	1865	6	5 10	1881	10	4 6
1849	4.5	9 0	1866	6	5 5	1882	10	4 6
1850	5	9 0	1867	6	5 5	1883	-	4 6
1851	4	7 6	1868	6	5 5	1884	10	4 2
1852	5	7 6	1869	6	5 5	1885	10	4 2
1853	5	6 6	1870	7	5 0	1886	8.6	4 2
1854	5	6 6						

Notes - No dividend in 1865, to provide funds for extending the works.
 No gas-price discount to large consumers in 1870; discount commenced in 1875; gas 4s 5d to large consumers in 1878; 4s 2d to Police Commissioners in 1879.
 Dividends in 1879 and 1886 (12s on £7 shares) and 1880 (13s) not precise percentages.

Total Profits - 1840 £113; 1857 £297

"Unappropriated Profits" - 1852 £110; 1853 £126; 1854 £80;
 1855 £50; 1856 £44

Number of consumers - 1843 85; 1855 202; 1875 232

Annual Gas Output (thou. cu. ft.) - 1843 600; 1855 1,100;
 1867 3,000; 1875 4,000

ANNAN COMPANY

(2) Capital Account

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Notes
1836-55	3,000	2,400	0	(A)
1856-64	3,000	3,000	-	(B)
1865	3,000	3,000	1,100	
1866	4,200	4,200	-	(C)
1867	4,200	4,200	700	
1868	4,200	4,200	450	
1869	4,200	4,200	-	
1870	4,200	4,200	350	
1871-86	4,200	4,200	0?	

- Notes - (A) All 600 £5 shares subscribed by 70 persons, but only £4 called up by August 1837
 (B) Final call-up on shares to purchase new condenser, purifiers, etc. (£506)
 (C) £1,200 "capitalized by converting the present £5 shares into shares of £7", because £1,401 above capital-stock reinvested in the works during previous year.

(3) Reserve Funds

Date	Fund £	Date	Fund £	Date	Fund £	Date	Fund £
1840	164	1843	111	1846	169	1849	134
1841	166	1844	148	1847	174	1850	146
1842	128	1845	175	1848	168	1851	141

Note - Additions to 'Sinking Fund' - 1839 £26, 1840 £17, 1841 £15, 1857 £139

In 1865 the Company held £600 Preference shares in Inverness and Aberdeen Junction Railway, but was unwilling to sell them during a depression of the share-market; in 1874 they realised £603 of which £305 was spent on mains pipes. In 1886, £400 stock in Glasgow and South Western Railway was sold for £456 to cover part of the cost of gasworks extensions.

ANNAN COMPANY

(4) Loan Capital

Source	Date	Loan £	Repaid £	Interest	Note
Commercial Bank	1865-?	500	-	5%	(A)
"	1867	250	-	-	
"	1868	100	150	-	
"	1870	0	100	-	
Messrs Simpson & Skelton	1865?-6	600?	-	-	
"	1867	450	150	-	
"	1868	350	100	-	
"	1869-70?	350	-	-	

Note - (A) Loan granted against security of £600 shares in Inverness and Aberdeen Junction Railway.

(5) Items of Capital Expenditure

Date	Cost £	Item	Monetary Source
1865	760	Gasholder and tank	A/B 260 C 500
1874	305	Mains extensions	A 305
1875	265	Workshops/new buildings (W. Johnstone, builder)	} A/B 447
	182	Purifiers etc (McKinnel, Dumfries)	
1879	101	Station meter (J. Milne, Edinburgh)	A/B 101
1882	159	Scrubber (Messrs R. Dempster)	A/B 159
	30	Livesey washer (Messrs R. Dempster)	A/B 30
1886	811	Works extensions	A 456 B 355

Notes - A Reserve Funds; B Working Costs; C Loans; D New Capital Stock

Coals -

Annan gasworks used mainly English coals for some years, and had an exceptional long-term railway contract. Until 1869 the Mickley Coal Company of Carlisle shipped coal to Silloth port and thence over the Glasgow and South Western Railway to Annan. In that year the G. and S.W. agreed to convey coal from the North Eastern Railway direct to Annan at 1s 11d per ton - the same as the old carriage rate from Silloth. That agreement was still in force in 1886.

Annan Minute Book 12/2/1886, 18/3/1886

(1) Revenue

Date	Gas Sold				Meter	Interest	Coke	Lime	Tar	Total
	A	B	C	D	Rent & Sales	on Funds	£	£	£	£
	£	£	£	£	£	£				
1850	1688	157	14	14	72	26	50	4	20	2371
1851	1998	166	22	22	83	46	38	3	30	2542
1852	1954	164	13	26	-	11	38	4	11	2557
1853	2402				-	83		102		2566
1854	2306				-	79		107		2501
1855	2530				-	90		174		3306
1856	2814				-	98		177		3118
1887	8198				259	-	199	35	329	9045
1888	7722				244	8	175	70	210	8973
1889	8349				268	55	182	52	351	9445
1890	7681				274	-	234	53	717	9405
1891	7933				281	131	305	55	973	10195
1892	8728				295	82	363	48	1059	10681
1893	9229				302	60	296	53	686	10765
1894	9719				309	75	310	44	354	10893
1895	9577				321	80	426	40	564	11055
1896	10,426				332	75	397	44	806	12154
1897	11,151				346	90	351	19	620	12571
1898	10,244				348	128	331	4	605	11940
1899	10,330				348	150	392	33	702	12142
1900	10,812				356	141	756	-	723	13035
1901	11,493				357	143	1083	-	931	14706
1902	11,841				351	142	826	-	907	14993
1903	11,461				347	108	887	-	461	14648
1904	11,163				346	130	900	-	579	14731
1905	9919				345	130	829	-	615	13476
1906	9659				345	123	785	-	450	12887
1907	9378				346	146	858	-	430	12675
1908	9413				346	156	1330	-	420	13126
1909	9531				341	114	1164	-	366	12396
1910	9600				337	102	1227	-	453	12544
1911	8956				338	124	1309	-	506	13162
1912	8498				333	81	1127	-	594	12773
1913	8732				316	70	1279	-	803	13602

Note - Reduction in total revenue from 1902, caused by competition from Ayr Newton Gas Company and from electricity.

Gas sold - (A) Private consumers ; (B) Town Lamps ;
(C) Bridge Trust ; (D) Harbour Trust.

Source - S.R.O. Ayr Minute Book op cit

AYR COMPANY(2) Expenditure

Date	Coal £	Salaries & Management £	Wages £	Lime £	Interest on Loans £
1850	656	90	204	29	133
1851	558	120	208	29	145
1852	594	120	214	27	-
1853	633	120	219	29	-
1854	902	134	209	32	-
1855	1711	150	214	34	-
1856	1072	150	218	43	-
1887	3257	561	872	250	244-
1888	3397	721	863	364	-
1889	3161	723	837	321	-
1890	3137	720	854	255	-
1891	3612	718	915	221	-
1892	4437	612	937	226	-
1893	4887	622	973	231	-
1894	4243	642	1024	214	-
1895	4391	639	1054	223	-
1896	4802	642	1206	243	-
1897	4657	916	1173	203	-
1898	4687	862	1202	184	-
1899	5044	814	1193	263	-
1900	5751	873	1251	251	-
1901	6961	876	1394	277	-
1902	6525	863	1419	266	-
1903	5893	871	1506	288	-
1904	5544	918	1448	269	-
1905	4697	905	1418	266	-
1906	4255	919	1380	244	-
1907	4019	929	1380	241	-
1908	4893	927	1395	273	-
1909	4378	951	1410	221	-
1910	3745	949	1169	135	-
1911	3871	1003	1123	38	-
1912	3717	947	1131	9	-
1913	4431	954	1148	55	-

Note - Iron oxide used as well as Lime in purifiers from 1910

AYR COMPANY

(3) Profit/Loss Account

Date	Charge £	Discharge £	Profit £	Profit if Arrears realised £	Balance to Company £	Dividend %
1850	3181	2310	871	1098	870	5
1851	3921	2732	1189	1082	1083	6
1852	3345	3010	335	1357	1585	6
1853	4339	2614	1725	1725	1725	6
1854	4445	2754	1691	1070	1695	6
1855	4960	4071	889	937	-	6
1856	4672	3550	1123	994	-	6
1857	5003	3829	1174	-	-	6
1858	5480	4506	974	-	-	6
1859	5595	4700	895	-	-	6
1860	5445	4850	595	-	-	6
1861	4589	4225	364	-	-	5
1862	4798	4219	579	-	-	6.5
1863	4928	4255	673	-	-	6.5
1864	5246	4257	989	-	-	6
1865	5788	4743	1045	-	-	6
1866	5849	4559	1290	-	-	6
1867	6452	5593	859	-	-	6
1868	7152	5222	1930	-	-	6
1869-78	-	-	-	-	-	6
1879-86	-	-	-	-	-	7.5

Note - A separate profit/loss account was used for meters, though few details are extant.

Gas Meters Account

Date	Charge £	Discharge £	Profit £	Cash in Bank £
1853	-	-	-	100
1854	-	-	-	53
1863	248	237	11	103
1864	114	308	214	437

AYR COMPANY

Profit/Loss Account continued

Date	Value of Gasworks £	Total Assets £	Profit £	Profit as % Works (£)	Dividends %
1887	-	-	2037	6.1	5
1888	33,162	38,609	-	-	5
1889	32,959	39,943	3317	10.1	6
1890	32,780	40,507	2807	8.6	6
1891	33,708	-	3565	10.6	8
1892	-	-	2585	c 7.7	-
1893	35,400	-	2510	7.1	-
1894	35,428	-	2925	8.3	-
1895	36,032	-	2607	7.2	-
1896	35,921	-	2732	7.6	6
1897	35,770	-	3579	10.0	-
1898	36,681	-	2791	7.6	-
1899	36,820	-	2948	8.0	6
1900	36,795	-	2987	8.1	7
1901	36,900	-	2738	7.4	7
1902	37,418	-	2698	7.2	-
1903	37,432	-	2929	7.8	-
1904	37,303	-	3319	8.9	9
1905	37,002	-	2804	7.8	8
1906	36,832	-	2918	7.9	-
1907	36,898	-	2855	7.7	-
1908	37,933	-	2404	6.3	8
1909	-	-	2815	c 7.4	8
1910	37,483	-	3754	10.0	8
1911	38,488	-	3058	7.9	8
1912	40,325	-	3041	7.5	8
1913	36,308	-	2823	7.8	8

AYR COMPANY

(4) Capital Account

Date	Nominal Capital Stock £	Paid-Up Capital £	Number of Shares Subscribed
1845	10,000	5642	1753
1846	10,000	8765	1753
1847-51	10,000	9970	1994
1852-7	13,300	13,300	2660
1858 -67	14,630	14,630	2926
1868-74	20,000	14,630	2926
1875-84	20,000	17,970	3594
1885	30,000	17,970	3549
1886	30,000	27,000	5400
1887	36,000	31,480	7200
1888 - 1910	36,000	36,000	7200

Note - Gasworks purchased in 1845 for £7500.

1847 stock raised £1205 towards repayment of debts.

1852 stock raised to repay debts.

1858 stock raised to provide 266 shares gratis to partners.

1875 new shares sold at £1 premium

1885 Stock raised £9030 before taking Limited Liability.

1886 stock 5380 fully paid £5 shares;

40 half-shares (shown in Table as 20 whole shares) of £2 10s fully paid up.

1887 Stock raised by 1820 new £5 shares.

Outlay on new gasholders in 1848, 1868, and 1885; and extensions to retort-house in 1849.

Source - S.R.O. Ayr Minute Book op cit.

AYR COMPANY

(5) Loan Capital and Reserve Funds

Date	External Loans	Reserve Funds -				Total Monies in Banks			
		Total	Added To	In Bank	'Loaned' for reinv- estment	Total	Union Bank	Bank of Scotland	C
	£	£	£	£	£	£	£	£	£
1845	3800	-	-	-	-	-	-	-	-
1846	-	-	-	-	-	-	-	-	-
1847	0	407	106	-	-	-	-	-	-
1848	1931	606	200	-	-	-	-	-	-
1849	2392	-	136	-	200	-	-	-	-
1850	2392 ?	843	364	-	-	1014	-	-	-
1851	2392 ?	859	1000	-	-	1172	-	-	-
1852	0	1000	-	293	707	536	-	-	-
1853	0	+1000	450	-	-	1721	-	-	-
1854	0	+1000	100	-	-	1695	-	-	-
1855	0	+1000	-	-	-	1001	-	-	-
1856	0	+1000	195	-	-	1091	-	-	-
1857	0	+1000	-	-	-	1142	-	-	-
1858	0	1000	-	-	-	1002	-	-	-
1859	0	-	-	-	-	1015	-	-	-
1860	0	522	-	-	-	670	-	-	-
1861	0	-	-	-	-	423	-	-	-
1862	0	-	-	-	-	551	-	-	-
1863	0	-	-	-	-	565	-	-	-
1864	0	537	-	-	-	1061	-	-	-
1865	0	-	-	-	-	840	-	-	-
1866	0	566	-	316	250	1096	-	-	-
1867	0	800	-	353	447	781	-	-	-
1868	2000	836	600	150	686	1610	-	-	-
1869- 74	2000 ?	-	-	-	-	-	-	-	-
1875	0	+2000	? 2000	-	-	-	-	-	-
1876- 84	0	-	-	-	-	-	-	-	-
1885	3000	-	-	-	-	-	-	-	-
1886	3000	c 2000	-	-	-	-	-	-	-
1887	3000	2000	-	2000	2000	2513	-	-	-
1888	0	-	500	-	-	-	-	-	-

AYR COMPANY

Loan Capital and Reserve Funds continued

Date	External Loans	Reserve Funds - Total			Total Total	Monies in Banks		
		Total	Added to	In Bank		Union Bank	Bank of Scotland	
	£	£	£	£	£	£	D £	C £
1889	0	c 1200	500	-	-	-	-	-
1890	0	-	400	1000	-	-	1000	-
1891	0	-	600	2360	5560	-	-	-
1892	0	-	400	-	-	-	-	-
1893	0	-	400	2000	2869	400	2000	469
1894	0	-	800	2000	-	-	-	-
1895	0	-	400	2000	3300	1600	1700	-
1896	0	-	500	2000	-	-	-	-
1897	0	-	-	-	-	-	-	-
1898	0	-	-	-	2608	930	1200	478
1899	0	-	-	-	2443	-	1450	63
1900	0	-	-	-	2262	-	1300	32
1901	-	-	-	-	2506	-	1550	26
1902	-	-	-	-	2025	930	1090	5
1903	-	-	-	-	-	-	-	-
1904	-	-	-	-	-	-	2000	-
1905	-	-	1380	-	-	-	1780	-
1906	-	-	250	-	-	-	1700	-
1907	-	-	1350	-	-	-	2050	-
1908	-	-	-	-	-	-	450	-
1909	-	-	-	-	-	-	500	-
1910	-	-	-	-	-	-	1000	-
1911	-	-	-	-	-	-	1000	-
1912	-	-	-	-	-	0	3430	-
1913	-	-	-	-	-	-	3925	-

Note - £ 2000 Reserve Fund invested in Consols 1893 - 1896
£ 3369 Reserve Fund invested in Glasgow Corporation Stock (3.5%)
from 1898 - 1911, when reduced to £ 1000.
£ 1000 Reserve Fund invested with Ayr Corporation 1898 -
1913

Additions to 'Reserve Fund' (termed Contingency Fund in
1847) were sometimes merely a transfer from one book
account to another.

AYR COMPANY(6) Items of Capital Expenditure

Date	Cost £	Items	Monetary Sources
1847	250	Masonry Tank (Mr. Sim)	C 250
	550	Gasholder (Reid/Hanna)	C 550
	282	Street Lamps	C 282
	618	Miscellaneous	C 618
1848	300	New Retort-House	C 300
1849	185	Hydraulic main	C 185
	246	Purifiers	C 246
1851	?	Manager's house/office	B ?
1853	452	Works improvements	A 452
1858	?	Chimney	B
1859	400	New Retort Bench/ C oal Sheds	B 400
1860	140	Extensions	B 140
1862	400	Improvements	B 400
1863	343	Enlarged mains pipes	B 343
1868	611	Gasholder; two Purifiers	C 611
	500	Manager's house	B 111 C 389
1871	?	Extra Retorts (£385), Exhauster (£500), hydraulic main (£?)	A ? B
1873	?	Rebuilding Retort Bench	A ? B
1877	?	4 extra Retorts; Purifier	A ? B
1883	1400	24 extra Retorts	A B
1885	5000	New gasholder and Tank	A 2000 ? C 3000 D D 9030
1891	?	Purifiers (£1400), 2 regenerat- ive benches, larger Mains (£534, Ayr Foundry), Condenser (£354, H.Balfour), Station Meter (£250, Bromley Gas Co.)	A B
1906-7	2258	2 new retort benches (R.S.Workman)	A 1600 B 648
1910	120	Livesey Washer (H.Balfour)	B 120
	415	Washer-Scrubber (W.C.Holmes)	B 415
1911	290	Exhauster (B.Donkin)	A 290
	1629	Gasholder (Clayton)	A 1629

Note - Street Lamps purchased in 1847 were to be purchased by Town Council at 6 per cent per year.

Monetary sources A reserve fund B working costs
C loan capital D new shares

Banff Company Finance -

(i) Revenue

Date	Gas	Coke & Tar	Meter Rent	Total Profits Revenue	Value of works on Books	Cash in Bank (C)	(D)
	£	£	£	£	£	£	£
1859	935	-	58	994	129	4084	-
1860	992	-	61	1053	295	4110	-
1861	1048	-	63	1118	327	4234	-
1862	1129	-	60	1196	343	4279	-
1863	962	-	66	1036	398	4357	97
1864	1049	-	65	1122	252	4381	-
1865	1046	-	62	1121	287	4326	-
1866	1194	-	70	1271	356	4376	-
1867	1291	-	70	1368	261	4415	272
1868	1301	-	73	1381	262	4534	204
1869	1434	-	73	1514	378	4877	292
1870	1447	-	72	1527	370	4935	189
1871	1495	-	70	1572	395	-	384
1872	1537	-	75	1623	474	5565	229
1873	1590	-	74	1671	411	5627	116
1874	1919	-	72	1998	435	5214	305
1875	1723	-	69	1799	411	5303	473
1876	1706	-	67	1780	511	4782	873
1877	1611	-	67	1689	477	4819	1008
1878	1596	-	68	1675	390	4865	1071
1879	1622	-	69	1710	415	4907	678
1880	1576	-	68	1661	390	4944	736
1881	1560	-	68	1646	433	4995	857
1882	1567	-	68	1657	446	4534	872
1883	1607	-	69	1676	446	4388	1006
1884	1597	-	69	1666	417	4404	1071
1885	1655	-	68	1724	345	4421	1021
1886	1644	-	68	1732	336	4213	-
1887	1616	-	66	1694	348	4031	-
1888	1610	-	62	1696	398	4036	-
1889	1562	-	59	1635	325	4054	-
1890	1566	-	70	1636	339	-	-
1891	1596	-	61	1656	177	4122	-
1892	1585	166	60	1828	296	-	-
1893	1573	167	56	1805	276	-	-
1894	1532	135	52	1729	291	-	-
1895	1540	129	50	1727	260	-	-
1896	1621	124	50	1802	359	-	-
1897	1659	144	50	1860	343	-	-
1898	1655	122	48	1834	323	-	-
1899	1739	121	49	1920	344	-	-
1900	1777	141	49	1934	297	-	-
1901	1928	-	49	-	225	-	-

Note - Tar and Coke recorded with Gas revenue until 1892

Book value of Works raised continually as extensions made.

Source - S.R.O. Banff Minute Book op cit

(2) Expenditure

Date	Coal Tons	Coal £	Wages £	Lime £	Retorts & bricks £	Meters £	Interest on loans £.s	Total Expenses £
1859	-	440	184	24	12	36	10.14	730
1860	386	455	186	16	9	25	6.1	-
1861	380	472	193	16	14	42	13.17	791
1862	367	528	199	14	14	34	12.18	853
1863	-	502	206	17	8	38	8.5	825
1864	394	531	200	23	16	44	8.6	870
1865	415	489	216	22	16	65	18.1	834
1866	481	523	249	24	13	36	33.9	915
1867	513	647	277	32	16	34	36.19	1108
1868	530	672	268	32	27	18	32.13	1119
1869	515	679	270	28	22	22	31.18	1211
1870	589	690	274	33	25	14	35.9	1157
1871	627	708	288	31	28	20	7.16	1154
1872	593	697	297	21	23	37	10.10	1149
1873	582	787	320	19	-	34	22.0	1260
1874	560	1088	314	21	35	27	18.19	1562
1875	560	880	327	25	38	12	12.6	1388
1876	570	778	340	26	24	7	4.10	1269
1877	588	716	343	28	20	21	0	1212
1878	601	762	355	30	25	14	-	1285
1879	638	781	373	25	9	8	-	1295
1880	606	756	372	22	29	22	-	1271
1881	611	688	372	33	37	20	-	1214
1882	627	710	377	29	12	26	-	1210
1883	-	691	391	32	22	-	-	1230
1884	663	692	402	27	15	7	-	1250
1885	778	832	395	26	27	4	-	1379
1886	918	883	378	39	14	3	-	1397
1887	798	834	379	33	25	16	-	1347
1888	775	754	400	39	17	4	-	1303
1889	774	754	400	36	33	6	-	1311
1890	-	718	426	35	25	-	-	1310
1891	-	684	330	34	129	-	-	1494
1892	771	740	318	27	76	-	-	-
1893	783	624	349	25	-	-	-	-
1894	-	630	332	28	36	-	-	-
1895	750	644	312	32	26	14	-	-
1896	-	607	320	38	-	-	-	-
1897	-	584	349	39	-	-	-	-
1898	-	562	343	25	-	-	-	-
1899	-	616	329	30	-	-	-	-
1900	-	684	356	28	-	-	-	-
1901	-	781	982	-	-	-	-	-

Source - S.R.O. Banff Minute Book op cit

Banff Company

(3) Capital Account

Date	Paid Up Capital Stock £	Dividend		Total Loans £	Sinking Fund		Gas Price	
		%	Bonus %		Total	Added To £	s	d
1859	2500	5	-	267.50	-	-	-	-
1860	2500	6	-	151.25	103	-	-	-
1861	2500	6	-	346.25	-	-	9	0
1862	2500	6	-	322.50	-	-	7	11
1863	2500	6	-	225	97	-	7	11
1864	2500	6	-	500	-	-	7	11
1865	2500	6	-	500	-	-	7	11
1866	2500	6	-	680	-	-	7	11
1867	2500	6	-	740	-	-	7	11
1868	2500	6	-	660	-	-	7	11
1869	3750	5	-	640	-	100	7	11
1870	4500	5	-	700	-	100	7	11
1871	4500	5	-	160	100	-	7	6
1872	4500	5	-	220	-	229	8	4
1873	4500	5	-	440	-	-	9	7
1874	4500	5	-	380	-	-	8	4
1875	4500	-	-	240	-	-	8	4
1876	4500	6	-	100	-	-	7	6
1877	4500	6	-	0	-	-	7	1
1878	4500	6	-	0	-	-	7	1
1879	4500	6	-	0	-	-	7	1
1880	4500	6	-	0	-	-	6	8
1881	4500	6	0.7	0	-	-	6	8
1882	4500	6	0.7	0	-	-	6	6
1883	4500	6	1.5	0	-	-	6	3
1884	4500	6	1.5	0	-	-	6	3
1885	4500	6	1.5	0	-	-	6	3
1886	4500	6	1.5	0	-	-	6	3
1887	4500	6	-	0	-	-	6	3
1888	4500	6	0.7	0	-	-	6	3
1889	4500	6	0.7	0	-	-	6	3
1890	4500	6	0.7	0	-	-	6	3
1891	4500	5	-	0	-	-	6	3
1892	4500	5	-	0	-	-	6	3.5
1893	4500	5	-	0	-	-	6	3.5
1894	4500	5	-	0	-	-	6	1
1895	4500	5	-	0	-	-	5	11
1896	4500	5	-	0	-	-	6	3
1897	4500	5	-	0	345	118	6	3
1898	4500	5	-	0	443	98	6	3
1899	4500	5	-	0	567	119	6	3
1900	4500	5	-	0	632	72	6	3
1901	4500	4.5	-	0	440	23	-	-
1902	4500	5	-	0	-	-	-	-
1903	4500	5	-	0	-	70	-	-
1904	4500	5	-	0	-	24	-	-
1905	4500	5	-	0	-	41	-	-

Source - S.R.O. Banff Minute Book op cit

Banff Company

Capital Account continued

Shares - Nominal value £10 1859-69

Revalued at £15 in 1869, but when 50 new shares sold th
these only realised £12 10s to £14
Revalued at £17 in 1906.

Loan Capital -

1859 loan from Commercial Bank for new gasholder

1864 - 1871 £500 loan from A.Murray, fish-curer of H
Whitehills (at 5 %) for extending mains pipes

1869 Bank overdraft.

1877 all loans repaid

Total loans 1859 - 1877 calculated from interest paid,
assuming 4 % to 1863, and 5 % on bank overdraft.

Evaluation of Equipment -

Professional evaluation at £4378 in 1901, when Book
value shown as £3501.

Annual Gas Output -

Date	Output cu. ft.	Date	Output cu. ft.
1859	2,166,450	1889	6,796,430
1861	2,307,400	1896	5,344,200
1864	2,639,350	1900	6,065,800
1865	2,642,600	1903	6,558,600
1872	3,574,000	1905	6,992,900
1873	3,707,000	1908	8,419,900
1876	3,709,700	1914	9,748,940

BANFF COMPANY

(4) Items of Capital Expenditure

Date	Cost £	Items	Monetary Sources
1859	690	Gasholder and Tank	C 690
	112	Mains Pipes	C 112
1860	56	Coal Shed	B 56
1861	24	Mains Pipes	B 24
1863	41	Station Meter (first)	B ?
1864-5	280	Gasholder/Tank (W.Murray, Banff Foundry)	C 280
	416	Extensions	B 196 C 220
1868	40	Gasometer plates (G.Laing, Banff)	B 40
	19	Scrubber (W.Smith,Inverness)	B 19
1870-1	145	2 Purifiers (W. Murray)	D 145
	170	Mains pipes	D 170
	203	Retort House alterations	D 203
1877	13	Washer (W.Murray)	B 13
1882	7	Purifier shelves (W.Murray)	B 7
1890	75	Exhauster (G.Walker,London)	B 75
1891	75	Ironwork (W.Murray)	A 75
	98	Bricks (Glenboig Co.)	A 98
	173	Retort Bench (G.Walker, Donnington)	A 173
	49	Steam Boiler (Muir and Findlay, Glasgow)	A 49
1901	135	Gasholder second-hand (D. Nelson, Kinleith)	A 135
	285	Transporting gasholder (Messrs Watson, Banff)	285
	55	'Maxim' Benzol-enrichment plant	A 55
1902	61	Erection of Gasholder	B 61
1903	39	Gasholder Plates	B 39
1905	60	Mains pipes	B 60
1906	91	Mains Pipes	B 91
1907	32	Ironwork (J.Blakey,Dewsbury)	B 32
1908	40	Chimney renovation (Gauld and Ferguson, Aberdeen)	B 40
1909	238	Retort Bench/House improved	A 238
1910	88	Mannesmann steel Mains Pipes	B 88
1912	53	Steel Mains pipe	B 53
1913	20	Pooley weighing machine	B 20

Note - A reserve fund B working cost C loans D new shares

BATHGATE COMPANY

(1) Revenue

Date	Gas		Meter Rent £	Waste Lime, Tar, &c £
	By Meter; £	Public Lamps £		
1846	294		-	-
1847	287	19	-	0.75
1848	278	20	-	0.60
1849	260	20	-	0.90
1850	239	19	-	0.80
1851	276		-	1.85
1854	210		-	-
1855	342		35	17.55
1856	343		17	24.55
1857	424		10	27.65
1858	402		11	25.95
1859	476		19	31.65
1860	550		21	16.30
1861	439		31	42.70
1862	482		23	32.0
1863	544		31	34.95
1864	595		30	46.80
1865	591		31	77.30
1866	646		33	100.65
1867	648		33	19.60

(2) Expenditure

Date	Coal (inc. freight)		Wages £	Salary Clerk &c £.p	Line £	Repairs, Extensions £	New Meters £
	Gas £	Furnace £					
1846	74	48	31	13	5	53	-
1847	97	36	40	16	3	21	-
1848	106	43	50	16	-	12	-
1849	78	20	155	16	3	-	-
1850	76	26	38	16	4	-	-
1851	73	25	-	-	-	-	-
1852	72		41	16	-	-	-
1855	146		53	22	9	143	34
1856	163		68	22	-	163	36
1857	189		93	25	8	79	83
1858	131		73	25	9	177	26
1859	138		83	25	3	66	45
1860	275		98	26.50	3	296	25
1861	191		97	26.50	16	-	35
1862	142		116	27.50	8	62	33
1863	224		105	26.50	12	59	20
1864	301		107	28	4	46	48
1865	249		90	28	13	13	13
1866	255		99	28	17	220	58
1867	316		130	30	16	587	71

BATHGATE COMPANY

(3) Profit/Loss Account

Date	Revenue	Expenses	Balance	Dividend		Total Book
	(Plus Cash Brt.Frwd.) £.p	(Inc.Divi.) £.p	Carried Fwd. £.p	%	£	Profits (Calculated) £.p
1837	258.0	247.45	10.55	0	0	10.55
1838	266.35	251.0	15.35	0	0	15.35
1839	233.85	207.05	16.80	0	0	16.80
1840	201.35	176.10	25.25	0	0	25.25
1841	226.75	163.35	63.40	5	45	108.40
1842	342.70	243.30	99.40	5	45	144.40
1843	313.95	271.75	42.20	5	45	87.0
1844	370.45	325.75	44.70	5	45	89.70
1845	288.80	257.35	31.45	5	45	76.45
1846	327.70	297.65	30.05	5	45	75.05
1847	342.60	298.90	43.70	5	45	88.70
1848	386.85	328.70	58.15	5	45	103.15
1849	373.50	361.50	12.0	5	45	57.0
1850	419.80	415.90	3.90	5	45	48.90
1851	454.35	-	-	5	45	87.20
1852	-	-	-	5	45	-
1853	-	-	42.20	5	45	-
1854	-	-	-	5	45	-
1855	463	459.65 *	3.35	5	45	48.35
1856	543	-	-	5	45	-
1857	626	617.05 *	8.95	5	45	53.95
1858	823	676.80 *	146.20	5	45	191.20
1859	730	486.90 *	243.10	5	45	288.10
1860	835	806.60 *	28.40	5	50	78.40
1861	607	525.25 *	81.75	5	50	131.75
1862	624	522.0 *	102.0	5	50	152.0
1863	720	667.40 *	52.60	5	50	102.60
1864	732	658.95 *	73.05	5	50	123.05
1865	774	654.05 *	119.50	10	100	219.50
1866	904	803.15 *	100.85	10	100	200.85
1867	1278	1177.15 *	100.85	10	100	200.85

Note - * figures calculated from other data by deducting Balance Forward from revenue. After 1851 the Reserve Funds deducted as 'Expenditure' are unknown. Great annual variation in book-profits caused by variable re-investment in capital equipment.

BATHGATE COMPANY

Profit/Loss Account (continued)

Date	Profit £	Date	Profit £
1882	465	1894	231
1883	443	1895	438
1887	326	1896	359
1888	270	1897	477
1889	351	1898	384
1890	275	1899	409
1891	287	1900	373
1892	230	1901	548
1893	183	1902	347

Dividends

Date	% Dividend	% Bonus	Date	% Dividend	% Bonus
1855-64	5	0	1889	10	0
1865-75	10	0	1890-8	7.5	0
1876-80	10	5	1899	7.5	2
1881-7	10	0	1900-2	10	0
1888	9	0	1903	10	2.5

BATHGATE COMPANY

(4) Capital Account

Date			Total Interest Reserve Funds				Notes
	Nominal £	PaidUp £	Loans £	on Loans £	Total £	Added-to £	
1833-7	1000	900 ?	-	-	-	-	
1838	1000	900 ?	122	-	-	-	
1839	1000	900 ?	92	-	-	-	
1840	1000	900 ?	53	-	-	-	
1841	1000	900 ?	0	-	-	10	
1842	1000	900 ?	0	-	-	10	A
1843	1000	900 ?	0	-	100	20	
1844	1000	900 ?	0	-	60	-	B?
1845	1000	900 ?	0	-	30	20	C
1846	1000	900 ?	0	-	70	1	D
1847	1000	900 ?	0	-	-	24	E
1848	1000	900 ?	43	-	33	-	
1849	1000	900 ?	0	-	43	-	
1850	1000	900 ?	0	-	68	-	
1851	1000	900 ?	0	-	91	30	
1852-7	1000	900 ?	0	-	-	-	
1858	1000	900 ?	300	13.20	-	-	F
1859	1000	900	300	15	-	-	G
1860	1000	1000	300	15.70	-	-	
1861	1000	1000	300	15	-	-	
1862	1000	1000	250	15	-	-	
1863	1000	1000	250	12.50	-	-	
1864	1000	1000	200	7.50	-	-	
1865	1000	1000	100	5.35	-	-	
1866	1000	1000	100	-	-	-	
1867	1000	1000	500	10.70	-	-	
1868-70	1000	1000	500	-	-	-	
1871	1000	1000	300	-	-	-	
1872-3	1000	1000	-	-	-	-	H
1874	2000	2000	-	-	-	-	I
1875-8	2000	2000	-	-	-	-	
1879	2000	2000	200	-	-	-	
1880	4000	3000	1000	-	-	-	J
1881	4000	3000	822	-	-	-	
1882	4000	3000	656	-	-	-	
1883	4000	3000	514	-	-	-	
1884	4000	3000	363	-	-	-	
1885-9	4000	3000	0 ?	-	-	-	
1890	4000	3000	0	-	-	50	
1891	4000	3000	0	-	-	50	
1893	4000	3000	0	-	-	-	K

Notes - A reserve fund termed Sinking and Contingency Fund
E Company used £51 reserves to purchase its own stock
F Purchase of new gasholder
G Sale of 50 shares, previously held in reserve
H £250 from Reserve Fund for new gasholder
I Nominal value of shares raised from £5 to £ 10
J 200 new £10 shares sold to old shareholders, £5 called up, then old/new shares combined as £20 shares
Cash taken from Reserve Fund for dividends - B £40,
C £50 ("loan"), D £50 ("loan"), E £48 ("loan"),
K £25

BATHGATE COMPANY

Capital Account (continued)

Date	Capital Nominal £	Stock PaidUp £	Total Loans £	Interest on Loans £	Reserve Total £	Funds Added To £	Notes
1895	4000	3000	0	-	-	200	
1896	4000	3000	0	-	-	100	
1897	4000	3000	920	-	-	0	
1898-9	4000	3000	920	-	-	-	
1900	4000	3000	871	-	-	-	
1901	4000	3000	623	-	-	-	
1902	4000	3000	523	-	-	-	

Note - Large extensions (£1015) to Balbardie Colliery in 1902 led the Company to take Limited Liability, with £12,000 nominal capital in £5 shares. 400 new shares were sold to existing shareholders to raise new capital.

Loan Capital -

Date	Source	Interest	Loan £	Repaid
1838	Bank (Royal?) overdraft		122	0
1839	do		92	30
1840	do		53	39
1841	do		0	53
1848	do		43	
1848	Debt to Shotts Iron Co.		38	-
1850	do		0	38
1858-9	(Western Bank ?)	5 %	300	0
1862	do		?	50
1864	do		?	50
1865	do		?	100
1867	Miss Duff		400	0
1871	do		?	200
1879	Royal Bank overdraft		200	0
1880	do refused £1000 loan		822	?
1882	do		656	? 166
1883	do		514	142
1884	do		137	377
1885	do		0	?
1899	?		920	
1900	?		871	49
1901	?		623	248

BATHGATE COMPANY

(5) Items of Capital Expenditure

Date	Cost £	Items	Monetary Sources
1834	500	Buildings/apparatus (Liddell,Glasgow)	D 500
	321	Pipes (Shotts Iron Co.)	D 321
1835	53	Pipes (Shotts)	B 53
	?	Third retort; improved hydraulic mn.	B ?
1837	50	Pipes (Shotts)	B 50
1845	24	Coal shed	B 24
1846	35	Gas Pipes	B 35
	22	Buildings extended	B 22
1847	11	Gasometer repaired	B 11
1859-60	350	Alterations/ new gasholder(£180), purifier (£56)	C 300 D 50
1866-7	550	New gasholder-tank(Scott,Inverkeith- ng), Purifiers, Gasholder	B 150 C 400
1868	35	Station Meter	B 35
1873	250	New gasholder (replacement)	A 250
1874	81	Gasholder repair (Hanna/D./W.)	B 81
1880	1179	Masonry/meter-house (£257, W.Robert, Bathgate) , Gas apparatus (£845, Hanna/D./W.), slating £77	B 179 D 1000
1883	186	Crane (£23, Hanna/D./W.), Coal shed (£163)	B 186
1885	621	Dwelling house (£564), Hislop's regenerative oven (£57)	A ? B ?
1886	175	Exhauster (Airdrie Iron Co.)	B 175
1889-90	275	Rebuilding Stokers' house	A 107 B 168
1897	1269	Gasholder (Barrowfield)	A 349 C 920
1902	1015	Mains pipes/extending retort house	B 15 C 1000

Note - Dwelling house sold to Manager in 1886 for £444

Monetary Sources - A reserve fund B working costs
C loan capital D new shares

BONESS COMPANY

(1) Revenue and Expenditure

(i) Revenue

Date	Consumers' Gas £	Street Lamps £	Contract Gas Sales to W. Wilson & Co. £	Kinneil Iron Works £	House Rent of Gas Manager £
1859	737	22	-	-	19
1860	618	22	147	-	19
1861	620	23	160	-	18
1862	618	23	151	-	14
1863	704	23	135	-	10
1864	-	-	-	-	-
1865	736	20	-	-	-
1866	-	-	-	-	-
1867	826	-	-	117	-
1868	765	35	-	203	-
1869	755	17	-		-
1870	729	18	-	100	-
1871	774	18	-	109	-
1872	923	21	-	129	-

(ii) Expenditure

Date	Coal Tons	£	Manager's Wages £	Workmens' Wages £	Collector/ Clerk £	Interest on Loans £
1859	495	376	55	59	25	48
1860	527	344	55	106		-
1861	432	246	55	76	25	70
1862	-	-	55	-	-	-
1863	368	208	55	-	-	-

(iii) Price of Gas per thou. cu. ft.

Date	Price s d	Date	Price s d	Date	Price s d
1845	8 4	1862	6 8	1875	5 10
1851-2	7 6	1871	5 10	1876	5 5
1853-5	6 8	1872-3	6 8		

BONESS COMPANY

(2) Capital and Profit/Loss Accounts

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Total Revenue £	Irrecoverable Debt Owed to Co. £	Book Profits £	Divi. %	Notes
1843	1,000	840	?	-	-	-	-	
1844	1,200	1,200	?	-	-	-	-	
1845	1,200	1,200	?	-	-	28	1.7	
June								
1846	1,200	1,200	?	111	-	72	5	(A)
Oct.								
1846	1,500	1,500	?	-	-	-	-	(B)
1847	1,500	1,500	318	-	-	96	5	(C)
1848	1,500	1,500	200	-	-	44	5	
1849	1,800	1,800	0?	438	-	203	-	
1850	2,100	2,100	0	-	-	34	5	(D)
1851	2,400	2,400	200	-	-	6	5	
1852	2,400	2,400	400	-	-	251	5	
1853	2,400	2,400	371	-	-	-	5	
1854	2,400	2,400	653	-	-	-	0	
1855	2,400	2,400	653	-	-	-	0	(E)
1856	2,400	2,400	653	-	-	-	5	
1857	2,400	2,400	653	-	-	-	5	
1858	2,400	2,400	1,245	-	-	34	5	
1859	2,400	2,400	1,700	809	46	445	5	
1860	2,400	2,400	1,700	843	42	27	5	
1861	2,400	2,400	1,700	849	31	158	5	
1862	2,400	2,400	1,600	-	43	147	5	
1863	2,400	2,400	1,000	922	37	186	5	
1864	2,400	2,400	800	348	41	346	5	(F)
1865	2,400	2,400	1,000	-	-	316	5	
1866	2,400	2,400	800	789	68	-	5	
1867	2,400	2,400	900	943	59	220	0	
1868	2,400	2,400	900	799	-	219	10	
1869	2,400	2,400	900	976	52	271	10	
1870	2,400	2,400	900	847	41	126	5	
1871	2,400	2,400	1,500	901	41	140	5	
1872	2,400	2,400	1,500	1,074	44	137	5	
1873	2,400	2,400	1,500	1,285	32	247	5	

BONESS COMPANY

Capital and Profit/Loss Accounts (continued)

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Total Revenue £	Irrecoverable Debt Co. £	Owed to Profits £	Divi. %	Notes
1874	2,400	2,400	1,500	1,330		40	315	5
1875	2,400	2,400	1,500	1,347		42	338	5.8
1876	2,400	2,400	1,000	1,320		?	265	10
1877	2,400	2,400	1,500	1,351		32	450	-

Notes - Divi. - Dividend

Total expenditure: 1846 £114; 1849 £235

Dividend in 1868 included 6s (5%) back-payment for 1867, and that in 1869 included a similar payment (5%) for 1855. The dividend of 1875 (7s) was calculated as 5% of the market value of shares (£7, compared to nominal value of £6)

(A) 'Profit' in 1846 may have included cash bought forward from the Reserve Fund

(B) 50 new £6 shares issued

(C) Company accounts held in Clydesdale Bank

(D) 50 new shares sold

(E) Works and assets evaluated at £4,221

(F) £200 loans repaid from Reserve Fund

Book Profits were recorded as "Cash Owed to Treasurer" i.e. balance held by treasurer.

In 1858 £445 debt was shown "due Treasurer", and £800 extra from the Bank; "debt due Treasurer" was liquidated in 1860.

BONESS COMPANY

(3) Sources of Loan Capital

Source	Date	Total Loan £	Repaid £	Interest	Notes
Clydesdale Bank	1848	200	-	5%	(A)
"	1849	0	200	-	(B)
"	1851	200	-	-	
"	1852	400	-	-	
"	1853	371	29	-	
"	1854-5	371?	-	-	
"	1857	400	-	-	
"	1858-9	1,200	-	-	(C)
"	1860	700	500	-	
"	1861-2	700	-	-	
"	1863	500	200	-	
"	1864	0	500	-	
Commercial Bank at Linlithgow	1859	500	-	-	(C)
"	1860-1	1,000	-	-	
"	1862	900	100	-	
"	1863	500	400	-	
"	1864	400	100	-	
"	1865	300	100	-	
"	1866-70	300	-	-	
"	1871	0?	300?	-	
Royal Bank	1865	300	-	-	
"	1866	100	200	-	
"	1867	600	-	-	(D)
"	1868-70	600	-	-	
"	1871	0?	600?	-	
"	1877-?	500	-	-	(E)
A.Blair, Harbour Master	1864-6	400	-	5%	
"	1867	0?	-	-	
Mr McNair	1867	500	-	5%	
"	1868	0	500	-	
Robert McNair	1871-?	500	-	5%	(E)

BONESS COMPANY

Source of Loan Capital (continued)

Source	Date	Total Loan £	Repaid £	Interest	Notes
Capt. James Marshall	1871-5	500	-	4.5%	
"	1876	0	500	-	
John Johnstone, grocer	1871-?	500	-	4.5%	(E) (F)
Andrew Stevens	1871-5	500	-	4.5%	
"	1876-?	1,000	-	4.5%	(E)

Notes - (A) Loan taken by Treasurer, on his own security, to finance mains pipes to Braehead

(B) Repaid by issue of new Stock

(C) To finance retort-house improvements

(D) To repay McNair's loan

(E) Repayment date unknown

(F) In 1877 J. Johnstone transferred his loan to his mother, Martha Taylor

In 1863 the interest paid was £29 11s (5.9%) to Clydesdale Bank and £23 (4.6%) to Commercial Bank

BONESS COMPANY

(4) Items of Capital Expenditure

Date	Cost £	Item	Monetary Source
1843	50	Chimney and buildings (A.McGregor, Boness)	D 50
	?	Mains pipes (Devon Iron Co.)	
1845	?	Mains pipes (Devon Iron Co.)	
1846	198	Mains pipes (Boness Foundry Co.)	} B 88 D 300
	109	Meters (J.Milne & Sons)	
	80	Meters (R.Laidlaw & Sons)	
1848 c.	320	Mains pipes to Grangepans	B 158? C200
	38	Coal shed	
1853	25	Station meter (J.Milne)	} B 45? C 270
	20	Extending purifier house	
	?	Extensions	
1857	?	Mains pipes (J.Laidlaw & Co.)	B + C 550
1859	?	Condensers (Grimsby Gas Co.)	B + C 500
1860	269	Retorts renovation	C 269
1865	?	Photometer (J.Milne)	B +
1866	?	Extra land leased	B +
	54	Coal shed (W.Donaldson)	B 54
1867	845	Gasholder, tank & governor (Hanna, Donald & Wilson)	} A 409 C 500
	64	Concrete tank	
1868	130	Gasholder	A + B +
	38	Concrete tank	
	130	Transporting second-hand gasholder	
1870	26	Hydraulic main (R.Laidlaw & Son)	} B + C 600
	35	Retort bench alteration (Brock & Syme, Linlithgow)	
1872	?	Mains pipes extension	
1874	95	Condenser (Robertson & Co, Berwick)	B 95
1875	199	Purifiers (Airdrie Iron Co.)	B 199
1877	347	Retort house ironwork (Laidlaw, Sons & Caine)	} B 139 C 500
	142	Masonry (R.Drysdale, Grangepark)	
	70	Slater work	
	80	Station meter (J.Milne & Son)	

Notes - A Reserve Funds; B Working Costs; C Loans; D New Capital Stock

1868 gasholder to replace one with subsidence damage; £300 compensation paid by Mr Pollock, mineral lessee at Corbiehall.

CUPAR COMPANY

(1) Revenue/ Expenditure 1840 - 4

(i) Revenue

Date	Gas by Meter		Street Lamps		Coke/Tar/Lime		Total Revenue £
	£	% Total	£	% Total	£	% Total	
1840	765	90.9	63	7.5	14	1.6	842
1841	789	92.0	58	6.7	11	1.3	858
1842	832	94.5	38	4.3	11	1.2	880
1843	717	92.4	51	6.6	8	1.0	776
1844	950	-	56	-	18	-	-

(ii) Expenditure

Date	Coal £	Salaries £	Bricks/Retorts £	Lime £	'Works' £	Dividend £
1840	273	80	91	-	96	186
1841	248	80	75	13	37	182
1842	239	80	101	-	34	138
1843	298	105	62	11	27	175
1846	303	87	22	1	160	160

Source - S.R.O. Cupar Minute Book op cit.

CUPAR COMPANY

(2) Profit/Loss Account

Date	Gas Price s d	Book Profits £	Dividends Ord. %	Bonus %	Date	Gas Price s d	Book Profits £	Dividends Ord. %	Bonus %	Pref. %
1838	13 0	-	-	-	1873	6 8	Def. 17	8.93	0	0
1841	12 0	-	-	-	1874	5 10	887	5	0	0
1842	11 0	-	7.5	0	1875	5 0	553	5	0	0
1843	11 0	253	7.5	0	1876	5 0	477	5	0	0
1844	10 0	-	7.5	0	1877	5 0	628	5	1	0
1845	9 0	-	7.5	0	1878	5 0	546	5	2	0
1846	9 0	-	7.5	0	1879	5 0	430	10	2	0
1847	8 4	385	7.5	0	1880	5 0	247	-	-	-
1848	8 4	127	7.5	0	1881	5 0	481	5	2	0
1849	8 4	249	7.5	0	1882	5 0	387	5	2	0
1850	8 4	234	7.5	0	1883	5 0	193	5	2	0
1851	8 4	-	7.5	0	1884	4 7	502	5	2	0
1852	7 6	-	7.5	0	1885	4 7	383	5	2	0
1853	6 8	-	7.5	0	1886	4 7	321	5	2	0
1854	6 8	-	7.5	0	1887	4 7	Def. 938	5	2	0
1855	6 8	-	7.5	0	1888	4 7	281	4	0	0
1856	5 0	-	7.5	2.5	1889	4 7	619	5	2.5	0
1857	5 0	-	7.5	2.5	1890	4 7	771	5	2.5	0
1858	5 0	-	7.5	2.5	1891	4 7	541	5	1	0
1859	5 10	-	10	0	1892	4 7	212	5	0	0
1860	5 5	-	10	0	1893	-	-	-	-	-
1861	5 5	129	10	0	1894	4 2	667	5	1	4
1862	5 5	406	10	0	1895	4 2	965	7.5	0	4
1863	5 5	404	10	0	1896	4 2	914	7.5	0	4
1864	5 0	-	10	0	1897	3 11½	1,089	8	0	4
1865	5 0	447	10	0	1898	3 11½	973	8	0	4
1866	5 0	334	10	0	1899	3 11½	920	8	0	4
1867	5 0	347	10	0	1900	3 11½	755	6	0	5
1868	5 0	324	10	0	1901	3 11½	741	6	0	5
1869	5 0	357	10	0	1902	4 2	917	7	0	5
1870	5 0	402	10	0	1903	3 11½	1,052	7	0	5
1871	5 0	-	-	-	1904	3 11½	1,132	7	0	5
1872	5 0	629	7.14	0						

Note - Ord. - Ordinary; Pref. - Preference; Def. Deficit

Depreciation Allowance -

Date	%	£	Date	%	£	Date	%	£
1894	1	87	1898	2.5	215	1902	-	200
1895	2	176	1899	-	200	1903	-	200
1896	2.5	215	1900	-	100	1904	-	250
1897	-	216	1901	-	100			

CUPAR COMPANY

(3) Share and Loan Capital

Date	Reserve Funds £	Added to Reserve Fund £	Nominal Share Capital £	Ordinary Paid Up Capital £	Preference Stock Subscribed £	Total Loans £	Notes
1830	-	-	2,500	1,870?	0	750?	A
1839	?	-	2,500	1,870?	0	750	B
1840	135	-	2,500	1,870?	0	700	
1841	238	-	2,500	1,870	0	600	
1842	419	100	2,500	1,870	0	500	
1843	293	-	2,500	1,870	0	400	
1844	0	-	2,500	1,870	0	550	C
1845	?	-	2,500	2,290*	0	200	
1846	?	-	2,500	2,290	0	200	
1847	?	-	2,500	2,500	0	300	D
1848	?	-	2,500	2,500	0	550	D, E
1849	?	-	2,500	2,500	0	700	
1850	?	-	2,500	2,500	0	400	
1851	?	-	2,500	2,500	0	0	
1852	?	150	2,500	2,500	0	0	
1853	?	50	2,500	2,500	0	0	
1854	?	50	2,500	2,500	0	0	
1855	?	50	2,500	2,500	0	0	
1856	?	50	2,500	2,500	0	0	
1857	?	60	2,500	2,500	0	0	
1858	?	50	2,500	2,500	0	0	
1859	?	-	2,500	2,500	0	0	
1860	?	100	2,500	2,500	0	0	
1861	426	-	2,500	2,500	0	0	
1862	578	100	2,500	2,500	0	0	
1863	635	-	2,500	2,500	0	0	
1864	-	-	2,500	2,500	0	0	
1865	840	-	2,500	2,500	0	0	
1866	519	-	2,500	2,500	0	0	
1867	674	-	2,500	2,500	0	0	
1868	751	200	2,500	2,500	0	0	
1869	612	-	2,500	2,500	0	1,000	D
1870	43	-	2,500	2,500	0	?	
1871	?	-	2,500	2,500	0	728	
1872	?	-	6,250	6,250*	0	728	
1873	392	-	6,250	6,250	0	1,000	F
1874	970	-	6,250	6,250	0	?	
1875	1,160	-	6,250	6,250	0	?	
1876	1,299	400	6,250	6,250	0	?	
1877	1,609	-	6,250	6,250	0	?	
1878	1,777	-	6,250	6,250	0	?	
1879	1,774	-	6,250	6,250	0	?	
1880	1,587	-	6,250	6,250	0	?	
1881	1,632	-	6,250	6,250	0	?	
1882	157	-	6,250	6,250	0	?	
1883	1,327	-	6,250	6,250	0	?	
1884	1,390	-	6,250	6,250	0	?	
1885	1,336	-	6,250	6,250	0	0	

Date	Reserve Funds £	Added to Reserve £	Fund	Nominal Share Capital £	Ordinary Paid Up Capital £	Preference Stock Subscribed £	Total Loans £	Notes
1886	1,188	-		6,250	6,250	0	600	D etc.
1887	413	-		6,250	6,250	0	600	
1888	256	-		6,250	6,250	0	570	
1889	593	-		6,250	6,250	0	480	
1890	828	-		6,250	6,250	0	500	
1891	773	-		6,250	6,250	0	396	
1892	534	-		6,250	6,250	0	300	
1893	?	-		6,250	6,250	0	200	
1894 :								
spring	?	-		7,321	6,250	1,071**	0	G, H
autumn	?	42		7,321	6,250	1,071	300	I
1895	800	100		7,321	6,250	1,071	200	I
1896	-	-		7,321	6,250	1,071	0	
1897	900	100		7,321	6,250	1,071	0	
1898	1,000	100		7,321	6,250	1,071	300	I
1899	1,100	100		11,000	6,250	4,750 ⁺⁺	0	D
1901	?	-		11,000	6,250	4,750	1,000	I

Note - Valuation of Works and Assets: 1844 £3,000; 1872 £6,284; 1894 £7,776

'Reserve Fund' was mobilized at same time as loans. 'Reserve Fund' had various meanings, including Sinking Fund and Contingency Fund and Working Capital.

A Construction; B Inadequate initial capital; C New Manager's House; D New Gasholder; E Inadequate liquidity; F Coal Crisis; G Regenerative Retort; H Bench Installation; I Liquidity shortage.

* 65 reserve shares of nominal £10 sold at £14

+ Each £10 share revalued at £25, after valuation of works; market price above £20 for several years

** 153 4% Preference shares of £7 sold

++ Original Preference shares recalled. 475 Preference shares of £10 issued instead.

'Valuation' of gasworks was made by an external consultant gas-engineer in each case.

Reserve funds in Banks -

	1840	1841	1842	1843	1844
British Linen Bank (£)	134	157	187	135	Def.166
Commercial Bank (£)	1	81	232	158	-

CUPAR COMPANY

(4) Sources of Loan Capital

Source of Loan	Date	Total £	Repaid £	Interest	Notes
?	1830	750?	-	-	A
James Russel	1839	750	-	4.5%	A
"	1840	700	50	4.5% (£32)	
"	1841	600	100	4.5%	
"	1842	500	100	4.5%	
"	1843	400	100	4%	
"	1844	400	-	4%	
"	1845	0	400	-	
British Linen Bank	1844	150	-	4%	B
"	1845-6	200	-	4%	
"	1847	200	-	5.5%	
"	1848	250	-	5.5%	
"	1849	0	250	-	
"	1869	1,000	-	-	C
"	1871-2	728	-	-	
"	1873	1,000	-	-	D
"	1874-9	?	-	-	
"	1880-5	0	-	-	
"	1886	600	-	4%	E
"	1887	600	-	4.5%	
"	1888	570	30	4.5%	
"	1889	480	90	4.5?	
"	1890	500	125	4.5?	
"	1891	375	75	4.5?	
"	1892	300	-	4.5?	
"	1893	200	100	4.5?	
"	1894	0	200	4.5?	F
"	1898	+300	-	4	G
"	1899	0	+300	-	
R. Balfour	1847	300	-	4.5%	H
"	1848	300	-	5%	
"	1850	0	300	-	
Mrs Cameron, Auchtermuchty	1849	400	-	4%	
"	1850	400	-	3.5%	
"	1851	0	400	-	
Mr Wescott	1894	300	-	3.5%	I
"	1895	200	300	3.5%	J
"	1896	0	200	-	
W. Honeyman	1901	1,000	-	4%	K

Note - A Inadequate initial capital

B Building manager's house

C Bank loan for 3 to 5 years at "cash account" rate to finance new gasholder

D Extra loan because coal prices doubled

E New gasholder and extensions

F Repaid by issue of Preference Shares during extensions to capital plant in 1894

- G To finance minor capital-equipment extensions; repaid the following year by sale of Preference Shares
- H New gasholder
- I Loan by Mr Westwood, a Director, during liquidity crisis caused by capital-equipment extensions; repaid within a few months
- J Temporary loan to pay dividends
- K Six months loan during liquidity crisis after construction of new gasholder
- + above

CUPAR COMPANY

(5) Items of Capital Expenditure

Date	Cost £	Item	Monetary Source
1847	70	Extra land	} C 100 D 420
	520	Gasholder (Jackson & Douglas, Strathedin Foundry)	
1856	60	Extra land	B 60
1859	100	Purifiers (local blacksmith)	B 100
1863	?	Gasholder repaired	B -
1865	449	Mains pipes extension	A 321 B 128
1867	28	Extra property	B 28
	?	New mains	B -
1869	990	Gasholder (T.J.Russel, Cupar)	} A 139 C 1,000
1870	39	Scrubber (J.Douglas, Cupar)	
	45	Station meter (Messrs Milne)	
1872	159	2 Purifiers	A ? B ?
	26	Purifier shed	
1877	85	Retort house improvements	B 85
1879	?	Mains pipes enlarged	B ?
1882	90	Scrubber	B 90
	62	Steam engine (E.Birnie, Glasgow)	B 152
1886	845	Gasholder (T.J.Russel, Cupar)	} A 243 B 200 C 600
	50	Excavation of tank	
	38	Masonry	
	110	New retort oven (4 retorts)	
1893	700	Regenerative system for 22 retorts (A.MacPherson, Kirkcaldy)	D 1,070
	150	Exhauster	}
	?	Governor	
	?	4 Purifiers	
1894	91	Chimney repaired	B 91
1897	150	Annular condenser (H.Balfour, Leven)	B 260
	60	Scrubber (Kirkcaldy Gas Co.)	
	50	Repairs to scrubber	
1898	100	Steam boiler	} B 532
	80	Retort house improved	
	352	Two dwelling houses	
1899	2,550	Gasholder (Ashmore, Benson & Pease, Stockton on Tees)	} D 3,679
	150	Gasholder tank	
1903	44	Purifiers (H.Balfour, Leven)	B 44

Notes - A Reserve Fund; B Working Costs; C Loans; D New Share Capital

DALKEITH COMPANY

(1) Revenue

Date	Gas in Shops & Houses £	Street Lamps £	Coke/ Tar £	Meter Rent £.p	Int- erest on Cash £.p	Total Book Revenue £	Total Revenue from Known Sources £
1831	333	102	5	-	-	440	440
1832	365	131	2	-	-	629	498
1833	520 *	*	2	-	-	604	522
1834	505 *	*	12	-	-	630	517
1835	601	110	19	-	-	3460	730
1836	665	127	9	-	-	948	801
1837	656	113	20	-	-	1221	789
1838	723	108	22	-	-	1727	853
1839	825	120	43	-	-	1771	988
1840	802	118	35	-	-	1673	955
1841	845	114	37	-	-	1836	996
1842	880	115	64	-	-	2092	1059
1843	892	129	26	-	-	1864	1047
1844	920	125	90	-	10.50	2108	1145
1845	828	111	42	-	2.10	1600	983
1846	930	107	40	-	3.25	1426	1080
1847	1015	89	26	-	24.50	1669	1154
1848	1008	83	19	-	-	1473	1110
1849	1011	90	26	-	-	1440	1127
1850	1082	85	15	-	-	1405	1282
1851	1103	88	25	-	1.40	1642	1217
1852	1056	88	16	-	4.60	1824	1165
1853	1038	94	10	7.20	5.20	1858	1154
1854	1058	77	32	7.50	5.85	1872	1180
1855	1298	40	23	7.95	8.80	2090	1378
1856	1407	50	79	9.30	-	2142	1545
1857	1460	51	84	10.15	-	1778	1605
1858	1495	56	100	11.15	-	1872	1662
1859	1470	54	115	11.75	-	2019	1651
1860	1485	63	140	15.10	-	2418	1703
1861	1578	60	113	17.0	-	2666	1768
1862	1641	66	158	21.05	-	2906	1826
1863	1707	58	133	23.45	8.15	3187	1930
1864	1895	64	131	24.45	13.95	5132	2128
1865	2003	73	152	25.10	29.40	3793	2282
1866	2060	82	183	28.20	24.05	4063	2377
1867	2170	83	235	27.0	28.20	4333	2543
1868	2299	95	177	30.50	14.35	2679	2615
1869	-	-	-	-	-	2203	-

Note - * Street Lamps included under Gas in Shops/Houses

' Tar/Coke includes sundries, scrap metal, &c

Total Book Revenue included Loans and Cash Brought Forward.

Total Revenue from Known Sources - calculated from annual trading revenue as shown in other columns.

Source - S.R.O. Dalkeith Minute Book op cit

DALKEITH COMPANY

(2) Expenditure

Date	Coal £	Salary Manager & Clerk £	Wages £	Total Working Costs £	Interest on Debts £.p	%	Dividends Bonus £	£.p
1831	-	-	-	-	-	0	-	0.0
1832	104	64	46 *	-	42.30	4	-	73.50
1833	121	64.50	33.	-	40.95	4	-	63.30
1834	128	63.50	52 *.	-	40.65	0	-	0.0
1835	137	62	40	-	40.80	5	-	60.80
1836	215	74.50	47	-	74.50	5	-	76
1837	328	76	55	-	29.60	5	-	76
1838	309	129	50	-	36.80	5	-	76
1839	295	100	55	-	-	7.5	-	91.50
1840	259	160	56	-	-	7.5	-	216.75
1841	300	117	57	-	-	7.5	1	205.50
1842	326	105	81	-	-	7.5	-	244.50
1843	319	105	81	-	-	7.5	4	220.50
1844	235	130	62	-	-	7.5	1	217.50
1845	372	130	81	-	-	7.5	284	213.0
1846	422	130	74	-	-	7.5		222
1847	579	145	111	1009	-	7.5	20	277
1848	503	145	115	893	-	7.5		220.50
1849	459	145	119	851	-	7.5		213
1850	346	145	110	744	-	7.5		235.50
1851	334	150	111	739	-	7.5		235.50
1852	296	150	109	664	-	7.5	225	225
1853	348	160	102	716	-	7.5	225	225
1854	326	190	93	785	-	7.5	150	225
1855	446	155	97	877	-	7.5		225
1856	619	185	131	1201	-	7.5		217.50
1857	514	165	112	1086	-	10		232.50
1858	638	175	107	1148	-	10		300
1859	545	185	105	1004	-	7.5		300
1860	651	215	117	1224	-	10		300
1861	621	215	125	1212	-	10		300
1862	716	215	135	1358	-	10		300
1863	626	255	135	1385	-	10		300
1864	688	215	162	1426	-	10		300
1865	820	240	161	1673	-	10		450
1866	898	215	161	1723	-	10		450
1867	983	235	165	1856	-	10		600
1868	932	185	165	1553	-	10		600

DALKEITH COMPANY

(3) Profits and Dividends

Date	Dividend % Bonus %	Profits £	Date	Dividend %	Profits £	Additions to Reserve Fund £	
1870	10	5	-	1892	12½	1,187	-
1871	10	-	-	1893	12½	1,473	-
1872	10	-	-	1894	12½	1,053	-
1873	10	-	-	1895	10	935	-
1874	7½	-	-	1896	12½	1,273	-
1875	10	-	-	1897	-	1,397	-
1876	10	2½	-	1898	12½	1,048	-
1877	10	-	1,043	1899	12½	1,019	-
1878	10	2	1,174	1900	12½	951	-
1879	10	-	1,020	1901	10	842	-
1880	10	5	1,276	1902	10	1,078	-
1881	10	5	1,245	1903	10	1,115	-
1882	10	5	1,118	1904	10	1,180	-
1883	15	-	-	1905	10	826	-
1884	15	-	1,267	1906	8	761	-
				1907	8	1,101	-
1887	15	-	952	1908	8	1,503	-
1888	15	-	1,151	1909	8	995	355
1889	15	-	1,170	1910	8	956	316
1890	15	-	1,217	1911	10	1,451	651
1891	10	-	712	1912	10	1,669	869
				1913	10	1,473	500
				1914	10	-	310

Note - in 1872 nominal capital raised from £6,000 to £8,000.

DALKEITH COMPANY

(4) Capital Account

Date	Nominal Capital £	Paid-up Capital £	Total Loans £	Reserve Funds in Bank £	Note	Date	Nominal Capital £	Paid-up Capital £	Total Loans £	Reserve Funds in Bank £	Note
1827	3,000	1,530?	600	-	A	1855	3,000	3,000	0	600	
1828	3,000	1,530?	600	-		1856	3,000	3,000	105	380	B
1829	3,000	1,530?	1,204*	30		1857	3,000	3,000	0	-	
1830	3,000	1,530?	2,200?	-		1858	3,000	3,000	0	40	
1831	3,000	1,530?	1,970?	-		1859	3,000	3,000	0	153	
1832	3,000	1,530?	1,930	-		1860	3,000	3,000	0	480	
1833	3,000	1,530?	1,930	-		1861	3,000	3,000	0	540	
1834	3,000	1,530?	1,810	-		1862	3,000	3,000	0	525	
1835	3,000	1,530	1,810	-		1863	6,000	6,000	0	500	B
1836	3,000	1,530	1,485	-		1864	6,000	6,000	0	900	
1837	3,000	1,530	757	-		1865	6,000	6,000	0	850	
1838	3,000	2,135 ⁺	223	-	B	1866	6,000	6,000	0	900	
1839	3,000	3,000	0	157		1867	6,000	6,000	0	1,090	
1840	3,000	3,000	0	-		1868	6,000	6,000	0	1,080	
1841	3,000	3,000	0	-		1869	6,000	6,000	0	2,203	
1842	3,000	3,000	0	-		1870					
1843	3,000	3,000	0	-		-71	6,000	6,000	0	-	
1844	3,000	3,000	0	962		1872	8,000	8,000	0	-	
1845	3,000	3,000	0	441		1899	8,000	8,000	0	2,510	
1846	3,000	3,000	0	107		1900	8,000	8,000	0	2,480	
1847	3,000	3,000	0	326		1901	8,000	8,000	0	-	
1848	3,000	3,000	0	236		1902	8,000	8,000	3,000	-	
1849	3,000	3,000	0	197		1903	8,000	8,000	?	-	
1850	3,000	3,000	0	100		1904	8,000	8,000	?	-	
1851	3,000	3,000	0	290		1905	8,000	8,000	921	-	
1852	3,000	3,000	0	510		1906	8,000	8,000	800	-	
1853	3,000	3,000	0	545		1907	8,000	8,000	500	-	
1854	3,000	3,000	0	520		1908	8,000	8,000	0	-	

Note - 1837 - 152 reserve shares distributed, and half called up to repay Gray's loan.

1838 - Second half called up to finance extensions.

1890 - Total Reserve Funds £2,600

* 1829 - £48 interest paid on £1,200 debt.

+ 1838 - Another £145 had been called up but not yet received.

A - Inadequate initial capital.

B - Extensions of equipment.

DALKEITH COMPANY

(5) Loan Capital

Source of Loan	Date	Total £	Repaid £	Interest	Reasons
Messrs John Gray & Sons of Dalkeith	1827	600	-	-	Inadequate in- itial capital & legal dispute. Iron retort failures.
	1828	600?	-	-	
	1829	1,000	-	4%	
	1830	1,200	-	£48	
	1831	1,200	-	£36	
	1832-5	1,200	-	-	
	1836	900	300	-	
	1837	600	300	-	
	1838	178	412	-	
1839	0	178	-		
National Bank	1829	204	-	4%	
	1830	c.1,000?	44	£83.50	
	1831	c. 770?	-	£9.10	
	1832	730	40	-	
	1833	730	-	-	
	1834	610	120	-	
	1835	610	-	-	
	1836	585	25	-	
	1837	157	428	-	
	1838	45	112	-	
	1839	0	45	-	
Commercial Bank	1856	105	-	-	
	1857	0	105	-	
	1902	3,0000	-	-	} New Retort House & Gas- holder
	1905	921	-	-	
	1906	800	121	-	
	1907	500	300	-	
	1908	0	500	-	

DALKEITH COMPANY

(6) Items of Capital Expenditure

Date	Cost £	Items	Monetary Sources	£
1826 -27	?	Buildings and wrought iron (A. Sanderson, Dalkeith)	} D. 702.5	
	?	Purifiers and condensers (Caledonian Foundry, Dalkeith)		
	130	Gasometer (Leith Foundry)		
	118	Hydraulic main and retorts (Caledonian Foundry)		
	28	Iron roof, Leith Foundry		
	67	Chimney (Bruce and Anderson, Edinburgh)		
1827	200	Legal compensation to engineer	C.600	
1828	?	Mains pipes (Devon Iron Co.)	B?	
	?	Iron retorts (George Mushet of Dalkeith and Calton Hill Foundry)	B?	
1829	?	Steelyard (J. Smith, Edinburgh)	} C 604	
	432	Extensions		
1830	?	Retort bench repairs	B?	} C c.400
	?	Iron retorts (G. Mushet)	B ?	
1833	125	Mains pipes (G. Mushet)	B ?	
1834	274	Tank and Gasholder (G. Mushet)	B ?	
1838	?	Gasholder-house (A. Sanderson) and Manager's house	} D. 795	
1842	82	Condensers, purifiers, etc (C. Umpherstone and Son, Loanhead)	} A. 855	
1842	455	Gasholder (G. Mushet)		
-45	236	Gasholder tank		
	31	Engineer's fees		
1854	479	Gasholder (D. Russell, iron-founder, Dalkeith)	B 479	
1855	175	Ironwork (D. Russell)	A 600 C. 105	
-56	145	Masonry (G. Blair, Dalkeith)		
	109	Bricklaying (A. McKechney, Dalkeith)		
1859	141	Station meter (Milne, Edinburgh)	B 141	
1863	100	Extra land	} D 1758	
	228	{ Governor		
	1430	{ Mains pipes (D. Russell) Gasholder (J. and A. Robertson, Berwick)		
1867	217	Mains pipes	B 217	
1870	121	Mains pipes	B 121	

DALKEITH COMPANY

Items of Capital Expenditure (continued)

Date	Cost £	Items	Monetary Sources	£
1875	706	Purifiers, condensers, etc. (postponed during 1873 coal crisis)	A 500* B 206	
1876	200	Repairs to Edinburgh property	B 200	
1878	300	Extensions	A 150 B 150	
1879	90	Mains pipes	B 90	
1880	60	Washer	B 60	
1881	200	Mains pipes	B 245	
1883	340	Purifiers	B 340	
1888	17	Photometer etc. (Milne, Edinb.)	B 17	
1891	158	3 new retorts and 3 ovens rebuilt (Mr Dennis)	} A 200 B 127	
	16	Retort mountings (D.Russell)		
	148	Ironwork (Anderson and Co., Musselburgh)		
1892	119	Ironwork (Anderson and Co.)		
1893	240	'Peebles' oil gas plant (A.F. Craig and Co., Paisley)	A 200 B 50	
1901	200	Extra land	B 200	
1902	100	Steam boiler	} A 1840 B 409 C 3000	
	270	Exhauster and engine		
	59	Scrubber etc. (Portobello Gas Co. and Anderson and Co.)		
	2395	Gasholder (Hanna, Donald and Wilson, Paisley)		
	415	Iron roof (A. and J. Main and Co. Ltd.)		
	1500	Retort dench, 25 new retorts.		
1910	?	Gas Compressor (Milne, Edinb.)	B ?	
1912	47	Governor (Parkinson and Cowan)	B 47	

Note :

* Portions of expenditure were sometimes "borrowed" from the Reserve Fund to be repaid over several years, viz :
1875 £500 , 1878 £150, 1892 £200 (2 years), 1893 £200 (repaid 1895, 1896)

A - reserve fund

B - working costs

C - loans

D - new stock sold

DALRY COMPANY

(1) Revenue Accounts

(i) Income from Various Consumers

Date	Total Revenue £	Kitchen etc Lights £	Weavers' Lights £	Gas by Meter £	Street Lamps £
1836	238	72	28	84	4
1837	264	106	57	98	7
1838	262	110	55	91	7
1839	263	123	55	84	-
1840	-	131	48	90	-
1841	300	149	48	104	-
1842	259	137	36	83	-
1843	267	139	37	88	-

Date	Cash Brought Forward £	Unpaid Gas Rent by - Kitchen Lights £	Weavers £	Meters £
1837	-	16	10	-
1838	6	34	20	-
1839	13	38	16	16
1840	20	30	21	11
1841	49	44	29	17
1842	112	9	4	5
1843	131	-	-	-

Note - Large arrears by consumers during 1841 textiles trade depression.

(ii) Revenue 1867-8

Date	Gas Consumed by Own Meter £	Hired Meter £	Meter Rent £	Tar/Ammonia (British Asphelte Co) £
1867	457	483	79	42
1868	467	487	77	18

Balance brought forward in 1867 £920, interest received £25, and total cash on hand £2,033.

Note - Great importance of meter-hire in encouraging gas sales.

DALRY COMPANY

(2) Gas Prices per Thousand cu. ft.

Date	Price s d	Date	Price s d	Date	Price s d	Date	Price s d
1834-7	11 0	1872	5 0	1876-81	4 7	1887-95	5 0
1837	10 6	1873-4	5 10	1882	4 2	1896-8	4 9½
1839-40	10 0	1875	5 0	1886	4 7	1899	4 7
1841	9 0						

Note - Minute Books for 1844-73 are not extant.

Gas price changed by coal crisis (1873), petition from "a large number of Consumers" (1882), and expensive coal plus a slump in by-products during 1887.

(3) Capital Account

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Dividends %
1834	800	795	60	0
1835	950	795	150	-
1836	950	795	150	4
1837	950	795	150	5
1838	950	795	150	5
1839	950	795	150	5
1840	950	795	150	6
1841	950	795	150	5
1842	950	795	150	7.5
1873-4	2,527.50	2,527.50	500	-
1875	3,538.50	3,538.50	500	-
1876-88	3,538.50	3,538.50	?	-
1889	3,538.50	3,538.50	350	-
1890	3,538.50	3,538.50	150	-
1894	3,538.50	3,538.50	800	-
1895	3,538.50	3,538.50	1,300	-
1896	4,200	4,200	-	-
1898	4,200	4,200	1,000	-
1899	4,200	4,200	800	-

Note - Nominal share value £5 in 1834, 1873; £10 10s in 1875. 63 shares sold in 1896 at upset price of £12. Property purchased in North Street for £100 in 1894 was sold to the County Council in 1896 for only £50. In 1896 the Company took Limited Liability, after apportioning £600 surplus on the ledger by paying £253 as 15s dividend per share, £300 as depreciation, and £47 carried forward. Paid up capital raised to £4,200 by selling 63 unissued £10 10s shares at upset price of £12.

DALRY COMPANY

(4) Sources of Loan Capital

Source	Date	Amount £	Repaid £	Interest %	Notes
?	1834-5	60	-	-	Bill
Miss L.Crawford	1835-7	150	-	-	
"	1838	0	150	-	
William Barr	1838-?	150	-	-	Bill
?	1873-5?	500	-	-	Bill
Robert Gray	1878-?	300	--	4.5	(A)
Bryce Knox	1878-?	300	-	4.5	(A)
R.B.Houston, merchant of Cumnock	1887-8	450	-	-	(B)
"	1889	350	100	-	
"	1890	150	100	-	
"	1891-?	150	-	-	
W.Alexander, postmaster, Dalry	1895-?	300	-	-	(C)
Thomas Campbell	1895-8	200	-	-	(C)
"	1899?	0	200	-	

Notes - (A) One month's notice on either side before repayment
 (B) To finance extension of works
 (C) Loan taken from the Gas Company's secretaries

GALASHIELS COMPANY

(1) Revenue and Expenditure 1857-68

(i) Revenue

Date to	Gas Income - Nov. £	Feb. £	June £	Total £	Police Lamps £	Tar £	Lime/ Coke £	House Rent £
1859	605	1,014	501	2,120	141	45	13	-
1860	670	1,165	480	2,315	63	-	41	-
1861	672	1,237	471	2,380	75	55	37	-
1862	507	1,051	475	2,033	78	91	49	-
1863	735	1,226	628	2,589	87	91	41	37
1868	1,146	1,514	820	3,480	114	29	15	52

(ii) Expenditure

Date	Coal/Lime inc. carriage £ £		Wages/Salaries £ £		Repairs £	Interest on Debts £	Miscellaneous £
1857	1,246		326		51	40.50	46
1858	1,040		305		117	87.50	49
1859	1,396		324		111	79.45	34
1860	1,292		324		39	53.45	48
1861	1,228	39	186	110	155	103.60	-
1862	1,067	36	169	150	169	83.60	-
1863	1,583	-	348	-	302	49.60	-
1864	1,550	-	-	-	-	-	-
1868	-	-	293	166	-	-	-

GALASHIELS COMPANY

(2) Output 1857-1897

Date	COAL		Gas Sold per Ton Coal (After leakage) cu ft	GAS		
	Tons	Average Price per Ton s d		Produced (nearest thou cu ft)	Sold	Leakage %
1857	-	-	-	-	5,926	-
1858	-	-	-	-	5,299	-
1859	930	-	6,486	-	6,032	-
1860	912	-	7,000	-	6,340	-
1861	916	-	8,082	-	6,547	-
1862	820	26 0 $\frac{1}{4}$	7,435	-	6,097	-
1863	1,051	-	-	-	8,035	-
1864	-	-	7,379	-	9,624	-
1865	1,357	23 4	8,784	-	11,132	-
1866	1,438	-	9,100	14,521	13,000	10
1867	1,502	25 0	9,401	-	14,121	8.25
1868	1,426	25 0	9,412	13,561	13,421	-
1869	1,759	23 0	9,425	18,465	16,579	10
1870	2,120	-	9,470	22,300	20,078	10
1871	2,253	19 11 $\frac{1}{2}$	9,193	-	20,713	-
1872	2,648	21 0 $\frac{1}{4}$	9,617.5	27,975	25,672	9
1873	2,766	27 10 $\frac{1}{2}$	9,226.5	28,225	25,520	9.5
1874	2,490	38 6 $\frac{1}{2}$	9,336	25,596	25,520	9
1875	3,025	26 11	9,325.5	30,605	28,204	7.75
1876	3,109	20 0 $\frac{1}{4}$	9,281	31,261	28,856	7.75
1877	3,140	19 6 $\frac{1}{2}$	9,464	31,492	29,719	5.75
1878	3,395	-	9,147	33,393	31,055	7
1879	3,440	-	9,448	35,457	32,502	8.33
1880	3,750	-	9,598	38,052	35,994	5.5
1881	4,088	-	9,620	41,628	39,328	5.5
1882	4,210	-	9,687	42,636	40,786	4.3
1883	4,419	-	9,698	44,202	42,857	3
1884	4,498	-	9,639	-	44,774	-
1885	4,629	15 9 $\frac{3}{4}$	9,672	46,310	44,774	3
1886	-	-	-	47,519	45,179	-
1887	-	-	-	52,118	49,259	-
1888	-	-	-	52,968	51,051	-
1889	-	-	-	56,078	53,192	-
1890	-	-	-	62,302	58,624	-
1891	-	-	-	57,253	55,591	-
1892	-	-	-	61,517	59,254	-
1893	-	-	-	60,465	58,749	-
1894	-	-	-	52,225*	50,621	-
1895	-	-	-	55,871	53,378	-
1896	-	-	-	56,310	53,378	-
1897	-	-	-	53,080	50,821	-

Note - * including oil gas.

GALASHIELS COMPANY

(3) Profits and Dividends

Date	Price of 1000 cu ft Gas s d	% Dividend	Profit* Nearest £	Date	Price of 1000 cu ft Gas s d	% Dividend	Profit* Nearest £
1843	5d reduction	-	-	1875	4 7	10	926+
1844	-	10	368	1876	3 9	10	2,179
1845	-	-	-	1877	3 9	10	1,447
1846	-	10	-	1878	3 9	10	1,390
1847	raised to 10s	10	770	1879	3 6	7½	1,098
1848	10 0	10	-	1880	3 4	8½	2,002
1849	8 0	10	-	1881	3 4	10	1,907
1850	8 0	10	-	1882	3 2	10	2,400
1851	7 0	10	-	1883	3 2	10	2,328
1852	6 0	10	-	1884	3 2	10	2,197
1853	6 0	10	648	1885	3 2	10	2,026
1854	6 0	10	554	1886	3 2	10	2,301
1855	6 0	10	-	1887	3 2	10	2,357
1856	6 0	10	-	1888	2 11	10	2,415
1857	6 8	10	-	1889	2 11	10	2,368
1858	7 6	7½	-	1890	3 1½	10	2,522
1859	7 6	7½	-	1891	3 6½	10	1,881
1860	7 6	7½	-	1892	3 9	10	1,934
1861	6 5½	7½	609	1893	3 6½	?	2,832
1862	6 5½	7½	498	1894	3 4	10	2,104
1863	5 10	7½	-	1895	3 4	10	1,869
1864	5 10	7½	305	1896	3 4	10	2,101
1865	5 5	10	1,155	1897	3 4	10	1,941
1866	5 5	10	900+	1898	3 4	10	2,052
1867	5 5	10	1,365	1899	3 4	10	2,103
1868	5 10	10	1,445	1900	3 9	10	2,467
1869	5 10	10**	1,141	1901	3 9	10	1,979
1870	5 5	10	1,722	1902	3 6½	10	2,112
1871	5 0	7½	1,953	1903	3 4	?	2,065
1872	5 0	7½	2,013	1904	-	10	2,278
1873	6 3	7½	1,108	1905	-	10	2,642
1874	5 5	10	1,571	1906	-	10	2,211
				1907	-	10	2,319

Notes - * Profit after deducting those profits which were re-ploughed as extra capital

+ Profit excluding Dividends

** i.e. 10% on original issue of £1,755 stock; £9 3s 3d% on 1848 shares of £877 10s, and £6 13s 4d% on 1861 issue of £1,367 10s stock and 1867 issue of £5,000 stock. Average £7 6s 9d%, though the Company stated "the Dividend" as 10%. The differential was maintained in later dividends. The Dividend was supplemented by a Bonus Dividend occasionally viz. 1876 5% bonus, 1877 2½%, 1884 2½%

GALASHIELS COMPANY

(4) Share and Loan Capital

Date	Nominal Capital £	Share Capital Paid Up £	Total Loans £	Notes
1834	1,755	1,755?	-	
1844				
-46	1,755	1,755?	-	i
1847	1,755	1,755?	775	A
1848	2,632.5	2,632.5	960	
1849	2,632.5	2,632.5	498	
1850	2,632.5	2,632.5	361	
1851	2,632.5	2,632.5	0	
1856	2,632.5	2,632.5	1,000	B
1857	2,632.5	2,632.5	1,000	
1858	2,632.5	2,632.5	1,739	
1859	2,632.5	2,632.5	1,805	
1860	2,632.5	2,632.5	3,250	
1861	4,000	4,000	3,250	
1862	4,000	4,000	1,550	
1863	4,000	4,000	1,050	
1864	4,000	4,000	1,050	
1865	4,000	4,000	1,050	
1866	4,000	4,000	0	C ii
1867	9,000	9,000	4,500	
1868	9,000	9,000	4,500	
1869	9,000	9,000	4,500	D iii
1870*	13,000	13,000	4,500	
1871	13,000	13,000	3,000	
1878	18,000	18,000	3,000	E
1884	18,000	18,000	3,000	
1885	21,000	21,000	4,200	F
1886	21,000	21,000	4,200	
1887	21,000	21,000	3,000	
1891	21,000	21,000	2,400	
1892	21,000	21,000	3,060	
1893	21,000	21,000	3,190	

Notes - A New gasholder; B New mains pipes; C Moving the entire gasworks; D New gasworks; E Nominal share values raised; F New Gasholder

Valuation of Works - i £3,010; ii £4,790; iii £16,765

1848 351 new Half Shares of £2 10s issued. All but 56 taken by existing shareholders

*1870 Nominal value of all shares raised from £5 to £7 10s

1878 Nominal value of all shares raised to £10

1885 300 new £10 shares sold

1866 £5 shares sold at upset price of £7 10s, 1,000 shares sold, 452 to existing shareholders

GALASHIELS COMPANY

(5) Reserve Funds and Reinvested Profits

(i) Reserve Funds -

Date	Reserve Fund Added to £	Total £	Date	Reserve Fund Total £
1844	200	-	1855	192
1847	-	0	1888	2,234*
1851	48	48	1889	2,588
1852	-	519	1892	186
1853	-	657	1893	458

Note - * Deposited in National Bank

(ii) Reinvested Profits -

In 1875, new gasworks at Galashiels paid £1,350 dividends, leaving an excess profit of £926, of which £426 was placed in a "surplus account" and £500 "carried forward". The "Carried Forward" account was subsequently used as a financial device to cover both Reinvested Profits. In June 1900 the Directors stated: "Reserve Fund ... invested in the Works £6,198 15s".

Date	"Carried Forward" £	Date	"Carried Forward" £	Date	"Carried Forward" £
1875	500	1886	3,924	1897	5,880
1876	654	1887	4,909	1898	5,829
1877	414	1888	5,225	1899	5,832
1878	791	1889	5,493	1900	6,199
1879	1,039	1890	5,915	1901	6,077
1880	-	1891	5,696	1902	6,089
1881	1,618	1892	5,530	1903	6,054
1882	2,218	1893	6,292	1904	6,132
1883	2,746	1894	6,266	1905	6,674
1884	2,693	1895	6,035	1906	6,786
1885	3,422	1896	6,036	1907	7,004

GALASHIELS COMPANY

(6) Sources of Loan Capital

Source	Date	Amount £	Interest	Note
National Bank	1847	775	-	A
"	Spring			
"	1848	1,300	-	
"	Autumn			
"	1848	960	-	
"	1849	496	-	
"	1850	361	-	
"	1851	0	-	
"	1858	739	-	
"	1859	105	-	
"	1860	0	-	
George Anderson, Bridgeheugh	1856-61	1,000	4.5%	B
"	1862	0	-	
John Thorburn	1859-61	700	4%	Bond
"	1862	0	-	
James Allan, Gatterside	1860-62	500	-	Pr. Bill
	1863	0	£49.50	-
{ John Dickson Addington	1860-64	424	-	Pr. Bill
{ Alison Dickson "	1860-64	63	-	Pr. Bill
{ Isabella Dickson "	1860-64	63	-	Pr. Bill
"	1865	0	-	
Andrew Riddell, N. Synton	1860-64	500	-	Pr. Bill
"	1865	0	-	
Misses Jane and Janet Dunn, Melrose*	1867-91	3,000	4%	Debt Bond*
Leithed's Trustees*	1867-71	1,500	4%	
"	1872	0	-	
?	1885-86	1,200	3.75%	C
"	1887	0	-	
?	1891-c.5	1,400	4%	+
?	1891	300	4%	
Gas Company Secy. }	1891	700	-	
"	1892	0	-	
?	1892	660	3.5%	D
"	1893	0	-	
?	1893	790	3%	
"	1894	0	-	

Notes - A New gasholder; B New retort house and mains pipes; C New gasholder (costing £4,800); D Temporary loan during coal crisis; Pr. Bill - Promissory Bill

* Loans arranged by W. Rutherford, writer

+ No data on Misses Dunns' loan is available after 1867, but it was apparently transferred to Mr Cochrane's Trustees who in 1891 demanded repayment of £3,000. Repayment was

made in that year, £500 in January, £400 in June, and £2,100 in August. New loans were taken to make good the amount - £300 in June, £2,100 at $3\frac{1}{2}\%$ for a few months in August, and a long term loan of £1,400 in November. The Reserve Funds in the Bank fell from £574 in June 1891, to an overdraft of £211 that October. A liquidity shortage led to loans being taken, for only a few months each, to pay dividends in 1892 and 1893. The 1891 loan of £1,400 was used to cover equipment extensions (£1,100) in 1893, and not repaid until about 1895. In 1904 retort ovens (£2,200) were purchased without extra loan capital.

GALASHIELS COMPANY

(7) Items of Capital Expenditure

Date	Cost £	Item	Monetary Source
1845	150	Extensions to works	B 150
1846	115	Repairs and maintenance	B 115
1847 -48	1,440	{ Iron gasholder tank (Robertson & Co., Berwick) Gasholder (Robertson & Lister, Glasgow) Extensions }	C 980 D 878
1853	143	Coal shed	B 143
1854	80	Purifiers (J. & A. Robertson, Berwick)	} B 186
	106	Mains pipes	
1855	37	Engineering (Amens & Brodie)	} B 112
	75	Retort house masonry	
1856	73	Bricks (A.Livingston, Portobello)	B 73 C 1,000
	605	Mains pipes	
1857	27	Retort bench rebuilt	B 27
1859	59	Gasholder repair (J. & A. Robertson, Berwick)	C 739
	675	Extra land	
	139	Station meter (J.Milne, Edinburgh)	B 139
1860	1,625	Gasholder (H./D./Wilson, Paisley)	-
1862	120	Retort house masonry (A.Herbertson & Son)	} B 401
	255	Condensers/appts. (J. & A. Robertson, Berwick)	
	26	Governer (J.Milne, Edinburgh)	
1864	114	Iron roof (James Tait, Edinburgh)	B 114
1867	3,490	Retort bench (R.Laidlaw, Glasgow)	} C 4,500 D 3,920
	3,400	Tank & holder (H./D./Wilson, Paisley)	
	1,530	Mains pipes (J. & A. Robertson, Berwick)	
1876	276	Purifiers (R.Laidlaw, Glasgow)	A/B 276
1877	2,200	Mains pipes (Robertson, Berwick)	A/B 2,200
1880	247	Enlarged gasholder (Robertson, Berwick)	} B 447
	200	Mains pipes	
1881	239	Boiler (J.Adamson & Co.)	} A/B 1,479
	1,240	Retort house extension (A.Herbertson & Co.)	
1883	269	Station meter (J.Milne, Edinburgh)	B 620
1884	620	Auxilliary gasholder (H./D./Wilson)	A/B 620
1885	4,800	Gasholder (H./D./Wilson, Paisley)	A 200 B 420 C 1,200 D 3,600
1886	82	Mains pipes	B 82
1889	1,155	Display shop in High Street	A/B 1,155

GALASHIELS COMPANY

(7) Items of Capital Expenditure (continued)

Date	Cost £	Item	Monetary Source
1890	1,731	Purifiers/exhauster etc. (H./D./Wilson)	} A/B 2,236
	505	Shop renovation	
1893	572	Peebles Oil Gas Appts. (J.Dennis, Dalkeith)	C 660
1894	155	Steel hydraulic main (R. & J. Dempster, Manchester)	B 155
1897	62	Rail waggons (R.Y.Pickering, Wishaw)	} B 202
	140	Prepayment meters (J.Milne)	
1904	2,200	Works reconstruction (R.Dempster, Elland, Yorkshire)	A 2,200
1908	2,172	Retort bench (8 ovens, 6 retorts each; R.Dempster, Elland)	A 2,172

Note - A Reserve Fund; B Working Costs; C Loans; D New Shares

LESMAGHAW COMPANY

(1) Profit /Loss Account

Date	Gas Price s d	Dividend %	Date	Gas Price s d	Dividend %	Bank Balance £	'Profit' before Dividend £
1846	6 0	-	1878	9 2	5	-	45
1847	7 6	-	1879	9 2	5	-	65
1848	7 6	4	1880	9 2	5	-	39
1849	7 6	6	1881	9 2	2.5	-	18
1850	7 6	6	1882	9 2	5	54	-
1851	7 6	6	1883	8 6	5	-	47
1852	7 6	6	1884	7 6	5	58	-
1853	6 8	6	1885	6 8	5	85	-
Late- 1850's	8 4	-	1886	6 8	2.5	164	-
1860	7 6	6	1887	6 8	2.5	107	62
1861	-	-	1888	6 8	5	92	-
1862	7 6	5	1889	6 8	-	-	-
1863	-	5	1890	6 3	2.5	39	-
1864	-	5	1891	5 10	5	124	-
1865	7 1	0	1892	5 10	5	136	-
1866	7 1	0	1893	5 5	5	147	-
1867	7 1	0	1894	5 5	5	150	-
1868	7 1	0	1895	5 5	5	57	-
1869	-	6.25	1896	5 0	5	75	-
1870	-	7.5	1897	4 7	5	214	-
1871	78 3	-	1898	3 9	5	150	-
1872	79 1	5	1899	3 9	5	136	-
1873	79 2	-	1900	3 9	5	12	-
1874	-	0	1901	4 7	5	11	-
1875	-	-	1902	4 7	5	46	-
1876	9 2	0	1903	4 2	5	138	-
1877	9 2	5	1904	3 9	5	206	-
			1905	3 9	5	118	-
			1906	3 9	5	208	-
			1907	3 9	5	250	-
			1908	3 9	5	154	-
			1909	3 9	5	1,298	-
			1910	3 9	4	239	-
			1911	3 9	5	354	-
			1912	3 4	5	395	-
			1913	3 4	5	463	-
			1914	2 11	7.5	375	-

LESMAHAGOW COMPANY

(2) Share and Loan Capital

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Notes	Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Notes
1844	500	100	-		1887	1,145	615?	470	
1845	600	395	-		1888				
1846					-89	1,145	615?	-	
-47	600	-	-		1890	1,145	615?	500	
1848	600	590	100		1891	1,145	615?	450	
1849					1892	1,145	615?	350	
-59	600	590	-		1893	1,145	615?		
1860	600	590	100		1894	1,145	615?	250	
1861					1895				
-63	600	590	-		-96	1,145	615?	-	
1864	600	590	180		1897	1,145	615?	150	
1865	600	590	150		1898-				
1874	600	590	8		1900	1,145	615?	-	
1875	600	590	52		1901	1,145	615?	1,000	
1876	600	590	261		1902	1,145	615?	1,450	
1877	600	590	250		1903	1,145	615?	2,100 (B)	
1878	600	590	230		1904	1,145	615?	-	
1879					1905	1,145	615	1,900	
-83	600	590	-		1906	3,075	3,075	1,750 (C)	
1884	1,145	615?	530 (A)		1907	3,075	3,075	1,400	
1885	1,145	615?	500		1908	4,000	3,075	1,200 (D)	
1886	1,145	615?	-		1909	4,000	3,075	1,400 (E)	
					1911	4,000	3,075	1,200	
					1913	4,000	3,075	1,000	

Notes - Reserve Fund in Bank - 1877 £70; 1881 £42; 1890 £38
Cash added to Sinking Fund - 1910 £50; 1911 £150; 1912 £100
In 1903, Old gasworks sold for £61
(A) 185 new Ordinary shares and 69 Preference 4% shares (£5) created but few issued.
(B) Location of gasworks altered.
(C) 5 new £5 shares given for each 1 share in old stock. Paid out of 2 years' profits.
(D) Took Limited Liability.
(E) Loans for extensions to works and manager's house.

LESMAHAGOW COMPANY

(3) Sources of Loan Capital

Source	Date	Amount £	Repaid £	Interest %	Notes
Mr Jamieson, Bridgeholm	pre 1849-?	100	-	-	(A)
Mr Gibb, Banker	1860	100	-	-	(B)
"	1864	180	-	-	
"	1865	0	180	-	
W. Jackson, farmer of Auchinbey	1865-?	150	-	5	(A) Bill
City of Glasgow Bank	1874	8	-	-	(C)
"	1875	52	-	-	
"	1876	111	-	-	(B)
"	1877	0	111	-	
? (i)	1876-?	150	-	-	(A)
? (ii)	1876-?	100	-	5	(D)
Mr McMorran	1890	500	-	4	
"	1891	450	50	4	
"	1892	350	100	4	
"	1893	350	-	4	
"	1894	250	100	4	
"	1895-6	250	-	4	
"	1897	150	100	4	
"	1898-?	150	-	4	(A)
John Simpson	1901-?	400	-	4	(A) }
Eliza Watson	1901-?	200	-	4	(A) } (E)
E. & C. McQueen	1901-?	200	-	4	(A) }
Andrew Cairncross	1901-?	200	-	4	(A) } (B)
Mrs Mary Brown (L)	1902-?	150	-	-	(A)
Miss Janet MacRae (L)	1902-?	150	-	-	(A)
John Simpson (L)	1902-?	150	-	-	(A)
Alexander Scott	1903-?	250	-	-	(A) (F)
James Duncan	1903-?	200	-	-	(A)
William McKerracher	1903-?	100	-	-	(A)
Agnes Simpson	1903-?	150	-	-	(A)

LESMAHAGOW COMPANY

Sources of Loan Capital (continued)

- Notes - (A) Repayment date unknown
(B) Loan to finance new gasholder
(C) Effect of high coal prices
(D) Private loan, to repay Bank loan
(E) To finance extensions of equipment
(F) Loans to finance removal of gasworks to better site
(L) Residents in Lesmahagow

MUIRKIRK GAS COMPANY(1) Revenue

Date	Output cu.ft.	Gas £	Meter Rent £,s	Tar & Liquor £.s	Waste Lime £.s	Coke £.s	Interest on Cash £.s	Total nearest £
1873	1,506,800	481	54.15	26.6	1.12	-	4.7	573
1874	1,598,550	596	56.12	24.12	0.7	-	1.19	681
1875	1,587,750	529	57.3	22.11	1.0	-	4.1	615
1876	1,724,300	467	59.12	31.16	1.0	0.9	7.19	569
1877	1,797,150	487	57.3	36.8	2.5	2.0	3.16	588
1878	1,519,500	412	50.13	41.11	2.0	0.5	4.4	513
1879	1,381,250	345	48.19	38.19	1.6	-	5.13	440
1880	1,590,900	398	49.4	43.11	1.17	1.6	4.2	499
1881	1,515,300	379	47.13	31.12	1.4	2.0	3.10	466
1882	1,505,950	382	44.15	47.7	1.8	0.7	5.14	484
1883	1,604,550	368	40.9	64.8	1.3	2.11	5.19	485
1884	1,621,600	372	38.13	77.0	1.5	2.5	5.15	505
1885	1,688,250	352	35.18	55.4	-	3.12	-	454
1886	1,511,250	344	34.10	28.2	3.2	5.9	4.13	420
1887	1,470,000	337	34.18	12.2	1.10	0.10	4.6	391
1888	1,504,500	345	33.4	16.3	1.13	1.0	2.11	401
1889	1,522,850	349	31.13	26.19	1.4	0.6	6.0	416
1890	1,606,750	368	31.15	57.17	1.7	0.16	6.2	468
1891	1,662,550	381	30.11	49.16	1.9	0.9	3.15	470
1892	1,766,550	405	28.11	60.9	1.15	1.5	2.10	520
1893	1,773,750	439	27.15	13.15	2.2	1.4	4.3	489
1894	1,865,750	466	27.3	16.5	2.7	0.4	-	521
1895	1,730,300	433	26.14	23.18	2.8	-	2.9	495
1896	1,845,000	461	24.9	22.3	2.1	1.7	0.14	675
1897	1,883,700	471	24.19	18.18	1.10	1.2	5.9	543
1898	1,961,300	490	24.13	8.6	1.8	1.12	-	547
1899	2,287,900	524	21.11	17.18	11.10	-	-	575
1900	2,804,900	643	22.15	22.11	2.6	6.4	-	697
1901	2,835,700	709	22.15	27.19	2.11	3.16	-	768
1902	2,855,400	714	25.10	32.0	2.9	1.16	-	776
1903	3,109,300	713	29.4	35.7	5.7	2.10	-	785
1904	3,298,450	756	31.13	40.3	3.8	5.15	-	841
1905	3,357,450	769	31.19	23.18	2.13	5.18	-	833
1906	3,600,200	750	38.18	28.17	4.4	14.4	-	842

Note - Paid-up capital stock £1000 1861 - 95, £2000 1896 - 1906

Source - S.R.O. Muirkirk Minute Book op cit

MUIRKIRK(2) Expenditure

Date	Coal £	Wages to - Manager & Assistant £.s	Salary to Assistant £.s	Cartage and Rail Carriage £.s	Lime Retorts £.s	Total £		
1873	198	97.11	-	20.0	19.6	6.16	56.1	429
1874	350	91.12	6.3	20.0	4.9	5.10	3.13	515
1875	315	90.14	9.4	20.0	5.19	5.8	15.12	510
1876	253	95.5	9.6	20.0	19.9	5.12	13.10	461
1877	227	96.14	11.14	20.0	27.1	7.7	28.13	430
1878	152	86.11	6.9	20.0	29.8	9.5	17.7	441
1879	182	77.13	7.8	20.0	15.1	6.8	14.15	354
1880	158	81.7	6.8	20.0	21.2	6.17	3.12	404
1881	141	82.12	7.14	20.0	15.19	6.15	24.4	337
1882	131	83.2	20.5	20.0	19.19	6.12	6.11	348
1883	146	75.6	9.18	20.0	16.11	5.13	21.17	340
1884	142	88.5	9.3	20.0	17.13	5.12	10.16	349
1885	178	93.3	15.6	20.0	18.0	5.11	-	375
1886	189	81.1	8.4	20.0	19.0	6.6	5.12	366
1887	112	79.11	0.10	20.0	20.0	3.8	4.10	286
1888	110	70.8		15.0	22.12	5.17	8.16	268
1889	96	62.2		15.0	19.11	6.4	9.9	269
1890	126	75.8		15.0	31.5	6.8	6.15	346
1891	164	71.7		15.0	23.5	7.19	9.18	460
1892	194	80.15		15.0	21.0	8.12	14.3	409
1893	167	75.1		15.0	19.18	9.6	12.17	353
1894	150	77.13		15.0	21.14	11.12	5.5	376
1895	184	73.5		15.0	22.1	11.6	12.15	411
1896	167	75.13		15.0	23.0	11.4	13.2	599
1897	153	78.4		22.7	18.16	9.13	-	416
1898	156	77.14	15.0	15.0	14.5	7.3	-	480
1899	167	100.15		15.0	19.11	10.6	5.7	397
1900	239	112.5		15.0	21.2	11.13	28.10	530
1901	295	109.17		15.0	21.12	16.1	-	544
1902	253	120.1		15.0	20.11	13.10	1.2	592
1903	258	119.10		15.0	23.3	16.13	-	555
1904	269	126.19		17.10	23.16	17.4	18.12	615
1905	278	127.8		22.16	25.11	17.2	19.18	635
1906	253	135.11		20.10	27.6	15.0	22.10	597

Source - S.R.O. Muirkirk Minute Book op cit.

MUIRKIRK(3) Profit/Loss Account

Date	Total Revenue to 1873	Annual Profits	Gas Price	Dividends	Total Assets	Assets Carried Forward	Reserve
	£	£	s d	%	£	Clydesdale Bank £	£
1864	407	213	8 4	10	-	-	-
1865	-	-	8 4	-	-	-	-
1866	465	261	6 8	10	1334	257	67
1867	437	178	6 8	10	1398	305	45
1868	456	197	6 8	10	1310	-	42
1869	443	200	5 5	10	1302	203	-
1870	420	209	5 5	10	1414	299	151
1871	415	92	5 0	10	1442	325	142
1872	435	99	6 8	10	1436	284	144
1873	573	144	7 6	10	1423	201	188
1874		166	6 8	10	1546	380	228
1875		105	5 5	10	1453	284	233
1876		108	5 5	10	1481	306	208
1877		159	5 5	10	1584	385	266
1878		72	5 0	10	1487	257	210
1879		87	5 0	10	1421	209	188
1880		95	5 0	10	1413	298	-
1881		130	5 0	10	1410	313	-
1882		135	4 7	10	1468	356	-
1883		145	4 7	10	1417	289	-
1884		152	4 2	10	1519	310	-
1885		79	4 7	10	1425	360	-
1886		54	4 7	7.5	1394	334	-
1887		105	4 7	10	1352	275	-
1888		133	4 7	10	1454	358	-
1889		147	4 7	10	1543	347	-
1890		123	4 7	10	1582	337	-
1891		10	4 7	10	1531	350	-
1893		112	4 7	10	1532	424	-
1894		147	4 7	10	1316	309	-
1895		84	5 0	5	1304	278	-
1896		76	5 0	7.5	1164	161	-
1897		127	5 0	4	2210	190	65
1898		68	4 7	5	2148	60	13
1899		178	4 7	6.25	2206	190	23
1900		166	5 0	6.25	2217	177	16
1901		224	5 0	6.25	2291	247	52
1902		184	4 7	7.5	2304	336	-
1903		230	4 7	7.5	2384	393	-
1904		225	4 7	7.5	2430	467	-
1905		195	4 2	7.5	2453	520	-
1906		244	3 9	7.5	2522	606	-

Note - additional bonus dividends of 2s per share in 1866, 1868, 1870
Rapid reduction in gas price before by-products slump in 1885
Cash owed by consumers was included in Assets in Bank

Source - S.R.O. Muirkirk Minute Book op cit

SELKIRK COMPANY

(1) Profit/Loss Account

Date	Gas Price per 1,000 cu ft s d	Dividend %	Book Profits £	Depreciation of Works £	Bad Debts Written off £
1836	15 0	0	-	-	-
1839	15 0	4	-	-	-
1840	15 0	5	-	-	-
1841	15 0	0	-	-	-
1842	15 0	5	-	-	-
1843	12 6	6	265	-	-
1844	10 10	6	-	-	-
1845	12 6	6	-	-	-
1846	12 6	6	-	-	-
1847	12 6	6	-	-	-
1848	10 10	6	-	-	-
1849	8 4	6	118	-	-
1850	8 4	6	-	-	-
1851	8 4	6	170	-	-
1852	8 4	6	150	-	-
1853	7 6	6	173	-	-
1854	7 6	6	154	-	-
1855	8 6	6	-	-	-
1856	8 6	6	270	83	7
1857	8 6	?	320	93	-
1858	8 6	6	255	77	-
1859	8 6	7½	368 ⁺	102	19
1860	7 11	7½	316	-	-
1861	7 6	7½	368	80	10
1862	7 1	8	183	-	-
1863	6 8	9	190*	?	20
1864	6 2	10	302*	88	29
1865	5 10	10 (B)	268	-	-
1866	5 10	10	329	41	4
1867	5 10	10	221	-	-
1868	5 10	10	320	0	-
1869	5 10	?	407	105	25

SELKIRK COMPANY

Profit/Loss Account (continued)

Date	Gas Price per 1,000 cu ft s d	Dividend %	Book Profits £	Depreciation of Works £	Bad Debts Written off £
1870	5 5	10	476	165	18
1871	5 5	10	429	108	-
1872	5 0	10	650	132	12
1873	6 8	10	280	-	-
1874	7 6	5s	188	-	-
1875	6 8	10	884	-	202
1876	5 10	10 (B)	1,032	-	21
1877	5 10	10	698	(2½%)	37
1878	5 5	10	597	125	21
1879	5 0	10	772	(2½%)	47
1880	4 7	10	500	-	40
1881	4 7	10	def. 51*	208	-
1882	4 2	10	176	-	-
1883	4 2	10	306	-	-
1884	4 2	10	300	-	-
1885	3 9	10	423	-	-
1886	3 6½	10	663	-	200
1887	3 6½	10	278	-	-
1888	3 6½	10	387	-	-
1889	3 4	10	835	-	-
1890	3 4	10	691	-	-
1891	4 2	?	594	-	-
1892	4 2	10	-	-	-
1893	4 2	5	def. 30	-	100
1894	3 11½	10	-	250	-
1895	3 9	10	-	250	-
1896	3 9	10	-	250	-

Notes - Def. : Deficit

* Profits after deducting Depreciation (used each year after 1881)

+ Profits before Depreciation (Gross profits 1881 - £157; 1882 - £535)

In 1877 2.5% depreciation allowed on £9,000 value of works.
Total gas revenue in 1843, £550

SELKIRK COMPANY

(1) Profit/Loss Account (continued)

Notes - (B) Bonus dividends were only paid in 1865 (5s); and 1876
2.5% on old stock and 1.25% on new stock
New stock from 1867 restricted to a maximum 5% dividend
Dividends paid in 1887 included £176 from profits in the
previous year; and in 1892 included £284 from the "Surplus
Account".

SELKIRK COMPANY

(2) Capital Account

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Total Reserve Funds £	Cash in Bank £	Total Sinking Fund £	Cash Added to Sinking Fund £	Notes
March								
1835	1,100	1,100	-	-	-	-	-	
June								
1835	1,200	1,200	-	-	-	-	-	A
1836	1,200	1,200	170	-	-	-	-	
1837								
-38	1,200	1,200	?	-	-	-	-	B
1839	1,200	1,200	400	-	-	-	-	
1840	1,200	1,200	300	-	-	-	-	
1841	1,500	1,500	?	-	-	-	-	
1842	?	1,500	-	-	-	-	-	
1843	1,690	1,690	0	-	297	-	-	
1844	1,690	1,690	-	-	-	-	-	C
1845	1,690	1,690	-	-	516	-	-	
1846								
-47	1,690	1,690	-	-	-	-	-	
1848	1,690	1,690	-	-	158	-	-	
1849								
-50	1,690	1,690	-	-	-	-	-	
1851	1,690	1,690	-	429	372	-	17	
1852	1,690	1,690	-	-	283	-	15	
1853	1,690	1,690	-	-	-	-	27	
1854	1,690	1,690	500	100	-	-	42	
1855	1,690	1,690	787	287	-	-	-	
1856	1,690	1,690	900	0?	-	-	27	
1857	1,690	1,690	900	-	-	-	32	D
1858	1,690	1,690	900	-	-	-	18	
1859	1,690	1,690	500	-	-	-	35	E
1860	1,690	1,690	500	0	-	-	31	
1861	1,690	1,690	500	100	-	-	100	F
1862	1,690	1,690	500	120	-	-	20	
1863	1,690	1,690	-	-	-	-	20	
1864	1,690	1,690	0	-	-	-	45	
1865	1,690	1,690	-	220	-	-	25	
1886	1,690	1,690	2,092	993	-	-	28	G

SELKIRK COMPANY

Capital Account (continued)

Date	Nominal Capital £	Paid Up Capital £	Total Loans £	Total Reserve Funds £	Cash in Bank £	Total Sinking Fund £	Cash Added to Sinking Fund £	Notes
1867	2,535	2,535	0	-	-	-	33	
1868	2,535	2,535	0	-	-	-	32	H
1869	2,535	2,535	0	802	-	58	23	I
1870	2,535	2,535	0	1,178	-	89	31	
1871	2,535	2,535	0	1,717	-	-	32	
1872	2,535	2,535	0	2,600	-	174	51	
1873	4,535	4,535	0	600	-	-	-	
1874	4,535	4,535	600	674	-	134	-	J
1875	4,535	4,535	600	-	-	67	67	
1876	4,535	4,535	-	1,236	-	167	100	
1877	4,535	4,535	100	1,920	-	172	54	
1878	4,535	4,535	-	-	-	-	59	
1879	4,535	4,535	-	2,437	-	298	-	

Notes - A Inadequate initial capital stock

B Shares of £5 nominal value

C 1845 new gasholder postponed

G Total assets in 1866 £3,103, and new gasholder built

Works valued in 1857 (D) at £1,857, in 1861 (F) at £1,850, in 1868 (H) at £3,815, and in 1870 (I) at £2,865.

E £400 debt repaid in 1859

J Reserve fund used to finance extensions

From 1837, 10% of annual profits was to be used to accumulate a Sinking Fund of £100; this fund was uplifted into the current account in 1854; and in 1877 only £172 was termed a "Sinking Fund" out of Banked reserves of £1,920. In 1879, the Company contract allowed a maximum sinking fund of only £300, and the provision of such a fund was deleted in the new contract of 1887. In 1867, upon the demands of consumers, 169 new (5%) shares were issued to new investors at an upset price of £1,103 10s. In 1873, 400 new shares sold at £7 10s provided £3,000, and all but 8 shares were subscribed by existing partners.

SELKIRK COMPANY

(3) Sources of Loan Capital

Source	Date	Total Amount £	Repaid £	Notes
?	1836	170	-	(A)
Mr Clegg	pre 1839	400	-	Bill
"	Feb 1840	0	400	
British Linen Co Bank	Feb 1840	400	-	
"	May 1840	300	100	(B)
"	1841	0?	300?	
"	1855	187	-	
"	1857	0	187	(C)
"	1874	600	-	(D)
Dr Anderson, surgeon	1854	500	-	(E)
"	1864	0	500	(F)
?	1855	100	-	
"	1856	500	-	
"	1857	400	100	
"	1859	0	400	
? (i)	1866	1,295	-	
"	1867	0	1,295	
? (ii)	1866	800	-	
"	1867	0	800	
Miss Scott	1875?	500	0	
"	1877	0	500	

Notes - No extant record of interest rates paid.

(A) To cover unpaid construction costs; (B) Partly repaid by issue of new Stock; (C) Repaid using another loan; (D) Overdraft whilst gas company sought a Bond; (E) Directors empowered to borrow up to £1,000 during construction of new gasholder/retort-house, and took a large bank overdraft in the months before obtaining Anderson's Bill; (F) Repaid through the Sinking Fund.

SELKIRK COMPANY

(4) Items of Capital Expenditure

Date	Cost £	Item	Monetary Source
1835	398	Masonry (T.Cranston & J.Thomson, Jedburgh)	D 1,100
	260	Pipes (Berwick Foundry)	
	375	Gas apparatus (Hooper & Miller, Kelso)	
1851	110	Extended retort house	B 110
1851			
-52	202	Mains pipes	A 89 B 113
1853	170	Extra land	A/B 353
	?	New coal shed	
1854			
-55	62	Iron roof (Hooper & Miller, Kelso)	C 300 B 131
	210	Buildings (A. & R. Hope)	
	885	Tank and gasholder (J. & A. Robertson, Berwick)	
	174	Purifier, condensers, etc (J. & A. Robertson, Berwick)	
1859	30	Station meter (J. & A. Robertson, Berwick)(second-hand)	B 30
1864	11	Photometer, pressure guage & "Coal Testing Meter"	B 11
1866	1,775	Tank and gasholder (J. & A. Robertson, Berwick)	C 2,095
	267	Coal shed (W.Deans, Selkirk)	
1867	291	Mains pipes	B 291
1873	1,765	Buildings & chimney (W.Deans)	} A 2,000 D 3,000
	328	Iron roof (H.Balfour, Leven)	
	541	Condensers etc. (Craik & Aird, Hawick)	
	989	Purifiers & crane (Lees & Graham, Carlisle)	
	676	Hydraulic main & mains pipes (Craik & Aird)	
	176	Station meter (J.Milne, Edinburgh)	
	106	2 governors (J.Milne)	
	419	Miscellaneous	
1874	828	Continued extensions	C 600
1892	2,125	Tank & gasholder (Airdrie Iron Co)	A 2,125
1894	901	Steam boiler & iron-work	A/B 901
1894	400	Exhauster & scrubber (Hanna, Donald & Wilson)	} ?
1895	993	Regenerative new retorts (C.M.Hamilton, Glasgow)	} ?
	335	Hydraulic main (Hanna, Donald, & Wilson)	

Notes - A Reserve Funds; B Working Costs; C Loans; D New Share Capital

STORNOWAY COMPANY

(1) Revenue (1861-8)

Date	Gas Price s d	Gas Output cu ft	Gas Revenue £	Meter Rent £	Public Lamps £	Coke & Tar £
1861	12 1	813,250	491	26	38	7
1862	-	809,175	491	12	45	11
1863	-	-	-	-	-	-
1864	12 1	779,450	-	-	-	-
1865	12 1	750,250	453	26	24	12
1866	12 1	928,200	561	26	38	18
1867	12 1	994,200	601	26	46	18
1868	12 1	914,175	552	27	42	18

Note - Gas reduced from 12s 1d to 10s in 1879

(2) Expenditure (1861-8)

Date	Coal £	Lime £	Manager Salary £	Secy Salary £	Fireman Wage £	Retort (i) Retorts £	Bench (ii) Freight & Clay £	(iii) Fitting £
1861	288	5	-	-	-	-	-	-
1862	-	-	-	-	-	-	-	-
1863	215	-	-	-	-	-	-	-
1864	-	-	-	-	-	-	-	-
1865	219	5	27	22	26	7	17	-
1866	219	5	27	27	26	14	3	5
1867	324	-	27	27	31	15	4	6
1868	286	10	27	27	31	39	4	10

Note - Retorts supplied, with fireclay, by Messrs Laidlaw of Glasgow; probably iron-retorts.

STORNOWAY COMPANY

(3) Capital and Profit/Loss Accounts

Date	Total Charge (Revenue) £	Total Discharge (Expenses) £	Profits £	Cash in National Bank £	Total Loans £	Added to Reserves £	Dividends s d	Total £
1861	1,009	1,005	-	-	-	-	-	-
1862	1,559	-	268	342	60	49	7 6	-
1863	1,201	-	-	-	-	-	6 6	-
1864	-	-	-	-	-	-	-	190
1865	-	-	-	-	-	-	5 6	146
1866	1,181	-	-	580	-	-	5 6	146
1867	1,333	-	-	335	-	-	5 0	161
1868	1,230	-	-	-	-	-	-	146

Stornoway¹ gas light company began in 1847 with a nominal capital of £1,500 in shares of £2 10s, but took loans before making a full call upon the shares. In November² 1847, 10s was called up, and in January 1848 the public bell-man was sent to threaten legal proceedings against defaulters. The second call, of £1 per share, was delayed until November³ 1848, and although one call of 10s is not recorded, the final 10s was not made until May 1854 to finance main-pipes to Newton. Nevertheless loans were apparently raised to repay construction costs of £1,440 by Messrs Laidlaw in 1848, and by 1851 the company had £80 on Bill from the National Bank, and £540 on Bill from Mrs Campbell Reid Watt⁴ at £25 interest per year. £90 was repaid⁵ in 1853, £100 in 1854, £100 in 1855 and £125 in 1856.

Bank credit remained important when working capital was not available. In August 1857 the company⁶ had no cash in their current deposit account, but ordered £122 to be paid through that account to pay Mr Cook, a coal agent, in the hope that credit would be extended. In 1858 the company had a total debt of £297, including the loan of

1. S.R.O. Stornoway Minute Book (GB1/77/1) 15/10/1847

2. *ibid.* 5/11/1847

3. *ibid.* 4/11/1848, 16/5/1854

4. *ibid.* 5/2/1851, 14/1/1851, 11/2/1852

5. *ibid.* 31/3/1855, 6/5/1856, 16/5/1854

6. *ibid.* 13/8/1857

STORNOWAY COMPANY

£125 from Mrs C.R.Watt, £143 owed to James Ferguson for Lesmahagow coal, and £17 owed to Laidlaw & Son for ironwork. This was repaid, including the whole of Mrs Watt's loan, the following year.¹ Lack of adequate working capital was reflected in an agreement signed in 1859 with Mr McIver,² who was to ship gas coal from Glasgow and allow "4 months credit to be given in payment of Freight after delivery"

The company³ paid its first dividend in 1861, at 4s per share, and raised the nominal value of shares from £2 10s to £4. The Directors explained that by April 1849 the original works had cost £2,020, while the 584 shares subscribed had only produced £1,460. Total interest paid on Mrs Watt's loan had been £150 15s, and £540 to repay the loan, and a further £272 had been spent on capital plant from 1849-61. Because that money had been paid out of revenue and consequently no dividends paid, the increased value of shares was justified.

1. *ibid* 4/1/1859
2. *ibid* 16/3/1859
3. *ibid* 30/3/1861

STRANRAER COMPANY(1) Revenue

Date	Gas Sold		Meter Rent		Ammonia and Tar	Waste Lime	Cash carried forward
	Received £	Bad Debts £.p	Received £	Bad Debts £.p			
1845	409	1	22	1	-	-	-
1846	421	1.50	24	0.50	4.65	1.50	-
1847	473	2	26	0.50	1.75	2	-
1848	472	24	25	1.75	1	-	-
1849	573	21.75	27	1.25	5.80	-	53
1850	571	6.35	28	1.50	3.35	-	84
1851	611	11.40	22	0.80	-	2.75	113
1852	622	12	24	0.55	7.35	-	154
1853	643	28.55	30	0.55	-	-	91
1854	761	12.75	34	1.55	-	-	46
1855	835	6.20	37	1.25	-	-	91
1856	859	5.65	43	0.70	-	-	94
1857	1011	5.30	51	-	-	-	192
1858	978	-	55	-	-	-	38
1859	984	13.60	53	-	-	-	229
1861	1050	8	57	0.20	-	-	142
1863	1134	10.65	70	1.75	-	-	298
1864	1182	10	69	1	-	-	-
1865	1081	6	80	0.50	-	-	-
1866	1056	16	64	2	-	-	43
1867	1159	8	80	0.55	-	-	100
1868	1207	4	80	0.45	-	-	60
1869	1255	20	72	2.35	-	-	88
1870	1337	17	75	1.50	-	-	240
1871	1302	13	76	0.65	-	-	63
1872	1367	9	77	1.20	-	-	39
1873	1637	6	76	0.90	-	-	5
1874	1791	9	71	0.40	-	-	-
1875	1918	9	69	1.40	-	-	-
1876	1738	4	69	1.40	-	-	-
1877	1802	9	71	0.70	-	-	-
1878	1928	10	71	0.40	-	-	-
1879	1908	16	71	0.75	-	-	-
1880	1858	9	69	0.90	-	-	-
1881	2008	9	69	1.50	-	-	-
1882	1910	21	68	1.35	-	-	-
1883	1895	30	41	2.10	-	-	-
1884	1754	19	40	1.45	-	-	-
1885	1965	17	41	1.85	-	-	-
1886	1996	34	52	1.25	-	-	-
1887	2006	4	57	0.25	-	-	-
1888	1866	9	50	0.50	-	-	-
1889	1854	9	53	1.10	-	-	-
1890	1870	23	50	0.55	-	-	-

Source - S.R.O. Stranraer Minute Book op cit

STRANRAER COMPANYRevenue continued

Date	Gas Sold		Meter Rent		Slot Meters	Cookers rent
	Received	Bad Debts	Received	Bad Debts		
	£	£	£	£.p	£	£.p
1891	1999	19	46	0.75	-	-
1892	2086	21	46	1	-	-
1893	2208	35	61	0.40	-	-
1894	2184	13	68	0.35	-	-
1895	2151	10	50	0.65	-	-
1896	2238	9	68	-	-	-
1897	2321	12	65	0.55	-	-
1898	2167	25	68	0.15	-	-
1899	2338	15	48	-	-	-
1900	2468	17	68	-	-	-
1901	2775	20	34	-	58	-
1902	2647	41	35	-	110	21
1903	2811	23	35	-	115	20

Source - S.R.O. Stranraer Minute Book op cit

STRANRAER COMPANY(2) Expenditure

Date	Coal/Freight £	Iron/Bricks £	Management £	Meters £
1845	123	41	-	-
1846	175	47	-	-
1847	212	7	-	-
1848	191	11	-	-
1849	170	18	76	-
1850	196	17	83	-
1851	194	76	90	-
1852	165	15	91	-
1853	218	25	102	-
1854	252	148	114	-
1855	371	56	125	-
1857	378	36	129	-
1857	411	36	149	-
1858	398	78	149	-
1859	343	57	150	-
1861	368	53	155	-
1863	425	130	166	-
1864	462	162	162	-
1865	534	89	158	-
1866	547	113	176	-
1867	706	86	167	-
1868	669	93	172	-
1869	679	69	191	-
1870	689	60	182	-
1871	716	42	183	-
1872	790	91	191	-
1873	1293	48	203	-
1874	1532	5115	216	16
1875	1249	56	219	13
1876	1071	132	250	32
1877	897	51	257	23
1878	983	62	265	22
1879	1033	95	277	37
1880	995	71	268	40
1881	1155	86	276	60
1882	1134	95	279	43
1883	1108	192	296	38
1884	1082	53	286	37
1885	1053	38	288	23
1886	1131	133	296	32
1887	1095	22	294	39
1888	1088	61	302	44
1889	925	36	298	54
1890	1231	26	310	25
1891	1217	83	306	49
1892	1108	94	314	40
1893	1309	576	331	44
1894	1515	80	333	150
1895	1147	168	329	42
1896	1124	85	331	47
1897	1204	58	338	57
1898	1436	151	350	57
1899	1061	160	396	14
1900	1620	-	477	-
1901	1566	-	510	-
1902	1555	-	641	-
1903	1444	-	417	-

STRANRAER COMPANY(3) Capital Account

Date	Nominal Share Capital £	Paid Up Share Capital £	Total Loan Capital £	Interest on Loans £.p	Total Income £	Total Expenses £	Nett Annual Profit £	Reserve Fund £
1836	2000	1400?	0	0	-	-	-	-
1837 -9	2000	1400 ?	0	0	-	-	-	-
1840	2000	1400	550	-	-	-	-	-
1841	2000	1547	1000	-	-	-	79	-
1842	2000	1600	1073	44	-	-	99	-
1843	2000	1600	1000	75	-	-	-	-
1844	2000	1600	985	75	-	-	158	-
1845	2000	1600	963	75	-	-	171	-
1846	2000	1600	1000	75.50	457	306	151	-
1847	2000	1600	1150	86.25	512	299	80	-
1848	2000	1600	-	-	501	292	209	-
1849	2000	1600	1100	82.50	543	287	253	-
1850	2000	1600	1050	-	603	321	282	-
1851	2100	2100	550	37.50	636	327	271	-
1852	2100	2100	500	-	653	311	342	-
1853	2100	2100	321	-	681	399	283	-
1854	2100	2100	350	26	802	572	230	-
1855	2100	2100	350	26	880	605	275	-
1856	2100	2100	350	26	906	613	293	-
1857	2500	2500	300	22.50	1073	671	402	-
1858	2500	2500	0	0	1055	830	225	-
1859	2500	2500	0	0	1039	622	417	-
1861	2500	2500	0	0	1120	641	329	231
1862	2500	2500	689	-	-	-	465	0
1863	2500	2500	689 ?	-	1258	818	440	100
1864	2500	2500	689 ?	-	1298	877	421	233
1865	2500	2500	689 ?	-	1232	880	352	103
1866	2500	2500	0	0	1175	945	230	0
1867	3000	2500	250	-	1314	1100	215	208
1868	3000	3000	0	0	1352	1067	285	-
1869	3000	3000	0	0	1381	1068	313	-
1870	3000	3000	0	0	1488	1023	465	-

Notes - Loan in 1840 a result of initial capital shortage for construction. Low nett profits in 1858 because of debt repayment. Interest on loans shown as 7.5 per cent from 1841 - 1857 : this was above the actual rate , and was a device used to hasten repayment (from 1842 - 5 it was calculated in a 'theoretical' debt of £1000, not on the actual debt). Reserve funds first placed in Bank deposit in 1859, but used together with profits to redeem debts in 1865.

Source - S.R.O. Stranraer Minute Book op cit

Capital Account continued

Date	Nominal Share Capital £	Paid Up Share Capital £	Total Loan Capital £	Interest on loans £.p	Total Income £	Total Expenses £	Nett Annual Profit £	Reserve Fund £
1871	3000	3000	0	0	1448	1160	288	-
1872	4200	4200	0	0	1527	1263	264	-
1873	4200	4200	0	0	1831	1666	175	-
1874	4200	4200	125	-	1961	1899	62	-
1875	4200	4200	0	-	2080	1665	415	-
1876	4200	4200	147	-	1935	1851	84	-
1877	4200	4200	371	-	1993	1347	646	-
1878	4200	4200	-	-	2157	1614	543	-
1879	4200	4200	28 ?	-	2139	1763	375	-
1880	4200	4200	42 ?	-	2035	1490	545	-
1881	4200	4200	-	-	2246	1714	533	-
1882	4200	4200	-	-	2169	1715	454	-
1883	4200	4200	-	-	2166	1755	411	-
1884	4200	4200	-	-	2020	1587	433	-
1885	4200	4200	0	0	2160	1548	612	-
1886	4200	4200	0	0	2169	1763	406	-
1887	4200	4200	0	0	2157	1636	521	-
1888	4200	4200	0	0	2061	1648	412	-
1889	4200	4200	0	0	2045	1497	548	-
1890	4200	4200	0	0	2083	1758	524	-
1891	4200	4200	0	0	2251	1829	422	-
1892	4200	4200	0	0	2363	1903	460	-
1893	4200	4200	0	0	2527	2473	51	-
1894	4200	4200	0	0	2630	2222	408	-
1895	4200	4200	0	0	2365	2052	312	-
1896	4200	4200	0	0	2478	1832	646	-
1897	4200	4200	0	0	2586	1863	706	-
1898	4200	4200	0	0	2437	2085	351	-
1899	4200	4200	0	0	2597	1973	624	-
1900	4200	4200	0	0	2851	2809	42	-
1901	8400	8400	0	-	3847	3806	398	-
1902	8400	8400	1400	-	3318	2608	710	-
1903	8400	8400	1100	-	3306	2885	421	-

Note - Nominal value of shares raised from £ 5 to £7 in 1872, and in 1901 one new 'paid-up' £ 7 share provided gratis to each old share owner.

Great variations in Nett Profit in 1873-6 and 1893, probably caused by reinvestment of profits on capital equipment. In some years 'Clear Profit' was distinguished from Nett Profit, though without explanation :

Clear Profit -	Date	£	Date	£	Date	£
	1846	112	1852	312	1865	102
	1848	120	1863	252	1867	201

Source - S.R.O. Stranraer Minute Book op cit

STRANRAER COMPANY(4) Items of Capital Expenditure

Date	Cost £	Items	Monetary Sources
1846	107	Brick retorts installation and alteration of purifiers.	B £107
1853	90	More and improved retorts and hydraulic main	B £90
1854	70	General improvements	D £400
	190	Gasholder (Hanna/Donald/Wilson)	
1857	157	Purifier, Governor (Hanna/D/W)	B £157
1860	149	Station Meter	B £149
1861	150	Replacing and extending mains pipes	B £150
1866	280	Extra land	B £280
	537	Gasholder 50ft dia. 15ft high (Bicket & Son, Kilmarnock)	B £125 C £250 D £500
	338	Gasholder-tank	
1870	80	New purifier and crane	B £80
1871	124	Purifiers	B £124
1872	95	Coal Sheds	B £95
1876	200	New house for manager	B £200
	526	Alterations to Retort House	B £188 C £338
1886	200	Extra Land	B £200
1892	143	Purifiers (Hanna/D/W)	B £143
1899	140	Purifiers (Broughty Ferry Gas Co.)	B £140
	90	Exhauster and engine (Hanna/D/W)	B £90
	380	3 regenerative ovens (6 retorts each)	B £380 ?
1903	787	Gasholder (Westwood and Wright)	B £314 B £290 C £1400
	1217	Gasholder-tank	

Note - Monetary sources A reserve fund; B working costs;
C loan capital; C new share capital

Source - S.R.O. Stranraer Minute Book op cit

VALE OF LEVEN COMPANY

(1) Output

Date	Gas Price		Gas (Thou cu ft)		Types of Consumers			Gas
	s	d	Produced	Consumed	Domestic	Factory	Public Lamps	Revenue
					(Thou cu ft)			£
1840	11	6	-	275	-	-	-	158
1841	11	6	-	1,159.45	-	-	-	-
1842	11	0	-	1,069.36	-	-	-	589
1843	11	0	-	1,095.4	-	-	-	631
1844	10	0	-	1,713	-	-	-	870
1845	9	0	-	1,824	-	-	-	1,120
1846	9	0	-	1,745	-	-	-	-
1847	9	0	-	1,777	-	-	-	-
1848	9	0	-	1,367	-	-	-	-
1849	8	9	-	1,357	-	-	-	-
1850	8	9	-	1,557	-	-	-	-
1851	8	9	-	2,023	-	-	-	-
1852	8	9	2,574	2,029	1,318	712	-	-
1853	7	6	3,153	2,788	1,585	1,203	-	-
1854	7	6	3,414	2,902	1,671	1,249	-	-
1855	-	-	3,110	2,587	1,389	1,198	-	-
1856	-	-	3,800	3,074	1,796	1,211	67	-
1857	-	-	4,795	4,430	2,450	1,980	134	-
1858	-	-	4,853	4,338	2,293	2,045	-	-
1859	-	-	5,717	4,977	-	-	-	-
1860	-	-	6,083	5,055	-	-	-	-
1861	-	-	6,821	5,602	-	-	-	-

VALE OF LEVEN COMPANY

(2) Profit/Loss Account

Date	Total	Coal		Meters	Book	Valuation *	Depreciation Allowed	Dividend	
	Revenue £	Purchased Tons	£	Purchased £	Profits £			£	£
1840	167	93	74	-	47	3,035	-	-	-
1841	-	-	-	-	-	2,791	-	-	-
1842	614	-	-	-	258	-	-	5	0
1843	-	-	143	16	290	-	-	8	0
1844	-	-	-	-	470	3,387	-	8	0
1845	-	-	-	-	383	3,680	-	9	0
1846	-	-	-	41	288	3,888	-	7	0
1847	-	-	-	-	495	4,050	-	7	0
1848	-	-	-	-	-	4,265	-	4	0
1849	-	-	-	-	164	4,415	-	3	4
1850	-	-	-	72	263	4,503	-	4	6
1851	-	-	-	-	-	4,826	-	4	6
1852	-	336	-	88	549	5,009	-	4	0
1853	-	400	-	-	478	5,074	-	6	0
1854	1,141	446	350	67	459	5,174	-	6	0
1855	1,071	447	346	46	435	5,243	-	6	0
1856	1,211	546	361	14	231	5,597	-	6	0
1857	1,577	719	607	125	432	5,872	141	7	0
1858	1,617	762	-	69	431	6,327	226	5	0
1859	1,918	719	603	57	669	6,417	-	-	-
1860	1,835	809	639	77	565	6,784	-	-	-
1861	1,925	820	667	165	601	6,956	284	-	-

Note - * Valuation of entire Gasworks recorded by the Directors in company Books

VALE OF LEVEN COMPANY

(3) Share and Loan Capital

Date	Nominal Capital £	Share Capital Paid Up £	Nominal Value of Shares £	Total Loans £
1839	2,500	-	5	-
1840	3,000	2,470	5	500
1841	3,150	2,470	5 5s	500
1842	3,150	2,470	5 10s	500
1843	3,150	2,470	5 10s	500
1844	3,150	2,470	6	300
1845	3,150	2,470	6	500
-46				
1847	5,000	5,000*	5	0
1858	5,000	5,000	5	116
1859	5,000	5,000	5	0
1860	5,000	5,000	5	0

Note - 1842 Thirteen unpaid shares were forfeited.

* 1847 250 shares with £4 "paid up" distributed to existing shareholders because £996 surplus profits used as capital; 400 new £5 shares sold to public.

(4) Source of Loans

Date	Source of Loan	Amount £	Interest Rate	Cash Added to Sinking Fund £	Notes
1840	Clydesdale Bank (Bill)	500	4% ?		A
1841	"	500	4% ?		
1842	"	500	4%		
1843	"	500	?	90	
1844	"	300	?		
1845	"	500	?		
1846	"	500	?		
1847	"	500	7%	250	
1848	"	0			B
1853				500	C
1858	Clydesdale Bank (over-	116			D
1859	draft)	0			

Notes - A Inadequate initial capital; B Extra stock issued; C Sinking fund termed 'Contingency Fund'; D Mains pipes and retort bench alterations.

1843 Expenses included £30 14s as Discount on Bill for 10 months.

1847 'Sinking Fund' was a Depreciation Fund; begun with a call of £1 on shares given to old shareholders.

1848 Expense of £50 to discount Bill for 18 months.

VALE OF LEVEN COMPANY

(5) Items of Capital Expenditure

Date	Cost £	Item	Monetary Source
1839	25	A.Cook, engineering plans	A * C 500
-40	1,120	Masonry Gasholder Tank (Barr & Craig)	D 2,470
	1,339	Gas pipes and Apparatus (Campbell & Christie)	
	257	Gasholder (Reid & Hanna)	
	89	Service pipes (D.McLachlan)	
	57	Gas pipes (Fulton & Neilson)	
	148	Miscellaneous construction costs	
1841	20	'Dwelling Room' for Manager	B 20
1844	203	Gasholder	B 203
1846	160	Mains pipes extended	B 160
1847	162	Coal shed	B 162
1850	25	4 new retorts	B 136
	25	Exhauster	
	60	Washer, condenser & purifiers	
	26	Station meter & exhauster house	
1855	88	Purifiers (J.Gardner, Alexandria)	B 88
1856	342	Mains pipes extension	B 376 ⁺ C 116
	?	3 extra retorts	
	?	Chimney moved	
1857	34	Mains pipes	B 34
1860	200	Telescopic gasholder (Hanna, Donald & Wilson)	B ? D 325
	?	Retort house extensions	
	133	Mains pipes	

Notes - A Reserve Funds; B Working Costs; C Debited Loans;
D New Share Capital
* 1840 £393 debt carried forward
+ Caused marked fall in declared 'profits' for 1856

APPENDIX VI

Company Finance Statistics - B

- (1) Miscellaneous Statistics on Capital and Working Costs
- (i) Auchtermuchty Balance Sheet 1852-3
 - (ii) Banchory - Analysis of Accounts (1856) by G. Marquis
 - (iii) Bathgate - Presentation of Accounts (1845)
 - (iv) Bridge of Weir - Accounts 1848
 - (v) Cupar, Fife - Accounts 1839
 - (vi) Dalkeith - Accounts 1829
 - (vii) Dundee Portable Gas Company - Estimate of Accounts 18 25
 - (viii) Dunfermline - Accounts 1830
 - (ix) Glasgow - Annual Accounts 1825-34
 - (x) Glasgow Accounts : (a) capital 1839
(b) capital 1859-60
(c) revenue/expenditure 1859/60
 - (xi) Greenock - Construction Costs 1827
 - (xii) Greenock - Accounts 1852
 - (xiii) Kirkcaldy - Capital Stock 1829-1908
Importance of Fixed Capital in Mains
Pipes and Meters (1862)
 - (xiv) Lesmahagow - Capital Equipment Estimate 1844; Accounts 1848
 - (xv) Stranraer - Accounts 1841
 - (xvi) Vale of Leven - Capital Account 1839 - 47
- (2) Expenditure Turnover - Total Annual Expenditure as Per Centage of Capital Stock at Ayr, Bathgate, Banff and Muirkirk
- (3) Relative Annual Expenditure on Various Working Costs -
- (i) Anonymous company 1852
 - (ii) Haddington (J. Robb) 1854
 - (iii) Hamilton - average 1843-6
 - (iv) Glasgow Gas Light Company 1860
 - (v) Glasgow Municipal Gasworks 1869
- (4) Loan Capital as Per-Centage of Paid Up Share Capital - at Ayr, Banff, Bathgate, Boness, Cupar, Dalkeith, Galashiels, Vale of Leven, Selkirk, Stranraer.
- (5) Accident Insurance
- (6) United Kingdom Gasworks - Capital and Turnover 1882 - 1913
- (7) Gross Profits of Gasworks in the United Kingdom, Compared With Railways, Mines and Ironworks 1865 - 1884

(i)

Auchtermuchty Balance Sheet 1852-3

EXPENDITURE

REVENUE

	£	s	d		£	s	d
Paid for new Meters (Total Meters £741 18s 1d)	20	19	6	Balance due to Company	49	17	2
Dividend @ 6% on £1500	90	0	0	Arrears at 1852 £22 0s 7d	}	20	3 4½
Gas Coal £131 19s 3d	186	10	0½	Given up as irrecoverable £1 17s 2½d			
Carriage £54 10s 9½				62	4	9½	Gas Consumed at 9s 2d
Furnace Coal £41 9s 5d	8	15	0				Interest on Meters £497 4s 2d
Carriage £20 15s 4½				14	15	0	Deduct arrears £55 9s 0½
Line £5 11s 0d	6	1	1				Coke sold £8 7s 6d
Carriage £3 4s 0d				6	15	11	Ashes sold £26 7s 6½
Blacksmith £0 1s 3d	6	1	1				Ashes sold £0 10s 3d
Inverkeithing brickwork				6	15	11	Waste Lime sold £1 5s 6d
£12 4s 3d	6	15	11				Fire Brick sold £0 1s 6d
Carpenter £2 19s 10d				6	15	11	Old arrears recovered £0
Poor rates £2 14s 0d	6	1	1				Extra service pipe £2 7s 5d
Property & Income Tax				6	1	1	Ground rent
£2 18s 4d	6	15	11				Less gas coal unpaid
Assessed Taxes £0 8s 9d				6	15	11	
Building Retorts	6	15	11				
Manager's Salary £34 12s 0d				60	5	0	
Assistant £14 8s 0d	60	5	0				
Clerk & Treasurer £10 0s 0d				60	5	0	
Gratuity to Manager £1 5s 0d	60	5	0				
Interest 13s 7d				5	8	10	
Prison assesment 2s 7d	5	8	10				
Journal 11s 3d				5	8	10	
Stationary 5s 0d	5	8	10				
Manager's petty Disbursements				36	18	9	
£3 1s 5d	36	18	9				
Printing 15s 0d				36	18	9	
Miscellaneous Disbursements	36	18	9				
Balance due to Company on account with Western Bank of Scotland				148	5	9½	
	148	5	9½				
	647	0	0				

Note - "Profit" is recorded under 'Expenses' as Bank Balance

Source - J.G.L. 10/2/1854 p.350 (See also J.G.L. 10/7/1852)

(ii) Banchory - Analysis of Accounts in 1856, by G. Marquis, accountant.

		(nearest) £
Fixed Capital -	"Gas Houses"	310
	Gas apparatus (inc. £75 plans)	344
	Gas Pipes	406
	Gas Meters	157
	Utensils	4
	Land, and manager's house	120
		<u>1340</u>
Liabilities -		
	Due North of Scotland Bank	590
	Borrowed money	300
	Due Alex Guthrie	36
	Outstanding accounts Due	105
		<u>1031</u>

1685 Shares with 10s called-up 842 10s

Payment on Shares -	Number shares	£ paid	£ unpaid
(1) Partners who signed contract			
11 paid calls on	550	275	0
13 partly paid calls on	645	153	169
13 paid nothing on	370	0	185
(2) Partners who did not sign contract			
3 paid calls on	35	17.5	0
7 partly paid calls on	85	23	19
	<u>47</u>	<u>429</u>	<u>374</u>

Gas sold -	October 1854 to June 1856	384,000 cu. ft.
	October 1855 to June 1856	200,000 cu. ft.

Estimated Expenditure to make 300,000 cu. ft. in coming year, 1856 - 7

	£
43 tons parrot coal (35s a ton)	75
20 tons fuel coal (25s a ton)	25
Manager's wages	30
Interest on borrowed capital	45
Feu duty, taxes, incidentals	25
	<u>200</u>

Estimated Revenue

Tar, meter rent, cottage rent, pipes	25
Gas at 10s per 1000 cu. ft.	150
	<u>175</u>
Deficit	25

Marquis advised the Company to increase the gas price to 12s 6d, to give £12 10s profit; or 13s 4d to give £25 profit.

Source - S.R.O. Banchory Minute Book op cit

(iii) Bathgate - Presentation of Accounts 1845

Revenue -	£	s	d	£	s	d
Balance brought forward	44	13	7			
Received for Gas	238	1	7			
Rent of ground leased out	4	9	0			
				288	15	11
Expenses -						
Dividend declared 21/5/1844	50	0	0			
Paid Credit of Bank Account	20	0	0			
Gas Coals, and carriage	35	3	9			
Furnace coals and carriage	49	16	3			
New retorts, pipes, bricks &c	28	11	3			
Erecting new coal shed	24	1	8			
Lime and carriage	4	9	10			
Management expenses	9	1	0			
Feu duty	3	2	6			
Printing and postage	1	16	9			
Workmen's wages	31	4	0			
Unpaid gas accounts (bad debts) held by Treasurer	31	8	11			
				288	15	11

Note - From 1845 all Bathgate shareholders received copies of this printed abstract. Capital expenses, eg. coal shed, charged to revenue.

Source - S.R.O. Bathgate Minute Book op cit 15/5/1845

(v) Cupar (Fife) - Presentation of Accounts 1839

Revenue 4 th June 1838 to 4 th June 1839		£	s	d			
Gas by meter, collected at August 1838		48	12	6			
	Nov. 1838	172	2	5			
	Feb. 1839	328	8	8 $\frac{1}{4}$			
	May 1839	181	7	7 $\frac{1}{2}$			
Cinders [coke]		12	3	4			
Street Lamps		81	9	9 $\frac{1}{2}$			
					819	4	4 $\frac{1}{2}$
Expenses -							
Coal		335	19	1			
Lighting Street Lamps		17	7	0			
Retorts, lime, bricks		52	15	9			
Miscellaneous		3	17	11 $\frac{1}{2}$			
Salary		80	0	0			
					489	19	9 $\frac{1}{2}$
Interest on Loans		30	17	4			
					298	7	2 $\frac{3}{4}$
Profits							

CHARGE June 1838 - June 1839

Cash in British Linen Bank		121	0	0			
Cash in Commercial Bank		105	0	0			
Gas sold	£819 4 4						
Deduct gas arrears	135 14 0 $\frac{1}{2}$						
		683	10	3 $\frac{3}{4}$			
Arrears recovered and gas income		155	10	3			
Cash for meters [sold]		7	8	0			
Cash for Pipes [sold]		4	7	11			
					1076	16	5 $\frac{3}{4}$
Total :							

DISCHARGE

Cash in British Linen Co.		131	15	7			
Cash in Commercial Bank		1	0	0			
Paid on Gas and Coal account		530	4	7			
Paid on Miscellaneous		3	17	11 $\frac{1}{2}$			
Paid on Profit and Loss		30	17	4			
Paid on Works		105	16	0 $\frac{1}{2}$			
Paid on meters		8	8	4			
Paid on Salaries		80	0	0			
Paid on Dividends		173	0	0			
Balance due by Manager		11	16	7 $\frac{3}{4}$			
					1076	16	5 $\frac{3}{4}$
Total :							

Source - S.R.O. Cupar Minute Book op cit

(vi) Dalkeith - Presentation of Accounts 1829

Income -	£	s	d			
Cash held by Treasurer	3	14	9			
Cash held by National Bank	30	0	0			
Cash borrowed from Bank	204	0	0			
Cash from Shares paid up	18	0	0			
Cash from Road Trustees for (lamp) globes	17	7	6			
				273	12	3
Income from Gas	403	12	11½			
Income interest on cash	2	3	0			
Income for burners, tar, &c	2	17	10			
				682	6	0½
Balance due Treasurer				15	13	10½
				<hr/>		
				697	19	11
 Expenses -						
Cost of Works				431	18	9
Interest on £1200	48	0	0			
Cost of coals	85	16	0			
Cost of management	132	5	2			
				266	1	2
				<hr/>		
				697	19	11

Source - S.R.O. Dalkeith Minute Book op cit 19/6/1829

Dalkeith - Presentation of Accounts 1830

Income -	£	s	d	Expenses-	£	s	d
Gas sold	303	5	9	Due to Treasurer in 1829	15	13	10½
Public lights	89	15	0	Coal and lime	96	19	0
Coke, tar &c	5	5	8	Manager's salary	52	0	0
Broken globes	0	15	0	Clerk's salary	20	0	0
Burners sold	4	4	0	Castings/ smith work	21	13	4½
Balance due Treasurer	7	4	7½	Labourers	20	0	0
				Mason and wrights	12	16	0
Total	406	10	4½	Tinsmith and plumber	3	17	1
				Lamplighter	14	18	10
				Ironmongery	9	1	0
				Globes	3	11	5
				Bricks and bricklayers	17	7	5
				Interest paid to J.Gray	48	0	0
				Interest paid Nat. Bank	83	10	0
				Cash repaid to Nat.Bank	44	0	0
				Total	406	10	4½

Source - S.R.O. Dalkeith Minute Book op cit 18/6/1830

ESTIMATE PREPARED BY DUNDEE PORTABLE GAS COMPANY (1825)

Consumption 12,000 cu. ft. per day	£11,887	10	0	
Oil (£25 per ton), raw materials, wear and tear	7,971	5	0	
Annual Profit	3,916	5	0	
<hr/>				
Yearly Expenditure to produce 3,756,000 cu.ft. (313 days)	£	s	d	Fixed Capital
Oil (£25 per ton, producing 85 cu.ft. gas)	4475	18	0	
Coal and coke for retorts (1s6d per 1000cu. ft.)	281	14	0	
Loss by condensation (10 per cent)	475	15	0	
Coal for 6 h.p. engine (6s a day)	93	18	0	
Rent of land	30	0	0	
Buildings 2½ % repairs/deterioration	50	0	0	2000
5 waggons and harness (£80 each) and 20 % repairs &c	80	0	0	400
5 horses (£40 each) 20 % deterioration	40	0	0	200
Feed and stall for horses (2s 6d a day)	288	0	0	
4 Car-men (15s a week) and 4 Attendants (20s a week)	364	0	0	
Working engineer and gasmaker (40s a week)	104	0	0	
Two workmen at 20s, and two at 25s	312	0	0	
Superintendent of pumps &c, Secretary, Clerk	400	0	0	
Petty charges and stationary	100	0	0	
Wear and tear on machinery (10 %)	936	0	0	9360
	7971	5	0	11,960

Yearly Revenue

Compressed Oil Gas at 62s 6d per 1000 cu.ft. (3,756,000 cu.ft.)	11737	10	0
Rent of one half to one third of all lamps (at 7½ % £150 to £225)	150	0	0
	11887	10	0

Fixed Capital for Compressed Oil Gas

	£
Apparatus with 12 retorts	1000
Gasometer with Tank (6000 cu.ft.)	600
Pumps and connections (1000 cu.ft. hour)	1000
Pressure Guage	30
Charging - Table	40
10 h.p. steam engine	600
Receiver and connections	60
Proving Valve and Cistern	30
Valves and reservoirs (lamps) per 30,000 cu ft	6000
Total	9360

Source - Perthshire Courier 29/4/1825;

"Proposals for Establishing a Portable Oil Gas Company in
Dundee" Dundee Ref. Lib. (cat. 310 (15)) ;

London Portable Gas Company leaflet Dundee Ref. Lib.

Note - Edinburgh portable gas company had only 6 retorts, and a gasometer
19 feet high and 17 feet diameter; a 12 h.p. steam engine and other items
manufactured in Manchester vide Edinburgh Advertizer 10/11/1828 p.3

Description of lamps vide Edinburgh Advertizer 25/3/1825 p.191

(viii)

Statement of Accounts by Dunfermline Gas Company 1830

Capital Stock

	£	s	d	£	s	d
To amount £ 5000						
Interest paid thereon by shareholders		14	0			
Cash from Consumers of Gas	364	11	1	5000	14	4
Cash for Meters sold	239	19	0			
Cash for Burners sold	37	17	11½			
Cash for service pipes	41	5	6½			
Cash for coke and waste lime	4	15	0			
Cash for earth from ground	8	8	0			
				696	16	7
Interest on deposit account in Bank of Scotland				36	0	1
Accounts Due by Company	565	14	4			
<u>Cost of Ground</u>	357	10	0			
Cost of Buildings	1079	7	9½			
Cost of Apparatus	950	5	4			
Cost of Pipes and Laying	1505	11	10½			
Cost of Sundries	104	14	4			
Counting House furniture	17	19	1			
Additional Plans	146	12	0			
Cost of Meters	211	6	2½			
Cost of Burners	69	6	3½			
Cost of Gas Making	242	9	0			
Stock in Hand	160	0	0			
Unpaid installments on Shares	135	0	0			
Balance on Deposit Account [i.e. loan] and interest due	1309	0	0			
Due by treasurer	9	3	6			
				6299	4	4

Note - Confusion between capital expenditure and working costs.

Pipe costs included £ 756 to Devon Iron Company, and

£ 215 to James Russell of Wednesbury.

Source - Dunfermline Ref. Lib. Dunfermline Gas Company Minute Book

26/3/1830

(ix) Statement of Annual Accounts at Glasgow 1825-34

	1826	1827	1828	1829	1830	1831	1832	1833	1834
(1) Debts Owed	8,641	17,292	9,824	1,801	1,794	1,341	8,132	5,373	1,999
(2) Floating Effects	8,792	10,313	9,736	9,631	7,661	9,458	12,854	8,307	8,725
(3) Gross Revenue	21,685	22,493	24,924	25,810	26,988	27,861	29,207	29,425	29,723
(4) Expenditure	14,711	14,597	15,651	13,279	15,691	15,925	16,464	17,171	17,752
(5) Nett Revenue	9,666	10,179	10,473	13,970	13,498	15,250	13,780	11,125	13,171
(6) Dividend 10%	10,000	10,000	10,137	11,137	11,125	11,125	11,125	11,125	11,125
(7) Capital Expenditure	9,081	7,996	5,100	4,674	4,660	991	3,335	8,469	4,378
(8) Surplus to Meters	-	-	-	2,228	1,201	5,310	3,485	3,241	3,225
(9) Interest Received	-	-	-	668	300	1,201	1,023	1,170	386
(10) Total Surplus	-	-	-	2,896	1,501	6,511	4,508	4,412	3,605
(11) Triennial Gross	-	-	-	-	-	80,660	-	-	88,355
(12) Triennial Surplus	-	-	-	-	-	11,696	-	-	24,670
(13) Gas Reduction as	-	-	-	-	-	14.5%	-	-	27.8%

Needed Under Act

Note -

New Stock under 1818 Act - £80,000 (1825), £20,000 (1826), £6,475 (1828), £4,775 (1829),

New Stock under Acts 1825-6 - £20,000 (1826), £12,800 (1828), £9,994 (1829)

(1) Debts owed by Company at Balance; (2) Floating effects and Debts due to Company;
 (4) Expenditure on coal, wages, wear and treat; (7) Capital expenditure on new property;
 (8) Surplus profit to Suspense Account and Meter Depreciation; (9) Interest on reserve
 funds; (10) Total surplus plus interest; (11) Triennial gross revenue; (12) Triennial
 surplus revenue (without interest)

It is not clear whether "debts owed" included part of the capital expenditure; and
 "Gross Revenue" is incorrect because numerous deductions have already been made. "Nett Revenue"
 is not "Gross Revenue" less "Expenditure", and the abstract accounts were presented to share-
 holders in a manner which deliberately prevented any meaningful analysis of revenue and expen-
 diture.

Source - Glasgow City Archives (D.G.E. 126)

(x)

Glasgow Gaslight Company - Presentation of Accounts 1825

<u>Dr.</u>	£	s	d	£	s	d
To General Expenditure on the works viz. Cost, per State in last report 1st June 1824	75414	5	2			
Additional since last balance, viz: Price of ground and houses in Rottenrow-street and new Bench of Retorts	3683	2	10			
Mains and Service Pipes and laying them in Streets and Closes	7917	11	4			
New Gasometer in Kirk-Street, balance of the cost of erection	1291	16	0			
Ground and houses purchased in Nicholas-Street	1587	19	8			
Apparatus for Singeing Works, Oil Gas Apparatus, Gas Meters, and finishing Manager's house, St. Nicholas Street	539	0	7			
Total laid out on the Works				90,433	15	7
To FUND for answering contingencies placed in New 4 per cent. Government Annuities				5,000	0	8
To FLOATING EFFECTS and DEBTS viz. Coals on hand, 2000 tons at 18s.	18000	0	0			
Argand and Cockspur burners on hand	485	5	10			
Retorts on hand	517	17	4			
Firebricks and clay on hand	221	17	6			
Lime on hand	80	0	0			
Counting-house furniture	111	2	5			
Debts owing to the Company, including arrears of Revenue and Government Dividends	1321	10	9			
Cash on hand	11	0	11			
				4,545	14	5
				99,979	10	4
<u>Cr.</u>						
By Proprietors of Stock holding 3200 Shares at £25				80,000	0	0
By Owing Paisley Union Bank				11,815	7	1
By Owing for Property purchased in Weaver-Street and in Rottenrow-street				2,320	7	4
By Sundry other Debts due by the Company				1,319	5	3
By Dividends of August 1824, unpaid				20	0	0
By Do of February last Do				57	10	0
	£	s	d			
By Revenue unappropriated at last balance	2741	16	2			
By Nett Revenue from Whitsunday 1824 to 1825	5705	4	6			
	8447	0	8			
Out of which paid Dividend to the Proprietors in February last	4000	0	0			
				4,447	0	8
				99,979	10	4

Note - Oil-gas apparatus purchased

Source - 'Report by the Committee of Management'
Glasgow Mitchell Library (G. 665.7*)

(x)

Glasgow Gaslight Company (a) Presentation of Capital Account 1839

Dr.

	£	s	d	£	s	d
General Expenditure on the Works -						
Value per state in last Report (1838)	144,187	17	4			
Less for depreciation in past year	1,550	0	0			
				142,687	17	4
Expenditure in past year -						
Extending Tradeston gasworks	1,102	15	5			
Mains and service pipes (plus cost of laying)	1,378	5	0			
				2,481	5	0
Estimated Value of works -				145,168	17	9
Gas Meters Let on Hire (plus cost of fitting)	2,100	3	2			
Less Depreciation/ Renewals	2,013	15	0			
				86	8	2
Investment in 3½ % Annuities required by Parliament				5,000	0	0
Floating effects/ Debts due Company	14,606	6	4			
Less Debts due to Tradesmen, and unpaid Divi.	3,278	13	4			
				11,327	13	0
				161,582	18	11

Cr.

Proprietors holding 5,000 shares of £25				122,500	0	0
Premium from Sale of Shares				25,449	17	11
Valuation of Feu Duties				6,447	0	0
Net Revenue for Past Year	14,840	14	4			
February Half Yearly Dividend £6125 0 0						
Deficit in Triennial Balance 1529 13 4						
				7,654	13	4
Balance of -				7,186	1	0
Next August Half Year Dividend 25 0 0						
Surplus into Triennial						
Suspense account 1061 1 0						
				7,186	1	0
				161,582	18	11

Note - Extensive reinvestment of profits, demonstrated in meter account where new meters were entered as deficit instead of their true value as new capital equipment.

Source - Glasgow City Archive (D.G.E. 24)

(b) Capital Account of Glasgow Gaslight Company 1859-60

(A) Partners' Capital	(£)	
1. Stock held by partners	150,000	
2. Premiums on stock sold	49,725	
3. Suspense account (£23,930) plus surplus revenue for past year (£2562)	26,492	
(B) Loans and Revenue		
4. Amount due Union Bank and others on open credit	19,216	
5. Sum borrowed on mortgage	50,000	
6. Amount due sundry parties on open account	3,321	
7. Unclaimed dividends	160	
8. Net surplus revenue for year (i.e. carried forward)	16,999	
	<hr/>	
	315,913	
(C) Capital Expenditure		Per Cent (of £313,351)
1. General Establishment		
Outlay up to 1859 balance	229,294	73.2
*Extensions during year £7,477		
Less depreciation £1,500		
	<hr/>	
	6,177	2.0
2. Gas meters lent to consumers	45,128	14.4
Extra expenditure during year		
	£3,580	
Less depreciation 2,500		
Less meters sold 2		
	<hr/>	
	1,078	0.3
3. Reserve fund invested in consols	5,000	1.6
4. Estimated arrears of rates out- standing	14,000	4.5
5. Property at Lancefield (feued to Spinning Co.)	1,843	5.9
6. *Coal (£7,103) and other stocks on hand, cash (£77) on hand, counting		

house furniture, outstanding

by-product revenue etc.

11,032

3.5

313,351

Note - Sums under each sub-heading also totalled in original statement. Sums stated to nearest £ (appear as £.s.d in original)

* Individual items stated in original

Source - J.McClelland J.G.L. 12/2/1861 p.96

(c) Glasgow Gaslight Company Revenue / Expenditure Account 1859 - 60

(A) Receipts from Revenue

(1) From Gas Rates -

Rates collected for current year

£ 65,901

Estimate of arrears (£18,000) which
can be collected

£ 14,000

Arrears recovered beyond previous
annual estimate

£ 422

80,322

(2) By-Products and Miscellaneous -

Ammoniacal Liquor

£ 2,888

Coke

£ 3,183

Tar

£ 373

Waste Lime

£ 208

Dividend on Consols

£ 155

Rents from House Property

£ 367

Ground annual from Lancefield Spinning Co.

£ 29

Old Metal

£ 108

Fees to Register Transfers of Shares

£ 8

7,319

(xi)

Construction Cost of Greenock Gasworks (1827)

	£	s	d
Buildings, ground, digging and walling gasometer pits, masonry	2627	2	5
Mains and service pipes	2840	19	4
Salaries, plans, cost of management during construction, cost of deeds, interest on subscriptions till 1/9/1828	1170	3	8
Total	8371	0	9
Public lamps (on which 6% per annum to be charged to Town for interest and repairs)	451	13	9
Note - Cost of pipes and lamps around the Quays paid by Harbour Trustees separately			
Total Capital Cost	8822	14	6
Profit/Loss 1/9/1828 to 15/5/1829			
Coal, lime, wages	768	8	1
Interest on capital subscribed	304	14	3
	1073	2	4
Gross revenue	2054	11	6
Balance in favour of the Works	981	9	2

Note - Mr Lowry as Manager and Engineer ;

Archibald Baine as Chairman of Committee of Subscribers

Source - Greenock Advertiser 30/6/1829

(xii)

Greenock Gasworks Balance Sheet 1851-2

EXPENDITURE	£	REVENUE	£
Parrot Coal	1903	Gas by Meter	7491
Interest on Cash	1199	Gas by Time Contract	109
Wages	611	Meter Rent	336
Salaries	330	Coke/Tar/Liquor	575
Repair of Retort Bench	287	Harbour/Town Lamps	1449
Feu Duty/Tax	197	Bad Debts Recovered	4
Gas to Town Clock	55		
Feu Duty/Interest on Ground	69	Profits	4079
Lime for Purifiers	133	Use of Profits	
Stationary/Printing	55	Greenock Town	750
Carting Ashes	13	Water Trustees	750
Repair of Apparatus	128	Repayment of Capital Loan	2500
Repair of Pipes	60	Contingency Fund	79
Repair of Meters	103		
Incidental	50		
	<hr/>		
	5194		
Extraordinary expense on pipes, meters, etc.	691		
	<hr/>		

Total

Source - J.G.L. 10/9/1852 p.423

(xiii)

KIRKCALDY COMPANY

(1) Capital Stock

Date	Nominal Capital Stock £	Paid Up Stock £	Nominal Value Shares £	Market Value Shares £	Revenue From New Stock £	Total Reserve Funds £	Contingency Fund £	Notes
1829	4,000	-	10	-	-	-	-	
1853	6,000	6,000	5	-	-	-	-	
1863	6,750	6,750	5	0.11	1,591	500	-	New gasholder, tank etc (£2,558)
1865 -66	6,750	6,750	-	-	-	5,401	1,000	Outlay on purifiers (£300), coal shed (£500), additional retort bench (£200)
1866	15,000	15,000	10	-	1,652	?	2,500	1350 shares of £5 revalued at £10, 150 new shares issued.
1867	15,500	15,500	10	-	581	-	-	£400 loan recalled from Har- bour Commissioners, Rapid expansion of plant.
1872	17,500	17,500	10	-	-	0	?	New gasholder & tank, Land £450, Brick tank (81 ft dia by 24 ft deep) by K. McKenzie, Callatown (£1,906), Gas- ometer 120,000 cu ft, by Bicket & Son, Kilmarnock (£1,348)
1877	17,500	17,500	10	-	-	-	-	
1878	20,500	20,500	10	-	4,673	-	-	To repay heavy loans (£1,673)
1882 -83	20,500	20,500	10	-	-	-	-	Took Limited Liability
1883	50,000	50,000	5	-	-	-	-	Three shares of £5 issued to each person holding one old share of £10 (6,150 shares)
1884	50,000	30,750	5	-	-	-	-	
1885	50,000	36,750	5	-	-	-	-	1,200 extra shares subscribed
1897	50,000	36,750	5	-	-	-	-	
1898	50,000	48,955	5	-	-	-	-	
1899	50,000	49,000	5	-	-	-	-	
1906	50,000	49,000	5	-	-	-	-	
1907	70,000	65,333	5	-	-	-	-	4,000 new shares sold
1908	70,000	65,333	5	-	-	-	-	

Notes - 1865-6 "working capital" £12,151

1867 New shares given maximum 6% (12s) dividend; of old shares had been 14½% (14s 6d) on their original value. Contingency Fund maintained by levy of 2s 6d per share out of profits.

1882 Took Limited Liability, with Nominal £10,500

1910 Gasworks sold to Kirkcaldy Town Council

KIRKCALDY COMPANY

(2) Importance of Fixed Capital Investment in Mains Pipes and Meters
(1862)

Items	£	% Total
Meters	1,515	12.1
Street Mains & Service Pipes	1,921	15.3
Buildings	2,168	17.3
Site of Buildings	1,432	11.4
Gasholders & Tanks	4,109	32.8
Manufacturing Apparatus	1,116	8.9
Moving Machinery	236	1.9
Miscellaneous	45	0.4
	<hr/>	
Total	12,542	

Note - Kirkcaldy had a capital stock of £6,750, and had reinvested £5,792 surplus profits. These figures represent the values after depreciation allowances.

Source - S.R.O. (B.T.2/1200)

(xiv)

Lesmahagow - Presentation of Accounts

(1) 1844 Capital Equipment Estimate

Estimate by consulting engineer J.Ritchie of Ardrossan which led to Capital Stock being set at £ 500

	£	s
Buildings, Gasholder and tank	90	0
Gas apparatus with two retorts	200	0
Mains pipes	152	14
Water traps	1	10
Service pipes	26	16
	<hr/>	
Total	471	0

(2) 1848 Accounts

	£	s	d
Cash from Shares	590	0	0
Donation from McKirdy (for change of location of works)	10	0	0
Interest on Bank money before expended	1	19	5
	<hr/>		
	601	19	5
Expense of Works	685	0	7½
	<hr/>		
Deficit	83	1	2½
Gas revenue 4/3/1846 to 28/2/1847	87	10	1½
Expenses of manufacture	93	18	6½
	<hr/>		
Deficit	6	8	5
Funds in Hand in 1847	10	9	4½
Gas revenue March 1847 to 31/3/1848	116	6	6
With Balance brought Forward	127	5	10½
Expenses of manufacture	92	2	6½
	<hr/>		
Profit	35	3	4
Cost of Meters (£ 12 unpaid)	105	13	0
Loan (Mr. Jamieson)	100	0	0
Dividend to shareholders 5 per cent			

Note - Deficit of 1847 probably caused by heavy reinvestment of revenue. Cost of capital expenditure on meters not integrated into the accounts.

Source - S.R.O. Lesmahagow Minute Book op cit 19/5/1848

(xv)

Stranraer - Presentation of Accounts 1841

(A) Capital Fund

	£	s	d
Mason and Wright Work	218	16	3
Iron and Brick Work	39	7	4
Miscellaneous	26	8	1
Meters	£99	15s	1d
less sold	10	9	4
	89	5	9
Pipes to Seuchan Church	15	0	0

(B) Profit/Loss Account

Revenue				Expenditure			
Gas	£273	1	1½	Management	£48	10	0
Less irrecoverable losses	0	10	7	Coals	136	4	0½
				Sundries	26	8	6
			272 11 6½	Net profit	78	15	5
Meter hire (rent)			17 7 9½	Dividend	71	4	3
				Carried Forward	7	11	5½

(C) Detailed Abstract

Income -

I. Stock	Subscribed	£1650	15s	Arrears Due	£104	Received	£1546	5s
II. Meters sold	£88	5s;	Hire in last year	£17	7s9½d	Total	£105	12s9½d
III. Gas	1st Quarter to 26 Jan. 41	£112	10s	5½	d			
	2nd Quarter to 26 May. 41	76	16	7				
	3rd Quarter to 19 Oct. 41	83	14	1				
	Total	273	1	1½				
	Less arrears due	28	6	10½				
						Received	£244	14s 3d
						Total Receipts	£1897	2 0½

Source - S.R.O. Stranraer Minute Book op.cit. 28/6/1841

Stranraer (continued)

Expenditure -		£	s	d
I. Plans per 1st account		40	0	0
II. Site of Works		56	7	0
III. Sea Wall		145	0	0
IV. Mason and Wright Work of Retort house, tank, manager's house &c. per 1st account	£608 7 0			
	per 2nd account 179 0 0	787	7	0
V. Iron and Brick Work per 1st account	820 8 11			
	240 7 0	1060	15	11
VI. Bricks		45	16	0
VII. Paving Stones		52	6	0
VIII. Miscellaneous	per 1st account 11 1 3			
	per 2nd account 24 9 3½	35	10	6½
IX. Meters	per 1st account 3 9 8			
	per 2nd account 157 11 11	161	1	7
X. Ordinary Expenditure				
	Management 48 10 0			
	Coals 136 4 0½			
	Sundries 26 8 10	211	2	10½
TOTAL PAYMENTS	£2595 7s 5½d			
TOTAL RECEIPTS	1897 2 0			
Balance due by Company	698 5 5			
	Income from Gas as above	273	1	1½
	Income from Meters as above	17	7	9½
	Deduct	290	8	11
ORDINARY EXPENDITURE	£211 2 10½			
FREE PROFITS	79 6 0			

Source - S.R.O. Stranraer Minute Book op.cit. 1/11/1841

(xvi)

Muirkirk - Presentation of Accounts

(1) 1861 Abstract of Accounts

Liabilities -	£	s	d	£	s	d
Capital	1000	0	0			
Due to Clydesdale Bank	548	0	10			
Due to Sundries	76	3	4½			
Profit	131	13	10			
				1755	18	0½
Assets -						
Works and Meters cost	1736	2	2			
Owing sundries, coal, and cash on hand	19	15	10½			
				1755	18	0½

(2) 1865 Abstract of Accounts

Year's revenue				430	8	0½
Expenses				215	12	8
Liabilities -						
Capital	1000	0	0			
Account to Sundries	83	18	0			
Due to Treasurer	0	14	10½			
Total				1084	12	10½
Surplus, being balance to credit of Revenue and Expenditure Account				214	15	4½
				1299	8	3
Assets -						
Works (reduced in 1864)	854	18	6½			
Meters	251	2	7			
Owing by Gas Consumers	12	6	4			
Owing by Gas Manager	40	4	11½			
Owing by Clydesdale Bank	131	7	4			
Owing by W. Sterart	5	12	0			
Stamps on hand	0	17	6			
Coal on Hand	2	19	0			
				1299	8	3

Note - The annual balance was made by placing Capital Stock and Profits as Liabilities, and comparing Liabilities with the presumed market value of fixed capital equipment plus cash on hand or on deposit, and raw materials on hand. In reality £131 "owing by Clydesdale Bank" was not an asset, but a debt owed by the Company.

Source - S.R.O. Muirkirk Minute Book op cit 10/8/1861, 19/6/1865

(xvii)

Vale of Leven Capital Account 1839-1847

RECEIPTS	£	s	d
Sale of 500 shares at £5 each	2500	0	0
Cash from Surplus Revenue after deducting dividends - 1841 £150 1842 £150 1844 £300 1845 £182 12s 7d			
Cash transferred from revenue to Meter Account £213 9s 8d	996	2	3
Loan from Clydesdale Bank	500	0	0
Debit due Clydesdale Bank on Current Account	159	0	7
Total	4155	2	10
EXPENDITURE			
Plans & Specifications	25	0	0
Original Gas Apparatus & Pipes	1324	1	3
Pipes & Later Extensions	575	1	3
Masonry of Houses, enclosure walls, & tanks	1235	9	6
Gas Holders	448	10	0
Wright Work	162	5	6
Slater Work	56	9	8
Plumbers	14	7	5
Bricks & Bricklaying	55	18	0
Stationary & Office Furniture	6	16	0
Law expenses for preliminary proceedings & submission of contracts	36	17	6
Sum invested in Meters let out to Consumers	213	9	8
	4155	2	10

Source - S.R.O. Vale of Leven Minute Book op cit 29/4/1847

(2)

EXPENDITURE TURNOVER - Total Annual Expenditure as Per Centage of Capital Stock

Date	A	B	C	D	E	Date	A	C	D	E
1837	-	27.5	-	-	-	1876	-	28.2	46.1	44.1
1838	-	27.8	-	-	-	1877	-	26.9	43.0	32.1
1839	-	23.0	-	-	-	1878	-	28.6	44.1	38.4
1840	-	19.5	-	-	-	1879	-	28.7	35.4	42.0
1841	-	18.1	-	-	-	1880	-	28.2	40.4	35.5
1842	-	27.0	-	-	-	1881	-	27.0	33.7	40.8
1843	-	30.3	-	-	-	1882	-	26.9	48.4	40.8
1844	-	36.2	-	-	-	1883	-	27.3	34.0	41.8
1845	-	28.5	-	-	-	1884	-	27.8	34.9	37.8
1846	-	33.1	-	-	19.1	1885	-	30.0	37.5	36.9
1847	-	33.2	-	-	18.7	1886	-	31.0	36.6	42.0
1848	-	36.5	-	-	31.3	1887	22.3	30.0	28.6	39.0
1849	-	40.2	-	-	17.9	1888	24.9	29.0	26.8	39.3
1850	23.2	46.2	-	-	20.0	1889	26.2	29.1	26.9	35.6
1851	27.4	-	-	-	15.6	1890	26.1	29.0	34.6	41.9
1852	22.6	-	-	-	14.8	1891	28.3	33.2	46.0	43.5
1853	19.7	-	-	-	19.0	1892	29.7	-	40.9	45.3
1854	20.7	-	-	-	27.2	1893	29.9	-	35.3	58.9
1855	30.6	-	-	-	28.8	1894	30.3	-	36.7	52.9
1856	26.7	-	-	-	24.5	1895	30.7	-	40.6	48.9
1857	28.8	-	-	-	26.8	1896	33.8	-	29.9	43.6
1858	30.8	-	-	-	33.2	1897	34.9	-	20.8	44.4
1859	32.2	-	29.2	-	24.9	1898	33.2	-	24.0	49.6
1860	33.2	-	-	-	-	1899	24.5	-	19.8	47.0
1861	28.9	-	31.6	-	25.6	1900	36.2	-	26.5	66.9
1862	28.8	-	34.1	-	-	1901	-	-	27.2	90.6
1863	29.1	-	33.0	-	32.7	1902	41.7	-	29.6	62.1
1864	29.1	-	34.8	19.4	35.1	1903	40.7	-	27.8	68.7
1865	32.4	-	33.4	-	35.2	1904	40.9	-	30.8	-
1866	31.2	-	36.6	20.4	37.8	1905	37.4	-	31.8	-
1867	38.3	-	44.3	25.9	44.0	1906	35.8	-	29.8	-
1868	35.7	-	44.8	26.0	35.6	1907	35.2	-	-	-
1869	-	-	32.3	24.3	35.6	1908	36.5	-	-	-
1870	-	-	25.7	21.1	34.1	1909	34.4	-	-	-
1871	-	-	25.6	32.4	38.7	1910	34.8	-	-	-
1872	-	-	25.5	33.5	42.1	1911	36.6	-	-	-
1873	-	-	25.0	42.9	55.5	1912	35.5	-	-	-
1874	-	-	34.7	51.5	63.3	1913	37.7	-	-	-
1875	-	-	30.8	51.0	39.6					

Note - A Ayr company
 B Bathgate company
 C Banff company
 D Muirkirk company

Sources - S.R.O. Gas Company Minute Books op cit

(3)

Relative Annual Expenditure on Various Working Costs

The relative scale of annual expenditure on various items of working costs, which could vary in sympathy with national price changes, is illustrated in Tables i- v

	(i) 1852		(ii) 1854		(iii) 1846	
	£	% expense	£	% expense	£.p	% expense
Revenue -						
Gas	750	-	853	-	-	-
Meter Rent	22	-	26	-	-	-
Meters/By-Products/ Pipes sold	17	-	12	-	-	-
Expenditure -						
Interest on loans	0	0	0	0	9.25	1.0
Parrot coal	164	35.8	231	39.9	415	44.5
Furnace coal	37	8.1	36	6.2		
Lime	5	0.1	6	1.0	-	-
Retorts/Bricks/Clay	12	2.6	39	6.7	*30	3.2
Meters	35	7.6	37	6.4	267	28.6
Miscellaneous	40	8.7	40	6.9	11	1.2
Taxes/Rates	17	3.7	18	3.1	32	3.4
Salaries	78	17	90	15.5	81	8.7
Wages	70	15.3	82	14.2	88	9.4
Total Expenses	458	100	579		933.25	
Profit	331	72.3	312		-	

Note - (1) Anonymous company in Scotland. 1.9 million cu ft sold at 7/11d. Meter rent 2/-. 9365 cu ft per ton coal.

J.G.L. 10/9/1852 p.416

(2) Haddington, where J.Robb's management skill was famous in Scotland. 2.16 million cu ft sold at 7/11d. Meter rent 2/-. J.G.L. 10/2/1854

(3) Hamilton Old Company. Average annual expenditure 1843-1846. £800 spent on meters 1844-6 to encourage their use. H. Commons 1846 vol. 102 11/5/1846 pp. 49, 63

* Repairs and Stationary

Relative Expenditure on Items of Working Costs

	(iv) 1860 Glasgow G.L.	
Revenue -	£	% expense
Gas	80,322	-
Meter Rent	0	-
Meters/By-Products/Pipes sold	6,472	-
Miscellaneous	667	-
 Expenditure -		
Interest on Loans	3,451	4.9
Coal	39,938	56.5
Lime	1,234	1.7
Retorts/Bricks/Clay	* 712	1.0
Meters	3,301	4.7
Miscellaneous	7,271	10.3
Taxes/Rates	2,744	3.9
Salaries	1,340	1.9
Wages	8,096	11.5
Repairs	<u>2,555</u>	3.6
Total Expenses	70,642	
Profit	16,819	

Note - * Bricks and Clay only. Miscellaneous includes £1500 depreciation. Glasgow Gaslight Company J.G.L. 12/2/1861 p.96. Vide infra p.825

(v) Estimate of Working Costs at Glasgow Municipal Gasworks (1869)

	% Total	Total Cost*	Cost per Ton Coal	
		£	£	s
(A) Revenue				
Gas (less 80,325,000 cu ft leakage)		75,305		
Coke/Liquor/Waste Lime (4/- per ton coal)		9,180	0	4.0
(B) Expenditure				
Cannel Coal (16/- ton; 10,500 cu ft)	64	36,720	16	0
Salaries	2.0	1,127	0	5.89
Inspectors, Collectors, & Clerks Wages	4.0	2,295	1	0
Wages of Workmen	14.0	8,033	3	6
Firebricks, Clay, Retorts, etc.	2.0	1,138	0	5.95
Lime	0.8	459	0	2.40
Tallow/oil for Engines	0.1	52	0	0.27
Shovels, Riddles, Barrows, etc.	0.2	101	0	0.53
Repair of Pipes	0.6	346	0	1.81
Repair of Works	0.6	340	0	1.78
Meters repair/renewal (2½% cost price)	2.3	1,300	0	6.80
"Working process of making gas" (?)	5.3	3,106	1	4.24
Gas burners given to consumers	0.1	52	0	0.27
Subscription to Royal Infirmary	0.0	13	0	0.07
Police etc. Rates	2.6	1,530	8	0
Office expenses	0.3	157	0	0.82
Stationary, Printing, Advertising	0.5	281	0	1.47
Incidentals	0.3	172	0	0.90
Law expenses	0.3	153	0	0.80
Total	100	57,375	25	0

4.5% Interest on £410,132 capital: £18,455

Note - * Total Cost to produce 481,950,000 cu ft from 45,900 tons
coal

Source - Glasgow City Archives, Miscellaneous Papers vol. 15 p.459

(4)

LOAN CAPITAL - as a percentage of Paid-Up Share Capital

Company	Date	%	Date	%	Date	%	Date	%
Ayr	1847	0	1852 - 7	18	1875-84	0	1887	9.5
	1848	17	1858 -67	16	1885	17	1888	0
	1849 - 51	24	1868 -74	14	1886	11	1889- 1910	0
Banff	1859	10.7	1864	20	1869	17	1874	8.4
	1860	6	1865	20	1870	15.6	1875	5.3
	1861	14	1866	27.2	1871	3.6	1876	2
	1862	13	1867	29.6	1872	4.9	1877-	0
	1863	9	1868	26	1873	10	1900	
Bathgate	1838	13.6	1861	30	1879	20	1901	20.7
	1839	10.2	1862-3	25	1880	33.3	1902	13
	1840	6	1864	20	1885 -96	0?		
	1841 -57	0	1865 -6	10	1897 -9	30.6		
	1858 -60	33	1867 -70	30	1900	29		
Boness	1843 -7	0	1853	15.5	1863	41.6	1871 -5	62.5
	1848	13	1854 -7	27	1864	33.3	1876	41.6
	1849 -50	0	1858	50	1865	41.6		
	1851	8.3	1859 -61	70.8	1866	33.3		
	1852	16.7	1862	66.6	1867 -70	37.5		
Cupar	1830 -9	40	1849	28	1874-85	?	1894	4
	1840	37	1850	16	1885	0	1895	2.7
	1841	32	1851 -68	0	1886-7	9.6	1896 -7	0
	1842	26.7	1859	40	1888	9	1898	4
	1843	21.4	1870	?	1889	7.7	1899	0
	1844	29.4	1871	29	1890	8	1900	?
	1845 -6	8.7	1872	11.6	1891	6.3	1901	9
	1847	1.2	1873	16	1892	5		
	1848	22			1893	3.2		
Dalkeith	1827 -8	39	1834 -5	118.3	1856	3.5	1905	11.5
	1829	79	1836	97	1857-	0	1906	10
	1830	143.8	1837	49.5	1901	0	1907	6.3
	1831	128.8	1838	10.4	1902	37.5	1908	0
	1832 -3	126.2	1839 -55	0	1903 -4	?		
Galashiels	1847	44.2	1856 -7	38	1862	38.8	1885 -6	20
	1848	36.5	1858	66	1863 -5	26.3	1887-90	14.3
	1849	18.9	1859	68.6	1866	0	1891	11.4
	1850	13.7	1860	123.5	1867 -9	50	1892	14.5
	1851 -5	0	1861	81.3	1870 -84	22.2	1893	15.2
Yale of Leven	1840	16.7	1844	9.5	1847-57	0	1859-62	0
	1841 -3	15.9	1845 -6	15.9	1858	2.3		

Sources - S.R.O. Gas Company Minute Books op cit

LOAN CAPITAL - as a percentage of Paid-Up Share Capital

Company	Date	%	Date	%	Date	%
Selkirk	1836	14.2	1843-53	0	1863-5	0
	1837-8	?	1854	29.6	1866	123.8
	1839	33.3	1855	46.6	1867-73	0
	1840	25	1856-8	53.3	1874-5	13.2
	1841-2	?	1859-62	29.6	1877	2.2
Stranraer	1836-9	0	1850	63.4	1874	3
	1840	39.3	1851	26	1875	0
	1841	64.6	1852	23.8	1876	3.5
	1842	67	1853	15.3	1877	9
	1843	61.5	1854-6	16.6	1878	?
	1844	60.2	1857	12	1879	0.6
	1845	?	1858-61	0	1880	1
	1846	62.5	1862-5	27.6	1881-4	?
	1847	71.9	1866	0	1885-	
	1848	?	1867	10	1901	0
	1849	68.8	1868-73	0		

Sources - S.R.O. Gas Company Minute Books op cit

(5) Accident Insurance

Insurance schemes reduced one of the main apparent hazards faced by gas company investors. Glasgow Gaslight Company¹ had one of the earliest Scottish policies, for a gasholder at Hutchesontown which was insured with the Sun Fire Insurance Company and Hercules Fire Insurance Company before being damaged by explosion on 22nd December, 1834. Generally, however, accidents were rare, and until the Employers Liability Act of 1880 workmen could obtain no recompense for personal injuries. From 1859 the 'Steam Boiler Assurance Company' of Manchester² provided comprehensive insurance for boilers.

The possibility of severe damage to capital equipment, or liability for damage, was always present. Alyth³ gasworks was badly damaged by fire in 1877, and Dunfermline⁴ in 1880 suffered £500 fire damage after an explosion in the 'governor'. Defective gas fittings caused £6,000 damage to a Maxwelltown⁵ factory in 1879. At Cupar⁶ in 1895, H. McIntosh was burned to death at the tar-loading bay, and besides paying only £6 to his widow, the gas manager was instructed for the first time to place notices prohibiting employees "from smoking in dangerous places"

Galashiels gas company took some insurance when it commenced in 1846, but accidents were not a serious financial problem for that Company. The first recorded⁷ accident claim, for £50, was made in 1895 by a local man who fell into an unguarded trench. He only received £10, though legal fees and payment to the Directors raised

-
1. Glasgow City Archives (D.G.E.133)
List of potential explosion and fire hazards in gasworks vide J.H.Chapman "Gasworks", Journal of the Insurance Institute of Great Britain (1901) Vol. 4
 2. W.A.Dinsdale History of Accident Insurance in Great Britain (1954) p.134
 3. J.G.L. 16/12/1877
 4. J.G.L. 2/3/1880
 5. J.G.L. 16/12/1879
 6. S.R.O. Cupar Minute Book op cit 12/1/1895, 14/2/1895, 14/3/1895
 7. S.R.O. Galashiels Minute Book op cit 5/2/1895, 20/2/1895

the overall cost. Also in 1895, a workman, R.Cook,¹ was burned to death at the gasworks, but his widow received only £20 compensation from the Company and £50 from the Boiler Insurance Company. In December, 1896, considerable damage was caused to pipes in Galashiels by the Corporation's new Steam Roller² and resulted in an explosion in School Close. The Corporation forced the Company to take responsibility, in return for closer co-operation over where the Roller was to be prohibited.

Insurance Policies Taken by Galashiels Gas Company

Date	Value of Insurance £	Rate Charged	Item
1846	150		Manager's Dwelling House
1867	50		Boiler - Boiler Insurance Co., Manchester
1868	-	5s%	Coal Shed - Scottish Union Insurance Co.
1868	-		Entire Works insured against fire.
1880's	250		Boiler
1896	750	£1 19s	Boiler
1898	All Claims	15s per £100 wages	Workmen's Compensation - Vulcan Boiler & General Insurance Co.
c.1900	"	7s 6d%	"
1903	"	10s%	"
1905	1,000		Boiler
1908	All Claims		Workmen's Compensation - General Accident, Fire & Life Assurance Co. Ltd.
		12s 6d%	Labourers
		2s 6d%	Clerical Staff

Source - S.R.O. Galashiels Minute Book op cit

In 1893 the Scottish Union and National Insurance Company agreed to cover the new "Peebles" oil gas enrichment plant without increasing the premium charged at Galashiels. In 1898 a policy was obtained against workmen's claims under the Employers Liability Act and "to cover all risks of accident to the Assistant Manager, Gas Collector, and Meter Surveyor and Plumber, as well as to the workmen!"

1. Ibid 20/2/1895

2. Ibid 1/12/1896, 5/1/1897, 2/2/1897

A new policy was taken in 1908 for claims under the Workmen's Compensation Act of that year.

Accident Insurance Policies Taken by Various Gas Companies

Company	Date	Policy
Ayr	1871	Fire & Insurance policy for £3,900 with Law Union Office.
Ayr	1872	New policy for £8,740 after an explosion wrecked a condenser worth £200 which was omitted from the earlier policy.
Ayr	1898	Against Workmen's Compensation claims (12s 6d%) with Scottish Employers & General Insurance Co.
Ayr	1898	Ditto, reduced from £1,000 to £300.
Ayr	1900	Ditto, rate reduced from 7s 6d to 5s%
Banff	1896	Boiler insured with Boiler Insurance & Steam Power Co., Manchester.
Banff	1898	Policy against Workmen's Compensation Act with Scottish Employers Liability & General Insurance at 12s 6d%
Banff	1898	First Fire & Explosion policy, with Caledonian Insurance Co. at 12s 6d%
Banff	1898	Retort-house roof on fire - insurance paid £16.
Banff	1913	Insurance against Workmen's Compensation Act, up to £450, with London & Lancashire Fire Insurance Co. Ltd. at 12s 6d%
Bathgate	1880	First policy for accidents, with Insurance Company of Scotland.
Cupar (Fife)	1879	Fire insurance policy with Staffordshire Fire Insurance Co. Ltd. at £7 7s per year.
Cupar	1883	Policy raised by £300 to £3,015 at £8 19s.
Cupar	1886	Raised to £4,000.
Cupar	1891	Steam Boiler insured for £100 at £1 3s a year.
Cupar	1893	Received circular from Scottish Employers Liability & Accident Insurance Co., and agreed to insure for £600 wages at 3s per £100 against claims under 1880 Employers Liability Act. Later in year, reduced sum to £500 because age limit excluded Manager, but

Company	Date	Policy
Cupar (cont.)		in 1894 raised by £150 to include Manager.
Cupar	1898	High rates because of 1897 Workmen's Compensation Act. Refused General Accident Company policy at 18s%; issued £650 wages with Scottish Employers Co. at 12s%
Cupar	1898	Fire & Insurance policy raised to £5,800 with the State Insurance Co.
Dalkeith	1897	Policy at 15s% on wages against claims under 1897 Workmen's Compensation Act, with Vulcan Boiler & General Insurance Company.
Dalkeith	1910	Fire Insurance Policy at 2s 6d% with Scottish Union & National Insurance Company.
Muirkirk	1894	Fire Insurance for £900 at 4s 6d% with Norwich Union Fire Society.
Muirkirk	1896	New tank and gasholder insured for £600 with Norwich Union.
Muirkirk	1899	Insurance against Employers Liability for £150 wages at 12s 6d% with General Accident Insurance Co. of Perth.
Stornoway	1856	£300 Dwelling house and offices; £700 retort-house, coal & lime sheds; £300 stock.
Stornoway	1857	£1,100 Northern Insurance Company.
Stornoway	1878	Fire (not explosion) - Policy changed from Northern Assurance Company to London & Lancashire Fire Assurance Company.
Stranraer	1898	£300 policy on wages at 12s 6d% against claims made under the Workmen's Compensation Act. (No Fire Insurance).

Note - Apart from Fidelity Guarantees (see above p.628), most companies took no outside insurance until the 1890's, but relied instead upon their Contingency and Reserve Funds to make good any accidental damage.

Sources - S.R.O. Gas Company Minute Books op cit

(6)

UNITED KINGDOM GASWORKS CAPITAL (1882 - 1913)

Date	Number of Companies	Nominal Share Capital £ Thou.	Nominal Loan Capital £ Thou.	Total (A) Shares and Premiums £ Thou.	Total Loans Taken £ Thou.	Annual Revenue £ Thou.	Annual Expenses £ Thou.	Annual Coals Thou. Ton
1882	352	38,184	8,722	28,589	4,346	-	-	4,929
1883	357	39,061	9,903	29,039	5,076	-	-	5,172
1884	361	39,575	9,396	29,594	5,331	-	-	5,362
1885	364	39,697	9,394	30,109	5,404	-	-	5,595
1886	377	40,403	9,570	30,960	5,680	-	-	5,778
1887	384	41,276	9,744	31,557	5,840	10,434	7,143	5,977
1888	395	41,310	9,742	31,736	6,003	10,535	7,102	6,051
1889	405	41,822	9,926	32,117	6,091	10,778	7,635	6,309
1890	416	42,279	10,068	32,894	6,569	11,672	8,917	6,618
1891	422	43,018	10,252	34,282	6,862	12,489	9,718	7,071
1892	429	43,477	10,555	35,267	7,149	12,693	9,547	7,119
1893	428	44,200	11,061	36,492	7,545	12,610	9,229	6,995
1894	428	44,431	11,152	37,059	7,740	13,006	9,110	7,128
1895	429	44,288	11,156	37,307	7,888	12,983	9,491	7,531
1896	433	48,483	11,527	41,433	8,186	13,020	9,539	7,682
1897	436	49,102	12,469	42,369	8,891	13,448	9,923	7,963
1898	439	50,802	12,908	44,134	9,360	14,092	10,310	7,959
1899	450	65,101	15,022	57,937	11,451	15,515	11,478	8,321
1900	453	66,243	15,347	59,639	11,776	17,639	13,865	8,427
1901	454	70,416	16,449	61,776	12,202	17,955	14,538	8,580
1902	454	74,319	17,275	64,299	12,830	17,205	13,167	8,520
1903	459	77,571	18,708	67,418	13,451	17,757	13,214	8,529
1904	469	79,978	19,557	68,953	13,776	17,829	13,398	8,673
1905	482	81,053	20,208	70,606	14,177	17,618	13,410	8,722
1906	491	83,108	20,878	72,008	14,468	18,166	13,671	8,923
1907	495	84,364	21,205	73,153	14,645	19,567	14,885	9,240
1908	499	85,225	21,491	74,329	14,944	20,014	15,476	9,262
1909	501	86,156	21,869	74,953	15,168	19,952	15,098	9,176
1910	511	88,047	22,153	76,797	15,396	20,446	15,309	9,236
1911	520	89,922	22,573	77,383	15,607	21,135	15,903	9,432
1912	520	89,463	22,897	77,964	15,816	22,358	17,231	9,563
1913	519	90,425	23,310	78,903	16,270	23,297	18,581	10,118

Notes - £ Thousands; (A) Total Paid-Up Shares and Premiums

Source - W. Page, Commerce and Industry - Tables of Statistics for the British Empire from 1815 (1919)

(7) Gross Profits of Gasworks Compared to Railways, Mines
and Ironworks in the United Kingdom 1865-84

Gross Profits £ million

Year to 5th April	Railways	Mines	Ironworks	Gas
1865	17	4.8	1.8	1.8
1866	19	5.0	1.8	1.9
1867	19	5.6	2.4	2.1
1868	19	5.7	2.0	2.0
1869	20	5.5	1.9	2.0
1870	21	5.5	2.0	2.2
1871	22	5.9	2.7	2.6
1872	23	6.3	3.1	2.7
1873	25	7.3	4.8	2.8
1874	26	10.5	7.2	2.7
1875	26	14.1	7.3	2.7
1876	26	14.6	3.9	3.0
1877	28	14.1	2.8	3.4
1878	28	12.9	2.3	3.9
1879	29	10.1	1.9	4.0
1880	29	7.5	1.7	4.2
1881	29	6.7	2.2	4.5
1882	32	6.7	2.9	4.6
1883	32	6.7	3.0	4.7
1884	33	7.1	3.0	4.9

Number of assessments, and average £

Date	Mines		Ironworks		Gasworks	
	No.	Av.	No.	Av.	No.	Av.
		£		£		£
1872	2,880	2,199	351	8,948	1,454	1,834
1873	2,932	2,484	342	13,924	1,464	1,910
1874	3,064	3,441	335	21,546	1,449	1,839
1875	3,142	4,490	333	21,804	1,452	1,811
1876	3,067	4,765	306	12,600	1,491	2,032
1877	2,886	4,882	320	8,734	1,481	2,318
1878	2,777	4,645	306	7,565	1,555	2,522
1879	2,645	3,813	2,742	7,075	1,565	2,538
1880	2,488	3,015	286	6,016	1,585	2,634
1881	2,518	2,647	281	7,752	1,593	2,828

Number of assessments, and average £

Date	Mines		Ironworks		Gasworks	
	No.	Av.	No.	Av.	No.	Av.
	£		£		£	
1882	2,527	2,662	541	11,435	1,607	2,887
1883	2,562	2,628	315	9,405	1,605	2,884
1884	2,432	2,904	292	10,320	1,616	3,019

Source - R.P.P. First Report of the Royal Commission appointed to inquire into the Depression of Trade and Industry (1886) pp. 234(218), 235(219) appendices 7, 8.

APPENDIX V I I

Chartered Scottish Gas Companies - Statistics and Regulations

- (1) Nominal Capital Stock and Borrowing Powers
- (2) Paid-Up Capital 1820 - 1865
- (3) Annual Dividends 1821 - 1865
- (4) Regulations -
 - (i) General Meetings :
 - (A) Quorum for General Meetings
 - (B) Voting Regulations at General Meetings
 - (C) Qualifications to Call Extraordinary
General Meetings
 - (ii) Calls Made Upon Shares
 - (iii) Qualifications of Directors
 - (iv) Contingency Funds
 - (v) Regulation of Pipe Trenches

(1)

CHARTERED COMPANIES - NOMINAL CAPITAL STOCK AND BORROWING POWERS

Company	Date	Nominal Capital £.s	Nominal Value Shares £.s	Maximum Borrowing Power £	Threshold Investment* £	Notes
Dundee New	1846	40,000	5	12,000		
Dundee New	1867	55,000	5	15,750		A
Dundee Old	1830	29,760.18	23.16	20,000		B
Dundee Old	1867	79,760.18	-	26,600		A
Edinburgh	1818	100,000	25		70,000	
Edinburgh	1829	150,000	25			
Edinburgh	1840	200,000	25	50,000		
Edinburgh Oil	1824	80,000	25	16,000	80,000	
Edinburgh/Leith	1840	150,000	25	-	75,000	C
Glasgow Old	1817	40,000	25	10,000		
Glasgow Old	1822	80,000	25	10,000		
Glasgow Old	1825	100,000	{ 25 6.5	10,000		
Glasgow Old	1826	150,000	{ 25 6.5	10,000		
Glasgow Old	1857	215,000	{ 25 6.5	50,000		D
Glasgow C. & S.	1843	150,000	10	25,000		A
Glasgow C. & S.	1857	200,000	10	25,000		
Hamilton New	1846	8,000	5	2,500		A,E
Inverness	1826	12,000	10	4,000		
Inverness	{ 1847	12,000	10	8,000		A
	{	12,000	5			
Inverness	1874	36,000	5	11,000		F

CHARTERED CO. - NOMINAL CAPITAL, continued

Company	Date	Nominal Capital £.s	Nominal Value Shares £.s	Maximum Borrowing Power £	Threshold Investment* £	Notes
Kilmarnock	1855	30,000	25	5,000		G
Leith	1822	15,000	20	3,750	15,000	
Paisley	1823	16,000	5	4,000	16,000	
Paisley	1832	32,000	5	8,000		
Tolcross	1836	6,000	20	20,000		

Notes - * Capital investment in Company before Act applicable.

- (A) All new stock to be issued and Sheriff shown that half paid up before new loans taken.
- (B) Total 1250 shares.
- (C) Borrowing power up to one third of subscribed capital.
- (D) Permitted loans reduced to £20,000 when half new shares taken.
- (E) Nominal capital mis-printed £80,000 in Act.
- (F) Inverness Loan powers in 1874 on sliding scale related to amount of new stock (half paid-up):-
- | | | | | |
|----------------------|--------|-------|-------|--------|
| New Stock | £3,000 | 6,000 | 9,000 | 12,000 |
| Extra Mortgage Power | £ 750 | 1,500 | 2,250 | 3,000 |
- Inverness could issue debentures instead of mortgages if so desired.
- (G) Permitted loans rose to £7,500 after all shares subscribed and so proved to Sheriff.

Sources - Acts of Parliament vide infra p. 1846 - 51

(2)

CHARTERED COMPANIES - PAID-UP CAPITAL 1820 - 65

Date	Dundee Loans £	Old Stock £	Edinburgh G.L. £	Edinb.& Leith £	Glasgow G.L. £	Glasgow C.& S. £	Hamilton New £	Inverness G.L. £	Paisley G.L. £
1820	-	-	-	-	40,000	-	-	-	-
1821	-	-	-	-	40,000	-	-	-	-
1822	-	-	-	-	40,000	-	-	-	-
1823	-	-	-	-	80,000	-	-	-	-
1824	-	-	-	-	80,000	-	-	-	-
1825	-	14,664	-	-	80,000	-	-	-	16,000
1826	-	19,060	-	-	100,000	-	-	8,000	16,000
1827	-	19,060	-	-	100,000	-	-	8,000	16,000
1828	-	20,000	-	-	101,500	-	-	8,000	16,000
1829	-	29,687*	-	-	111,250	-	-	8,000	16,000
1830	-	29,687	-	-	111,250	-	-	8,000	16,000
1831	2,487	29,687	-	-	111,250	-	-	8,000	16,000
1832	3,076	29,687	-	-	111,250	-	-	8,000	22,000
1833	3,076	29,687	-	-	111,250	-	-	8,000	25,600
1834	3,544	29,687	-	-	111,250	-	-	8,000	28,800
1835	6,099	29,687	-	-	111,250	-	-	8,000	32,000
1836	7,804	29,687	-	-	116,250	-	-	8,000	32,000
1837	15,527	29,687	-	-	116,250	-	-	8,000	32,000
1838	17,101	29,687	-	-	116,250	-	-	8,000	35,200
1839	18,000	29,687	-	-	122,500	-	-	8,000	36,800
1840	18,000	29,687	-	89,050	122,500	-	-	8,000	38,400
1841	18,000	29,687	-	89,050	122,500	-	-	8,000	40,000
1842	18,000	29,687	-	89,050	122,500	-	-	8,000	40,000
1843	13,000	29,687	-	89,050	122,500	-	-	8,000	40,000
1844	13,000	29,687	-	89,050	122,500	120,000	-	8,000	40,000
1845	15,000	29,687	-	89,050	122,500	120,000	-	8,000	40,000
1846	15,000	29,687	-	89,050	122,500	120,000	-	8,000	40,000
1847	20,000	29,687	-	89,050	122,500	120,000	-	8,000	40,000
1848	-	29,687	-	-	122,500	-	-	8,000	40,000
1849	-	29,687	-	-	122,500	-	-	9,936	40,000
1850	-	29,687	150,000	98,640	122,500 ⁺	135,000	7,500	10,000	40,000
1851	-	-	150,000	-	140,000	150,000	8,000	24,000	40,000
1852	-	-	150,000	-	150,000	150,000	8,000	24,000	40,000
1853	-	-	150,000	-	150,000	150,000	8,000	24,000	40,000
1854	-	-	150,000	-	150,000	150,000	8,000	24,000	40,000
1855	-	-	150,000	-	150,000	150,000	8,000	24,000	40,000
1856	-	-	150,000	-	150,000	150,000 [†]	8,000	24,000	40,000
1857	-	-	150,000	-	150,000	200,000	8,000	24,000	40,000
1858	-	-	150,000	-	150,000	200,000	8,000	24,000	40,000
1859	-	-	150,000	-	150,000	200,000	8,000	24,000	40,000
1860	-	-	150,000	-	150,000	200,000	8,000	24,000	40,000
1861	-	-	150,000	-	150,000	200,000	8,000	24,000	40,000
1862	-	-	150,000	-	175,000	200,000	8,000	24,000	40,000
1863	-	-	150,000	-	175,000	200,000	8,000	24,000	40,000
1864	-	-	150,000	108,000 ⁱ	175,000	200,000	8,000 ⁱⁱ	24,000	40,000
1865	-	65,145*	150,000	108,000 ⁱ	190,000	200,000	8,000 ⁱⁱ	24,000	40,000

Note - * Dundee Old £29,687 10s 1829-47, £65,145 6s 1865.

Dundee New £24,076 1847, £ 31,318 1848, £32,811 1849, £33,815 1850.

Kilmarnock £24,000 1865.

+ Glasgow G.L. in 1850 had a further £25,451 (premiums) invested on which no dividends were paid.

† Glasgow C. & S. in 1856 had loans of £25,000

i Edinburgh & Leith in 1864-5 had loans of £ 27,500

ii Hamilton New company in 1864-5 had loans of £2,000

Sources - B.P.P. 1847 (734) LXIV 359 ; B.P.P. 1865 (55) L 733

B.P.P. 1866 (519) LXVI 486

(3)

CHARTERED COMPANIES - ANNUAL DIVIDENDS

Date	Dundee Loans Intst.	Old	Edinburgh G.L.	Edinb.& Leith	Glasgow	Glasgow C.& S.	Hamilton New	Inverness	Paisley
	£ s %	£ s %	£ s %	£ s %	£ s %	£ s %	£ s %	£ s d %	£ s %
1821	-	-	-	-	7 10	-	-	-	-
1822	-	-	-	-	8 0	-	-	-	-
1823	-	-	-	-	10 0	-	-	-	3 0
1824	-	-	-	-	10 0	-	-	-	-
1825	-	-	-	-	10 0	-	-	-	-
1826	-	0 0	-	-	10 0	-	-	-	5 0
1827	-	7 8	-	-	10 0	-	-	0 0 0	6 0
1828	-	10 0	-	-	10 0	-	-	2 5 0	7 0
1829	-	8 0	-	-	10 0	-	-	2 2 6	8 0
1830	-	6 14	-	-	10 0	-	-	2 7 6	8 0
18 1	8 14	8 8	-	-	10 0	-	-	2 2 6	8 0
1832	8 14	9 4	-	-	10 0	-	-	2 5 0	8 0
1833	9 2	9 8	-	-	10 0	-	-	3 3 9	8 0
1834	9 2	9 12	-	-	10 0	-	-	4 1 3	8 0
1835	9 0	10 2	-	-	10 0	-	-	4 3 9	8 0
1836	9 0	10 10	-	-	10 0	-	-	5 0 0	8 0
1837	6 8	8 8	-	-	10 0	-	-	5 0 0	8 0
1838	7 4	8 8	-	-	10 0	-	-	3 3 4	8 0
1839	8 4	10 10	-	-	10 0	-	-	4 6 8	8 0
1840	9 4	12 12	-	-	10 0	-	-	5 2 6	8 0
1841	9 4	12 12	-	-	10 0	-	-	6 0 0	8 0
1842	9 4	12 12	-	6 0	10 0	-	-	7 5 0	8 0
1843	10 4	12 12	-	6 10	10 0	-	-	7 5 0	8 0
1844	8 10	10 10	-	6 10	10 0	-	-	8 0 0	8 0
1845	6 14	8 8	-	6 10	10 0	3 0	-	8 0 0	8 0
1846	6 0	8 8	-	6 10	10 0	7 10	-	8 0 0	6 8
1847	-	-	-	-	5 0	-	-	-	6 8
1848	-	4 4	10 0	6 10	6 0	6 10	7 0	7 10 0	6 8
1849	-	4 4	10 0	6 10	5 0	5 0	8 0	7 10 0	-
1850	-	4 4	-	-	7 10	6 10	8 0	5 10 0	6 13.3
1851	-	-	10 0	-	10 0	8 18	8 0	7 10 0	6 13.3
1852	-	-	10 0	-	10 0	9 0	8 0	7 10 0	6 13.3
1853	-	-	10 0	-	10 0	10 0	9 0	7 0 0	6 13.3
1854	-	-	10 0	-	10 0	10 0	8 0	7 0 0	6 13.3
1855	-	-	10 0	-	10 0	10 0	5 0	7 0 0	6 13.3
1856	-	-	10 0	-	10 0	10 0	7 0	7 0 0	6 13.3
1857	-	-	10 0	-	10 0	10 0	-	7 0 0	6 13.3
1858	-	-	10 0	-	10 0	10 0	4 0	7 0 0	6 13.3
1859	-	-	10 0	-	10 0	10 0	9 5	7 0 0	6 13.3
1860	-	-	10 0	-	10 0	10 0	4 15	7 0 0	6 13.3
1861	-	-	10 0	-	10 0	10 0	7 0	6 10 0	6 13.3
1862	-	-	10 0	-	10 0	10 0	7 10	7 0 0	6 13.3
1863	-	-	10 0	-	10 0	10 0	8 0	7 10 0	6 13.3
1864	-	-	10 0	8 0	10 0	10 0	8 0	7 10 0	6 13.3
1865	-	-	10 0	8 0	10 0	10 0	8 0	7 10 0	6 13.3

Note - Dundee New 1846 £2 10s %, 1847 0 %, 1849 0 %, 1850 £2 10s %.

Kilmarnock 1863 10% on £15,000 and 7.5 % on £9000 ;
1864-5 8.75 % on £ 15,000 and 7.5 % on £9000

Glasgow 1863 - 5 10 % on £150,000 and 7.5 % on £25,000 new stock

Glasgow C.& S. 1863 - 5 10% on Old stock and 7.5 % on new stock.

Sources - B.P.P. 1865 (55) L 733

B.P.P. 1866 LXVI (519) 486

(4)

CHARTERED COMPANIES REGULATIONS(i) General Meetings

Eight to fourteen days notice in a local newspaper had to be given in advance of Annual General Meetings, and in some cases also postal letters to shareholders.¹ Voting by proxy² was normally permitted as at Glasgow³ in 1817, though it had to be through another shareholder, who could only hold a certain number of proxies. Edinburgh in 1840 allowed 3 proxies, while Dundee in 1830 and Tolcross in 1836 only allowed 2. To avoid confusion, the right of voting was denied to persons who had only recently made purchases. Edinburgh Oil Gas Company in 1824 stipulated a waiting period of 4 months, but 6 months at Paisley in 1823. For a similar reason, corporate bodies holding shares could vote only in the name of their first member to sign for the shares.⁴

(A) Quorum for General Meetings

Company	Date	Partners Present
Ardrossan	1886	Shareholders with £2,000 stock
Glasgow C. & S,	1843	10 shareholders with 200 shares
Hamilton New	1846	30 shareholders with £300 stock
Inverness	1826	Shareholders with 2/3 total stock
Kilmarnock	1855	10 shareholders with £2,000 stock
Stirling	1898	5 shareholders with £2,000 stock
Tolcross	1836	Partners with £100 stock

Source - Acts of Parliament vide supra p. 1542; also p.1846

1. e.g. Tolcross 1836 a. XLII; Hamilton 1846 a. XIX. Abbreviation vide supra p. 946

2. Shares could be represented personally or by proxy. Tolcross 1836 a. XIV; Hamilton 1846 a. X; Kilmarnock 1855 a. XXXIII; Inverness 1826 a. XVIII; Ardrossan 1886 a. XXXIV; Stirling 1898 a. ILV

3. A copy of the correct form was usually inserted in the Act.

4. e.g. Paisley 1823 a. XXXIII; Inverness 1826 a. XIX

(B) Voting Regulations at General Meetings

Company	Date	Votes Permitted	Maximum Votes per Shareholder
Glasgow	1817	1 vote per 1 share	10
Edinburgh	1818	1 vote per 2 shares	6
Glasgow	1822	1 vote per 1 share	20
Leith	1822	1 vote per 1 share	10
Paisley	1823	0 vote per 3 shares; 1 vote 4 shares; 2 votes 10 shares; 3 votes 20 shares; 4 votes 40 shares; 5 votes 80 shares.	5
Edinburgh Oil	1824	1 vote per 1 share; 2 votes 5 shares; 3 votes 10 shares.	3
Inverness	1826	1 vote per 1 share	50
Dundee Old	1830	1 vote per 1 share up to 10 shares; then 1 vote per 5 shares.	-
Tolcross	1836	1 vote per 1 share	-
Edinburgh & Leith	1840	1 vote per 1 share	-
Edinburgh	1840	1 vote per £50 stock; 2 votes £150; 3 votes £300; 4 votes £500; 5 votes £750; 6 votes £1,050; 7 votes £1,400; 8 votes £1,800; 9 votes £2,050.	10
Glasgow C. & S.	1843	1 vote per 5 shares.	20
Hamilton New	1846	1 vote per 1 share; 2 votes 2 shares; then 1 vote per 2 shares.	-
Kilmarnock	1855	1 vote per 1 share up to 20; then 1 1 vote per 3 shares.	-
Dundee Old	1867	1 vote per £20 stock up to £200; then 1 vote per £100 stock.	-
Ardrossan	1886	1 vote per 1 share up to 10 shares; then 1 vote per 5 shares up to 100 shares; then 1 vote per 10 shares.	-
Stirling	1898	1 vote per 1 share up to 10 shares; then 1 vote per 5 shares.	-

(C) Qualifications to Call Extraordinary General Meetings

Date	Company	(i) Shareholders		(ii) Directors Minimum No.	Days No- tice in Newspaper
		Minimum Number	Their minimum stockholding		
1817	Glasgow	10	100 shares	3	14
1818	Edinburgh	20	20% total	5	14
1822	Leith	-	20% total	5	14
1823	Paisley	10	1/7th total	3	14

Date	Company	(i) Shareholders Minimum Number	Their minimum stockholding	(ii) Directors Minimum No.	Days No- tice in Newspaper
1824	Edin. Oil	10	100 shares	5	10
1826	Inverness	-	100 shares	Majority	8
1830	Dundee	-	200 shares	-	7
1836	Tolcross	2	30 shares	-	-
1840	Edin./Leith	15	600 shares	-	14
1843	Glasgow C. & S.	5	50 shares	-	-
1855	Kilmarnock	5	£1,000 stock	-	-

(ii) Calls Made Upon Shares

Date	Company	Nominal Shares £	Maximum Call Each Time/ Share %	Advance Notice (days)	Minimum (months) interval between calls
1817	Glasgow	25	10	14	1
1818	Edinburgh	25	20	14	1
1822	Leith	20	20	14	1
1823	Paisley	5	20	14	1
1824	Edin. Oil	25	10	14	1
1826	Inverness	10	(£4)	14	2
1836	Tolcross	20	25	14	3
1840	Edin./Leith	25	(£7 10s)	30	1
1843	Glasgow C. & S.	10	(£2) A	30	2
1846	Hamilton New	5	(12s 6d)	-	0.5
1847	Dundee New	-	10	-	2
1847	Inverness	5	(£1 5s) B	-	2
1855	Kilmarnock	25	(£5) C	-	2
1867	Dundee Old	-	20	-	2
1874	Inverness	-	20	-	3
1877	Coatbridge	-	20 D	-	3

Note - A By mutual agreement, could pay up more rapidly (and in 1857 maximum call of 80% in one year on new shares).

B Maximum 75% call in 12 months.

C Maximum 80% call in 12 months.

D Maximum 75% call in 12 months.

(iii) Qualifications of Directors

Date	Company	No. of Directors	Qualification (No. of shares)	Quorum	Number to Retire Annually	Minimum period of Retirement (Month)
1817	Glasgow	12 8 4	4 2	5	4	0
1817	Edinburgh	12? 2 8 2	12(G;D.G.) 8(O.D.) ?(E.D.)	-	-	-
1822	Leith	-	2	5	3	12
1823	Paisley	22 1 1 10 10	20(G) 10(D.G.) 5(O.D.) 4(E.D.)	4	22	0
1824	Edin. Oil	24	10	5	5	0
1826	Inverness	13 1	10(G)	7	13	0
1830	Dundee Old	-	1	3	4	0
1836	Tolcross	4	5	3	4	0
1840	Edin./Leith	-	10	5	3	0
1840	Edinburgh	-	20(G;D.G.) 12(O.D.) 6(E.D.)	-	2	12
1843	Glasgow C. & S.	11	25	-	11	0
1846	Hamilton New	12	1	3	12	0
1846	Dundee New	5-12	30	3	-	0
1847	Inverness	13	(£50 stock)	9	13	0
1855	Kilmarnock	6-12	4	3-5	-	0
1867	Dundee Old	8-12	(£200 stock)	4-6	-	0
1877	Coatbridge	3-9	20	4-5	All	0
1888	Ardrossan	3-5	(£100 stock)	2-3	*	-
1898	Stirling	5-9	20	3-5	-	-

Notes - G - Governor Chairman; D.G. - Deputy Governor; O.D. - Ordinary Director; E.D. - Extraordinary Director
 * Elections as under the Companies Clauses Act of 1845. In many cases the total number of Directors varied. Edinburgh information of 1817 from Company Prospectus (not Act).

(iv) Contingency Funds

Company	Date	Annual Increment * % profit	Minimum Total Fund £	Directors could raise Fund to : £	Max. annual Dividend until Depleted Fund Restored %
Glasgow	1817	100	2,000	3,000	5
Edinburgh	1818	+ 10	5,000	10,000	-
Glasgow	1822	-	5,000	-	-
Leith	1822	+ 10	1,000	2,000	5
Paisley	1823	+ 10	1,500	3,000	5
Edinburgh Oil	1824	+ 10	6,000	-	5
Inverness	1826	+ 25	6,000	-	**
Dundee Old	1830	+ 5	5,000	-	-
Edinburgh	1840	***	5,000	-	-
Glasgow C.& S.	1843	+ 5	5,000	-	5

Note - * percentage annual profits to be added to fund until complete.

+ above

** restoration at 25 per cent of all annual profits.

*** annual increments at 2 per cent of total annual outlay.

Directors had to invest the Fund in Government securities or loan it out at interest upon real securities.

(v) Regulation of Pipe Trenches

To reduce public inconvenience, trenches in town streets were carefully controlled. Pipe-trenches in Glasgow¹ in 1817 could not exceed 100 feet in length, and had to be refilled within 48 hours of commencement, to the satisfaction of the Road Trustees, upon a penalty of 40s per extra day; otherwise the Trustees could refill them and charge all expenses to the Company. The company had to keep the road repaired for one year. Trenches had to be fenced, and lit all night under a penalty of £5; and from 1818 those in Edinburgh required a watchman, which became standard practice.

In Edinburgh, Leith and Paisley trenches were limited to 150 feet in length, which became the standard length. If Dundee gas company failed to provide a watchman, the Town Council could do

1. Glasgow 1817

2. eg. Edinburgh 1818 a.XV, Dundee 1830 a.XI, Hamilton 1846 a.XXIX. Several later companies had to give advance notice of pipe-laying eg. Coatbridge (1877 a.50) one month to Postmaster General if pipes near telegraph system; Ardrossan (1866 a.52), Fort William (1896 a. 16) and Mussulburgh (1887 a.26) notice to local railway companies.

so at the Company's expence. In these towns, trenches had to be refilled without delay. Dundee New Company ¹ was subject to a fine of £5 per day for delays, or the Street, Sewer or Drain Managers could do the work and charge the cost to the gas company. This also applied at Hamilton, where the fine was 40s per day. Only in the event of accidents or burst pipes could immediate street excavations be made,² and all such leaks had to be repaired within 24 hours.

From the 1830s onwards, in the light of experience, Parliament ruled that if the Town Council or Road Trustees found it necessary to alter the roads, the gas company was obliged to remove its mains pipes, or could be charged with the cost of such removal.³ Paisley company in 1823, and Edinburgh Oil Gas Company in 1824, had to place "an Iron or Stone mark" at 40 yard intervals and at all bends on pipes; the Edinburgh and Leith company in 1840 had to put markers every 100 yards. Glasgow City and Suburban Company⁴ had to provide a raised longitudinal rib and the letters C.S.G.C. on all mains pipes to identify them.

Special clauses regulated gas pipes crossing rivers. Glasgow company ⁵ could lay pipes across the Old and New Gallogate Bridges, and any bridges built later, only by giving seven days notice to the Magistrates and paying all damages. Paisley was empowered to lay pipes across the bed or bridges of the River Cart, and Edinburgh company to pipe across the Water of Leith.⁶ Edinburgh Oil Gas Company had to repair all leaks in their pipe across the bed of the Water of Leith within 24 hours, upon a penalty of £20 per day; the Leith company had the same obligation, but a penalty of only £5 per day.⁷

1. Dundee New 1846 a. XXXIII

2. eg. Paisley 1823 a. XVII, Inverness 1826 a. LV, Glasgow C. & S. a.168 (or £5 per day penalty).

3. eg. Dundee 1830 a. XIII, Hamilton 1846 a. XXXIV,

4. Glasgow C. & S. 1843 a.162

5. Glasgow 1817 a. XIV

6. Paisley 1823 a. XX, Edinburgh 1840 a. XIV

7. Edinburgh Oil 1824 XIX, Leith 1822 a.

Pipe Regulations in Chartered Gas Companies

Date	Company	A	B	C	Date	Company	A	B	C
1823	Paisley	-	6	2	1830	Dundee	4	6	3
1824	Edinburgh Oil	2	9	2	1836	Tolcross	-	9	4
1825	Glasgow	3	9	4	1840	Edinburgh	4	9	4
1826	Inverness	3	9	3	1840	Edinb/Leith	4	9	4
1829	Edinburgh	*	9	4	1846	Hamilton	4	9	4

Note -

- A minimum distance (feet) between gas and water pipes.
- B minimum length (ft) of gas pipes crossing water pipes
- C minimum distance (ft) between joints of gas and of water pipes in public streets.
- * maximum possible distance of seperation.

APPENDIX V I I I

Municipal Gasworks - A

Parliamentary Regulations; Entrepreneurship; and Financial Statistics

- (1) Finance - Borrowing Powers
- (2) Compulsory Sinking Funds
- (3) Judicial Factors
- (4) The Gas Manager as Entrepreneur in the Municipal Context -
 - (i) Greenock 1839
 - (ii) Port Glasgow 1874
 - (iii) Hamilton 1892
- (5) Scale of Output from Municipal Gasworks : 1884, 1890, 1895
- (6) Loan Capital employed by Municipal Gasworks : 1889, 1895,
1900, 1907.
- (7) Municipal Action Upon the 1876 Burghs' Gas Supply (Scotland)
Act

Appendix
VIII

MUNICIPAL GASWORKS - PARLIAMENTARY REGULATION; and
ENTREPRENEURSHIP

(1) Finance - Borrowing Powers

Date	Town	Notes	Max. Loan £*	Date	Town	Notes	Max. Loan £*
1881	Aberdeen		55,000	1840	Greenock		20,000
1893	Aberdeen		90,000	1865	Greenock		70,000
1904	Airdrie	(A)	100,000	1871	Greenock		130,000
1913	Airdrie		30,000	1882	Greenock		20,000
1871	Arbroath		20,000	1901	Greenock		100,000
1899	Arbroath		15,000	1902	Hamilton	(H)	40,000
1912	Arbroath	(B)	15,000	1875	Inverness		40,000
1886	Ardrossan	(C)	Purchase price	1879	Inverness	(I)	5,000
1901	Ardrossan	(D)	40,000	1892	Inverness	(J)	12,000
1870	Broughty Ferry		8,000	1905	Inverness	(K)	15,000
1880	Broughty Ferry		6,000	1881	Irvine	(L)	5,000
1899	Broughty Ferry		15,000	1871	Kilmarnock	(M)	50,000
1872	Dundee		60,000	1901	Kilmarnock	(N)	60,000
1877	Dundee		100,000	1912	Kilmanrock		10,000
1899	Dundee		50,000	1876	Kirkcaldy	(O)	10,000
1888	Edinburgh/ Leith	(E)	300,000	1845	Paisley	(P)	15,000
1894	Edinburgh/ Leith		100,000	1879	Paisley		45,000
1898	Edinburgh/ Leith		400,000	1899	Paisley		25,000
1900	Falkirk		80,000	1900	Paisley	(Q)	80,000
1910	Falkirk	(F)	55,000	1901	Paisley	(Q)	25,000
1871	Forfar		5,000	1902	Paisley	(Q)	30,000
1880	Forfar		4,000	1906	Paisley	(R)	45,000
1869	Glasgow		1,000,000	1910	Paisley	(Q)	85,000
1910	Glasgow		1,815,000	1871	Perth		15,000
1817	Greenock	(G)	30,000	1888	Perth		20,000
				1897	Perth		50,000
				1899	Perth		25,000
				1904	Perth		17,000

Note - * New Borrowing powers, mortgages or cash credit (not cumulative totals)

- (A) Airdrie - £61,300 purchase price, £15,000 gasholder, £5,000 working capital.
- (B) Arbroath - To finance new gasholder, and cookers to hire out.
- (C) Ardrossan - Maximum 50 years for repayment of loan.
- (D) Ardrossan - Had borrowed £39,000 under earlier Act (1886) and repaid £5383. New loan for extensions (also £60,000 for waterworks).
- (E) Edinburgh/Leith - Loan secured against revenue.
- (F) Falkirk - Falkirk admitted taking loans of £5,000 above those allowed under the previous Act (1900).
- (G) Greenock - Loan powers 1810-40 were for Water Trustees who operated the gasworks (sum stated in 1817 in cumulative total; only £10,000 new borrowing power). By 1909 total loans taken were £130,000 from 1871, £20,000 from 1882, £54,618 from 1901.
- (H) Hamilton - Corporation had earlier borrowed £40,000 to purchase the Company, as permitted under the Company's Act of 1846 which placed no limit of municipal borrowing power. Total £80,000 allowed in 1902.
- (I) Inverness - Also £15,000 for waterworks.
- (J) Inverness - New gasholder (also £10,000 for waterworks).
- (K) Inverness - Also £1,000 for waterworks.
- (L) Irvine - Loan secured against revenue.
- (M) Kilmarnock - To finance pipe extension to Kilmaurs.
- (N) Kilmarnock - Annual financial report to be made to Secretary for Scotland.
- (O) Kirkcaldy - Loans of £10,000 plus purchase price (or cash to redeem annuities).
- (P) Paisley - Gas Trust given same borrowing power as preceeding Company.
- (Q) Paisley - Borrowing Powers in 1900, 1901, 1902, 1910 secured against gasworks but used for municipal Electricity undertaking.
- (R) Paisley - Borrowing power in 1906 £45,000 for gasworks, and £50,000 for Electricity (secured against gasworks).

(2) Compulsory Sinking Funds

Date	Municipality	Years Before Fund Commenced	Annual Increment to Sinking Fund
1871	Aberdeen	2	2% total loans
1881	Aberdeen	2	Unaltered
1893	Aberdeen	-	(no sinking fund on new loans)
1904	Airdrie	-	Optional; total repayment within 35 years.
1871	Arbroath		£200
		10	£100 (additional)
1899	Arbroath	-	10/-% on new loans. Total fund to be sufficient at 3% compound interest to repay all debts within 40 years of commencement
1912	Arbroath	-	(New arrangement - Old increments cease). 1/40th total annuities (valued at 28 years' purchase) and on loans outstanding from 1871, 1899. Plus 1/40th value loans raised 1871, 1899, 1912.
1901	Ardrossan	2	Sufficient at 3% compound interest to repay all loans within 50 years of borrowing.
1873	Ayr	3	Sufficient at 4% compound interest to repay all debts and annuities within 70 years.
1870	Broughty Ferry	1	Above £100
1899	Broughty Ferry	-	(New arrangement - Old increments cease). 2% value of annuities, calculated at 22½ years purchase. 2% existing loans 3% new loans from 1899
1880	Broughty Ferry	-	Above £75 a year (additional)
1876	Campbeltown	3	Sufficient at 4% compound interest to repay all debts and

Date	Municipality	Years Before Fund Commenced	Annual Increment to Sinking Fund
			annuities within 70 years.
1873	Dumbarton	3	£100 for first 10 years; then £150 for 10 years; then £200 for 10 years; then £250 per year. Plus 1% all cash borrowed [†]
1868	Dundee	-	£1000
1872	Dundee	5	Additional £1500
1882	Dundee	Immediate	Additional £1300
		1	Additional £1250
		2	Additional £1250
1899	Dundee	-	£1/10/-% of all extra loans, provided that with 3% compound interest, all loans repaid with- in 40 years of being borrowed.
1888	Edinburgh & Leith	1	1% all loans (even if some re- paid). Plus 15s% value of ann- uities at 28½ years' purchase (even if redeemed) [†]
1898	Edinburgh & Leith	-	Payments suspended for 5 years.
1894	Falkirk	1	1% all loans, or instalments [†] giving total repayment within 50 years of borrowing.
1900	Falkirk	-	Payments suspended for 1 year.
1910	Falkirk	-	1½% on loans under Acts of 1894 and 1900, 2% on new loans. If repaid instead by instalments total repayments to be within same period as if Sinking Funds used.
1871	Forfar	3	£150 [†]

[†] Invested in government securities or chartered banks

Date	Municipality	Years Before Fund Commenced	Annual Increment to Sinking Fund
1869	Glasgow	2	Above 1% of all loans. Minimum £2000.
1871	Greenock	Immediate	1% all loans for first 5 years; then £1/10/-% for 5 years; then £2%
1909	Greenock	-	£5000 on new loans (re-borrowed).
1902	Hamilton	Immediate	Sufficient at compound interest to repay existing debts in 30 years, and new debts in 40 years (rate maintained even if some repaid).
1875	Inverness	3	Sufficient at 4% compound interest to repay total debts within 50 years. Plus 1% value of annuities at 20 years' purchase price (rate maintained even if some repaid).
1909	Inverness	-	3% value of new loans
1881	Irvine	3	Sufficient at compound interest to repay all debts and annuities within 50 years.
1871	Kilmarnock	3	1% total loans
		8	10/-% total loans (extra)
1901	Kilmarnock	-	£1/10/-% on new loans (if interest under 3% on total, including amount repaid, Corporation to make good the deficit).
1876	Kirkcaldy	3	Sufficient at 4% compound interest to repay all debts and annuities within 50 years.
1899	Paisley	-	Sufficient at 3% compound interest to repay total loans of 1845, 1870, 1879, and 1899 within 40 years.
1902	Paisley	-	New loans to be repaid within 40 years.

Date	Municipality	Years Before Fund Commenced	Annual Increment to Sinking Fund
1906	Paisley	-	New loans to be repaid within 40 years.
1910	Paisley	-	Ditto
1871	Perth	2	£500
		12	£200 (additional)
1888	Perth	2	£300 (additional)
1897	Perth	2	£500 (additional)
1899	Perth	-	£250 (additional)

(3) Judicial Factor -

Powers of Mortgagees and Annuitants to enforce payment on monies owed by Municipal Gas undertakings, by appointing a Judicial Factor.

Date	Municipal Authority	Time Payment Overdue	Number of Mortgagees & Amount Overdue	Number of Annuitants & Amount Overdue
1845	Paisley	30 days	One £500 Several £1000	One £500 Several £1000
1868	Dundee	2 months	One £200 Several £5000	One £200 Several £5000
1870	Broughty Ferry	2 months	One £100 interest One £500 principal Several £1000 principal Several £200 interest	One £100 interest Several £200 interest
1870	Paisley		One or several £100 interest One or several £1000 principal £1000	One or several £100 interest One or several £1000 principal £1000
1871	Kilmarnock		£1000	£1000
1871	Perth	3 months	One £100 interest Several £200 interest One £1500 principal Several £3000 principal	One £100 interest Several £200 interest Several £200 interest
1871	Greenock	1 month	£3000	£3000
1871	Arbroath	1 month		
1871	Forfar		One £20 interest One £500 principal Several £40 interest	One £20 interest One £500 principal Several £40 interest

Date	Municipal Authority	Time Payment Overdue	Number of Mortgages & Amount Overdue	Number of Annuitants & Amount Overdue
			Several £1000 principal	Several £1000 principal
1875	Inverness	1 month	£300 interest £3000 principal & interest	£300 interest
1876	Kirkcaldy	1 month	£1000	£1000
1876	Campbletown		£3000	£3000
1888	Edinburgh & Leith	1 year	£3000 principal	£300 annuity
1894	Falkirk		£1000	
1904	Airdrie	1 month	One £3000 Several £5000	

Note - Alternatively they could sue in court for arrears plus 5% interest, e.g. 1871 Perth a.33.

(4) The Gas Manager as Entrepreneur in the Municipal Context

The organizational and administrative importance of the Gas Manager was as great, if not more so, in municipal gasworks compared with gas companies. This was particularly evident in the cases of Greenock (1839), Port Glasgow (1874) and Hamilton (1892).

(i) GREENOCK

When A. Ritchie¹ was appointed manager in 1839 the mains leaked badly, purifiers and condensers were inadequate, and the gasholders too small. The Council management had been unable to make cheaper gas, so the price was still 11/3d, and about 40% of gas was lost by leakage.² In 1838-9 17.5 million cu ft gas was produced, and should have given a revenue of £9843, but the actual revenue was only £5996. Ritchie improved the pipes so that in 1850 when 26.25 million cu ft was produced, the estimated revenue was £8743, and the actual revenue £8477. These improvements were very largely Ritchie's personal achievement, but involved the Council in very heavy expenditure which was largely caused by their bad management before 1839.

In the absence of compulsory purchase powers, £4200 had to be spent on extra land to enlarge the gasworks. All malleable-iron service pipes were replaced by cast iron at a cost of £1500. The old street mains were so narrow that 12/10 inch pressure at the gasworks (resulting in great leakage), was reduced to 5/10 at Cathcat Square, and 3/10 at Cartsydyke. Larger mains cost £8000. On Ritchie's suggestion the Council spent £4000 on meters, which were loaned out in order to eliminate the surreptitious burning of gas. A new gasholder cost £3000, a new washer £600, and a new purifier £500.

Under the Contract system, one kitchen burner cost 22/9d a year in advance. Ritchie enable these lights to burn gas for twice the length of time by meter, for the same price. He developed the first markets³ for the gaswork's ammoniacal liquor, and sold

1. Letter to Editor, Greenock Advertiser 9/4/1847 p.3

Note - the original engineer and manager at Greenock was Mr Lowry vide Greenock Advertiser 30/6/1829 p.3

2. J.G.L. 10/5/1851

3. "Report by the Manager of Greenock Gas Works" Greenock Advertiser 16/4/1847

coke to the poor as fuel, two markets which gave an annual revenue of £300 by 1846. The problem of bad debts was also tackled. In 1839 only £400 was collected out of £800 overdue. Three collectors a year instead of two, and greater vigilance, reduced the bad debts to £10 in 1850, although the number of consumers rose during the interval from 1500 to 4780. Average bad debts in 1836-9 were £150 or $3\frac{1}{2}\%$ of annual gross revenue (£4300), but by 1840-6 the average was £37 or 0.63% of £5756 revenue. The quality of gas was improved, from 48-60 minute duration (Jet Photometer) to 75-85, by reducing the large amount of splint coal previously used. Profits rose considerably under Ritchie's management, although gas price was reduced from 6/3d to 5/10d and large discounts allowed. He encourage the use of gas by the working classes, and claimed success in raising the number of small consumers, as shown in the following tables.

Consumers in Various Categories of Annual Consumption

	Under 5s	5-10s	10-15s	15-20s	20-40s	Above 40s
1846	81	472	561	479	-	-
1850	524	1000		1250	880	818

Profit/Loss Accounts

	1836-9	1843-6
Total Profit (£)	4372	7400
Extensions of Plant (£)	838	4515
Gas Output (thou. cu ft)	60493	65904
Gross Revenue (£)	19570	26060
Leakage (per 1000 cu ft)	4s 9d	1s 5d
Gas Price (1000 cu ft)	11s 3d	9s 4d

Improvements After 1839

Date	Profit £	Extensions £	Date	Profit £	Extensions £
1836	1381	339	1843	1900	562
1837	562	165	1844	2000	1026
1838	865	203	1845	1900	1306
1839	1563	131	1846	1600	1621

(ii) PORT GLASGOW

When Mr Carlow¹ became manager at Port Glasgow in 1874, the works were in a badly dilapidated condition, and supply was so poor that the council considered purchasing gas instead from Greenock. The eleven retorts made up to 110,000 cu ft per day, yet the gasholders could only contain 45,000 cu ft; to meet demands, half of the retorts were "hung" from 11 p.m. to 5 a.m., and then again until the afternoon - a wasteful practice of leaving coal in at low distillation temperatures until demand increased; very low gas output per ton was obtained. At 10 p.m., mains gas-pressure was reduced as low as possible in order to keep some gas in the holders - consumers obtained hardly any light. If too much coal was used in the retorts, or sunshine caused the gas in the holders (30,000 cu ft, 9,000 cu ft, and 6,000 cu ft) to expand, the surplus gas had to be wasted by allowing it to blow out of the water in the gasholder tank, or through plugs in the purifiers, a highly dangerous practice.

Most other aspects of technology had been similarly neglected. The station meter was defective and inaccurate. Inadequate coal storage led to the use of wet coal direct from railway waggons. The gas was not cooled by an inadequate condenser (a chest 9 feet long and 2 feet wide with two rows, each of 8 pipes 16.8 inches dia.) It passed through an "old-fashioned washer" which merely increased back-pressure, and then to purifiers (4 boxes, 6 feet square and 4 feet deep with 4 layers of sieves) which acted more as condensers and a tar-sump. Despite heavy expenditure on lime (£50 lime for 13 million cu ft output), and a full-time labourer (plus a part-time evening labourer) to charge two purifiers daily, a cement formed which created 12 inches back-pressure and occasionally blew out the lutes. The gas contained so much hydrogen sulphide that large factories in Port Glasgow sometimes had to suspend work temporarily.

Under Carlow's direction the entire works was renovated by 1879, sales increased, and the undertaking was saved from dissolution. In 1874-5 a new double-bench of 24 retorts was installed

1. Mr Carlow "Disadvantages of Manufacturing and Supplying Gas with Deficient Plant" (West of Scotland Association of Gas Managers) Journal of Artificial Light, 18/10/1879 p.51

which produced 6,500 cu ft each per day (from 50% shale, 50% splint). Gas holder capacity was increased to 160,000 cu ft; the station meter repaired; coal stores built to hold 1,000 tons. A large new condenser (2 rows of 20 pipes each 12 inches dia.) efficiently cooled gas from 90°F to 47°F; the washer was replaced by two large scrubbers (16 ft high, 7 ft square; three rows of perforated iron-plates covered with leather) with water pumped by a new exhaustor engine (£110) which increased by-product revenue from £63 in 1873 to £300 in 1877. Consequently, the new purifiers (3, each 14 ft square holding 6½ tons lime in 6 inch layers on 4 rows of sieves) required the labour of only one man every two weeks to clean one out; the lime cost only £96 to purify 19 million cu ft gas. The new prosperity of Port Glasgow gasworks was very largely achieved by Carlow's initiative, with the consent of his superiors.

(iii) HAMILTON

Hamilton gasworks were in technologically outmoded in 1892 when William Ewing¹ became manager. 57 retorts were heated by direct-fire; mains pipes were in disrepair and leaked 22.5%; the overall layout of equipment was congested.

During 1893 most of the ovens were converted to regenerative-firing, which allowed the number of retorts in each oven to be increased (from 3 to 5, and 4 to 6). With 82 retorts the output capacity rose from 330,000 to 750,000 cu ft per day. This proved so successful that in 1896 he installed a double bench with 14 settings, each of 8 retorts, with a regenerative system copied from that installed at Dysart by A. MacPherson of Kirkcaldy.

Although the municipal gas committee had always to agree upon capital expenditure for these improvements, in all three cases gas managers were the innovators who analysed the situation, decided upon suitable action, and galvanized the municipal management in to making an appropriate investment.

1. W.Ewing "Retort Settings and the Practical Results Obtained"
N.B.A.G.M. 1898

(5)

MUNICIPAL GASWORKS - SCALE OF OUTPUT

Town	1884		1890		1895	
	Tons Coal	Thou. cu. ft. Gas	Tons Coal	Thou. cu. ft. Gas	Tons Coal	Thou. cu. ft. Gas
Aberdeen	27,000	286,770	31,618	327,154	40,150	408,421
Alloa	2,390	22,831	3,200	29,856	-	44,276
Alva	-	-	870	8,374	960	9,100
Arbroath	3,905	41,630	4,293	43,703	4,628	46,306
Ardrossan	-	-	1,123	10,405	-	-
Broughty Ferry	2,379	23,056	2,335	25,776	3,172	29,930
Burntisland	950	8,790	1,200	12,000	1,100	10,000
Campbeltown	-	-	1,422	13,637	1,854	17,384
Darvel	280	2,700	350	3,500	600	5,001
Denny	-	-	800	7,815	1,050	10,387
Dumbarton	3,164	29,750	4,000	40,000	4,500	46,500
Dunbar	-	-	596	5,333	700	6,029
Dundee	33,339	370,558	35,861	385,209	45,369	475,832
Dumfries	3,798	38,662	5,079	51,314	5,964 } oil (100) }	62,159
Dunoon	-	-	-	-	1,780	16,000
Edinburgh/Leith	-	-	84,174	828,220	135,219	1,401,880
Elgin	1,284	14,337	1,600	16,000	1,900	19,000
Falkirk	-	-	-	-	8,000	67,000
Forfar	2,300	22,500	2,500	25,000	3,000	28,000
Glasgow	243,850	2,324,000	298,645	2,905,796	463,887	4,273,274
Gourock	900	8,250	1,000	9,245	1,700	15,500
Greenock	19,600	191,100	19,000	189,306	22,884	225,000
Hamilton	4,434	38,165	5,486	48,983	7,772	80,623
Invergordan	180	1,200	-	-	-	-
Inverness	3,088	30,880	4,400	44,000	5,000	50,000
Johnstone	-	-	2,181	19,303	3,150	25,778
Kilmarnock	5,046	49,109	6,700	63,000	10,000	84,000
Kilsyth	-	-	623	5,000	998	8,373
Kirkcudbright	-	-	-	-	341	2,600
Kirkintilloch	2,061	18,353	2,371	22,624	2,881	25,782
Lockerbie	-	-	-	-	332	2,377
North Berwick	-	-	-	-	920	8,500
Paisley	18,500	180,000	23,421	221,308	29,221	279,400
Peebles	860	8,000	1,052	9,804	1,078	10,867
Perth	6,429	65,084	7,560	79,681	8,919 } oil (295) }	96,567
Peterhead	1,252	12,120	1,414	14,418	1,730	17,096
Port Glasgow	2,500	23,293	2,400	22,500	2,928	26,159
Portsoy	-	-	-	-	140	1,000
Renfrew	950	8,000	-	10,554	1,350	12,054
Rothesay	2,200	21,000	3,200	28,068	4,200	35,000
Troon	-	-	435	3,225	700	6,272
Wishaw	-	-	-	15,004	1,900	23,250

(6)

MUNICIPAL GASWORKS - LOAN CAPITAL

Town	Date Municipal	Loans 1889 £	Loans 1895 £	1900		1907	
				Total inc. repd. £	Repaid £	Total inc. repd. £	Repaid £
Aberdeen	1871	69,136 *	133,600	126,109*	43,751	169,765*	88,430
Airdrie	1904	-	-	-	-	64,998	-
Alloa	1878	20,575	21,875	55,627	31,352	60,499	24,143
Alva	1876	8,400	7,600	10,600	3,570	20,100	4,278
Arbroath	1871	46,850	46,850	60,850	12,994	60,850	12,994
Ardrossan	1886	-	-	12,258	2,390	31,900	3,350
Broughty Ferry	1870	24,035	23,164	35,287	17,883	43,743	12,568
Burntisland	1879	9,397	9,397	11,754	4,326	13,205	6,125
Campbeltown	1876	8,600	8,600	10,780	1,057	14,179	-
Darvel	1876	-	3,500	3,149	-	4,568	618
Denny	1885	6,000	6,000	6,835	1,282	11,773	2,778
Dunbarton	1873	23,070	-	-	-	26,124	14,073
Dunfries	1876	26,194	53,235	50,000	18,750	58,700	28,766
Dunbar	1886	-	7,000	7,400	1,980	9,900	3,797
Dundee	1868	169,265*	246,265	408,904	179,128	608,850	237,302
Dunfermline	1896	-	57,357	99,970	4,816	102,482	24,480
Dunoon	1895	-	10,000	34,000	-	36,500	4,250
Edinburgh/Leith	1888	-	1,103,698	1,367,698	122,997	2,117,665	52,417
Elgin	1880	14,000	23,400	19,000	6,000	21,000	12,500
Falkirk	1894	-	77,050	-	-	165,990	19,472
Forfar	1871	21,000	21,000	21,387	7,043	24,187	9,465
Glasgow	1869	80,472*	1,385,100	1,181,500	-	2,040,464	-
Gourock	1884	8,600	11,250	17,690	2,041	25,600	5,250
Greenock	1830	130,000	150,000	150,000	83,838	81,409	5,000
Hamilton	1868	22,100	22,100	72,895	37,345	46,750	-
Helensburgh	1899	-	15,000	35,000	-	41,000	4,583
Invergordon	1877	-	1,500	-	-	850	175
Inverness	1875	38,000	38,000	54,900	7,176	55,720	6,570
Johnstone	1876	21,685	24,000	33,300	12,179	35,927	9,413
Kilmarnock	1871	33,025	-	45,310	23,625	58,184	28,473
Kilsyth	1876	-	3,200	6,400	700	8,650	2,061
Kirkcudbright	-	-	5,000	5,600	1,792	6,608	2,871
Kirkintilloch	1876	19,000	19,000	23,000	10,650	30,000	23,100
Lockerbie	1891	-	5,400	6,000	890	7,500	2,651
Millport	1896	-	3,500	5,800	145	6,000	875
North Berwick	1893	-	-	5,800	463	23,850	1,803
Paisley	1870	102,001	134,032	146,557	68,858	163,379	58,374

MUNICIPAL GASWORKS - Loan Capital continued

Town	Date Municipal	Loans	Loans	1900		1907	
		1889	1895	Total inc.repd.	Repaid	Total inc. repd.	Repaid
		£	£	£	£	£	£
Peebles	-	-	5,800	-	-	16,940	1,066
Perth	1871	60,000	75,000	202,813	-	285,373	86,191
Peterhead	1878	15,280	15,000	22,500	9,099	29,790	12,001
Port Glasgow	1830	19,438	17,100	17,500	-	17,375	7,488
Portsoy	1876	-	-	1,400	20	1,560	290
Rothsay	1843	-	-	-	-	24,350	4,470
Renfrew	-	4,489	5,236	9,591	-	30,506	5,720
Tain	1891	-	-	4,300	660	4,300	1,430
Troon	-	-	1,000	1,000	-	17,500	-
Wishaw	1881	11,500	15,000	21,000	7,812	39,150	12,687

Note - Statistics are not available on Irvine (municipal in 1881), Kirkcaldy (1876), Newmilns (1901), Monifieth (1905) or Newport (Fife, 1907). West Linton gasworks, run by a village committee from 1902 (acetylene-gas) had £250 loans in 1907, when Old Meldrum municipal works had £700, and Grangemouth had £ 23,500 loans.

Source - C.W.Hastings Gas Works and Water Companies Directory and Gas and Electric Lighting Companies Directory and Statistics

ANALYSIS

Date	Number of Undertakings Recorded-		Sum Total Capital -			
	Municipal	Companies	Municipal		Companies	
			Loans inc.repd.£	Repaid £	Stock + Loans £	Loans Only £
1889	27	171	993,131	-	871,838	59,280
1895	39	167	3,810,978	-	777,672	18,497
1900	41	169	4,411,464	728,102	909,634	32,553
1907	50	142	6,795,163	844,348	917,361	47,300

Note - inc.repd. - Loan including amounts repaid since time of borrowing.
* - excluding annuities

(7)

Municipal Action Upon the 1876 Burghs' Gas Supply (Scotland) Act

Date in <u>J.G.L.</u>	Town	Action	Notes
11/7/1876	Brechin	B	
3/10/1876	Dumfries	A	1
7/11/1876	Johnstone	A	2
10/7/1877	Alloa	A	3
31/7/1877	Elgin	A	
11/8/1877	Banff	C	
14/8/1877	Wishaw	A	4
11/9/1877	Burntisland	A	
4/12/1877	Peterhead	A	
3/9/1878	Kirkintilloch	A	5
8/10/1878	Lockerbie	B	
20/11/1883	Motherwell	B	
11/12/1883	Castle Douglas	B	
4/9/1884	Kirkcudbright	A	6
7/10/1884	Largs	B	
25/11/1884	Gourock	A	7
20/4/1885	Dunbar	B	
21/7/1885	Denny/Dunniplace	A	
8/9/1885	Leith	B	
24/11/1885	Grangemouth	B	
22/12/1885	Moffat	A	
29/12/1885	Stranraer	B	

Notes - Action: A - decision in favour of Municipal takeover of gasworks; B - under active consideration; C - considered but rejected.

Arbitrators of gasworks' price: (1) B.M.McCrae of Dundee, for Council, and S.Stewart of Greenock for Company (J.G.L. 11/12/1877); (2) Mr Brodie of Paisley for Police, W.Foulis of Glasgow for Company (J.G.L. 11/12/1877); (3) W.Foulis of Glasgow for Council, W.P.Wilson of London for Company; (4) B.M.McCrae of Dundee for Council & G.R.Hislop of Paisley for Company (J.G.L. 11/12/1877); W.Foulis of Glasgow for Council & W.P.Wilson for Company; (6) J.Hepworth of Carlisle for Council & S.Stewart of Greenock for Company (J.G.L. 31/3/1885); (7) W.R.Copland of Glasgow & J.McGilchrist of Dumbarton (J.G.L. 22/9/1885)

APPENDIX I X

Municipal Gasworks - B

Financial Statistics at Sample of Individual Municipal Gasworks

- (1) Dundee 1872 - 1881
- (2) Edinburgh and Leith Gas Commissioners -
- (i) Capital Account 1889 - 1913
 - (ii) Profit/Loss Accounts 1889 - 1913
 - (iii) Gas Production 1870 - 1890
 - (iv) Productivity - Working Costs compared with
Output 1870 -99
 - (v) Working Costs 1870 - 1899
 - (vi) Coal Consumption 1870 - 1913
 - (vii) Items of Working Costs
- (3) Glasgow -
- (i) Revenue and Expenditure 1870 - 1885
 - (ii) Loans and Annuities 1870 - 1885
 - (iii) Revenue and Expenditure 1904 - 1914
 - (iv) Capital and Profits 1870 - 1900
 - (v) Depreciation Allowed up to 1900
 - (vi) Dawsholm Gasworks - A Test of Municipal Efficiency
 - (vii) Overall Efficiency Compared with Other Gas
Undertakings of Similar Size (1891)
 - (viii) Public Lighting as a Market for Gas
 - (ix) Growing Complexity of Gas-Price Zones :
1905, 1910, 1914
- (4) Greenock -
- (i) Revenue 1829 - 1850
 - (ii) Gas Revenue and Varieties of Consumers 1829 -50
 - (iii) Expenditure 1829 - 1850
 - (iv) Capital and Profit/Loss Accounts 1837 - 1850
 - (v) Profit/Loss Accounts 1865-8
 - (vi) Continued Expansion 1871 - 1913
- (5) Hamilton -
- (i) Profit/Loss Accounts 1894 - 1914
 - (ii) Varieties of Consumers 1894 - 1914
 - (iii) Coal Costs and Prices 1894 - 1914
- (6) Kilmarnock -
- (i) Raw Materials Expenditure and Gas Output
1861 - 1874
- (7) Paisley -
- (i) Capital and Profit/Loss Accounts 1825 - 1843
 - (ii) Funds and Loans 1825 - 1843
 - (iii) Capital Account 1851 - 1900
 - (iv) Revenue 1860 - 1900
 - (v) Expenditure 1860 - 1900

(1)

DUNDEE MUNICIPAL GASWORKS 1872 to 1881

Date 1872	Gas Price		Consumption Thou. cu.ft.	Revenue				Total £	Surplus- (or Def. deficit)
	s	d		Gas £	Meter Rent £	Coke £	Other By-Products £		
1872	4	2	234,224	37,553	1945	1153	3220	43,873	547
1873	4	2	252,294	40,298	2058	1633	2959	46,950	Def.3348
1874	6	0	265,995	61,423	2147	1862	2430	67,864	651
1875	5	8	268,946	58,982	2220	797	2763	64,763	Def.2065
1876	5	0	285,313	54,999	2266	1337	2985	61,588	2488
1877	4	5	292,605	51,023	2339	679	3338	57,380	Def.1527
1878	4	2	316,055	52,470	2388	1441	4314	60,625	1167
1879	3	11	322,808	50,737	2416	888	3943	57,985	Def.296
1880	3	8	340,490	50,179	2408	1034	4137	57,759	Def.1070
1881	3	8	349,335	50,569	2434	1326	4280	58,609	Def.2629

Expenditure

Date	Coal £	Purifying A £	C £	D £	E £	F £	G £	H £	I £	Total £	
1872	22,265	995	246	535	1070	579	585	941	173	1752	43,325
1873	29,305	1231	116	216	533	1006	338	305	262	1968	50,299
1874	44,902	1461	146	225	398	1023	286	541	221	2056	67,212
1875	43,248	1125	317	361	555	1527	388	516	259	2143	66,828
1876	35,816	1078	229	440	488	923	367	805	192	2243	59,099
1877	31,477	897	290	475	647	1122	361	583	306	2284	55,853
1878	33,738	1251	218	470	694	1285	284	666	187	2517	59,447
1879	31,172	683	287	594	707	1154	531	710	329	2529	58,282
1880	31,867	692	355	535	1050	1408	671	665	315	2543	58,830
1881	32,561	996	640	587	913	1726	756	799	323	2563	61,238

Key - A purifying material; B repair of mains pipes;
 C repair of service pipes; D repair of meters;
 E retorts and settings; F repair of buildings;
 G gas apparatus; H refuse removal;
 I salaries and labour.

Note - Large increase in coal expenditure in 1874-5, partly offset by reduced outlay on pipe and building repairs. Heavy deficit in 1873 revenue, and recurring smaller trading losses.

Source - J. G. L. 3 / 1 / 1882

See also - J.G.L. 1/2/1876

Gas World 4/7/1885, 11/7/1885, 18/7/1885

A.Yuill "The History of Dundee Gas Supply" British Association Handbook - Dundee (1912) pp.170-4

EDINBURGH AND LEITH GAS COMMISSIONERS - CAPITAL ACCOUNT 1889 - 1913

Date	Total Expended on Works	Annuities	Loans	Redeemed through Sinking Fund -	
				(1) Annuities	(2) Loans
	£	£	£	£	£
1889	462,304	350,000	103,699	-	-
1890	470,115	350,000	104,699	-	-
1891	476,001	350,000	104,699	-	-
1892	491,421	350,000	134,699	-	-
1893	497,450	347,941	134,699	2,059	-
1894	502,126	347,941	134,699	2,059	-
1895	507,269	347,941	130,399	2,059	4,300
1896	531,746	347,581	130,399	2,419	4,300
1897	549,533	347,179	180,399	2,821	4,300
1898	593,508	363,415	220,399	6,585	4,300
1899	767,619	359,886	362,129	10,114	12,570
1900	847,061	356,147	378,702	13,854	16,320
1901	987,063	352,870	617,252	17,130	20,770
1902	1,206,671	351,210	775,271	18,790	20,770
1903	1,290,301	348,665	883,728	21,335	20,770
1904	1,355,208	347,550	952,089	22,450	20,770
1905	1,434,184	346,341	937,784	23,659	20,770
1906	1,533,620	345,580	1,106,187	24,420	20,770
1907	1,612,959	344,519	1,191,811	25,481	52,417
1908	1,616,185	341,934	1,183,375	28,066	79,873
1909	1,621,872	341,893	1,210,411	28,107	79,873
1910	2,244,528	914,851	1,176,378	78,149	104,873
1911	1,807,954	894,567	1,099,195	98,433	134,873
1912	1,810,135	874,681	1,047,468	118,319	166,773
1913	1,822,936	859,916	1,000,861	133,084	215,373

Note - Capital expended to 1889 included £350,000 as the nominal value of Annuities (£34,000 per annum) granted to shareholders in the Edinburgh and the Edinburgh & Leith Gas Companies. Capital expended in 1898 included £20,000 nominal value of Annuities to shareholders in Portobello Gas Company (£ 1,200 per annum) .

From 1909 the Annuities were stated at their redemption value (£993,000) instead of their nominal value (£370,000) previously used. Redemption at 28 1/2 years purchase price was permitted from 1908.

Source - S.R.O. (G.B.# / 29 / 25) Edinburgh and Leith Gas Commissioners' Minutes

EDINBURGH AND LEITH GAS COMMISSIONERS - PROFIT/LOSS ACCOUNTS 1889-1913

Date	Gross Revenue £	Manufacture costs £	Pensions £	Debt Charges			Extra Expenses £	Surplus (+) or Deficit (-) £
				A £	B £	C £		
1889	195,324	123,354	1533	26,501	3,789	-	1,081	+ 39,066
1890	219,254	159,255	2039	34,000	4,490	8304	27,000	- 15,835
1891	259,955	210,840	1973	34,000	5,157	8314	-	- 347
1892	292,912	216,949	1474	34,000	5,096	8314	-	+ 27,078
1893	260,310	209,784	842	33,900	4,624	15831	7050	- 11,722
1894	248,264	180,072	790	33,800	5,190	8772	-	+ 19,641
1895	245,732	184,938	751	33,800	4,398	17413	3249	+ 1,184
1896	232,326	192,760	762	33,783	4,562	8886	3504	- 11,930
1897	243,330	202,032	727	34,346	5,874	8916	5077	- 13,641
1898	247,047	191,039	1013	34,703	7,021	9650	524	+ 3,097
1899	266,755	207,711	798	34,354	10,271	13054	6000	- 5434
1900	297,225	226,849	918	33,910	12,761	11291	954	+ 10,543
1901	323,400	280,168	1076	33,689	17,923	15431	-	- 24,886
1902	327,556	255,871	998	33,458	23,680	12782	-	+ 767
1903	329,052	245,529	1037	33,195	28,521	17468	-	+ 3,302
1904	315,880	234,675	1734	33,105	31,070	18591	5021	- 8,318
1905	309,724	215,930	2060	33,015	33,409	19344	432	+ 5,534
1906	307,575	214,441	1787	32,945	36,635	20308	660	+ 800
1907	325,222	221,561	1541	32,828	42,993	21403	909	+ 3,987
1908	351,063	246,471	1549	32,635	42,409	23418	3111	+ 1,435
1909	347,502	233,881	1473	32,555	41,574	23,904	5594	+ 8,520
1910	359,373	228,932	5080	32,458	41,166	42,896	28115	- 19,275
1911	338,053	217,465	4713	31,888	40,057	23,548	14633	+ 5,748
1912	335,105	211,077	4506	31,183	37,895	24,637	16746	+ 9,062
1913	364,877	242,384	4500	30,636	36,108	25,724	17397	+ 8,129

Notes - Debt Charges : A Annuities, B Interest,
C Sinking Funds

Extra Expenses : Cost of Transfer (1889)

Additions to Reserve Fund (1890, 1904 - 13)

Reinvestment of revenue - e.g. mains pipes (1893),
new workshops at New Street (1895), alterations to New Street works
(1896 - 7), purchase of carburetted water-gas plant (1899).

Sinking and Reserve Funds in 1910 charged to revenue account of that year
instead of out of the balance being carried forwards which was previously
done ; hence two years' contributions explain the apparent deficit of
£19,275 in 1910.

Source - S.R.O. (G.B.1 / 29 / 25) Edinburgh and Leith Gas
Commissioners' Minutes

(2.iii) EDINBURGH AND LEITH GASWORKS 1870 - 90

Date	<u>Output</u>		<u>Edinburgh</u>		<u>Leith</u>		Gas Price (s/d)	Combined Total Output
	Output (Thou. Cu. Ft.)	% Leakage	Candlepower	Output	% Leakage	Candlepower		
1870	389,642	10.31	28.7	221,079	19	31.4	4/6	610,121
1871	420,458	12.9	29.8	237,696	21.6	31	4/6	658,154
1872	428,800	11.29	30	236,387	17.2	29.3	4/2	665,187
1873	444,902	11.81	28.8	244,233	16.2	27	4/2 & 5/5	689,135
1874	467,111	11.89	27.1	251,886	14.9	28.4	5/5 & 6/0	718,997
1875	477,471	12.15	26.3	255,879	17.9	30.3	5/8	733,350
1876	492,790	10.31	26.1	257,809	16.9	30.3	4/10	750,590
1877	532,053	13.05	26.9	265,241	14.7	27.1	4/7	797,294
1878	539,213	10.64	26.2	269,998	14	28.4	4/4	809,211
1879	562,233	11.05	25.8	280,093	13.9	27.8	4/2	842,326
1880	574,593	10.87	25.5	277,292	12	27.2	4/2	851,885
1881	622,428	10.85	25.4	288,873	11.6	28	3/10	911,301
1882	645,762	9.83	27.9	311,184	11.9	27.3	3/10	956,946
1883	662,496	9.60	28.4	319,261	10.6	27.3	3/10	981,757
1884	693,923	10.08	29.1	330,189	10.3	26.9	3/8	1,026,112
1885	745,395	9.82	28.6	344,092	9	26.6	3/8	1,089,487
1886	804,430	11.82	28.4	366,252	9.3	26.7	3/8	1,170,682
1887	838,450	12.65	28.8	383,191	8.7	27.1	3/6	1,221,641
1888	839,362	10.22	28.6	389,005	7.6	27.7	3/6	1,228,367
1889*	756,837	-	28.1	349,866	-	27	3/6	1,106,723
1890	847,723	-	27.8	425,622	-	27.8	3/6	1,273,345
1891	973,833	-	25.5	399,924	-	26.1	3/9	1,373,157
1892	997,114	-	26.1	367,435	-	26.7	4/6	1,364,549
1893	920,371	-	25.7	439,254	-	25.5	4/6	1,359,625
1894	936,951	10.23	24.9	457,498	6	24.8	3/10	1,394,449
1895	1,001,817	8.97	25.7	487,492	5.4	24.9	3/6	1,489,309
1896	1,037,069	10.28	25.7	517,368	4.6	24.9	3/2	1,554,437
1897	1,097,015	10.13	25.2	544,932	6.1	25.3	3/-	1,664,147
1898	1,102,892	10.47	25.7	562,323	5.4	25	3/-	1,708,551
1899	1,151,726	8.71	25.6	594,891	5.8	25.1	3/-	1,784,699

Note - * Statistics in 1888 - 9 are August to May, instead of the full 12 months normally used.
Both companies charged the same price for gas, until purchased by Edinburgh and Leith Gas Commissioners in 1888 - 9.

** From 1896 - 7 the figures include Portobello gasworks.

Source - Tables 1 - 5 are taken from S.R.O. Edinburgh and Leith Gas Commissioners Minutes.

(2.1v)

ANALYSIS OF ANNUAL WORKING COSTS AT EDINBURGH AND LEITH COMPARED TO GAS OUTPUT:-PRODUCTIVITY (OLD PENCE) PER 1000 CU. FT.

Date	(Less By) (Product) Coal (Revenue)		Manufacture		Works Maintenance & C.		Pipes/Meters Maintenance & C.	
	Edinburgh	Leith	Edn.	Leith	Edn.	Leith	Edn.	Leith
1870	16.89	15.13	8.51	5.43	3.52	1.06	4.94	1.13
1871	17.08	14.98	7.6	5.5	2.58	0.82	2.76	1.25
1872	16.24	14.8	7.96	5.74	1.96	0.55	2.73	1.15
1873	22.69	19.34	11.7	6.9	2.62	0.86	3.48	1.37
1874	25.64	24.99	11.51	7.91	2.23	0.8	4.21	1.19
1875	25.92	25.57	10.63	7.76	2.61	1.18	4.56	1.22
1876	20.61	22.45	10.19	7.59	2.2	0.91	4.27	1.67
1877	20.00	17.68	9.43	7.49	1.61	1.01	4.25	1.31
1878	18.73	17.47	9.54	7.43	1.57	0.86	4.82	1.53
1879	17.78	17.29	9.05	6.27	1.95	1.02	4.40	1.51
1880	15.92	14.39	8.89	5.97	2.22	1.8	4.77	1.28
1881	14.61	15.14	8.42	5.96	1.55	1.57	4.85	2.39
1882	13.13	15.29	7.78	6.14	1.93	1.36	4.85	2.31
1883	13.03	14.13	8.08	6.26	3.02	1.4	4.83	1.91
1884	11.59	12.01	7.66	6.22	3.32	1.67	4.81	1.75
1885	12.32	11.23	7.77	6.97	2.9	1.59	4.85	1.30
1886	14.59	12.6	7.83	6.69	2.09	1.36	3.56	1.43
1887	14.19	11.35	7.70	6.28	1.8	1.21	2.85	1.32
1888	13.13	9.73	7.40	5.87	1.21	1.08	2.43	1.41
1889	11.07	9.22	6.40	6.75	1.41	1.22	1.54	1.24
1890	10.11	10.12	7.48	7.0	1.09	1.76	2.09	3.24
1891	14.87	14.03	8.07	8.16	0.94	2.25	2.41	5.22
1892	18.04	18.96	7.28	7.73	1.08	2.24	2.70	3.40
1893	17.54	16.74	7.48	7.32	1.71	1.65	2.82	3.09
1894	11.63	10.23	7.29	7.31	1.28	1.76	3.04	2.80
1895	10.12	10.96	7.03	7.14	1.04	1.91	2.28	2.19
1896	10.46	10.29	7.22	7.18	1.71	1.41	3.47	2.21
1897	10.41	9.58	6.75	7.30	2.52	2.16	3.75	2.37
1898	9.79	9.51	6.32	7.36	1.56	1.84	2.73	2.26
1899	9.05	9.49	6.35	7.56	1.90	1.63	2.56	2.91
Coal and Oil								
1904	14.92							
1905	13.73							
1906	13							
1907	12.52							
1908	14.77							
1909	14							
1910	11.02							
1911	11.31							
1912	11.22							
1913	12.25							

(2.v)

ANALYSIS OF TOTAL ANNUAL WORKING COSTS AT EDINBURGH AND LEITH

Date	Total Working Costs (£)		Prime Cost (Old Pence) Per 1000 Cu. ft. Gas			
	<u>Edinburgh</u>	<u>Leith</u>	(I) Gas Output		(II) Gas Consumed (after Leakage)	
			<u>Edinburgh</u>	<u>Leith</u>	<u>Edinburgh</u>	<u>Leith</u>
1870	54,916	20,963	33.82	22.75	37.65	23.1
1871	52,628	22,330	30.04	22.55	34.57	23.74
1872	51,651	21,907	29.90	22.24	32.66	26.67
1873	75,103	28,974	40.51	28.47	46.03	33.96
1874	84,899	36,625	43.62	34.89	49.63	42.02
1875	87,025	38,098	43.74	35.73	49.9	43.54
1876	76,575	35,044	37.29	32.62	41.68	39.26
1877	78,162	30,379	35.25	27.49	40.65	32.22
1878	77,903	30,697	34.67	27.29	38.9	31.73
1879	77,792	30,460	33.20	26.09	37.42	30.33
1880	76,187	27,087	31.82	23.44	35.82	26.64
1881	76,370	30,158	29.44	25.06	33.15	28.34
1882	74,571	32,552	27.71	25.10	30.74	28.52
1883	79,997	31,527	28.98	23.70	32.25	26.53
1884	79,428	29,779	37.39	21.65	30.65	24.2
1885	66,539	30,241	27.86	21.09	31.08	23.18
1886	94,140	33,698	29.08	22.08	32.05	24.33
1887	92,774	32,189	26.55	20.16	30.64	22.09
1888	84,609	29,332	24.19	18.09	27.14	19.63
1889	64,465	26,869	20.44	18.43	-	-
1890	73,427	39,235	20.78	22.12	-	-
1891	106,749	49,190	26.30	29.66	-	-
1892	120,910	49,502	29.10	32.33	-	-
1893	113,346	52,720	29.55	28.8	-	-
1894	90,760	42,132	23.24	22.1	25.90	23.50
1895	85,453	45,090	20.47	22.2	22.44	23.47
1896	98,799	45,473	22.86	21.09	25.66	22.10
1897	107,092	48,608	23.43	21.41	26.25	22.95
1898	93,767	49,142	20.40	20.97	22.92	22.30
1899	95,315	53,532	19.86	21.59	21.88	23.08

(2.vi)

COAL CONSUMPTION AT EDINBURGH AND LEITH GASWORKS

Date	<u>Tons of Coal per Year</u>		<u>Gas Output per Ton</u>		<u>Coal Cost (Average per Ton)</u>			
	Edinburgh	Leith	Edinburgh	Leith	Edinburgh		Leith	
					s	d	s	d
1870	42,775	21,974	9,191	10,061	16	1 5/12	15	4 3/4
1871	46,444	23,773	9,053	9,999	16	2 1/2	15	2 1/2
1872	47,916	24,140	8,949	9,762	15	7 4/12	14	9 3/4
1873	56,285	25,376	7,904	9,621	19	6	18	5 3/4
1874	50,464	26,127	9,256	9,641	24	4	22	11
1875	49,752	25,679	9,597	9,965	24	1 3/4	23	7 1/2
1876	52,565	25,860	9,375	9,969	19	10 1/4	20	11 1/4
1877	61,453	26,844	8,658	9,880	18	7 9/12	18	1 1/4
1878	57,316	27,595	9,408	9,784	19	4	17	9 3/4
1879	60,258	28,089	9,334	9,972	18	6	17	10
1880	64,106	27,668	8,963	10,022	16	7 5/12	15	5 3/4
1881	65,893	27,739	9,446	10,414	16	3 1/4	16	9 3/4
1882	62,703	29,712	10,298	10,473	15	3 4/12	17	5
1883	65,630	31,184	10,094	10,238	15	8 6/12	15	11
1884	70,338	31,833	9,894	10,365	15	3 4/12	15	1 3/4
1885	76,091	35,678	9,796	9,644	15	5 7/12	14	0 3/4
1886	82,292	37,396	9,775	9,794	15	3 5/12	13	10
1887	84,961	39,204	9,868	9,774	15	0 2/12	12	2 3/4
1888*	85,570	39,744	9,809	9,788	14	3 9/12	11	0 3/4
1889°	76,960	35,882	9,825	9,751	12	5.29	10	5 3/4
1890	87,139	41,045	9,728	10,369	11	6.29	11.	9.5
1891	100,640	39,868	9,676	10,032	16	4.16	15	5
1892	99,937	35,279	9,977	10,415	18	2.6	19	4.75
1893	90,217	41,818	10,201	10,504	17	2.7	16.	9.5
1894	89,757	43,223	10,556	10,584	13	10.2	12	1.87
1895	95,362	46,169	10,505	10,558	12	9.43	12.	11.57
1896	102,266	48,852	10,141	10,590	11	8.48	11	6.45
1897	108,606	51,416	10,101	10,598	11	5.38	10.	8.52
1898+	105,213	53,351	10,482	10,540	10	10.37	10	5.51
1899	109,424	56,557	10,530	10,518	10	8.85	10	11.37
1904	187,557		10,361		12	10.59		
1905	182,405		10,798		12	4.26		
1906	180,236		10,973		11	10.62		
1907	186,907		10,951		11	5.13		
1908	187,450		11,074		13	7.59		
1909	188,691		10,688		12	5.71		
1910	197,609		10,639		9	9.23		
1911	190,997		10,703		10	1.02		
1912	187,254		10,702		10	0.08		
1913	194,053		10,803		11	0.35		

* Note - From 1898 'Coal' includes oil equivalent viz. 1373 Tons oil in 1898 is shown as 7678 tons coal;
2638 Tons oil in 1899 is shown as 15,772 tons coal.

(2.vii)

ITEMS OF WORKING COSTS AT EDINBURGH AND LEITH GASWORKS (NEAREST £)

Date	<u>Coal</u>		Sum Total	<u>Manufacture and Purification (Inc. Wages)</u>	
	Edinburgh	Leith		Edinburgh	Leith
1870	34,468	16,923	30,391	13,746	5,000
1871	37,772	18,070	55,842	13,323	5,441
1872	37,401	17,881	55,282	14,223	5,653
1873	54,879	23,459	78,338	21,701	7,015
1874	62,448	29,989	92,437	22,421	8,301
1875	60,064	30,341	90,405	21,164	8,277
1876	52,143	27,064	79,207	20,923	8,158
1877	57,277	24,286	81,563	20,816	8,278
1878	55,367	24,582	79,949	21,443	8,355
1879	55,745	25,047	80,792	21,221	7,320
1880	53,259	21,401	74,660	21,301	6,897
1881	53,596	23,331	76,927	21,844	7,171
1882	49,898	25,452	75,350	20,948	7,962
1883	51,228	24,853	76,081	22,329	8,329
1884	53,664	24,120	77,784	22,216	8,554
1885	53,844	25,075	83,919	24,162	9,989
1886	62,879	25,861	88,740	26,267	10,206
1887	63,775	23,978	87,753	26,917	10,022
1888	61,244	21,994	83,238	25,888	9,508
1889*	47,875	18,809	66,684	20,228	9,848
1890	50,467	24,226	74,693	26,454	12,408
1891	82,257	30,718	112,975	32,750	13,605
1892	91,044	34,223	125,267	30,257	11,830
1893	77,711	35,097	112,808	28,715	13,402
1894	61,465	26,272	87,137	28,439	13,939
1895	60,969	29,928	90,897	29,343	14,502
1896	59,862	28,183	88,045	31,181	15,482
1897	62,167	27,535	89,702	30,862	16,573
1898	57,157	27,899	85,056	29,060	17,237
1899	58,751	30,959	89,710	30,489	18,757
1904	120,810				
1905	113,281				
1906	107,105				
1907	106,800				
1908	127,771				
1909	117,704				
1910	96,524				
1911	96,310				
1912	93,689				
1913	107,012				

(2.vii ctd.)

WORKING COSTS AT EDINBURGH AND LEITH GASWORKS (Continued)

Date	<u>Repairs/Maintenance/Renewals of Works</u>		<u>Repair/Maintenance/Renewal of All Pipes and Meters</u>	
	Edinburgh	Leith	Edinburgh	Leith
1870	5,721	982	8,023	1,042
1871	4,528	814	4,843	1,237
1872	3,510	544	4,890	1,141
1873	4,873	880	6,465	1,398
1874	4,358	844	8,201	1,251
1875	5,198	1,258	9,082	1,301
1876	4,548	974	8,778	1,796
1877	3,580	1,120	9,426	1,442
1878	3,535	966	10,830	1,720
1879	4,570	1,192	10,329	1,768
1880	5,326	2,061	11,422	1,482
1881	4,023	1,887	12,594	2,875
1882	5,211	1,767	13,077	2,999
1883	8,354	1,869	13,334	2,539
1884	9,643	2,295	13,956	2,413
1885	9,022	2,282	15,071	1,864
1886	7,008	2,068	11,960	2,190
1887	6,299	1,925	9,958	2,117
1888	4,262	1,756	8,525	2,291
1889	4,453	1,774	4,857	1,807
1890	3,883	3,118	7,409	5,754
1891	3,843	3,752	9,814	8,455
1892	4,498	3,432	11,206	5,209
1893	6,572	3,025	10,805	5,647
1894	5,005	3,352	11,879	5,339
1895	4,362	3,879	9,500	4,442
1896	7,417	3,044	14,972	4,764
1897	11,522	4,894	17,151	5,384
1898	7,169	4,311	12,533	5,295
1899	9,096	4,034	12,275	7,209

(2.viii)

EDINBURGH AND LEITH GAS COMMISSIONERS :

Leith Gasworks :

The Edinburgh and Leith Company's works were prosperous at the time of municipal acquisition. Gas sales had risen 50 % over 9 years, from 241.017 million cu.ft. in 1879 to 358.627 million cu.ft. in 1888, and leakage reduced from 13.8 to 7.6 %. The storage of 2,256,000 cu.ft was equal to 70 % maximum daily consumption. The site was crowded, but by placing purifiers on an upper floor of the former gasholder-house, floor space had been increased by 3 acres. The four retort houses held 256 Siemens regenerative retorts, and 124 non-regenerative retorts of which a maximum of 192 were required in winter. Capacity was therefore quite adequate to meet demand, when Mr Livesey, C.E. of London examined the plant, and A.Lass F.C.A. checked the accounts for the Commissioners in 1888.

Source : Gas World 8/9/1888

Output by Edinburgh/Leith Commissioners Gasworks 1904-1913 :

Date	Output (thou.cu.ft.)	Candle-Power	Average Price s d	Number of Cookers on Hire *
1904	1,943,365	24.4	2 9.9	6773
1905	1,969,647	24.2	2 9.01	6856
1906	1,977,847	24.1	2 8.96	7156
1907	2,046,973	20.8	2 8.95	7517
1908	2,075,828	20.7	2 10.83	8234
1909	2,016,742	19.9	3 0.24	8689
1910	2,102,425	17.6	2 10.4	8843
1911	2,044,182	17.1	2 8	8957
1912	2,004,083	17	2 7.3	9408
1913	2,098,346	17.1	2 7.3	14253

Note : Cookers on free loan from 1913

Source : S.R.O. Edinburgh and Leith Gas Commissioners
Minutes (G.B.1/29/25)

(3)

GLASGOW MUNICIPAL GASWORKS

(1) Revenue and Expenditure (1870-85)

(A) Revenue -

Date	Gas Price per 1,000 cu ft		Gas Revenue £	Coke Revenue £	Tar & Ammonia £	Total Revenue £
	s	d				
1870	4	7	210,736	9,557	13,972	235,701
1871	4	2	225,095	8,275	17,902	252,357
1872	4	0	238,048	9,274	21,189	269,976
1873	4	0	255,726	13,917	18,788	289,620
1874	4	7	325,105	10,798	20,702	357,702
1875	5	5	345,641	8,547	22,923	378,393
1876	4	7	326,660	9,735	27,286	364,896
1877	4	2	306,001	7,730	27,679	342,909
1878	4	0	290,816	7,114	27,907	327,430
1879	4	0	299,517	7,880	27,909	337,964
1880	3	10	295,930	7,669	35,219	341,274
1881	3	8	302,793	8,238	40,015	353,811
1882	3	8	326,399	7,100	41,986	378,133
1883	3	8	350,112	9,915	44,355	406,977
1884	3	6	353,529	13,828	48,908	418,775
1885	3	6	364,203	15,306	46,798	428,227
1886	3	3	-	-	-	-
1887	3	0	-	-	-	-
1888	2	10	-	-	-	-
1889	2	8	-	-	-	-
1890	2	6	-	-	-	-
1891	2	6	-	-	-	-

Sources - Gas World 24/10/1885J.Nicol Statistics of Glasgow (1885, Glasgow) p.119J.Nicol Statistics of Glasgow 1885-1891 (1891, Glasgow)

GLASGOW MUNICIPAL GASWORKS

(B) Expenditure -

Date	Manufacture £	Distribution & Maintenance £	Annuities & Sinking Fund £	Depreciation & Written off £	Total Expenditure £
1870	149,062	24,893	42,702*	13,908	230,565
1871	154,303	29,850	42,044*	19,573	245,770
1872	174,377	37,831	47,675	8,084	267,967
1873	221,052	35,391	55,495	3,159	315,097
1874	253,403	32,004	66,100	8,829	360,336
1875	237,227	37,976	69,066	15,944	360,213
1876	208,834	47,390	67,058	16,679	339,961
1877	195,829	46,666	66,260	16,354	325,109
1878	197,990	51,278	66,011	18,350	333,629
1879	194,444	46,953	71,329	31,066	343,792
1880	180,930	46,149	70,141	30,272	327,492
1881	193,340	49,737	73,077	50,614	366,768
1882	197,842	56,664	67,376	68,409	410,291
1883	211,796	61,795	79,935	65,035	418,561
1884	244,213	59,350	67,339	58,624	429,526
1885	231,769	60,132	64,580	54,883	411,364

Note - * includes £7,486 Parliamentary expenses

(ii) Loans and Annuities 1870-85

Date	Total Loans & Annuities £	Date	Total Loans & Annuities £	Date	Total Loans & Annuities £
1870	534,265	1876	1,042,494	1881	954,609
1871	597,600	1877	1,029,294	1882	877,009
1872	760,325	1878	1,006,257	1883	816,749
1873	874,807	1879	984,144	1884	722,209
1874	1,044,639	1880	982,339	1885	600,924
1875	1,065,494				

GLASGOW MUNICIPAL GASWORKS

(iii) Revenue and Expenditure 1904-14 (Incomplete Records)

Revenue -

Date	Gross Revenue £	Tar & Ammonia Liquor £	Tons	Coke Total £	Per Ton s d	Total By- Products per Ton Coal s d
1904	-	-	270,002	-	-	3. 9.86
1905	800,177	-	260,581	-	-	3 5.08
1906	832,171	-	274,905	-	-	3 5.06
1907	-	-	302,759	-	6 7.23	-
1908	1,006,153	14,047	315,396	118,799	8 2.13	3 7.27
1909	-	-	280,116	-	7 8.3	-
1910	879,434	16,185	305,120	101,149	7 3	3 10.72
1911	896,046	18,383	289,476	104,578	7 10.13	4 6.13
1912	924,103	26,676	298,729	118,710	8 7.8	5 2.53
1913	1,022,918	25,174	307,178	146,321	10 0.84	5 5.88
1914	1,051,970	10,512	307,934	145,493	9 7.91	-

Expenditure -

Date	Gross Expenses £	Coal Tons	Per Ton s d	Depreciation £	Annuities £	Interest on Loans £
1904	-	706,853	-	-	-	-
1905	652,606	680,235	-	36,120	23,084	60,348
1906	634,362	712,097	-	58,243	22,822	63,442
1907	-	740,492	-	-	-	-
1908	784,682	738,701	-	59,835	21,857	64,403
1909	-	-	-	-	-	-
1910	664,439	638,311	-	-	-	-
1911	683,482	675,580	-	-	-	-
1912	697,511	687,542	8 7.2	-	-	-
1913	797,799	741,838	11 8	-	-	-
1914	890,428	781,065	13 3	-	-	-

Notes - Added to Sinking Fund: 1905 £31,734; 1906 £43,275; 1908
£47,775

Added to Loans Fund: 1905 £8,261; 1906 £8,263; 1908 £8,288

Source - Glasgow City Archives Glasgow Corporation Accounts (annual)

GLASGOW MUNICIPAL GASWORKS (iv) Capital and Profits 1870-1900

Date	Capital Expenditure on Works £	Gross Revenue £	Gross Annual Expenses £	Gross Profit £	Profit as Per Centage of Stated Capital
1870	532,317	235,701	173,956	61,745	11.6
1871	600,326	252,357	184,154	68,203	11.4
1872	698,207	269,976	212,208	57,768	8.3
1873	899,210	289,621	256,443	33,178	3.7
1874	984,781	357,702	285,408	72,294	7.3
1875	1,016,593	378,393	275,203	103,190	10.2
1878	1,036,367	364,896	256,224	108,672	10.5
1877	1,044,082	342,909	242,495	100,414	9.6
1878	1,017,847	327,430	249,268	78,162	7.7
1879	1,002,327	337,964	241,397	96,567	9.6
1880	987,071	341,275	227,080	114,195	11.6
1881	937,215	353,812	243,077	110,735	11.8
1882	876,103	378,134	254,506	123,628	14.1
1883	817,920	406,977	273,591	133,386	16.3
1884	775,505	418,775	303,563	115,212	15.0
1885	722,123	428,227	291,901	136,326	18.9
1886	690,375	401,307	283,115	118,192	17.6
1887	643,255	386,246	285,461	100,785	15.7
1888	611,270	383,566	285,126	98,440	16.1
1889	605,250	392,897	284,396	108,501	17.9
1890	637,132	417,589	317,826	99,763	15.6
1891	700,475	483,577	423,795	59,782	8.5
1892	1,031,803	547,473	498,490	48,983	4.7
1893	1,135,198	594,049	464,449	129,600	11.4
1894	1,155,360	569,547	455,929	113,618	9.8
1895	1,140,427	629,362	489,911	139,451	12.2
1896	1,161,946	605,794	472,845	132,949	11.4
1897	1,239,852	607,623	505,683	101,940	8.2
1898	1,275,530	631,645	526,355	105,290	8.3
1899	1,315,610	700,149	574,967	125,182	9.5
1900	1,400,921	770,003	646,281	123,722	8.8
			Total	3,119,873	

Note - 'Capital Expenditure' was the book value after subtracting depreciation and 'realization', repayment of loans. Per centage profits are calculated here against the book value of the works.

Source - J.D.Marwick Glasgow - The Water Supply of the City with Notes on Various Developments in the City (1901, Glasgow) Appendix p.76

The capital 'book value' of Glasgow gasworks from 1870 - 1900 was far less than the market value because heavy depreciation and repaid loan-capital was subtracted from the 'book value'.

Fixed capital assets	Total Cost £	Depreciation and Realization £	Per centage of Total Cost subtracted from book- value
Dawsholm gasworks	554,774	250,863	45.2
Dalmarnock gasworks	257,709	189,677	73.6
Tradeston gasworks	335,687	146,575	43.7
Temple gasworks	221,723	49,707	22.4
Provan gasworks	71,526	-	0
Old Kilpatrick gasworks	6,852	1,728	25.2
Pollockshaws gasworks	4,313	2,187	50.7
Land at Pollockshaws	1,910	-	0
Property at Partick	20,526	18,821	91.7
Workshops (Stirling St.)	21,899	12,913	59.0
Offices (Virginia St.)	9,726	186	1.9
Dawsholm Chemical Works	20,299	13,702	67.5
Tradeston Chemical Works	14,466	3,056	21.1
Workmen's Houses (Dawsholm)	4,396	2,977	67.7
Pipes (including laying)	615,236	288,984	47.0
Gas Meters	407,373	226,534	55.6
Gas Stoves (cookers &c)	71,602	31,287	43.7
Furniture	1,712	1,072	62.6
TOTAL	2,641,190	1,240,269	47.0

Capital Expenditure shown in the Books in 1900 - £ 1,400,921

Source - J.D.Marwick Glasgow - The Water Supply of the City with

Notes on Various Developments in the City (1901, Glasgow) Appendix p,76

GLASGOW MUNICIPAL GASWORKS

(vi) Dawsholm Works -

The new Dawsholm gasworks built by Glasgow corporation in 1871-3 on a 33 acre site, was an important test of the efficiency of municipal management as it coincided with widespread support for municipal control in Scotland, but preceeded most municipal takeovers. It was expected to superceed the outdated Townshead and Partick works of the former Glasgow Gas-light Company, and successfully illustrated how a municipal authority could incorporate modern technology and design into an entirely new gasworks. Located alongside the North British Railway, a high-level branch line into the gasworks enabled coal to be tipped directly into the stores. A low-level railway removed coke, and two locomotives were purchased for the works. Some raw materials, especially lime but also coal, came by the Bowling branch of the Caledonian Canal which abutted the works. In 1873, 540 retorts were in use with 5 per oven over open fires, later increased to 6. By 1887 there were 832 retorts, set on the Siemens regenerative system of 8 in each oven, and three telescopic holders holding 3.3 million cu ft. Residuals were manufactured at an adjacent chemical works, constructed by the Corporation but leased to the West of Scotland Chemical Company.

Fresh water was available from the River Kelvin, and the gasworks was constructed in three segments each capable of operating independently. The Granton works at Edinburgh in 1902 had similar segmental design. Two of the earliest hydraulic charging and drawing machines for the retorts, by Mr Foulis, were installed and could service 30 retorts in as many minutes. Glasgow corporation maintained that "there is no important city where gas is used in private dwellings to such an extent as in Glasgow"¹, and Dawsholm became the main station in this distribution network which by 1896 comprized an area 16 miles long from Bowling in the west to Mount Vernon in the east, and 10 miles wide from Bearsden in the north west to Burnside in the south east.

1. W.W.Watson Statistics of Glasgow (1875, Glasgow)

Dawsholm Works Compared to Other Gasworks in Glasgow Municipal
Supply Zone

	Date	A	B	C	D	E	F	G	Total
Number of Retorts	1869	-	868	216	228	120	-	-	1,432
"	1872								
"	-3	540	830	216	440	120	-	-	2,146
"	1896	1,946	832	-	1,088	-	27	8	3,901
Gas Holder Capacity (Thou cu ft)	1869	-	2,000	747	1,260	411	-	-	4,418
"	1872	-	4,500	747	2,471	411	-	-	8,129
"	1896	10,978	4,260	-	8,000	-	150	25	23,413
Maximum Output per Day (Thou cu ft)	1869	-	3,405	1,391	1,348	650	-	-	6,794
"	1872								
"	-3	3,250	4,443	1,230	2,322	621	-	-	11,866
"	1896	20,320	13,984	-	13,388	-	297	130	48,119

Notes - A: Dawsholm/Temple B: Dalmarnock C: Townhead D: Tradeston
E: Partick F: Pollokshaw G: Old Kilpatrick

Sources - Gas World 11/6/1887 p.751

Glasgow City Archives Statistics of Glasgow 1873

J.Bell & J.Paton Glasgow - Its Municipal Organization and Administration (1896, Glasgow)

GLASGOW MUNICIPAL GASWORKS

(vii) Efficiency Compared to Undertakings of Similar Size (1891)

Town	Total Capital	Capital per Ton coal Carbonized per year			Capital per 1000 cu. ft. gas per year		Coal Tons carbonized per year	Gas Sold per year Thou. cu. ft.	Gas Per Ton Coal
		£	s	d	6s	9d			
A	1,065,999	2	16	2	6s	9d	379,130	3,508,633	9518
B	11,362,500	5	16	3	12	3	1954,429	19,941,066	10203
C	832,166	3	19	5	8	7	209,545	2,078,488	9919
D	2,949,351	4	12	6	9	11	637,583	6,304,947	9889
E	1,370,000	3	18	11	8	7	346,915	3,304,542	9526
F	1,629,457	5	9	11	10	10	296,493	3,193,973	10773
G	2,324,998	5	10	3	12	4	421,709	4,089,990	9699
H	1,073,698	8	10	7	18	9	128,183	1,273,165	9932
I	394,720	9	12	5	20	4	41,031	421,611	10275

	Total Number Consumers	Gas per Consumer cu.ft.	Number of Public Lamps	Gas per Public Lamp cu.ft.	Candle-power	Gas Price		Total Annual Revenue £
						s	d	
A	139,013	21,217	17,414	8,616	21.71	2	6	483,576
B	213,833	82,031	50,946	19,535	20.92 * 16.43	3	1	3397,866
						2	3	
C	21,323	85,875	5,229	21,922	16.32	2	4	337,308
D	74,385	74,581	18,292	22,088	16.50	2	3	988,838
E	79,479	-	-	-	19.26	2	6	488,424
F	63,700	43,030	17,461	15,807	21.50	2	8	509,642
G	55,122	64,841	12,186	16,221	17.21	2	4	579,872
H	61,117	17,045	11,494	6,566	26 - 28	3	6	219,253
I	31,179	11,560	4,554	6,161	26 - 27	3	6	75,415

Note -

A	Glasgow	}	London
B	Gas Light and Coke Company		
C	Commercial Gas Company		
D	South Metropolitan Gas Company		
E	Manchester		
F	Liverpool		
G	Birmingham		
H	Edinburgh		
I	Dundee		

Glasgow capital was considerably reduced by 'depreciation', and far less than that of Dundee and Edinburgh compared to gas output. Edinburgh had more capital invested yet produced only about a third as much gas as Glasgow. Glasgow served a very large number of small consumers. Glasgow charged no Meter Rent, unlike the other undertakings with the exceptions of Edinburgh and Birmingham.

* cannel gas

Source - J. Nicol Statistics of Glasgow 1885-1891 (1891, Glasgow) p.126

(viii)

Glasgow - Public Lighting as a Market for Gas

Date	Public Lamps Number	Common-Stair Private Lamps Number	Municipal Expenditure per Year £	Lamplighters Employed Number	Gas Consumed per Year Millions cu ft
1780	(oil) 9	-	-	-	0
1818	1,472	-	-	-	-
1830	1,460	-	-	-	-
1850	7,358	-	3,913	-	-
1855	-	-	8,516	-	-
1860	-	-	10,440	-	-
1865	-	-	15,610	-	-
1870	7,483	3,174	29,246	294	31,359
1875	7,873	3,136	37,301	306	103,180
1880	8,385	3,198	49,659	354	140,323
1885	8,885	3,249	46,150	394	164,978
1890	9,658	3,323	41,733	421	191,049
1896	13,062	4,262	59,986	548	249,209
1901	19,416		81,041	710	-

Notes - 266 electric street lights used in 1893, and 467 by 1901

2,500 incandescent gas-lamps used in street lights by 1901

Source - J.D.Marwick Glasgow - The Water Supply of the City and Notes on the Various Developments of the City (1901, Glasgow)

GLASGOW MUNICIPAL GASWORKS

(IX) Growing Complexity of Price Zones

	1914		1910		1905				
	Price	Thou cu ft	Price	Thou cu ft	Price	Thou cu ft			
	s	d	s	d	s	d			
(A) Glasgow City Supply District									
Lighting	1	11	4,629,560	2	1	20,077	2	1	4,983,797
"	1	10	369,764	2	0	4,768,670			
"	1	9	37,124						
"	1	8	52,251						
Gas Engines	1	11	20,724	1	9	9,163	2	0	318,438
"	1	6	220,955	1	8	334,979			
"	1	5	120,779						
Manufacturing	1	11	34,342	1	9	235			
"	1	6	222,417	1	8	225,274			
"	1	5	150,609						
"	1	4	1,050						
Contract Gas	1	11	185,025	2	0	256,858	2	1	477,169
"	1	10	7,816						
"	1	9	4,000						
"	1	8	45,285						
"	1	6	329,662						
(B) Supplementary District Outside Old Kirkpatrick									
			Milngavie Area		Milngavie				
Lighting	2	10½	8,904	3	1	37	3	1	15,855
"	2	9	279	3	0	18,682			
Gas Engines	2	10½	60	2	8	376	3	0	443
"	2	3	162						
Manufacturing	2	10½	40	2	8	839			
"	2	3	83						
Contract	2	3	455	3	0	1,716	3	1	1,297
In Old Kilpatrick									
Lighting	2	1	20,692						
Gas Engines	2	1	92						
"	1	8	538						
"	1	7	177						
Manufacturing	2	1	120						
"	1	8	167						
Contract	1	8	1,822						

(C) Prepayment Gas

City District	2 5	91,180	2 8	14,590	
Supplementary District	2 7	4,537	2 7	339,408	
Used in Gasworks		88,767		78,046	66,463
Total		7,469,437		6,374,950	5,887,934

Differential prices were a great benefit to city-centre manufacturers.

Source - Glasgow City Archives Glasgow Corporation Reports (annual)

(5)

GREENOCK MUNICIPAL GASWORKS(i) Revenue 1829-50

Date	Gas By Meter	Gas By Contract	Harbour & Town Lamps	Bad Debts	Discount	Discount on Town Lamps	Net Gas Revenue	Potential Revenue if No Waste	Annual Loss Leaks	Loss
	£	£	£	£	£	£	£	£	%	£
1829	623	819	787	25	0	309	1,894	0	-	0
1830	1,053	1,091	953	76	0	349	2,693	3,138	13.02	465
1831	1,388	1,089	1,011	109	20	360	2,999	3,681	16.36	682
1832	1,753	1,132	1,241	96	148	370	3,312	3,842	11.38	531
1833	2,003	1,065	1,146	50	169	439	3,557	4,337	15.61	781
1834	2,226	1,226	1,190	47	141	464	3,989	5,261	21.49	1,271
1835	2,511	1,188	1,181	101	277	446	4,054	5,813	26.48	1,758
1836	2,777	1,173	1,363	74	277	634	4,328	6,723	31.07	2,395
1837	2,624	1,215	1,612	66	320	857	4,209	6,388	28.55	2,180
1838	2,814	1,324	1,614	127	286	864	4,475	7,548	34.81	3,073
1839	2,991	1,383	1,624	55	273	857	4,813	8,678	39.19	3,866
1840	3,163	1,327	1,638	367	300	603	4,858	7,274	28.27	2,416
1841	3,950	302	1,600	18	395	495	4,948	5,626	10.37	678
1842	4,428	273	1,619	23	200	521	5,576	6,093	7.56	517
1843	4,300	230	1,610	65	265	515	5,295	5,959	9.74	663
1844	4,931	156	1,787	26	546	630	5,672	5,986	4.36	314
1845	5,472	140	1,659	23	598	465	6,185	6,481	3.91	296
1846	6,951	66	1,515	46	876	349	7,261	7,650	4.35	386
1847	7,755	69	1,521	31	975	430	7,939	8,484	5.51	545
1848	7,302	69	1,373	58	516	178	7,992	8,445	4.92	453
1849	6,746	130	1,240	57	350	78	7,641	7,822	2.16	180
1850	7,008	155	1,315	35	372	117	7,953	8,228	3.13	275

Source - J.G.L. 10/5/1851

GREENOCK MUNICIPAL GASWORKS(i) Gas Revenue and Varieties of Consumers 1829-50

Date	Price Gas/ 1000 cu ft		Average Discounts/ 1000 cu ft		Gross Revenue/ 1000 cu ft ex- cluding Public Lamps			Lost Gas (/1000 cu ft)		Number Meter	Consumers Contract	Gross Return/ 1000 cu ft in- cluding Public Lamps		
	s	d	s	d	s	d	s	d	s			d	s	d
1829	12	6	-		9	0	-			89	433	10	11	
1830	12	6	-		7	6 $\frac{1}{2}$	1	7 $\frac{1}{2}$		157	547	10	10 $\frac{1}{2}$	
1831	11	3	0	2	6	8 $\frac{1}{2}$	1	10 $\frac{1}{4}$		209	577	9	4 $\frac{1}{2}$	
1832	11	3	0	8 $\frac{1}{2}$	6	1 $\frac{1}{2}$	1	3 $\frac{1}{2}$		278	618	9	11 $\frac{1}{2}$	
1833	11	3	0	9	6	10 $\frac{1}{2}$	1	9 $\frac{1}{4}$		301	629	9	5 $\frac{1}{2}$	
1834	11	3	0	6 $\frac{1}{2}$	6	6 $\frac{1}{2}$	2	5 $\frac{1}{2}$		328	700	8	1 $\frac{1}{2}$	
1835	11	3	1	1 $\frac{1}{2}$	6	3	3	0		369	751	8	3	
1836	11	3	0	11 $\frac{1}{4}$	5	9	3	6		416	819	7	9	
1837	11	3	1	2 $\frac{1}{4}$	5	7 $\frac{1}{2}$	3	2 $\frac{3}{4}$		436	845	8	0 $\frac{1}{4}$	
1838	11	3	0	11 $\frac{1}{2}$	5	3 $\frac{1}{4}$	3	11 $\frac{1}{4}$		475	916	7	3 $\frac{1}{2}$	
1839	11	3	0	10	4	11 $\frac{1}{2}$	4	5		515	984	6	10	
1840	11	3	0	10 $\frac{1}{2}$	5	10 $\frac{3}{4}$	3	2 $\frac{1}{2}$		649	992	8	0 $\frac{3}{4}$	
1841	10	0	0	11 $\frac{1}{2}$	6	6	1	0 $\frac{1}{2}$		1,193	350	8	11 $\frac{1}{2}$	
1842	10	0	0	5	6	10 $\frac{1}{2}$	0	9 $\frac{1}{2}$		1,402	281	9	2 $\frac{3}{4}$	
1843	10	0	0	7	6	7 $\frac{1}{2}$	0	11 $\frac{1}{2}$		1,504	220	9	0 $\frac{1}{4}$	
1844	10	0	1	1	7	0 $\frac{3}{4}$	0	6		1,988	152	9	6	
1845	9	2	1	0	6	9 $\frac{1}{2}$	0	4 $\frac{1}{2}$		2,750	121	8	9 $\frac{1}{2}$	
1846	8	4	1	0 $\frac{1}{2}$	6	6 $\frac{1}{2}$	0	4 $\frac{1}{2}$		3,554	19	7	11 $\frac{1}{2}$	
1847	8	4	1	0 $\frac{1}{2}$	6	7 $\frac{1}{4}$	0	6 $\frac{1}{4}$		4,000	16	7	9 $\frac{1}{4}$	
1848	7	6	0	6 $\frac{1}{2}$	6	0 $\frac{1}{8}$	0	4 $\frac{1}{2}$		4,250	15	7	1 $\frac{1}{2}$	
1849	6	8	0	3 $\frac{1}{2}$	5	6 $\frac{1}{2}$	0	1 $\frac{1}{2}$		4,458	25	6	6 $\frac{1}{6}$	
1850	6	8	0	3 $\frac{1}{2}$	5	5 $\frac{1}{2}$	0	2 $\frac{1}{2}$		4,756	25	6	5 $\frac{1}{2}$	

Note - The Consumers' Movement of 1845 had a considerable influence in reducing the price of gas.

Source - J.G.L. 10/5/1851

GREENOCK MUNICIPAL GASWORKS(iii) Expenditure 1829 -50

Date	Interest on Loans	Coal	Wages	Sala- ries	Lamps	Repair of Retort Bench	Lime	Feu Duty, Tax.	Repairs and Stati- onary	Total
	£	£	£	£	£	£	£	£	£	£
1829	305	366	94	158	44	2	44	20	20	1054
1830	464	486	172	165	69	101	68	29	67	1621
1831	340	517	208	325	111	202	91	38	63	1894
1832	411	612	347	200	239	207	116	22	75	2231
1833	387	749	350	207	222	148	83	28	73	2246
1834	406	851	461	220	209	267	58	47	172	2692
1835	530	747	462	220	206	36	35	78	119	2433
1836	638	974	587	220	218	157	57	74	126	3051
1837	679	1697	616	220	265	319	73	63	100	4032
1838	690	1558	632	220	274	184	87	72	96	3813
1839	675	1402	574	219	267	87	95	80	65	3493
1840	701	1224	465	234	202	91	79	129	225	3350
1841	687	1068	373	230	246	200	72	205	95	3176
1842	720	1239	353	298	275	200	48	104	174	3411
1843	734	1152	437	322	268	331	47	165	260	3715
1844	759	1170	327	300	231	122	38	123	135	3204
1845	784	1368	351	297	211	132	46	139	148	3476
1846	1059	1923	458	308	246	260	69	140	188	4652
1847	1358	2702	617	295	297	234	65	154	665	6391
1848	1467	2721	622	330	225	294	72	181	363	6274
1849	1467	2085	533	330	190	276	72	260	297	5510
1850	1380	1880	598	330	206	235	82	258	250	5219

Note - Exceptionally high coal costs 1837 -9 ; low coal costs 1840 -4;
expensive coal 1847 -9.

Source - J.G.L. 10/5/1851

GREENOCK MUNICIPAL GASWORKS

(iv) Capital and Profit/Loss Accounts 1837-50

Date	Capital Invested	Net Total Revenue	Ordinary Expenditure including Interest	Gross Profits	Cost of Extensions & Depreciation	Profits Used by Town	Public Benefit from Reduced Gas Prices below 11s 3d/1000 cu ft
	£	£	£	£	£	£	£ -
1837	13,557	4,785	4,058	727	165	562	£ -
1838	13,557	4,963	3,865	1,068	1,068	865	-
1839	13,557	5,254	3,561	1,693	1,693	1,563	-
1840	13,557	5,719	3,390	2,329	2,329	1,873	-
1841	13,557	5,460	2,957	2,503	2,503	1,503	1,812
1842	16,550	5,854	3,137	2,717	2,717	1,933	1,040
1843	17,550	5,560	3,088	2,462	2,462	1,900	910
1844	18,550	5,984	2,952	3,032	3,032	2,000	1,170
1845	21,000	6,501	3,295	3,206	3,206	1,900	1,720
1846	23,000	7,662	4,440	3,220	3,220	1,600	3,400
1847	30,000	8,367	5,610	2,757	2,757	1,500	3,460
1848	30,000	8,540	5,940	2,600	2,600	1,500	4,100
1849	30,000	8,346	5,318	3,028	3,028	1,500	5,500
1850	28,550	8,893	5,014	3,879	3,879	1,500	6,000

Source - J.G.L. 10/5/1851

GREENOCK MUNICIPAL GASWORKS

Greenock gasworks, "one of the safest and most remunerative of the town trusts" according to The Scotsman (22/1/1887; J.G.L. 5/7/1887), was a long term success and in 1868 provided working statistics which assisted Glasgow corporation in its decision to undertake the supply of gas:

Date	Net Revenue £	Consumption million cu ft	Date	Net Revenue £	Consumption million cu ft
1828	1,895	3.2	1870	19,399	116.496
1850	7,953	26.256	1886	31,710	184

Note - Profits to Common Good of Burgh - 1882 £7,200; 1886 £2,500

(v) Profit and Loss Accounts 1865-8

(A) Sources of Revenue -

Average income per 1,000 cu ft gas sold.

Date	Gas by Meter s d	Meter Rent d	Coke /Tar/ Ammonia Liquor d	Harbour and Street Lamps - (i) Gas d	(ii) Lamplighting d
1865	3 1	1.75	4.25	5	1
1866	3 2	1.75	3.5	4.5	1
1867	3 2.25	1.75	3.75	4.5	1.25
1868	3 0.25	-	4	5.25	1.25

Note - Annual output of 200,000 gallons tar, and 400,000 gallons (3,000 tons) of 5% Ammoniacal Liquor, sold at 3s 6d for a total £525. Total by-products £1,613 in 1868, or 2s 7d per ton coal consumed.

(B) Productivity -

Date	Coal Tons	Coal Price per Ton s d	Gas per Ton (cu ft)	Gas Output (Thou cu ft)	Gas Leakage (Thou cu ft)
1865	10,825	9 1.5	8,685	94,020	9,637
1866	11,362	8 9.75	8,713	99,000	9,049
1867	11,654	12 8.75	8,555	99,700	9,143
1868	12,443	13 2	8,646	107,588	12,374

GREENOCK MUNICIPAL GASWORKS

(C) Gross Revenue

	1865	1866	1867	1868
Consumed by Meter	15,278	16,629	16,714	16,979
Interest on Meter	701	739	772	3
Coke, Tar, Ammoniacal Liquor	1,648	1,374	1,619	1,811
Harbour and Town Lamps	2,305	2,110	2,148	2,830
Houses etc Lamps	202	134	122	183
Lighting Harbour Lamps	94	94	94	111
Lighting Town Lamps	357	380	429	382
Total	20,586	21,446	21,851	22,348

(D) Expenditure

Parrot Coal	4,936	5,002	7,409	8,194
Wages	1,971	1,904	2,105	2,182
Salaries	457	590	590	701
Repairs to Retort Bench	484	703	223	525
Tax and Insurance	678	624	548	708
Lime and Oxide for Purifiers	465	508	536	517
Cartage of Ashes	2	2	10	55
Stationary and Printing	93	80	107	114
Repairs to Retort House	162	283	216	354
Repairs to Apparatus	144	110	102	284
Repair and Renewal of Main and Service Pipes	865	137	67	115
Working Exhauster	157	133	88	100
Repair of Meters	249	251	259	427
Incidental Charges	152	155	89	63
Total	5,883	5,484	4,946	6,152

(vi) Continued Expansion 1871-1913

Year	Gas Price s d	Sales Thou cu ft	Gas Revenue £
1871	4 7	124,980	24,025
1872	4 7	129,145	26,007
1873	4 7	139,000	30,663
1874	4 7	148,440	35,295
1875	4 7	149,483	36,808
1876	4 7	151,477	38,155

GREENOCK MUNICIPAL GASWORKS

Year	Gas Price s d	Sales Thou cu ft	Gas Revenue £
1877	4 2	159,952	37,551
1878	4 2	168,631	39,130
1879	4 2	170,160	38,128
1880	4 2	159,095	35,930
1881	4 2	166,100	37,985

Source - D.Campbell Historical Sketches of Greenock (1881, Greenock)
p.81

In 1872 Greenock gasworks moved from Glebe to a new site at Inch Green and output continued to rise rapidly. A further rapid rise occurred from 1909 to 1913 when consumption rose 31%, from 292 to 383 million cu ft per year, and the number of consumers rose to 16,201. In 1918 the 48-retorts Klönne bench was replaced by 32 vertical Duckham retorts, with a wide range of automated equipment, water-cooled condenser-towers in place of annular condensers, and new steel mains pipes (6 and 8 inches in diameter) to the town centre.

Source - J.Macleod "Greenock's First Gas Supply" N.B.A.G.M. 1913

Vide supra p. 405 Fig. 3.76

(5)

HAMILTON MUNICIPAL GASWORKS

(i) Profit/Loss Accounts

Date	Gas £	By-Products £	Stove Hire £	Total Revenue £	Profit* £
1894	8,558	1,774	-	-	-
1895	6,711	2,729	-	-	-
1896	8,084	2,767	-	-	-
1897	8,589	2,720	-	-	-
1898	9,018	2,450	-	-	-
1899	10,507	2,396	-	-	-
1900	11,631	3,119	-	-	-
1901	12,512	4,437	202	17,329	-
1902 ⁺	18,378	5,268	286	23,730	-
1903	15,898	6,121	236	22,322	1,250
1904	13,012	6,441	245	19,859	1,250
1905	13,517	5,865	359	19,965	0
1906	14,357	6,208	441	20,908	0
1907	14,307	6,093	422	20,946	3,750
1908	16,112	6,941	452	23,501	0
1909	15,930	6,181	434	22,748	2,000
1910	14,491	5,680	438	20,787	1,200
1911	14,309	7,235	551	22,119	2,000
1912	13,632	7,156	606	21,387	1,250
1913	14,423	8,607	889	23,695	625
1914	15,014	9,192	744	25,538	0

Notes - * Clear Profit used for Common Good of Burgh

+ Statistics for 1901-2 March to May; previously March to March annually; from 1903 May to May annually.

Source - Hamilton Ref. Lib. Hamilton Council Record

HAMILTON MUNICIPAL GASWORKS

(ii) Varieties of Consumption

Date	Total Output Thou cu ft	% Leaks	Number of Ordinary Meters	Consumers using Prepay Meters	Hired Cookers	Hired Fires
1894	71,876	19.97	-	-	-	-
1895	80,623.1	19.03	-	-	-	-
1896	95,637.8	16.59	-	-	-	-
1897	105,000	19.53	-	-	-	-
1898	102,018.9	13.15	-	-	-	-
1899	117,225.5	12.62	-	-	-	-
1900	132,400	14.60	-	-	-	-
1901	144,456	15.62	4,661	410	-	-
1902 ⁺	146,197.8	11.33	4,663	451	-	-
1903	148,211.2	12.62	4,910	605	-	-
1904	145,867.6	12.19	4,828	1,029	-	-
1905	145,907.1	11.77	4,914	1,419	-	-
1906	153,384.6	12.06	-	-	1,351	-
1907	154,008.7	11.98	5,053	2,035	1,545	-
1908	157,644.8	10.08	5,126	2,285	1,779	-
1909	161,021.8	9.1	5,103	2,417	1,973	-
1910	163,132.2	10.15	5,082	2,579	2,117	-
1911	161,816.6	9.22	5,003	2,802	2,491	-
1912	160,066.7	6.23	4,903	3,131	2,870	-
1913	161,816.6	11.08	5,084	3,578	3,336	327
1914	160,066.7	11.0	5,029	3,801	3,706	603

Notes - + as before

Decline in output in 1898, 1904, 1911-12 and 1914. In 1911-12 and 1914 this was caused by reduced leakage and not a decline in consumption.

HAMILTON MUNICIPAL GASWORKS

(iii) Coal Costs and Gas Prices

Date	Tons Coal	Total Coal Cost £	Coal		Gas per Ton Coal cu ft	Gas Price					
			s	d		Normal		Power		Prepay	
						s	d	s	d	s	d
1894	7,296	-	8	5.5	9,851	2	11	-	-	-	-
1895	7,772	-	8	4.4	10,373	2	1	-	-	-	-
1896	10,032	-	8	7.4	9,533	2	1	-	-	-	-
1897	10,803	-	7	8.2	9,719	2	1	-	-	-	-
1898	10,606	-	8	3.0	9,618	2	1	-	-	-	-
1899	12,495	-	8	0.6	9,382	2	1	-	-	-	-
1900	12,236	-	11	6	10,003	2	1	-	-	-	-
1901	14,879	11,025	14	4.5	9,708	2	6	-	-	-	-
1902 [†]	15,133	12,220	13	8.6	9,660	2	6	-	-	-	-
1903	15,300	9,261	11	1.6	9,686	2	1	-	-	-	-
1904	15,125	7,444	9	10.1	9,644	2	1	-	-	-	-
1905	15,292	7,140	9	4	9,541	2	1	-	-	-	-
1906	15,627	6,950	8	10.7	9,815	2	1	-	-	-	-
1907	15,782	7,034	8	11	9,758	2	1	1	10.5	2	5
1908	16,123	9,287	11	6.2	9,777	2	3.5	2	1	2	5
1909	16,288	8,062	9	10.7	9,885	2	1	1	10.5	2	5
1910	16,110	7,385	9	2	10,126	2	1	1	8	2	2.5
1911	15,486	7,418	9	7	10,449	1	10.5	1	5.5	2	0
1912	15,506	6,888	8	10.6	10,323	1	10.5	1	5.5	2	0
1913	16,517	8,506	10	3.6	11,109	1	8	1	5.5	2	0
1914	18,831	11,954	12	8.2	10,438	1	8	1	5.5	2	0

Notes - + as before

Special cheap rate for gas used as fuel in gas-engines;
expensive gas in pre-payment meters to cover wear-and-tear
costs of meters.

High coal prices 1900-2, 1908, and 1913-14; higher gas prices
in 1901-2 and 1908.

KILMARKOCK GASWORKS

Raw Materials Expenditure and Gas Output 1861 - 1874

Date	Coal Tons	Coal Cost Average Per Ton		Coals Gross Cost £	Lime Cost Per Ton				Gas Sold per Ton Coal cu. ft.	Total Gas Sales Thou.cu.ft.
		s	d		Irish s	Scottish d	s	d		
1861	2094	14	9.25	1547	14	0	8	6	8795	18,417
1862	2117	13	8.25	1450	14	0	8	6	8819	18,671
1863	2022	14	6.25	1470	14	0	8	6	9254	18,71
1864	2067	14	4.25	1484	14	0	8	6	9453	19,540
1865	2163	15	0.5	1627	14	0	8	6	9469	20,48
1866	2457	14	8	1803	14	0	8	6	9087	22,328
1867	2830	14	7.5	2071	14	0	8	6	8390	23,745
1868	2879	15	11.25	2295	14	0	8	6	8212	23,645
1869	2983	15	0	2937	14	0	8	6	8008	23,890
1870	3203	13	0.5	2090	14	0	8	6	7456	23,883
1871	3576	12	9.5	2287	14	0	8	6	7340	26,250
1872	3728	12	10.75	2406	14	0	8	6	7497	27,952
1873	3730	19	6.25	3641	20	0	14	0	7841	29,247
1874	4377	28	6.5	6249	20	0	14	0	7608	33,302

Note - Rise in lime prices besides coal during 1873 coal crises.

Source - J.G.L. 20/10/1874

PAISLEY COMPANY

(i) Capital and Profit/Loss Accounts 1825 - 43

Date	Total spent on Works £	Paid-Up Capital Stock £	Assets £	Stated Profits £	Profit as % Stock	Profit as % Assets	Extensions paid from Loans or Profit £ (Total)
1825	15,792	15,989	16,612	604	3.8	3.6	0
1826	18,055	15,991	18,911	1123	7.0	5.9	2064
1827	18,447	15,996	21,325	1111	6.9	5.2	2451
1828	19,134	15,996	21,827	1304	8.2	6.0	3138
1829	19,404	16,000	22,063	1508	9.4	6.8	3402
1830	19,460	16,000	22,422	1587	10.6	7.0	3640
1831	20,658	16,000	23,280	1989	12.4	8.5	4658
1832	22,731	19,735	27,973	2268	11.5	8.1	2996
1833	24,226	25,203	30,435	2878	11.4	9.5	0
1834	26,322	28,340	35,155	3725	13.1	10.6	0
1835	27,795	31,453	39,372	3677	11.7	9.3	0
1836	29,304	31,979	41,069	4186	13.1	10.2	0
1837	32,238	32,000	41,390	3339	10.4	8.1	283
1838	33,120	35,030	42,905	3346	9.6	7.8	0
1839	33,885	36,597	45,338	3572	9.8	7.9	0
1840	36,332	38,267	47,810	4263	11.1	8.9	0
1841	36,354	39,850	49,748	4163	10.4	8.4	0
1842	36,571	39,997	50,500	3930	9.8	7.8	0
1843	26,587	39,999	52,183	4855	12.1	9.3	0

Note - Where total spent on works exceeded Stock, this is shown as extensions financed by loans or reinvested profits. 'Assets' were originally shown as 'Dr. and Contra'. From 1833 the book-value of the works remained largely below Stock capital, and surplus profits were channelled instead into the rapidly rising Assets in other forms. Total profits were depressed during the coal-shortage, and consequent high prices, of 1837 -9. Dividends remained steady at 8 per cent from 1829 -43.

Source - H. Lords 1844 Vol 8 31/7/1844 pp. 212-45

PAISLEY COMPANY(ii) Funds and Loans 1825 -43

Date	Total Contingency Fund £	Total Depreciation Fund £	Bank Deposits £	Funds in Bank (A) £	Funds invested in Paisley Town Council £
1825	-	-	478	-	-
1826	60	-	703	-	-
1827	153	-	2224	-	-
1828	266	-	1441	-	-
1829	449	-	1190	449	-
1830	678	-	1375	678	-
1831	985	-	858	985	-
1832	1500	184	2311	1500	-
1833	1562	414	2880	62	-
1834	1923	657	5118	423	-
1835	2897	920	6584	1397	1397
1836	3000	1749	5814	-	2000
1837	3000	2042	1951	-	2000
1838	3000	1376	2714	334	1000
1839	3000	1787	4023	1306	500
				(B)	
1840	3000	2129	2775	29	500
1841	3000	2700	5289	600	500
1842	3000	3543	5365	1443	509
1843	3000	4153	5444	53	509

Loans Borrowed - £ 1000 from Miss Alicia Dickson 1826 - 1832
£ 1000 from William Griffin 1827 - 1832
£ 2000 from Dr. Freer 1828
£2000 from Mrs Cowper 1828 - 1830
£ 2000 from James Scott 1831 - 1833

Additional Investments of Contingency Funds -

3 per cent Government Consols £1500 1833 - 5
£3000 1836 - 43
Paisley Water Company £1600 1841 - 3
Loan to City of Glasgow £2055 1843

Note - Funds in Paisley Union Bank (1825-39) and Glasgow Union Bank (1840-3) included both Contingency and Deterioration Funds. Funds listed separately in bank were (A) Contingency, and (B) Deterioration Funds. No loan capital after 1832.

Source - H. Lords 1844 Vol B-31/7/1844 pp. 212-45

PAISLEY GAS TRUST(iii) Capital Account 1851 - 1900

(a) Dr. (Discharge)							
Date	Total Expended on Works	Total Dr.	Owing to Community of Paisley	Owing to Union Bank	Contingency Government Stock	Fund in Held in Union Bank	
	£	£	£	£	£	£	£
1851	38,011	48,435	283	7003	-	-	
1852	38,012	46,712	283	4041	-	-	
1853	38,012	47,508	274	5610	-	-	
1854	38,012	45,893	274	3700	-	-	
1855	38,012	46,216	274	3014	-	-	
1856	37,959	47,500	337	4811	-	-	
1857	37,857	47,279	321	3796	-	-	
			Meters Value Dep.				
1860	37,857	49,512	4747	549	2330	3000	2000
1861	37,857	49,853	2756	551	2887	3000	2000
1862	37,857	50,018	2598	520	3348	3000	2000
1863	37,857	50,587	-	-	2007	3000	2000
1864	37,857	49,504	-	-	2700	3000	2000
1865	37,857	48,288	-	-	1272	3000	2000
1866	37,857	50,176	3309	662	3453	3000	2000
1867	37,857	50,557	2838	284	2526	3000	2000
1868	37,857	52,454	2932	293	4210	3000	2000
1869	37,857	54,402	2729	273	6195	3000	2000
							In British Linen Bank
1870	37,857	54,668	-	-	7144	3000	2000
1871	40,000	54,372	—		819	-	11310
1872	47,000	54,265			2828	-	-
1873	47,000	53,426			2644	-	-
1874	47,000	54,457			2784	-	-
1875	47,000	54,973			1993	-	-
			Deposit Current				
1876	47,000	56,288	2413		3454	-	-
1877	50,020	69,684	2601		9425	-	-

PAISLEY Capital Account continued (Dr.)

Date	Total Expended on Works £	Total Dr. £	Reserve in Union Bank		Surplus Profits Capitalized £
			Deposit £	Current £	
1878	62,824	72,524	3021	863	-
1879	76,152	85,137	3521	-	-
			In British Linen Bank		
1880	78,002	91,969	3665	2695	-
1881	78,002	88,421	3665	2647	-
1882	78,002	90,138	3950	3813	-
1883	78,002	92,824	5430	4312	-
1884	78,002	-	-	-	9652
1885	78,002	-	-	-	9102
1886	78,002	-	-	-	3102
1887	102,002	-	-	-	2962
1888	102,001	-	-	-	2962
1889	102,002	-	-	-	2867
1890	108,300	-	-	-	3465
1891	-	-	-	-	-
1892	118,154	-	-	-	3069
1893	110,033	-	-	-	-
1894	110,033	-	-	-	-
1895	127,792	-	-	-	-
1896	110,033	-	-	-	-
1897	110,033	-	-	-	-
1898	134,033	-	-	-	-
1899	134,033	-	-	-	-
1900	145,920	-	-	-	-

Note - 'Owing' to Union Bank and Community of Paisley were sums loaned out by the Gas Trust. Meter depreciation 20 per cent till 1866, then 10 per cent. Meters included in Works account from 1871 when £529 written off.
Dep. Depreciation

Source-Paisley Ref. Lib. Paisley Financial Statements (annual)

PAISLEY Capital Account continued

Date	Shares of		Contingent		Dividends		Surplus	Expended on		
	Partners	Comm.	Fund		C	D	Profits	E	F	G
	£	£	A	B	£	£	£	£	£	£
1851	40,000	-	1796	1801	2485		2144	-	-	-
1852	38,625	1357	1159	2037	2485		412	-	-	-
1853	38,625	1357	1159	2443	2485		1274	-	-	-
1854	38,625	1357	-	2883	2485		487	-	-	-
1855	38,625	1357	-	3167	2485		601	-	-	-
1860	37,125	2875	-	4646	2287	177	960	-	-	-
1861	36,343	3657	-	5000	2229	224	1467	-	-	-
1862	35,843	4157	-	5000	2208	256	702	-	-	-
1863	35,843	4157	-	5000	2208	256	457	-	-	-
1864	35,608	4392	-	5000	2212	273	629	-	-	-
1865	33,573	6427	-	5000	2095	401	1764	-	-	-
1866	33,298	6702	-	5000	2095	422	2021	-	-	-
1867	32,443	7557	-	5000	2042	476	1344	-	-	6
1868	31,975	8025	-	5000	2004	503	2260	-	-	-
1869	31,975	8025	-	5000	1995	501	1544	-	-	-
1870	31,418	8582	-	5000	1969	538	798	-	-	-
1871	26,621	8582	-	-	1770	-	2205	500	-	-
1872	25,804	14,196	-	0	1640	-	2172	500	152	-
1873	25,376	-	-	0	1607	-	179	500	210	-
1874	25,151	14,849	-	0	1592	-	19	500	439	-
1875	24,301	15,699	-	-	1568	-	2159	500	367	-
1876	24,251	15,749	-	-	1541	-	1524	500	260	-
1877	24,056	15,944	-	-	1527	-	3036	500	290	-
1878	24,006	15,994	-	-	1519	-	2090	500	648	-
1879	24,006	15,994	-	-	1504	-	2872	500	229	-
1880	23,471	16,529	-	-	1488	-	1530	1000	1190	-
1881	23,057	16,943	-	-	1453	-	1241	1000	1382	500
1882	22,087	17,913	-	-	1384	-	3148	1000	1421	500
1883	21,762	18,238	-	-	1356	-	4863	1000	1320	500
1884	21,749	18,251	-	-	1363	1144	6980	500	63	457
1885	21,277	18,723	-	-	1334	1163	13387	500	39	500

Note - Contingency Funds (A) of Old Company (including deterioration fund), (B) of Public Trust.

Expenditure on (E) Sinking Fund to redeem annuities,
(F) Interest on debts, (G) Contingent Fund
Dividends paid to (C) Shareholders, and (D) Gas Commission

PAISLEY Capital Account continued (Cr.)

Date	Shares Purchased		Loans from			Interest paid on	
	No.	£	Bank £	Town £	Jamieson Fund £	Mortgage £	Jamieson Fund £
1861	156.5	1123	-	-	-	-	-
1862	100	722	-	-	-	-	-
1863	-	-	-	-	-	-	-
1864	47	365	-	-	-	-	-
1865	407	3139	-	-	-	-	-
1866	55	419	-	-	-	-	-
1867	171	1278	-	-	-	-	-
1868	93.5	732	-	-	-	-	-
1869	-	-	-	-	-	-	-
1870	111.5	895	-	-	-	-	-
1871		7674	-	-	-	-	-
1872		1308	6244	-	-	-	-
1873		684	1191	4222	-	-	-
1874	225	360	2071	4222	-	-	-
1875	850	1291	1246	4222	-	-	-
1876	50	80	4822		-	-	-
1877	195	312	14622		-	-	-
1878	50	80	15000		350	-	-
1879	-	-	9294	15000	300	588	13
1880	-	-	13900	15000	250	713	11
1881	-	-	28,900		200	1125	5
1882	-	-	28,900		150	1132	5
1883	-	-	28,900		150	1125	5

Mortgages -							
	Total	New	Repaid in	Repaid by			
	£	£	Last Year	Sink Fund			
	£	£	£	£			
1884	28,350	-	550	-	1132	5	
1885	28,200	-	150	700	1066	-	
1886	58,000	30,000	-	0	1227	-	
1887	58,340	140	-	700	2140	-	
1888	57,840	-	500	1200	2210	-	
1889	57,935	7,117	7022	1200	2124	-	
1890	63,635	13,100	7400	1200	2316	-	
1891	-	-	-	-	-	-	
1892	73,885	5,450	3450	1200	2474	-	

PAISLEY Capital Account continued (Cr.)

Date	Mortgages -		Repaid in Last Year	Repaid by Sinking Fund	Interest on Mortgages	"Tempo- rary Loan "
	Total	New				
	£	£	£	£	£	£
1893	73,885	-	-	-	2552	-
1894	64,817	-	9068	4128	2520	-
1895	62,517	5350	7150	4628	2071	1700
1896	62,657	18450	18310	4628	2041	1700
1897	62,257	3500	3900	5028	1785	1700
1898	62,257	100	100	5028	1795	1700
1899	60,057	4917	7117	7228	1783	1700
1900	64,847	7490	2700	8128	1697	2330

*

*

*

Date	Shares of Partners	Comm.	Dividends		Surplus Profit	Expended on				
			C	D		E	F	G	H	I
	£	£	£	£	£	£	£	£	£	£
1886	200	39,800	658	1145	7549	500	-	500	8794	16,293
1887	200	39,800	-	1158	8256	500	-	500	3500	16,910
1888	13	39,987	-	-	8590	500	-	500	4116	18,208
1889	13	39,987	-	-	6792	1000	-	-	5414	16,515
1890	-	-	-	-	7138	500	-	500	1440	16,758
1891	-	-	-	-	-	-	-	-	-	-
1892	-	-	-	-	7039	500	-	-	-	16,725
1893	-	-	-	-	4004	500	48	-	3069	10,464
1894	-	-	-	-	8152	1000	245	-	-	14,951
1895	-	-	-	-	10334	571	51	-	3487	18,885
1896	-	-	-	-	8381	588	106	-	7421	17,008
1897	-	-	-	-	7057	605	179	-	11464	11,464
1898	-	-	-	-	7938	623	219	2748	-	7,716
1899	-	-	-	-	6281	642	197	1923	2000	6,917
1900	-	-	-	-	4310	1080	464	-	1000	6,316

Notes - "Temporary Loan", permitted by Parliament, to be repaid within twelve months of borrowing.
 Dividends paid to (C) shareholders and (D) Gas Commission
 Expenditure on (E) sinking fund to redeem annuities,
 (F) interest on debts,
 (G) Contingency Fund, (H) Common Good of Burgh,
 (I) Carried Forward

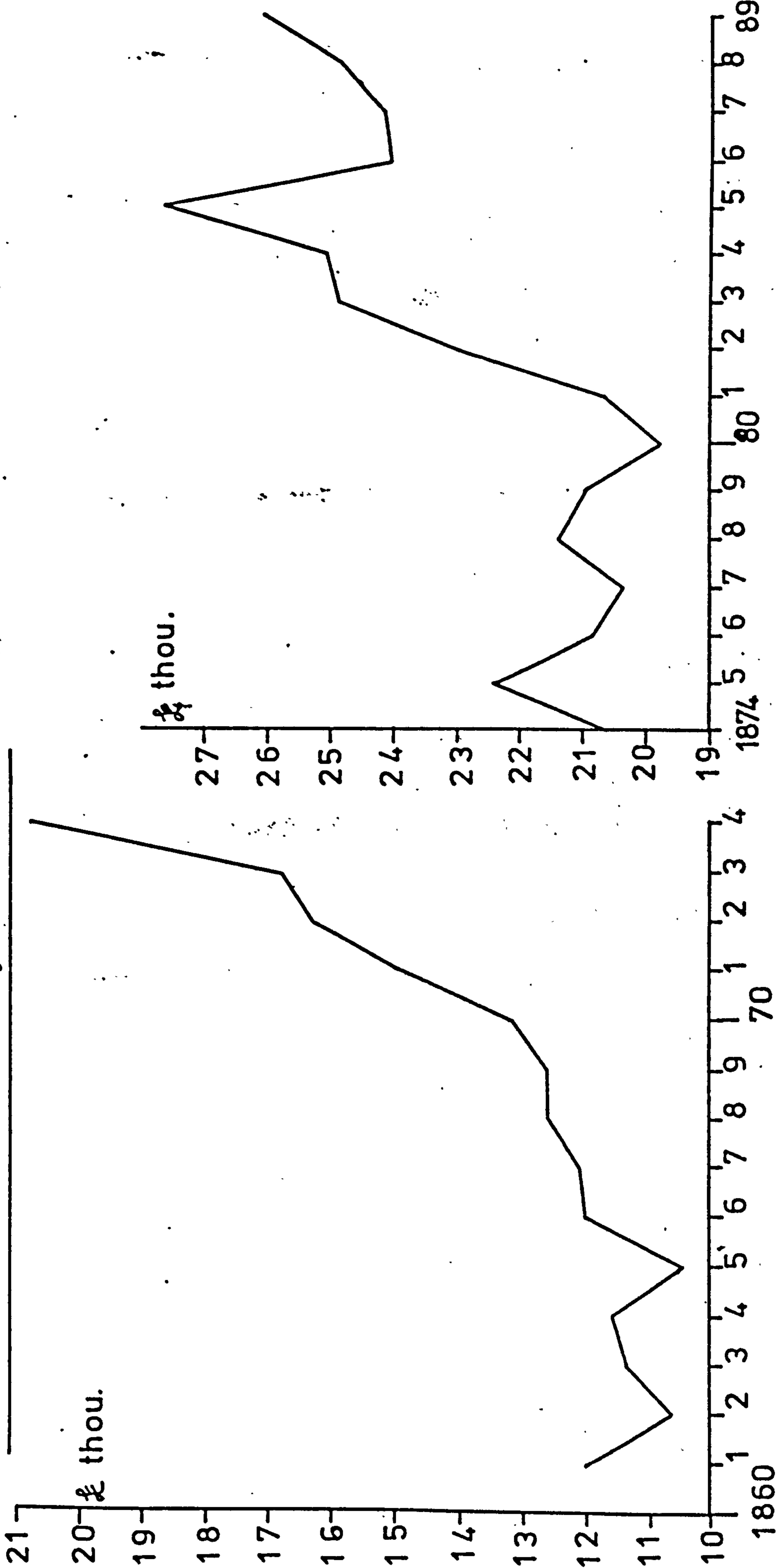
Surplus Profit - Stated separately, but definition obscure.
 Contingency Fund in British Linen Bank in 1870.
 Loans from Union Bank 1872-5; Royal Bank 1879.
 In 1864 £1500 written off book value of telescopic gasholder.
 Dividends from 1856 declared after deducting Income Tax.
 Deficiency on Electric Lighting Authority stated as Cr. :
 1898 £58, 1899 £409, 1900 £472
 "Common Good" payments in 1895 included £600 to Road Trust,
 and £900 to Improvement Trust.

PAISLEY GASWORKS

(iv) Revenue 1860 - 1900

Date	Gas Sales Meter	Contract	Public Light	Meter rent	Ammonia Water	Tar	Coke	Lime	Inter- est	Stove Hire
	£	£	£	£	£	£	£	£	£	£
1860	11,405	57	605	567	334	567	178	41	80	-
1861	12,009	60	634	588	371	581	163	48	148	-
1862	10,771	55	623	596	338	555	182	45	158	-
1863	11,437	60	632	603	376	633	187	39	118	-
1864	11,659	58	723	613	341	668	161	37	121	-
1865	10,539	57	600	621	332	725	149	48	171	-
1866	12,018	58	600	631	489	900	132	52	151	-
1867	12,187	70	650	636	592	879	145	40	166	-
1868	12,566	76	386	640	663	793	100	51	127	-
1869	12,585	91	570	653	656	846	78	76	153	-
1870	13,206	118	579	669	663	905	112	73	175	-
1871	14,928	91	600	684	763	891	148	136	139	-
1872	16,256	94	620	698	640	1009	374	87	-	-
1873	16,797	95	719	720	880	1016	781	69	-	-
1874	20,845	130	1374	734	1184	1260	612	76	89	-
1875	22,381	157	1598	734	1217	1210	302	46	74	-
1876	20,960	138	1288	754	1171	1205	292	144	49	-
1877	20,412	123	1318	747	1089	1292	263	16	49	-
1878	21,406	124	1410	756	1114	1300	267	-	62	-
1879	20,999	115	1460	763	981	1554	338	-	89	-
1880	19,829	104	1430	745	1296	1613	335	-	65	-
1881	20,774	107	1515	761	1420	1586	366	-	75	-
1882	23,017	109	1563	763	1506	1789	415	-	119	-
1883	24,919	124	1620	766		3458	495	-	119	-
1884	25,090	129	1149	779		3413	461	-	122	7
1885	27,688	137	1174	788		4011	441	-	177	9
1886	24,144	122	1234	778		1900	305	-	154	16
1887	24,226	121	1220	776		1333	450	-	324	31
1888	24,941	117	1253	786		2109	291	-	200	33
1889	26,053	135	1322	803		2349	443	-	237	41

Total Gas Sales at Paisley 1861-89



PAISLEY GASWORKSRevenue continued

Date	Gas Sales		Public	Meter	Ammonia	Tar	Coke	Lime	Inter-	Stove
	Meter	Contract	Lights	rent	Water				est	Hire
	£	£	£	£	£	£	£	£	£	£
1890	27,526	150	1456	824	3429	1778	-	362	48	
1891	-	-	-	-	-	-	-	-	-	
1892	31,222	157	1240	858	5308	1236	-	98	77	
1893	31,427	160	1249	859	3221	927	-	-	88	
1894	30,341	156	1271	868	2926	1004	-	287	95	
1895	32,105	152	1353	925	4313	1284	-	70	133	
1896	32,345	163	1318	890	4316	1723	-	13	117	
1897	32,996	171	1382	963	4053	1003	-	34	147	
1898	34,392	157	1409	1014	3755	1338	-	39	154	
1899	37,113	187	1427	1054	4173	2021	-	66	159	
1900	38,767	170	1360	1107	5223	2543	-	-	174	

Note - Public lighting revenue is shown after allowing rebates, which included £143 on £743 gas in 1871; a discount of 33.3 per cent in 1885, and 25 per cent in 1886.

Coke revenue in 1892 included sales from a stock-pile.

Gas from prepayment meters was first recorded seperately at £187 in 1899, and £682 in 1900.

Source - Paisley Ref. Lib. Paisley Financial Statements (annual abstracts)

PAISLEY GASWORKS

(v) Expenditure 1860 - 1900

Date	Coal	Purifying Material	Wages	Salaries	Pipes and Castings	Retorts and Clay	Total Appar- atus	Total Turn- over
	£	£	£	£	£	£	£	£
1860	5817	127	-	-	660	234	1125	13,835
1861	5603	119	1140	752	219	586	868	14,649
1862	5173	158	1099	735	588	349	1292	13,339
1863	5395	202	1221	717	215	264	925	14,161
1864	5310	133	1242	737	217	426	1000	14,565
1865	5608	161	1265	731	184	188	660	13,252
1866	5886	168	1491	733	291	339	1012	15,067
1867	6531	246	1844	776	416	321	1279	15,415
1868	5873	256	1937	776	113	176	630	15,456
1869	6516	247	1911	842	193	75	654	15,762
1870	7021	349	2283	864	894	178	1658	16,568
1871	7285	381	2746	873	141	155	837	18,394
1872	8256	269	3162	927	40	44	1710	19,919
1873	11,000	257	3686	938	602	64	1411	21,139
1874	16,712	436	3791	939	561	71	1036	26,257
1875	15,060	336	4019	925	1099	321	1849	27,655
1876	13,581	316	4092	960	1472	491	1872	26,049
1877	11,166	316	4171	985	4902	438	2455	25,418
1878	12,596	177	4609	1011	1644	541	1804	26,376
1879	10,943	156	4116	1044	1587	505	2463	26,205
1880	10,804	92	4040	1085	1300	637	2634	25,251
1881	10,583	8	3777	1035	1692	486	2472	26,291
1882	11,759	52	4252	1029	1442	346	2156	29,299
1883	11,774	-	4273	1046	1252	378	1859	31,503

Note - Total Turnover represented total annual general expenses and thus total annual revenue, since large items of capital expenditure were recorded seperately.

Purifiers used some Iron Oxide in 1873 and 1878, besides lime, and entirely Iron Oxide after 1879.

Some Furnace Coal used in 1860-3, in addition to the Cannel Coal recorded above : 1860 £137, 1861 £ 61,
1862 £7, 1863 £ 8

PAISLEY GASWORKS

Expenditure continued -

				Relative Costs					
Date	Compared to Turnover.			Compared to Coal. Wages %	Date	Compared to Turnover.			Compared to Coal. Wages %
	Coal %	Wages %	Salary %			Coal %	Wages %	Sal. %	
1860	42.0	-	=	-	1880	42.8	16.0	4.3	37.4
1861	38.2	7.8	5.1	20.3	1881	40.3	14.4	3.9	35.7
1862	38.8	8.2	5.5	21.2	1882	40.1	14.5	3.5	36.2
1863	38.1	8.6	5.1	22.6	1883	37.4	13.6	3.3	36.3
1864	36.5	8.5	5.1	23.4	1884	39.2	9.2	4.3	23.4
1865	42.3	9.5	5.5	22.6	1885	31.1	8.6	3.9	27.5
1866	39.1	9.9	4.9	25.3	1886	35.5	10.6	5.4	29.8
1867	42.4	12.0	5.0	28.2	1887	34.2	10.8	5.2	31.6
1868	38.0	12.5	5.0	33.0	1888	33.9	10.8	4.9	31.8
1869	41.3	12.1	5.3	29.3	1889	33.9	11.5	4.9	34.0
1870	42.4	13.8	5.2	32.5	1890	32.3	10.8	4.4	33.3
1871	39.6	14.9	4.7	37.7	1891	-	-	-	-
1872	41.4	15.9	4.6	38.3	1892	43.6	10.8	4.3	24.8
1873	52.0	17.4	4.4	33.5	1893	43.2	11.1	4.5	25.7
1874	63.6	14.4	3.6	22.7	1894	33.3	11.9	4.9	35.7
1875	54.5	14.5	3.3	26.7	1895	40.4	11.4	4.5	28.1
1876	52.1	15.7	3.7	30.1	1896	39.8	12.4	4.6	31.2
1877	43.9	16.4	3.8	37.4	1897	43.4	13.4	4.7	30.8
1878	47.8	17.5	3.8	36.6	1898	40.7	13.5	4.7	33.3
1879	41.8	15.7	4.0	37.6	1899	43.7	13.5	4.4	30.9
					1900	51.0	13.6	4.3	26.6

Note - Expenditure (£) on coal, wages and salaries as per centage of annual Turnover; Cost of Wages as per centage of Coal cost.

Wages compared to Turnover, low in 1861, 1864, 1885, 1890; high in 1873, 1878, 1889.

Wages compared to Coal, low in 1860, 1874, 1884, 1892; high in 1872, 1879, 1889.

Coal compared to Turnover, low in 1864, 1890, 1894; high in 1873-4, 1878, 1900.

PAISLEY GASWORKS

Expenditure continued

Date	Coal £	Purifying Material £	Wages £	Salaries							Total Turn- over £
				Sum £	A £	B £	C £	D £	E £	F £	
1883	11,774	-	4273	1046	350	314	15	50	317	-	31,503
1884	12,101	195	2831	1316	592	334	15	50	310	15	30,845
1885	10,563	288	2910	1321	586	336	15	50	324	10	33,960
1886	10,028	227	2993	1524	590	372	251	300	11	28,248	
1887	9,568	304	3025	1465	589	396	194	270	16	27,978	
1888	9,936	164	3156	1445	592	386	189	262	16	29,322	
1889	10,509	168	3578	1514	629	399	194	276	16	31,008	
1890	11,332	218	3777	1542	661	395	191	279	16	35,134	
1891	-	-	-	-	-	-	-	-	-	-	-
1892	17,111	292	4237	1678	677	411	225	349	16	39,230	
1893	16,292	286	4193	1714	704	400	233	361	16	37,722	
1894	12,113	403	4323	1765	450	245	452	235	383	-	36,321
1895	16,501	336	4639	1830	450	261	470	235	393	16	40,816
1896	15,980	402	4988	1844	450	242	485	235	411	21	40,186
1897	17,646	609	5443	1916	450	273	522	235	420	16	40,686
1898	17,146	719	5703	1977	450	283	557	235	434	16	42,177
1899	20,219	442	6242	2054	450	306	586	265	431	16	46,294
1900	25,478	662	6787	2162	450	322	636	265	473	16	49,944

Note - Salaries paid to (A) Engineer, (B) Officer (originally combined jobs), (C) Meter Inspectors, (D) Treasurer and (E) Clerks, (F) Collectors, (G) Auditor

Growing importance of office workers compared to wage-earning staff in late 1880s. Great reduction in wages in 1884.

Coal costs included wages for stowing; breakdown of costs in 1894 showed £17,035 less £4417 on hand, £238 stowing, and £267 cartage.

Oil used besides coal from 1898 : 1898 £1116, 1899 £1523, 1900 £ 1675

APPENDIX X

- (1) Competition between Engineering Manufacturers -
as a factor in reducing capital equipment costs
- (2) Examples of Cast-Iron Gas Mains Prices -
 - (A) 1815 London
 - (B) 1829 Devon Iron Company
 - (C) 1845 H.Balfour and Company
 - (D) 1859 Messrs Laidlaws, Glasgow
 - (E) 1864 Various Firms
 - (F) 1874 Wm. McLeod of Glasgow
 - (G) 1881 Various Firms
 - (H) 1896 Macfarlane, Strong and Company
- (3) Construction of Scottish Gasholders (1870 - 92) -
An Index of Company and Regional Prosperity

(1)

Appendix X Competition between Engineering Manufacturers

Many items of capital expenditure, from bricks and carpentry to parts of structural ironworks, could be purchased from established craftsmen and iron foundries. For these, and for more specialized requirements from retorts to gasholders, gas companies employed the same system of taking sealed tenders as that used for their annual coal contracts. By avoiding close trading links with particular suppliers, gas companies from the 1820's encouraged competition amongst suppliers to produce cheap equipment; the intensity of competition is evident in many extant records.

Dalkeith¹ gas company in 1827 advertized for equipment tenders in the Edinburgh, Leith and Glasgow Advertiser before ordering gas mains, iron retorts and a hydraulic-main from Omoa Iron Company; and purifiers and condensers from the Caledonian Foundry. The gasometer and retort-house contracts were advertized in the Edinburgh Evening Courant, Scotsman, and Edinburgh, Leith and Glasgow Advertiser. Offers for the buildings and wrought iron were received from Messrs Brown of Edinburgh (£548), J.T.Mason and R.Wilson of Dalkeith (£544), and A.Sanderson, builder of Dalkeith (£518) who was accepted. Offers to supply the gasometer were received from the Caledonian Foundry at Leith, Redpath and Brown of Edinburgh, and John Anderson of Leith Foundry who obtained the contract (£130) and also supplied an iron roof (£28) for the retort house. The chimney (£67) was by Bruce and Anderson, bricklayers of Edinburgh.

Retorts and pipes of iron were a frequent purchase, and there were sufficient suppliers to ensure the absence of artificially raised prices. Some retorts and connecting pipes for Dalkeith in 1827 were from Caledonian Foundry (£118), but others in 1828 were from Calton Hill Foundry, and from George Mushet's Dalkeith Foundry (which paid 3/- per cwt for old scrap retorts). In 1832 Mushet lost

1. The 1827 gasometer tenders were received by the gas company's consultant engineer, "John Neilson". S.R.O. Dalkeith Minute Book op cit 12/2/1827, 19/2/1827, 12/3/1827, 2/4/1827, 13/4/1827, 11/5/1827, 9/8/1828, 18/8/1830, 12/1/1833, 15/7/1834, 18/7/1837

the contract by charging £10 per ton, compared to £7/12/- from John Patterson's Edinburgh Foundry, and Alex Wilson & Co. of Dalkeith. In 1837 Mushet's price of 9/6 per cwt for retorts was turned down in favour of Shotts and the Devon Iron Co. at 9/-. Tenders to supply new mains pipes in 1831 were received from C.Limhouse millwright of Loanhead, J.Anderson of Leith Walk Foundry, Alex Wilson of Dalkeith (who was chosen to supply 2 inch dia. pipes) and G.Mushet (who was chosen for 1½ inch pipes). When pipes worth about £125 were required to Newbattle Abbey in 1833, Mushet obtained the contract (at 1/9 per yard) in competition with Omoa Iron Co.* which offered the same price.

Tenders were taken at Dalkeith for a new gas-holder, iron tank and purifier in 1834, and Mushet obtained the main contract (£274) only by competition with Leith Foundry (which built the purifiers) and with Redpath and Brown ironmongers of Edinburgh. New purifiers and a coal-drying oven were purchased in 1842 from C.Umpherston of Loanhead (£82) after viewing offers by George Mushet (£96) and by W. Fleming of Dalkeith (£115).

At Annan¹, where the works were designed by A.Liddel of Glasgow, advertisements for equipment were placed in the North British Advertiser, Carlisle Journal, and Dumfries newspapers. Liddel obtained the ironwork contract (£1180) by competition with Sanderson & Co. of Glasgow (£1310) and Roxburgh & Cumming of Annan (£1310). Masonry was by E.Irving (£286) though offers were also made by Johnstone and Irving (£474) and McDowdie and Laidlaw (£380). Iron retorts were purchased in 1843 after Annan company compared Liddel's price with those of Carlisle iron-foundries, and in 1845 others were purchased from Robert McLaren of Glasgow (9/6d per cwt) who underbid A. Liddel, Falkirk Iron Co., Carron Iron Co., and Shotts Iron Co. Competition for contracts was reduced during upswings in the economy. In 1847 Ayr² gas company required about 900 yds of 9-10" pipes, but despite requesting tenders from many Glasgow foundries, only the Canal

1. S.R.O. Annan Minute Book op cit 26/2/1838, 13/4/1838, 29/9/1839, 11/9/1843, 15/8/1845

2. S.R.O. Ayr Minute Book op cit 28/1/1847, 29/3/1847, 10/4/1847, 26/6/1847, 27/9/1847, 10/8/1847, 19/8/1847

* Vide B.F. Duckham Scottish Coal Industry (1970) op cit p. 188

Basin Foundry and Messrs Robertson and Wilson replied; the latter were accepted because the gas Directors stated that "from the present state of the trade, there was no chance of these pipes being got cheaper". The same year, Ayr took tenders for a new gasholder from Reid and Murray of Glasgow, Piggot of Birmingham, and T. Westwood and Winged of Dudley, before accepting Reid and Hanna of Paisley (£550). Stornoway¹ gas company in 1848 took tenders from Messrs Blackie and Son, Messrs Macdonald & Ballardie of Glasgow, Messrs Robertson and Lester, and Messrs Laidlaw and Sons of Glasgow, before agreeing to purchase equipment for the new gasworks from the latter. Laidlaw and Sons tendered £1400, compared to £1600 from Macdonald and Ballardie.

The following examples indicate both the choice of equipment suppliers, the range of prices offered, and the reduction in price variation when competition intensified.

Construction of Selkirk Gasworks (1835) - Tenders

	£
Masonry - A. Ingress and A. Walker, Selkirk	560
A. Anderson and J. Walker	475
J. Stirling, Galashiels	462
J. Cransten and J. Thomson, Jedburgh*	398
Apparatus/Pipes - Messrs Hooper and Miller, Kelso	670
Berwick Foundry	649
Apparatus only - Messrs Anderson, Leith Walk Foundry	423
Berwick Foundry	398
Messrs Hooper and Miller*	375
Pipes only - Shotts Foundry	294
Berwick Foundry*	260

Note - * contracts awarded

Source - S.R.O. Selkirk Minute Book op cit 12/5/1835

New Gasholder at Galashiels (1846) - Tenders

	£
Gasholder - Ramsey and Morris, Berwick	1181
(40 ft dia., 14 ft deep) Robertson and Co., Berwick	1122
Robertson and Lister, Glasgow*	576

Note - an iron tank was purchased (to replace one of masonry) from

1. S.R.O. Stornoway Minute Book op cit 15/4/1848

Robertson and Co. in 1847.

Source - S.R.O. Galashiels Minute Book op cit 8/5/1846, 28/7/1847

Extensions to Ayr Gasworks (1848) - Tenders

	£
Hydraulic Main and Fittings - James Mitchell	393
Canal Basin Foundry	225
Robertson and Wilson	200
James Miller, Ayr [*]	186
Purifiers - London Vulcan Iron Co.	255
Robertson and Wilson	250
James Miller, Ayr	250
Canal Bason Foundry [*]	194

Source - S.R.O. Ayr Minute Book op cit 7/9/1848

New Purifiers at Vale of Leven (1855) - Tenders

	£
Robert McLaren, Glasgow	116
James Welsh, Johnstone	115
McArthur and Weems, Johnstone	105
Hanna, Donald and Wilson, Paisley	105
Martin and Stevenson, Airdrie	105

Note - McLaren offered 6/- per cwt, and Messrs Hanna, D. and W. offered 3/6 per cwt to purchase the old scrap purifiers, provided they obtained the contract.

Source - S.R.O. Vale of Leven Minute Book op cit 7/8/1855

Alterations to Selkirk Gasworks (1854) - Tenders

	£
Iron Roof (Retort House) - Mr. Bathgate, Selkirk	116
Messrs Hooper and Miller, Kelso [*]	62
Masonry - Messrs Herbertson and Son	266
George Inglis	242
A. & R. Hope [*]	210

Source - S.R.O. Selkirk Minute Book op cit 9/5/1854

Alterations to Galashiels Gasworks (1859-60) - Tenders

	Gasholder, £	Iron Tank, £
Messrs Hooper and Miller, Kelso	436	-
J. Douglas, Cupar	-	915
Hanna, Donald and Wilson, Paisley	500	1056
Robert Douglas, Kirkaldy	-	835

	Gasholder, £	Iron Tank, £
J. & A. Robertson, Berwick	-	1056
John Scott, Inverkeithing	500	1673
R.Laidlaw and Son, Glasgow		1673
		Station Meter
D.Grant and Co. Edinburgh	£95 (10,000 cu ft/hour)	
J. Milne and Son, Edinburgh*	{ £109 (8,000 cu ft/hour);	
	{ £139 (10,000 cu ft/hour)	
W.Cowan, Edinburgh	{ £90 (8,000 cu ft/hour);	
	{ £110 (10,000 cu ft/hour)	
		Iron Retort-House Roof
James Talt, Edinburgh*		£114
David Howath and Co. Rockdale		112
Hanna, Donald and Wilson, Paisley		120

Note - Tank and holder contract delayed until 1860 when awarded to H. Drew (£1625) despite extra competition from C.Walker and Sons of Midland Ironworks, Shropshire; Cowden and Brodie of Paisley; and John Black of Tweedmouth.

Source - S.R.O. Galashiels Minute Book op cit 21/5/1859, 3/8/1859

Two New Purifiers at Banff (1872) - Tenders

	£
J.Johnstone and Co. Elgin	168
T.Russell, Cupar, Fife	164
G.W.Murray, Banff Foundry*	145

Source - S.R.O. Banff Minute Book op cit 4/8/1870

Alterations to Boness Gasworks (1874-5) - Tenders

	£
Condensor - Hanna, Donald and Wilson, Paisley	120
Laidlaw, Sons and Caine, Glasgow	115
J.Morrison, Seaview Ironworks, Boness	114
J.Ballantyne, Grange Foundry, Boness	110
Forth Bank Foundry, Boness	109.50
Robertson and Co., Berwick*	95
Purifiers - H.Balfour and Co., Leven	235
J.Milne and Son, Edinburgh	220
Airdrie Iron Co.*	199
Robertson and Co., Berwick	196

Note - J. Ballantyne offered to pay 71/- per ton for old purifiers if new contract placed with him, but several others also offered to purchase the scrap metal, e.g. Boness Foundry 70/- per ton. Airdrie Iron Co. chosen for purifiers because of their "great experience in such work".

Source - S.R.O. Boness Minute Book op cit 25/6/1874, 23/10/1874, 14/8/1875.

New Gas Apparatus at Bathgate (1880) - Tenders

	£
Wm. Brodie and Co., Paisley	945
Laidlaw, Sons and Caine, Glasgow	926
Hanna, Donald and Wilson, Paisley*	845

Source - S.R.O. Bathgate Minute Book op cit 3/9/1880

New Purifiers for Ayr (1890) - Tenders

	£
R. Dempster and Sons, Elland	1341
R. & J. Dempster, Manchester	1313
Hanna, Donald and Wilson, Paisley	1250
G. & W. Walker, Shropshire	1208
Wm. Brodie and Co., Paisley	1150

Note - These purifiers had to process 38 million cu ft per year; specialist gas-equipment manufacturers were not undercut by local foundry companies (cf. Boness).

Source - S.R.O. Ayr Minute Book op cit 24/2/1890

Steel Hydraulic Main at Galashiels (1894) - Tenders

	£
Thomas Aimers and Sons, Galashiels	244
A.F. Craig and Co., Paisley	219
R. & J. Dempster, Manchester*	155

Source - S.R.O. Galashiels Minute Book op cit

Alterations to Works at Muirkirk (1896) - Tenders

	£
Balfour and Co., Leven	717
Whessa Foundry Co., Darlington	667
Hanna, Donald and Wilson, Paisley	574
Messrs Laidlaw, Sons and Caine, Glasgow*	535

Source - S.R.O. Muirkirk Minute Book op cit 22/1/1896

Tenders Received by Boness Gas Company 1843

	A		B		C		D		E		F	
	£	s	£	s	£	s	£	s	£	s	£	s
Iron Work (Apparatus)	325	10	310	0	238	10	244	0	0	0	250	0
Cast Iron Tank	180	10	175	0	214	10	150	0	-	-	135	0
Iron Work plus Tank	506	0	485	0	498	0	394	0	424	10	385	0

Iron Pipes - cost per yard

	s	d	s	d	s	d	s	d	s	d	s	d
0.5, inch dia.	1	3	1	3	-		1	3	0	10	0	7
0.75	1	4	1	4	-		1	4.5	1	0	0	9
1	1	6	1	5	-		1	6	1	2	0	11
1.25	1	7	1	6	1	4	1	4.5	1	4	1	2.5
1.5	1	9	1	8	1	5.5	1	6	1	5	1	5.5
2	2	0	1	11	1	8	1	10	1	10	1	10.5
2.5	2	4	2	2	2	0	2	2	2	1	2	0.5
3	2	8	2	6	2	7	2	6	2	5	2	6.5
4	3	3	3	0	3	2	3	3	3	4	3	3.5

*

*

*

*

	G		H		I		J		K		L	
	£	s	£	s	£	s	£	s	£	s	£	s
Iron Work (Apparatus)	-	-	585	0	-	-	286	11	-	-	519	0
Cast Iron Tank	-	-	240	0	-	-	156	0	-	-	247	0
Iron Work plus Tank	416	0	825	0	470	0	442	11	-	-	766	0

Iron Pipes - cost per yard

	s	d	s	d	s	d	s	d	s	d	s	d
0.5 inch dia.	-		-		-		1	3	0	8	-	
0.75	1	4.5	-		1	0	1	4.5	0	8.5	-	
1	-		-		1	2	1	6	0	11.5	-	
1.25	-		1	6	1	4	1	8	1	1.25	-	
1.5	1	9	1	8	1	8	1	11	1	5.25	-	
2	2	2	2	2	2	0	2	5	1	8.5	-	
2.5	2	5.5	2	4	2	3	2	10	1	11	-	
3	3	2.5	2	10	2	6	3	7	2	3.5	-	
4	3	10	3	4	2	9	4	2	2	9.5	-	

Notes - (A) A.Sinclair, Shotts Co; (B) Boness Foundry Co.;
 (C) H.Balfour, Leven; (D) Robertson & Wilson, Glasgow;
 (E) Wm.Smeallie, Coatbridge; (F) A.Turiff & Co, Paisley;
 (G) Neilson & Mitchell, Glasgow; (H) J.B.Maxton, Leith;
 (I) John Scott, Inverkeithing; (J) J.Whitlaw, Charleston;
 (K) Devon Iron Co. ; (K) A.Lawrie, Leith Walk.

Devon Iron Company was one of the principal Scottish suppliers of gas pipes.

Source. - S.R.O. Boness Minute Book op cit 4/12/1843

TENDERS TO SUPPLY NEW GASHOLDERS

(A) Annan 1865	£
Masonry Tank - Hugh Ker, builder	640
George Payne	509
John Irving*	430
Casholder - Hanna, Donald and Wilson	380
(20,000 cu ft) R.Laidlaw and Sons, Glasgow*	330
Source - S.R.O. Annan Minute Book op cit 13/6/1865	
(B) Muirkirk 1880	
Casholder - Laidlaw, Sons and Caine, Glasgow	440
John Bicket and Son, Kilmarnock*	415
Source - S.R.O. Muirkirk Minute Book op cit 17/4/1880	
(C) Galashiels 1885	
Casholder (100 ft dia. x 20 ft) & Tank -	
Wm. Brodie and Co., Paisley	5124
Messrs Robertson, Berwick	4620
Hanna, Donald and Wilson*	4490
Source - S.R.O. Galashiels Minute Book op cit	
(D) Annan 1886	
Casholder (20,000 cu ft; 40 ft dia. x 16 ft) -	
R. & J.Dempster, Manchester	385
R.Dempster and Son, Elland	328
Willy and Son, Exeter	315
W.C.Holmes, Huddersfield	309
Laidlaw, Sons and Caine, Glasgow	290
Hanna, Donald and Wilson, Paisley	277
Wm. Brodie and Co., Paisley	269
Source - S.R.O. Annan Minute Book op cit 18/3/1886	
(E) Banff 1895	
Casholder - Airdrie Iron Co., Airdrie	104
H.Balfour and Co., Leven	90
Hanna, Donald and Wilson*	80
Source - S.R.O. Banff Minute Book op cit	

(F) Dalkeith 1902

£

Telescopic Gasholder -

H.Balfour and Co., Leven	2695
Messrs Laidlaw, Sons and Caine, Glasgow	2400
Hanna, Donald and Wilson, Glasgow	2395

Source - S.R.O. Dalkeith Minute Book op cit 26/9/1902

(G) Ayr 1911**Telescopic Gasholder -**

W.C.Holmes, Huddersfield	2100
G. & W.Walker, Shropshire	2022
Ashmore & Co.	1860
Newton Chambers & Co.	1754
Messrs Laidlaw, Sons and Caine, Glasgow	1650
Messrs Clayton and Sons, Leeds	1629

Source - S.R.O. Ayr Minute Book op cit 6/3/1911

(2) Examples of Cast Iron Gas-Mains Prices(A) 1815 London

Diameter (inches)	Cost per Yard	Length (feet)	Diameter (inches)	Cost per Yard	Length (feet)
2	5s 0d	6	6	12s 0d	9
3	6 0	6	7	13 6	9
4	8 6	9	8 to 11	£11 5s per ton	9
5	10 0	9			

Source - F. Accum Practical Treatise (1815) op cit p. 186

(B) Devon Iron Company 1829

Diameter (inches)	Length		Weight			Cost					
	Ft.	Ins.	Cwt.	Qr.	Lbs	Per Cwt	Per Yd.	Per Pipe	Per Pipe	Per Pipe	Per Pipe
						s	d	s	d	s	d
1	4	8	0	0	12	-		1	2	1	9
1.25	4	8	0	0	17	14	0	1	5	2	1
1.5	6	3	0	1	6	11	0	1	8	3	4
2	6	3	0	1	23	9	6	2	2	4	4
2.5	9	4	0	3	14	9	6	2	9	8	3
3	9	4	1	0	12	9	0	3	4	10	0
3.5	9	4	1	1	0	9	0	3	9	11	3
5	9	4	2	0	6	9	0	6	2	18	6

Source - Dunfermline Ref. Lib. Dunfermline Minute Book op cit 16/4/1829

(C) H. Balfour & Co. 1845

1 inch diameter 1s 1d per yard
1.5 inch diameter 1s 4d per yard

Source - S.R.O. Cupar Minute Book op cit 11/2/1845

(D) Messrs Laidlaw of Glasgow 1859

Diameter (inch)	Per Yard		Diameter (inch)	Per Yard	
	s	d		s	d
1.5	1	4.5	3	2	3.5
2	1	9	4	3	2
2.5	2	2			

Source - S.R.O. Muirkirk Minute Book op cit 16/7/1859

(E) Various Firms 1864

5 inches diameter pipes in 9 foot lengths, tested to 11 feet water-pressure.

	Per Yard	
	s	d
Messrs Eddie and Spencer, Glasgow	3s	5d
A. and J. Stewart, Glasgow	3	3.5
Robertson and Wilson, Glasgow	3	0

Source - S.R.O. Cupar Minute Book op cit 3/6/1864

(F) Wm. McLeod of Glasgow 1874

	Per Ton	Per Yard
8 inches diameter turned and bored	£8	9s 3d
8 inches diameter, socket joints	£7 12s	8 10
6 inches diameter turned and bored	1 10	6 1

Source - S.R.O. Cupar Minute Book op cit 31/3/1874

(G) Various Firms 1881

	Cwt.	Gr.	Lbs.									
6 inches diameter pipes weighing	2	1	14									
5 inches diameter pipes weighing	3	3	14									
4 inches diameter pipes weighing	1	1	14									
Prices per Ton for				4 inch dia.			5 inch dia.			6 inch dia.		
	£	s	d	£	s	d	£	s	d	£	s	d
J. Muir, Dalry	4	7	6	4	6	0	4	6	0			
Allan Loudon	4	6	0	4	5	0	4	5	0			
Wm. Thomson	4	3	6	4	2	0	4	2	0			
A. Laidlaw and Son	4	6	0	4	5	0						
Wm. McLeod and Co.	4	6	0	4	4	0	4	4	0			
Eglinton Foundry	4	2	7	4	1	0	4	1	0			

Note - Dalry purchased from Messrs McLaren, Eglinton Foundry
Source - S.R.O. Dalry Minute Book op cit 22/3/1881

(H) Macfarlane, Strong and Co. 1896

6 inches diameter 3s 8d per cwt.
8 inches diameter 5 4.5 per cwt.

Source - S.R.O. Selkirk Minute Book op cit 4/4/1896

Comprehensive details on pipe costs are not available, but the main reduction in costs occurred between 1815 and the 1840s.

(3)

Construction of Scottish Gasholders - An Index of Company and
Regional Prosperity 1870-92

Date (J.G.L.)	Town	Capacity cu ft	Size, Dia (ft) & Height	Notes
1874	Peterhead	25,000		
1/6/1875	Aberdeen	600,000	130 dia	Second largest in Scotland
26/10/1875	Newton on Ayr	20,000		
3/7/1877	Broughty Ferry	45,000		Total storage 105,000
7/8/1877	Dundee	140,000	101 dia, 20 ft	£5,000
21/8/1877	Falkirk J.S.	80,000	86 dia, 20 ft	Stone tank
18/9/1877	Coupar Angus	16,500	40 dia, 14 ft	By McCrae, Dundee
9/10/1877	Partick, H & M	400,000	100 dia, 25 ft	Telescopic, 2 lifts
1877	Paisley	640,000		
1/10/1878	Pollockshaws	100,000		Telescopic
7/2/1880 (J.A.L.)	Dundee	1,000,000	150 dia, 60 ft	Clayton, Leeds
7/2/1880 (J.A.L.)	Forfar		60 dia	Piggot & Co., Sheffield
20/2/1883	Elgin		60 dia, 18 ft	J. Porter, Lincoln
1/5/1883	Kirkintilloch		63 dia, 18 ft	McGilchrist, Dumbarton
28/8/1883	Dunfermline	120,000		
11/9/1883	Aberdeen	{ 600,000 600,000		
15/7/1884	Broughty Ferry	90,000		£2,642
5/8/1884	Edinburgh		140 dia, 74 ft	2 lift; C & W Walker
9/12/1884	Dumfries	150,000		£3,000
17/3/1885	Kelso	35,000	50 dia, 18 ft	£1,200; Robertson, Berwick
22/9/1885	Edinburgh/Leith	1,152,182	151 dia, 31ft	2 lifts
22/12/1885	Galashiels		100 dia, 20 ft	Hanna, D & W
23/10/1888	Rothesay	72,000	50 dia	2 lift, £1,600 Hanna, D & W
12/3/1889	Saltcoats	50,000	61 dia	£2,000
23/4/1889	Paisley	1,300,000	162 dia, 32 ft	2 lifts
7/5/1889	Portobello	160,000		Telescopic
1/10/1889	Falkirk	250,000	92 dia, 20 ft	
22/4/1890	Johnstone	120,000		McGilchrist, Dumbarton

31/3/1891	Bothwell		85 dia, 24 ft	
28/7/1891	Dunoon		60 dia, 32 ft	Hanna, D & W
17/11/1891	Motherwell	205,000		£5,700
29/12/1891	Glasgow		236 dia, 45 ft	3 lifts

Notes - J.A.L. Journal of Artificial Lighting

J.G.L. Journal of Gas Lighting

APPENDIX X I

Gas and Coal Quality Analysis and Early Gas Burner Designs

- (1) Early Photometry Experiments by Christison and Turner
- (2) Later Photometry Methods and Chemical Analysis of Coal

Appendix XI Gas and Coal Quality Analysis and Early Gas Burner Design

(1) Early Photometry Experiments by Christison and Turner

Early Argand and Batswing gas burners, designed by rule-of-thumb methods and crude visual comparisons of illuminating power, posed a micro-economic problem for consumers which attracted little attention from gas companies until they were faced with competition under which the quality of lighting became the main item of contention.

In the early 1820s the controversy over candlepower from coal- and oil- gas involved a complexity of factors which were only satisfactorily unravelled by Christison and Turner. Previously "the discrepancy which exists among the opinions of well-known experimenters, regarding the light of oil and coal gas ... [was] quite incomprehensible." ¹ Original work by Dr. Henry of Manchester, suggested that it was the dense 'olefiant' (ethylene) content of both gases which produced a clear white flame; other constituents like carbonic oxide (CO), light carburetted hydrogen (C₂H₄) and hydrogen produced little light during combustion. He estimated the proportion of olefiant gas by the quantity of oxygen consumed by oil or coal gas during detonation; or alternatively by the amount of gas absorbed by chlorine in the dark.

Professor Leslie assumed that specific gravity increased in a constant ratio to the proportion of olefiant gas, and tried to calculate the candlepower of coal and oil gas from their weight. Later research showed that other constituents of such gases also caused weight variations. Dr. Fyfe in Edinburgh continued to believe that chlorine absorption was the best test of illuminating power in the 1820s, though both Dalton and Henry demonstrated that another gas in the mixture was also absorbed by chlorine. Henry later also disproved the accuracy of his detonation experiments.

Visual measurements of illuminating power were inaccurate and lacked standardization. Christison and Turner began experiments on the specific gravity of illuminating gases, and found that although this was the principal variable many other

1. Edinburgh Philosophical Journal (1826) Vol. 13 p.1

factors were involved. Coal gas alone varied from 400 to 700 S.G.¹

The illuminating power of coal gas to oil gas had been stated by earlier researchers as : 1 to 2.5 by Brande, 1 to 3.5 by Dewey, 1 to 2 or 2.5 by Neilson, 1 to 1.5 by Dr. Fyfe, 1 to 2 by Herepath and Rootsey, 1 to 1.5 by Leslie, and 1 to 3.5 by Phillips and Faraday, 1 to 2.25 by Dalton, and 1 to 4 by Ricardo.

Christison found that the London coal gas used by Dewey had a specific gravity of 407, that used by Phillips and Faraday 429, that by Brande 494, and the Wigan-cannel gas of Dr. Henry was 620 to 650. The Edinburgh coal gas averaged 600, but varied from 510 to 680; Glasgow gas was similar; and Anderson of Perth claimed the gas there to be .700. The weights of oil gases varied even more widely, since that new process used a greater variety of equipments and raw materials: " Gas of very different qualities has been made from whale-oil, cod-oil, palm oil, cocconut oil and linseed oil, but as these oils do not differ materially from one another in chemical composition, we suspect that the gas would be nearly the same from all, if the process was properly adapted for each", reported Christison and Turner.

Oil gas used by Dr. Henry varied from 463 to 758, that by Brande was 769, and that provided for Leslie by Milne's brass foundry was from 674 to 943. Gas produced from cod-oil by Taylor and Martineau was 906; that in Dewey's experiments was 939; and that used by Phillips and Faraday was 966. Christison and Turner themselves used whale-oil gas at 820, supplied by Milne, and similar gas of 778 to 1110 produced at Ranken's Glass Manufactory in Edinburgh.

The second major factor influencing experimental results was variable combustion in different gas burners, and the third factor inaccurate photometers. Detailed investigation of these factors by Robert Christison, Professor of Medical Jurisprudence in Edinburgh, and Edward Turner, chemist, was financed by Edinburgh Oil Gas Company in 1825, and published in the Edinburgh Philosophical Journal of 1826 - " On the Construction of Oil and Coal Gas Burners and the circumstances that influence the Light emitted by the Gases during their Combustion; with some observations on their relative Illuminating Power, and the different modes of ascertaining it."

1. Specific gravity in the 1820s was stated in hundreds units.

An examination of the "coal and oil gas burners of various towns, such as London, Dublin, Edinburgh and Glasgow", revealed these "to differ materially in principle from one another, not only in different places, but even in the establishment of the same company", such that the light varied "in the extravagant ratio of 10 to 14 or even 15." This variation was caused by "the multiplicity of points to be attended to in the construction of burners, and by their reciprocal influence on each other." Progress was impossible without an accurate means of measuring the light emitted from different burners.

Two types of photometers were in widespread use at that time, designed respectively by Professor Leslie and Count Rumford. Leslie's Thermometric Photometer was unreliable because it could not measure down to 0.25 candlepower without being made too large or placed too close to the light. Using a photometer made by Leslie himself for the Astronomical Institution, Christison found that it required 40 minutes to take each reading, whilst the accuracy was affected by non-luminous heat, and by lights of different colours independently to their illuminating power. Thus red appeared hotter than white light. Previously this photometer was used for gas-light readings indiscriminantly without the faults being realised.

Count Rumford's photometer based on the comparison of the intensity of shadows, proved acceptable though the method had previously been abused by scientists recording the intensity of gas light: "We know of some, whose results have been a good deal relied on, employed the crude and inaccurate measurement of estimating the intensity of the shadows, as they were simply cast on a white wall in an open room!" Rumford's instrument gave "uniform equality of the angles of the incident rays, and protects the eye from every light, except what illuminates the shadows, and a very small space around them!" The accuracy of visual comparisons of light of the same colour was proved using exactly the same lights after several days' intermission. But Rumford's photometer was inadequate to compare different colours of light: thus the comparison of a candle and an Argand gas burner was only accurate if they were both checked against a light of intermediary colour,

from a gas jet.

The photometer lacked an absolute scale of light, and a tallow or even wax candle was not considered a reliable standard because of the "dusky" coloured flame. Candle-light intensity also varied relative to the time of snuffing. The standard light chosen by Christison, and probably the first standard to have any reliability in the gas industry, was that of a 3 or 4 inch gas jet within a graduated gas tube. The flame length was kept steady to within 1/20th inch by using a gasometer of 1.5 cu.ft., into which water flowed at a precisely controlled rate to force the gas out. The gasometer was graduated to show consumption, and the device provided sufficient coal gas for 2.33 hours experiments, or oil gas for 4.25 hours.

Sir Humphrey Davy had earlier shown the role of carbon in gas lighting, and demonstrated that "the white light is caused by the charcoal passing into a state, first of ignition, and then of combustion." By placing a wire gauze horizontally above the gas, which was lit above the gauze, a blue flame with little light was produced, and Christison concluded that in such a case "the air is at once supplied in such quantity in proportion to the gas, that the first effect is to burn the gas, not to decompose it" into incandescent carbon. Thus any Argand burner which was to be improved by having a larger central air-hole or narrower chimney for greater air-flow, required a larger number of gas-jet holes to ensure carbon formation.

An optimum length of flame for illumination was demonstrated by Christison and Turner:

(A) Simple Jet Burners

(i) Coal Gas

Flame length (ins.)	2	3	4	5	6
Light, compared to 3 inch jet	55.6	100	150.6	197.8	247.4
Expenditure of gas	60.5	101.4	126.3	143.7	182.2
Amount of light for equal expenditure	100	109	131	150	150

(ii) Oil Gas

Flame length (ins.)	1	2	3	4	5
Light compared to 3 inch jet	22	63.7	96.5	141	178
Expenditure (small constant error by a leak)	33.1	78.5	90	118	153
Amount of light for equal expenditure	100	122	159	181	174

(B) Argand Burners

The same factors were involved in Argand burners:

(i) Coal Gas

Flame Height (5 holes) ins.	0.5	1	2	3	4	5
Light compared to 4 inch jet	18.4	92.55	259.9	308.9	332.4	425.7
Expenditure	83.7	148	203.3	241.4	265.7	318.1
Amount of light for equal expenditure	100	282	560	582	582	604

(ii) Oil Gas

Flame from 15 hole burner (No. 1 of Edinburgh Oil Gas Co.)

Flame Height (ins)	0.5	1	1.5	2	2.5
Light compared to 3 inch jet	31.3	153	241	377	435
Expenditure	97.4	173	216	255	288
Amount of light for equal expenditure	100	276	347	460	472

Tall burning jets were brighter than others for a given consumption of gas, because less of the volume was exposed at any one time to sufficient oxygen for combustion. Ignorance of these factors affecting illuminating power had virtually nullified earlier attempts to compare the candlepower of coal gas with oil gas. Thus Dr. Fyfe, who wrote to the Edinburgh Philosophical Society that the ratio in candlepower was 1 to 1.42, had been misled by comparing an optimal 3 inch coal gas flame with an unfavourable 1.75 inch oil gas flame. Peckston's book on Gas Lighting (1819) perpetuated the error by advising experimenters "to burn a candle against an Argand burner, and to alter the flame of the latter by means of a stop cock, till the lights are equal!" Although Brande in 1820 tested gas flames at their maximum brightness, he had not realised the significance of this action.

Christison and Turner further deducted that "the ordinary mode of altering the flame of gas-burners according to the quantity of light required, is very far from being economical. For each burner there is but one height of flame which is economical, and if it be lessened by reducing the supply of gas, the saving is by no means proportional to the diminution of light. For example, if the flame of a 5-hole gas-burner be reduced from its ordinary elevation of 3 inches to half an inch, the light is diminished to a seventh part, but the expenditure to a third only!" To reduce the light

economically it was necessary to use a different burner, or have a device in the burner "for cutting off the central supply of air as the flame is shortened?"

Gas burners were designed primarily "to render the combustion as vivid as possible"; but several manufacturers who had increased the supply of air for better combustion (as by increasing the diameter of the central aperture in Argands), had actually reduced the candlepower. Thus a 5-hole Edinburgh coal-gas burner with a $9/50$ inch air aperture and 2 inch flame, was shown to have 25% less light than a burner with $1/50$ th and a 3 inch flame. No previous attempt had been made to illustrate or explain that discrepancy. Experimental trial and error showed the optimum for coal gas of S.G. 600 was 10 holes of $1/32$ inch diameter on a circle of $3/10$ inch radius. That configuration had already been adopted by the Glasgow and Edinburgh coal gas Companies, but at a far higher development cost. Edinburgh had used $1/40$ inch holes until faced with competition from oil gas.

Optimal holes for oil-gas burners varied with the specific gravity of the gas. With 15 burners in a $3/10$ th radius the best diameter was $1/50$ inch for S.G. 900 to 1,000; $1/40$ th inch for S.G. 680; and $1/45$ inch for S.G. 778. In the absence of these figures, manufacturers were advocating holes far too small. Taylor and Martineau advised $1/60$ inch, while Dublin gasworks used $1/70$ inch. Such small holes caused inaccuracies in drilling, and Christison and Turner also showed that such lack of uniformity in the holes was another factor causing a large loss of efficiency and candlepower.

Brande in the 1820 Philosophical Transactions was the first to declare "that the light increases in a greater ratio than the expenditure when several jets are united together in an Argand burner." He showed this to occur only when the jets overlapped, but was unaware of the full importance of the spacing of the holes. Brande's experiments were inaccurate as he was unaware that gas efficiency was related to the height of the flame as well as the quality of gas, and he turned down the height of the test flame to give a light equal to one wax candle.

To test the importance of hole spacing, an Argand burner was used by Christison with a $6/10$ inch circle, like a No. 2 burner

of Edinburgh Oil Gas Company. The holes were $1/50$ th inch diameter, and in each case the optimum flame height was used:

Number of holes	8	10	15	20	25
Light (compared to 4 inch jet)	360	360	390	409	382
Expenditure of gas	367	318	296	289	275
Light for equal expenditure (efficiency)	98	113	132	141	139

20 holes proved most efficient. Hence the optimum distance between jet holes of $1/50$ inch was $9/100$ inch. In comparison, the distance used by Taylor and Martineau and London oil-gas companies was $15/100$, but in Edinburgh $18/100$ giving a loss in efficiency of 7 to 15%. The burners in Dublin varied at random from $25/100$ to $17/100$.

Similarly, coal-gas Argand burners followed no standard pattern. Peckston had recommended holes of $1/32$ inch set at a distance of $2/10$ ths. Glasgow coal gas company used a distance of about $18/100$ with 10 holes on a circle $6/10$ inch and 14 holes on a circle $8/10$ inch. The Edinburgh burners were much inferior - one had 10 holes on a circle of $8/10$ inch, or $25/100$ inch separation; another with 5 holes separated by $37/100$ inch gave 20% less efficiency than those of Glasgow. The overall requirement was sufficient air for total combustion, but supplied slowly enough to allow carbon particle formation in the flame.

Argand burners in use by Edinburgh Oil Gas Company comprised 10 holes in a circle of $3/8$ th inch diameter; 15 holes in a $5/10$ th inch circle; 20 holes in a $6/10$ inch circle; or 25 holes in a $95/100$ inch circle. The rim was $12/100$ broad, and experiments showed this to be the economic maximum, since greater width caused a lateral airflow which would disrupt the column of burning gas and hasten combustion. Using glass chimneys 6 inches high, Christison and Turner found that chimney width was also significant, the optimum diameter in the respective cases being $8/10$, $12/10$, $13/10$ and $15/10$ inch sizes.

The glass chimney was used on an Argand to give a steady flame, and to "enliven the combustion;" but no previous study had been made of its operation. With inadequate coal-gas Argands at Edinburgh, the 1.9 or 2 inches diameter chimneys in normal use

served only to steady the flame. Narrower chimneys actually decreased the candlepower: 1.6 inch diameter caused 19% decrease, 1.3 inch caused 44% loss. Christison devised an improved Argand: A double chimney, the lower section 4 inches long and 1.7 diameter, and the upper 3 inches long and 1.1 inches wide, gave an increase in candlepower of 15%.

In a properly constructed Argand, where the central air aperture was small and the jets united at the base of the flame, an increase in gas flow at the centre could cause the entire circle of gas to coalesce 1 inch above the burner, giving a wasteful yellow or brown smoky flame from lack of combustion. A glass chimney improved the central influx of air, and thus combustion, at a rate which increased as the distance between the gas-flame and the chimney was decreased. "In relation to the expenditure, the greatest light will be emitted when the flame is fully opened out"

Therefore all scientists who had previously tested gas candlepower on Argands, had false results, since the influence of the chimney had not been taken into account. All arguments on coal and oil gas had been based upon statistics which were purely relative to the particular observer who made the experiment. Christison and Turner therefore used in all tests of candlepower, a 1.5 inch diameter glass for burners of 8 and 10 holes, 1.2 inch diameter for 15 and 20 holes, and 1 inch diameter for 25 holes. Every Argand began smoking after a maximum flame height was reached:- 4 inches for 8 holes, 3.5 inches for 10 holes, 2.5 inches for 15 or 20 holes, 2 inches for 25 holes. Christison and Turner noted that at these maximum elevations, "all the flames emit nearly the same quantity of light;" but only the 25 hole burner lacked blue streaks, making it the most economical and "the most brilliant and most beautiful light we have ever seen!" It could not be used by the consumers of a public company, because of the necessity to reduce the flame on all burners whenever a few lights were extinguished in the neighbourhood altering the mains pressure. The most economical burner for the normal consumer was thus one of 15 holes on a 6/10 inch circle.

The significance of this research by Christison and Turner has been largely ignored since the mid nineteenth century. Nevertheless, they provided the basis for 'jet photometry' and the first

accurate analysis of the illuminating power of town gas. Their observations illustrate the significance and existence of fine precision engineering in the gas-fittings industry at a very early stage in the development of gas lighting.

- Sources - Edinburgh Philosophical Journal (1826) Vol. 13 pp.1-39
W.Matthews A Compendium of Gas Lighting (1832) 2nd Edition pp.80-2
The Repertory of Patent Inventions (1827) Vol. III 159, 223-4
Mechanics Magazine 1839-42 Vol. 32 pp. 340-3
 "On the Comparative Advantages of Oil & Coal Gas", Annals of Philosophy (1825) Vol. X pp. 190-3
E.A.Parnell Applied Chemistry (1844) op cit Vol. 1 p.126
J.G.L. 29/12/1885 p. 1149
Ambix - Journal for the Study of Alchemy and Early Chemistry (1969) Vol. XVI pp. 70-71
 Notes on Dr. Christison as one of the discoverers of paraffin (c.1830) vide Transactions of the Royal Society of Edinburgh (1836) Vol. 13 pp. 118-23
D.Bremner The Industries of Scotland (1869, Edinburgh)p.486
 Late research on economical Argand burners by Mr. Lowry of Greenock vide: Sir Richard Phillips A Familiar Cyclopaedia or Dictionary of the Arts of Life and Civilisation (c.1830, London)

(2) Later Photometry Methods and Chemical Analyses of Coal

In the 1830's when the Aberdeen gas-manager, Massie,¹ used glass-plates in front of a gas flame to estimate the brightness of gas by the number of plates through which it could be seen, most tests employed another visual test of no better accuracy, the "comparison of shadows"². A vertical, opaque body was positioned between a wax candle and a gas-burner until equal shadows were produced by both sources of light, and the "candlepower" of gas calculated by measuring the distance from both sources to the vertical object and then applying the inverse square law. In the absence of any standardization of gas-burners or gas-pressure, which both affected the results, conclusions varied from one experimenter to another.

The "Jet Photometer" provided the first accurate, national standard, and was devised by Professor T.Thomson³ (1773-1852) of Glasgow about 1841, although credit has always gone instead to Andrew Fyfe⁴ (1792-1861) whose later version was the basis⁵ for the Standard Jet Photometer by G.Lowe in 1860. Since illuminating power was closely proportional to the specific gravity of gas, and heavy gas took longer to burn, Thomson measured the time duration (minutes) of one cubic foot of gas propelled through a burner of specific size (one thirtieth of an inch) with sufficient pressure to produce a four-inch flame. The results showed gas from Lesmahagow coal as 103 (minutes), Monkland 100, and Skaterig 75.

Quality tests in terms of output per ton were, obviously, related to the technology of the individual gasworks, and were undertaken by individual gas managers. Thus Dunse gas company⁶ in 1838

1. New Statistical Account vol. XII p.78

2. King's Treatise (1879) op cit vol. II p.241

Professor T.Thomson "On Coal Gas", Proceedings of the Philosophical Society of Glasgow 1841-4 vol. I pp.165-74

3. Dictionary of National Biography 1909 vol. XIX p.751

4. Fyfe's photometer results appeared in S.Clegg's Practical Treatise (1853) op cit p.85

5. King's Treatise (1879) op cit vol. II p.250

T.Newbigging The Gas Manager's Handbook (1883) 3rd Edn. p.258

Dictionary of National Biography (1908) vol. VII p.780 Vide supra pp.711,1206

6. S.R.O. Dunse Minute Book op cit 2/6/1838, 2/7/1838

tested one hundredweight charges of coals and estimated the output at 8410 cu ft per ton from Sir George Grant Suttie's Prestongrange coal, 7610 from Elphinstone coal and 7384 from Edgehead coal. When Prestongrange ceased to produce parrot coal in 1841 and Dunse took advice from Edinburgh gaslight company upon coal supplies, it is evident from the statistics supplied by Edinburgh (on Suttie's coal) that Dunse could not obtain equal results in output and could only use the figures as an approximation of coal values. Already, however, Edinburgh was making use of the new photometric measurement. (Table i).

Table i - Analysis of Coal Quality by Edinburgh Gaslight Company
(M.Taylor, 1841)

	Output per Ton cu ft	Relative Duration (Jet Photometer)
Sir G. Suttie's Coal (Prestongrange)	1st Class	0.56
	2nd Class	0.72
	3rd Class	0.84
Marquis of Lothian (Newbattle)	12,000	0.65
Ayton's Wemyss/Methil	11,980	0.75

Source - S.R.O. Dunse Minute Book op cit 14/8/1841

The high test output figures stated by Edinburgh were probably produced at ideal distillation temperatures, which varied from one coal to another. Where coals of various quality were mixed, a compromise had to be reached over the temperature and length of distillation, both of which factors also affected the illuminating power of the gas. During the 1830's, Aberdeen¹ used coal which could produce 6 cu ft gas per 1 lb, but maintained higher candle power by extracting only 4½ cu ft per lb. When Paisley gas company was threatened by competition in 1843-4, low retort heats were used temporarily to raise the candlepower from local Skaterigg coal although this involved reducing the gas output by 5,500 cu ft per ton, or over half the total. Moreover, the Paisley manager A.Cook used these temperatures to produce a calculation of candlepower which, in order to mislead a Committee of the Lords², stated that quite poor coals gave

1. New Statistical Account vol. XII p.78

2. H. Lords, 1844, vol 2/8/1844 pp.77-8

gas of a quality comparable to the established high standards from Lesmahagow coal, viz. Lesmahagow 100, Skaterigg 96, Kilburnie 96, Knightswood 95, Arthurlee 92.

More reliable figures were produced in 1843 by Andrew Fyfe who combined the time-duration of a five-inch flame from the gas of different coals, with the traditional methods including the amount of gas condensed by chlorine as earlier used by Dr Henry. (Table ii) Besides the quality of gas, Fyfe also estimated the proportion of gas and coke which could be obtained from the coals, and the ash content of the coke, which affected its market value.

Table ii - Analysis of Coal Quality by Andrew Fyfe (1843)

(a) Relative Quality and Value of Gas Output

Coal	(A) Comparison with Skaterigg Coal			(B) Analysis Results Relative Illuminating Power	Relative Value of Coals
	Shadow Test	Chlorine Test	Time Duration		
Skaterigg	1	1	1	1	1.12
Knightswood	1	1	1.05	1	1
Marquis of Lothian (A)	1.3	1.5	1.35	-	2.15
Marquis of Lothian (B)	1.42	1.41	1.26	1.76	1.81
Torryburn	1.44	1.44	1.26	1.8	2.22
Lesmahagow (Fergusson)	1.54	1.70	1.36	2	2.2
Monkland	1.74	1.77	1.46	2.54	2.85
Lesmahagow(Duke)	1.79	1.79	1.40	2.48	3.58
Wemyss	1.88	2.16	1.46	3.08	3.41
Arniston	1.9	1.94	1.5	2.90	3.43

(b) Relative Quantity of Gas Output

Coal	Gas %	Coke %	Ash in Coke %
Midlothian (A)	62.0	38.0	4.0
Arniston	57.5	42.5	5.0
Torryburn	56.3	43.7	3.0
Lesmahagow	56.3	43.7	3.5
Midlothian (B)	54.3	45.7	4.5
Monkland	53.6	44.4	6.3
Wemyss	48.8	51.2	1.9
Knightswood	46.7	53.3	4.0
Skaterigg	46.5	53.5	5.0

Source - Edinburgh New Philosophical Journal 1843-4

Fyfe devised a minit^aure laboratory gasworks¹ for testing coal samples, and similar apparatus² was later adopted at most gasworks to maintain a constant check upon supplies because coal quality fluctuated within a single seam. He was also one of the first to popularize the new, and accurate, "grease-spot" photometer³ which was devised in 1848 by Bunsen at Marburg and first adopted by Mr King of Liverpool gasworks upon the advice of Lyon Playfair who had been analysing blast-furnace gases with Bunsen. This reduced errors caused by the observer's judgement, but imperfections remained due to variations in the light from standard candles⁴ used as the basis for comparisons.

During the 1850's, several comprehensive analyses⁵ of coal quality and value were published (Table iii) including a list of the coals used at all major British gasworks⁶ as compiled in 1850. Later analyses were published throughout the nineteenth century.⁷

Coal analysts, like Dr Fyfe, were paid a commission by coalmasters who quoted their analyses in advertisements. Two prominent analysts of the 1850's were Dr D.Maclagan⁸ of Edinburgh and Dr Penny at the Andersonian University in Glasgow. Dr Penny in 1849 was the first to analyse Torbanite, the best Scottish gas coal, and in 1851

1. An earlier experimental gasworks by A.Anderson at Perth has already been mentioned. Vide supra pp. 132, 413
2. H.Banister Apparatus Employed in the Analysis of Coal (1863)
Mr Hislop (Ayr) "The Experimental Retort" J.G.L. 31/8/1869 p.697
R.Gray (Dunfermline) "Commercial Analysis of Coal" J.G.L. 22/8/1865 p.639
Testing apparatus at Tradeston, Glasgow, J.G.L. 24/2/1885; at Dundee Gas World 18/7/1885 p.76
3. Civil Engineer and Architect's Journal June 1848 p.184
S.Hughes Treatise on Gasworks (1853) op cit p.297
J.G.L. 10/2/1849, 10/7/1849, 10/1/1850
R.Routledge Discoveries and Inventions in the Nineteenth Century (1876) p.550
4. Parliament stipulated candles weighing 6 in 1 lb, burning 120 grains per hour, but in 1852 Professors Graham and Brande found that consumption varied up to 135 grains per hour, and candlepower varied even with an equal rate of combustion.
King's Treatise (1879) op cit vol. II pp.243, 254
5. Scottish coals vide J.G.L. 10/11/1851, 10/4/1853, 10/5/1853, 10/6/1853
6. J.G.L. 11/11/1850; updated in J.G.L. 28/4/1857
7. e.g. King's Treatise (1878) op cit vol. I pp.86-95
T.Newbigging The Gas Manager's Handbook (1883) pp.19-42
8. E.Ronalds & T.Richardson Chemical Technology (1855) vol I part II pp.570-7

Table iii Early Published Analyses of Scottish Gas Coals (1850-5)

(1) Analysis of Principal Scottish Gas Coals (1850)

Coal	Candlepower (Gas)	Output (cu ft)	By-Product Value (% Coal Cost)
Torbanite	38	11,500	5
Lesmahagow (I & II)	30	10,800	20
Arniston	30	10,800	20
Monkland	29	10,500	20
Kinneil	24	10,400	20
Grange	24	10,400	20
Skaterigg	20	10,400	17.5
Newbattle	30	10,000	17.25
Lesmahagow (III)	28	10,000	20
Cappedrae	30	9,800	15
Old Wemyss	33	9,625	10
Lochgelly	20	9,300	17.5
Lumphinan	20	9,300	17.5
Methil	27	9,000	5

Note - Coal like Cappedrae and Wemyss was valued more for its candlepower output than for the quantity of gas

Source - J.G.L. 11/11/1850

(2) Dr Penny's Analysis of Scottish Cannels (1855)

Coal	Volatile Matter %	Fixed Carbon %	Ash in Coke %
Torbanite	71	11	60
Bathville	64	13	64
Bartonshill	48	40	20
Cowdenhill	46	45	10
Cairnbroe	43	43	27
Stevenston	40	40	32
Kelvinside	40	53	3
Breadisholm	39	48	14
Balbardie	39	30	51
Hillhead (Kilmarnock)	37	32	46

Source - E.Ronalds and T.Richardson Chemical Technology (1855)
vol. I Part II p.572

(3) Output from Scottish Cannels at Chartered Company, London (1855)

Coal	Output (cu.ft.)	Coal	Output (cu. ft.)
Torbanite	15,000	Lesmahagow (II)	13,200
Cappeldrae	14,400	Knightswood	13,200
Wemyss	14,300	Kirkness	12,800
Lesmahagow (I)	13,500	Arniston	12,600

Note - Maximum output (involving reduction of candlepower).

Source - Ronalds and Richardson Chemical Technology (1855) op cit
vol. I Part II p.576

published¹ comparisons of this with Lesmahagow, Breadisholm, average Scottish cannels, and Derbyshire cannel in terms of specific gravity, the proportions of ash, volatile matter and coke, and sulphur content. Penny's work was later continued by T.Leadbetter and E.Mills.²

Despite these statistics, the assessment of coal value long remained a badly neglected aspect of cost-benefit analysis. In 1869 Dr Wallace³ of Glasgow and Dr Macadam of Edinburgh believed that this miscalculation was the principal cause of a wide range in profitability displayed by Scottish gas companies regardless of their geographical advantages in relation to coal supply. They devised a new method of tabulating the value of coal (Table iv). Wallace later improved the analysis by estimating manufacturing and freight costs, and with statistics from thirty varieties of Scottish gas coal he showed that prime output costs varied from 2s 1½d to 3s 0½d. Despite the value of Wallace's method of calculation, it was apparently not widely adopted.

During the 1870's, coalmasters criticised gas managers for their ignorance on the types of gas coal available. Partly this was due to the sheer number of varieties - Greenock took analyses of 80 varieties, and Mr Robb of Haddington checked up to 150 printed coal-analyses each year. Nevertheless, L.Hislop⁴ was unable to persuade

1. J.G.L. 10/1/1851 p.2

2. T.J.Leadbetter "The Presence of Chlorine in Coal" J.G.L. 6/11/1860
E.J.Mills ('Young' Professor) Destructive Distillation (1877)

3. "Some Points on the History of Coal Gas" J.G.L. 31/8/1869 p.698

4. J.G.L. 1/8/1876

the North British Association of Gas Managers to publish annual abstracts of coal quality, and gas-managers continued to rely upon tables very similar to those of the 1850's, especially by G.R.Hislop¹ of Paisley (Table v) and A.Bell² of Dalkeith gasworks, for their overall picture of the coal market.

Table iv - Analysis of Coal Value by Dr Wallace (1869)

Coal cost relative to Gas Output for Illumination equal to a Standard of 10,500 cu ft (30 candlepower) per ton coal -

Market Cost (per ton)	Output per Ton cu.ft. Candlepower	Relative Value, i.e. Coal Cost to produce Standard Illumination
10s 0d	9,000	21
17s 0d	11,000	31
24s 6d	12,000	33

Source - J.G.L. 31/8/1869

Table v - Commercial Value of Principal Scottish Gas Coals (1877)

Coal	Location	Gas cu.ft/ton	Gas Quality (*)	Coke Quality % carbon	Coke Output lbs/ton coal
Kirkness	Kirkness	13,825	717	75	1,034
Chapelside	Airdrie	13,265	860	81	973
Old Wemyss	Wemyss	13,220	780	74	1,036
Dykehead	Airdrie	13,126	929	85	1,109
Lesmahagow	Lesmahagow	12,420	824	87	1,060
Muirkirk (I)	Muirkirk	12,160	781	95	1,125
Cleugh	Carnwath	11,894	676	89	1,193
Haywood	Carnwath	11,706	733	83	1,135
Niddrie (II)	Portobello	11,650	657	86	1,039
Niddrie (I)	Portobello	11,615	735	93	1,037
Kirkwood	Coatbridge	11,615	722	87	1,007
Cairntable (I)	Cairntable	11,480	788	94	1,164
Wilsontown	Carnwath	11,120	697	92	1,279
Bellshill	Bellshill	10,913	680	83	1,250
Breadisholm	Baillieston	10,859	689	80	1,245
Muirkirk (II)	Muirkirk	10,658	680	89	1,165

1. Vide R.W.Dron The Coalfields of Scotland (1902) pp.52,59,129,138

2. J.G.L. 30/10/1877 p.684

Table v (continued)

Coal	Location	Gas cu.ft/ton	Gas Quality (*)	Coke Quality % carbon	Coke Output lbs/ton coal
Benhar	Whitburn	10,640	674	58	1,385
Lanemark	New Cumnock	10,602	701	90	1,241
Allanton	Hamilton	10,561	536	92	1,272
Kirkwood (II)	Coatbridge	10,538	682	87	1,060
Crofthead	W. Calder	10,535	608	91	1,234
Knockshinnoch	New Cumnock	10,320	613	94	1,281
Braehead	Old Monkton	10,033	648	86	1,267
Shieldmuir	Motherwell	9,520	555	92	1,242

Note - (*) Grains of Spermaceti Candle equal to 1 cu ft gas in illuminating power.

Decline in relative quality of Lesmahagow since 1850

Analysis by G.R.Hislop of Paisley Gasworks

Source - W.Richards Practical Treatise (1877) op cit p.63

APPENDIX X I I

Coal

- (1) Scottish Gas Coal Supplies - Locations and Terminology
- (2) Coal Supplies Available to Glasgow Gasworks (1869)
- (3) Complexity of Supplies - Varieties and Prices of Coal offered
to Galashiels Gasworks (1879)
- (4) Coal Quality, and Expenditure compared to other Working Costs
at Greenock Gasworks (1829 - 1850)
- (5) Coal Supplies to Paisley Gasworks 1834 - 1842
- (6) Lesmahagow Coal Prices in Western Scotland 1825 - 1872 :
 - (A) At Paisley Gasworks 1825 - 1870
 - (B) At Glasgow Gaslight Company Works 1857 - 1872
- (7) Prices of Coals Used by Chartered Scottish Gas Companies :
 - (A) Best Quality Coal 1825 - 1847
 - (B) Average Coals 1847 - 1865
- (8) Scottish Gas Coal Prices noted by Journal of Gas Lighting
1849 - 1873
- (9) Regional Variations in Average Gas-Coal Cost per Ton(191))
- (10) Gas Coals Used at Galashiels and Cupar Gasworks 1850 - 1900
- (11) Coals Carbonized and Gas Output at Selkirk 1874 - 1896
- (12) Coals Carbonized at Ayr Gasworks -
 - (A) Increase in Variety in 1890s
 - (B) Decrease in Variety in 1900s
- (13) Sample of Coal Supplies to Various Scottish Gasworks
1885 - 1913
- (14) Coal Consumption in Scottish Gasworks -
Statistics for 1891, 1901, 1913
- (15) Scottish Shale Oil Production (1873 - 1914)
- (16) Mineral Oils Carbonized in Scotland to Enrich Coal Gas :
1900, 1904, 1910

Appendix XII - COAL

(1) Scottish Gas Coal Supplies - Locations and Terminology

Identification or Location	Coal Type/Collieries	Quality
(i) Ayrshire Coalfield		
Glenbuck/ Muirkirk	4 inch seam in Three Foot Coal	Poor
	11 inch seam in Nine Foot Coal	
	7 inch "Boghead Type" at Glenbuck	Good
Grievehill	20 inch Clay Gas Coal	
Dalgain (Sorn)	Small gas-coal pit	
Dalry/Kilburnie/ Kilmaurs	27 inch Wee Coal - occasional gas coal	
Girvan	Craigie Coal; Rotten Coal	
New Cumnock	12 inch and 37 inch Upper Gas Coal	
	12 inch Lower Gas Coal	
Adamhill	Gas coals	
(ii) Lanarkshire Coalfield		
Airdrie/Rawyards	'Main Coal' Pugs	Poor
Uddingston/ Hamilton/Wishaw	Splint coal (19 inch at Uddingston) also used by blast furnaces	
	15 inch and 6 inch Gas Coal Seams	
	Quarter colliery gas coal (Hamilton) near Hamilton	
Allanton		
New Monkland	Mussel-Band at Drumshangie, Dykehead, Shettleston	
Virtuewell Coal	at Newarthill and Cleland; called "Benhar Coal" at Shotts and Benhar; "Wild Coal" at Larkhall and Stonehouse	
Coatbridge	Kiltongue gas coal	*
Airdrie/Darngavil	3 inch cannel	Very good
	13 inch Drumbowie Gas Coal	
Auchenheath	Lesmahagow (this seam below L. Lime- stone, 21 inch)	
	Wee Gas Coal (10 inch seam)	
Bankend/ Auchlochan	Seams within Muirkirk Seven Foot Seam	
	Seams (5 to 8 inch) within Glenbuck Seam	
	Auchlochan Six Foot Seam and Nine	*

Identification or Location	Coal Type/Collieries	Quality
	Foot Seam	
Ponfeigh/Rigside Coalburn	Cannel seams in Big Drum coal. Gas coal and lime for purifiers (Poneil Coal Co.)	
Glasgow region	Lumloch and Garscube collieries - poor gas coals	
Climpy Gas Coal	(12 inch seam)	} Haywood, Wilson- town & Climpy collieries
Wilsontown Gas Coal	(9 to 20 inch seam)	
Carluke	9 inch Lesmahagow Seam (also mined at Crossford and Fence)	
(iii) Dumbartonshire Kirkintilloch/Kilsyth Coalfield		
Knightswood coal	New Kilpatrick parish (exhausted by 1900)	
(iv) Stirlingshire Slamannan Coalfield		
Longriggend	Johnstone coal-seam oil-shale sold for gas (used for oil at Stanrigg works)	
Banknock	Kiltongue, Virtuewell and Shale coals	
(v) Linlithgowshire		
Bridgeness	H.M.Cadell's pits (vide <u>Trans. Inst. Mining Eng.</u> vol. XIV)	
Kinneil	Cannel (corresponding to Craw Coal) 12 inch Parrot seam in Lower Ironstone	
Balbardie	7 inch Cannel, 3 inch Wild Gas Coal, Jewel Coal (Balbardie colliery conc- entrated on gas coal output)	
Armadale	Torbanehill cannel; Upper Cannel (oil); 4 inch gas coals at Colinshiels pit	
(vi) Lothians Coalfield		
Whitehill	Parrot Rough (in Great Seam)	
Prestongrange	Great Seam Jewel Coal	
Niddrie	Best gas coals in Edmonstone Parrot, and Great Seam (No. I Niddrie); 12 inch South Parrot and Stairhead Cannel	

Identification or Location	Coal Type/Collieries	Quality
	(steeply inclined seams, heavy working cost; great wastage in supports)	
(A) Western Side of Trough south of Sheriffhall Fault Loanhead/Penicuik	36 inch seam gas coal; 36 inch Corbie splint	
(B) Eastern Side of Trough south of Sheriffhall Fault Newbattle Arniston	36 inch Jewelar Arniston Parrot; 24 inch Diamond coal; 48 inch splint coal Arniston Parrot; Diamond Coal (24 inch seams sold as Arniston Dundas Coal)	
(vii) Haddingtonshire Coalfield Pathead	Arniston Parrot (termed Hauchielin coal); 8 inch Newbattle (Marquis) seam	
(viii) Fife Coalfield Dunfermline Splint Four Foot Seam	48 inch at Halbeath and Kingsleat, 42 inch at Townhill, 41 inch at Wellwood Halbeath and Kingsleat (above 8 Foot Seam; mainly sold as steam coal) (Possibly the original Halbeath gas-coal seam)	Medium quality
Parrot Aitken Hartley Coal	Halbeath, Townhill, Fordel, Donibristle Five Foot Seam at Aitken Colliery (also for steamships)	
Lochgelly splint	Also termed Bank Coal (Lindsay and Aitken pits)	
Rosewell Gas Coal Co. Blairhill	Jersey and Rough Coals in Kelty area Cadell's Parrot Coal (Blairhill Colliery) 36 inch Blairhill Main Coal	*
'Lochgelly'	'Lochgelly Splint' and Cannel were mis-named. Jewel and Main Coals from Steel-end Pits	
(ix) Lochgelly Coalfield (Fife) 'Plesio Boghead' } Lochgelly Parrot }	Benarty Colliery (Lochore and Capeldrae Cannel Coal Co.), Kelty (Problems with water and faulted seams)	

Identification or Location	Coal Type/Collieries	Quality
	Plesio gave better coke than genuine Boghead	
(x) Kirkcaldy Coalfield		
Dundonald	24 inch second-class gas coal	
(xi) East Fife Coalfield		
Largowood splint	Mined at Largo, Largowood, Radernie	
Drumhead Colliery	Splint coals	
Wemyss Coal	Earl's Parrot Coal (18 to 36 inch) mined at Wemyss and Buckhaven (comparable to Virtuewell/Drumgay seam in Lanarkshire)	

Note - * - Frequently used

Sources - R.W.Dron The Coalfields of Scotland (1902)

W.Gibson Coal in Great Britain (1920)

(2) Coal Supplies Available to Glasgow Gasworks (1869)

Output per Ton (cu ft)	Candle- power	Coal	Price per Ton (s.d)	County of Origin
13,900	27	Lochore	23.0	Fife
13,000	35	Airdrie Hill	20.0	Lanark
12,800	27	Bells Dyke	22.6	Lanark
12,573	34	Arniston	24.2	Lothian
12,500	50	Torbanite	36.0	Linlithgow
12,500	35	Lesmahagow	24.6	Lanark
12,500	34	Newbattle	24.2	Lothian
12,500	34	Climpy	25.0	Lanark
12,000	30	Old Wemyss	30.0	Fife
12,000	29	Crosshill	20.0	Fife
11,800	25	Grange	17.0	Lothian
11,800	30	Muirkirk No.I	21.0	Ayr
11,500	35	Rigside	24.0	Lanark
11,500	24	Grange II	17.0	Linlithgow
11,500	27	Hamperhill	15.0	Lanark
11,000	24	Boness	17.0	Linlithgow
10,880	28	Cleugh	16.0	Lanark
10,750	30	Milnwood	20.0	Lanark
10,500	25	Kirkwood	12.0	Lanark
10,500	24	Lanemark	12.9	Ayr
10,500	30	Rochsaltock	19.0	Lanark
10,500	25	Wilsontown	16.3	Lanark
10,000	23	Fortisset	10.0	Lanark
10,000	24	Limphan	12.9	Fife
10,000	28	Niddrie	21.0	E. Lothian
10,000	24	Cowdenbeath	14.0	Kinross
10,000	20	Lochgelly	12.9	Fife
9,888	32	Haywood	16.0	Lanark
9,500	23	Elphinstone Tower	17.9	Lothian
9,000	27	Provanhall	10.0	Lanark
9,000	19	Wyndage	10.0	Lanark
9,000	24	Hawkwood Burn	10.0	Linlithgow
9,000	23	Jerviston	9.6	Lanark
9,000	25	Dykehead	9.0	Lanark

Source - Glasgow City Archives - Miscellaneous Papers vol. 15 p.435

(3) Complexity of Supplies - Varieties and Prices of Coals Offered
to Galashiels Gasworks (1879)

Company	Coal	Per Ton (s.d)
Drumpark Coal Co, Glasgow	Drumpark	15.6
W.Bar & Sons, Glasgow	Lochlee	18.0
Drumpeller Coal Co, Coatbridge	Foulshiels	12.10
J.White, Galashiels	Stanrigg	31.4
Lanemark Coal Co, New Cumnock	Lanemark	17.10
Eddlewood Colliery Co, Glasgow	Craigrethan	30.4
James McKelvie	Burghlee	20.0
"	Pirnie	15.0
"	Home Farm	13.6
James Walker, Glasgow	Haywood	21.2
"	Splint	10.4
"	Faskin Bonnets	13.0
"	Hartley	12.7
Bellsdyke Coal Co, Airdrie	Bellsdyke	30.4
"	Shale	7.10
Chapelside Coal Co, Airdrie	Chapelside	33.0
Rigside Mining Co, Glasgow	Rigside	20.8
"	Douglas	21.10
Love & Stewart, Glasgow	Longlee	18.7
"	Lochgelly	15.2
"	Merryton	13.4
Andrew Miller, Portobello	Camp	13.10
"	Calderhead	14.3
Robert Marshall	Quarter	13.1
"	Auchlochan	14.3
"	Thrashbrush	12.6
"	Trashbrush Nuts	9.3
"	Fairholm	13.6
"	Dykehead	13.6
"	Merryton	13.3
"	Faskin Bonnets	13.3
"	Weshwood	13.11
"	Roslin	22.0
R.Addie & Sons, Coatbridge	Langloan	15.2
James Miller, Son & Co, Glasgow	Niddrie	21.0
"	Lesmahagow	31.1
"	Lesmahagow	27.4
"	Springwells	27.10
"	Balshagray	23.7
"	Bank	15.6
"	Tannochside	15.6
"	Merryton	13.3
"	Weshwood	14.2
John Romans, Edinburgh	Grange	26.4
"	Virtuewell	12.4
"	Polton	9.8
W.Darling's Trustees, Glasgow	Cleugh	22.10
William Lees, Edinburgh	Polton	9.6
"	Westwood	14.6
"	Bredisholm Splint	12.9
"	Cannel	16.0

Company	Coal	Per Ton (s.d)
William Lees, Edinburgh	Cairntable	26.6
Cowdenbeath Coal Co.	Cowdenbeath	13.6
J. Robertson & Son, Glasgow	Heading Coal	11.10
Blindburn Coal Co, Glasgow	Blindburn	14.7
G. Wilson & Co, Boness	Kinneil	23.9½
J. Darling, Shotts	Calderhead	12.9
"	Shale	12.0
G. Paul, Wilsontown	Moss-side	21.10
"	Wilsontown	22.4
"	Clumpy	10.10
Renyards Colliery, Airdrie	Splint	11.0
"	Heading	12.0
Lumphinians Coal Co, Lochgelly	Lumphinians	13.6
H. Walker & Son, Bathgate	Balbardie	26.9
"	Balbardie Boy	24.6
"	Balbardie Inch	12.6
Benhar Coal Co.	Hartlwoodhill	11.6
Arniston Coal Co, Gorebridge	Arniston	24.6
Newbattle Coal Co.	Newbattle	24.0
J. & W. Wood, Glasgow	Monkhall	23.6
"	Roslin	22.0
"	Auchinlee	14.6
"	Shields	13.3
"	Shieldmuir, Allanton	
"	& Merryton	12.6
"	Barbanchlaw	10.6
J. Nimmo, Edinburgh	Virtuewell Shale	11.0
Deans & Moor, Musselburgh	Billyford	15.8

Source - S.R.O. Galashiels Minute Book op cit 23/4/1879

(4) Coal Quality and Expenditure compared to other Working
Costs at Greenock Gasworks (1829-50) : (A) Expenditure

Date	Coal		Wages		Salaries		Total Expenditure £	Average Coal Price		Gas Output thou cu ft
	£	% Tot	£	% Tot	£	% Tot		(ton)	s d	
1829	366	34.7	94	8.9	158	15.0	1,054	14	2½	3,200
1830	486	30.0	172	10.6	165	10.2	1,621	13	7	5,700
1831	517	27.3	208	11.0	325	17.2	1,894	12	10	7,412
1832	612	27.4	347	15.6	200	9.0	2,231	13	2	8,279
1833	749	33.3	350	15.6	207	9.2	2,246	12	9	8,880
1834	851	31.6	461	17.1	220	8.2	2,692	13	8	10,511
1835	747	30.7	462	19.0	220	9.0	2,433	12	8½	11,800
1836	974	31.9	587	19.2	220	7.2	3,051	13	0	13,704
1837	1,697	42.1	616	15.3	220	5.5	4,032	16	4½	13,567
1838	1,558	40.9	632	16.6	220	5.8	3,813	15	7½	15,688
1839	1,402	40.1	574	16.4	219	6.3	3,493	13	5½	17,534
1840	1,224	36.5	465	13.9	234	7.0	3,350	15	2½	15,189
1841	1,068	33.6	373	11.7	230	7.2	3,176	15	7¼	13,058
1842	1,239	36.3	353	10.3	298	8.7	3,411	16	7	13,674
1843	1,152	31.0	437	11.8	322	8.7	3,715	15	8	13,607
1844	1,170	36.5	327	10.2	300	9.4	3,204	15	9	14,378
1845	1,368	39.4	351	10.1	297	8.5	3,476	16	1	16,510
1846	1,923	41.3	458	9.8	308	6.6	4,652	16	5	21,410
1847	2,707	42.4	617	9.6	295	4.6	6,391	19	11	23,739
1848	2,721	43.4	622	9.9	330	5.3	6,274	20	5½	24,527
1849	2,085	37.8	533	9.7	330	6.0	5,510	17	3	24,919
1850	1,880	36.0	598	11.5	330	6.3	5,219	13	3	26,256

(B) Coal Quality and Output at Greenock (1829-50)

Date	Tons Coal Parrot	Splint	Output per Ton, cu ft	Date	Tons Coal Parrot	Output per Ton, cu ft
1829	448	68	6,200	1841	1,368	9,545
1830	716	0	7,960	1842	1,497	9,134
1831	807	0	9,184	1843	1,473	9,237
1832	929	0	8,900	1844	1,510	9,521
1833	1,174	0	7,564	1845	1,701	9,705
1834	1,245	0	8,442	1846	2,342	9,141
1835	1,150	25	10,040	1847	2,716	8,740
1836	1,293	202	9,166	1848	2,660	9,200
1837	553	1,522	6,538	1849	2,420	10,292
1838	452	1,542	7,863	1850	2,833	9,271
1839	550	1,530	8,430			
1840	1,404	205	9,460			

Note - No splint recorded in use after 1840

Source - J.G.L. 10/5/1851

(5) Coal Supplies to Paisley Gasworks 1834-42

Use of Poor Quality Coals to Offset High Coal Prices 1838-41

(A) Total Consumption

Date	Tons	Total Cost £	Average Ton Cost s d	Date	Tons	Total Cost £	Average Ton Cost s d
1834				1839	4,284	3,147	14 6
-35	2,632	1,684	12 9½	1840	4,722	3,133	13 3
1836	3,196	2,012	12 7	1841	5,314	3,488	13 1½
1837	3,642	2,571	14 1	1842	3,867	2,486	12 10
1838	3,352	2,574	15 4	1843	3,397	2,000	11 9

(B) Supplies of Coal

		1834	1835	1836	1837	1838	1839	1840	1841	1842
Lesmahagow	Tons	613	122	294	1017	907	-	17	-	224
	Price	18.0	20.0	24.0	21.0	18.0	-	18.0	-	16.8
Ruchill (Maryhill)	Tons	2003	-	1515	-	-	-	-	-	-
	Price	11.6	-	12.2	-	-	-	-	-	-
Skaterigg	Tons	165	239	15	1004	896	180	-	126	1354
	Price	11.6	11.6	15.6	12.2	15.0	15.0	-	12.11	12.0
J.Grieve jr.	Tons	-	2552	1042	-	1955	45	108	-	-
	Price	-	12.2	12.2	-	12.2	-	12.6	-	-
Wilson & Co.	Tons	-	-	-	-	-	5072	2759	2765	28
	Price	-	-	-	-	-	13.9	13.0	12.11	12.11
Other* Suppliers	Tons		443	363	-	713	305	513	124	-
	Price		8.0	9.8	-	11.3	9.0	8.0	10.6	-
			to	&						
			12.0	13.6						

Notes - Prices given in (shillings.pence)

* e.g. 369 tons from J.Jamieson (1835); 207 tons from Salt-coats at 9s 8d (1836); 664 tons from Sandholes at 11s 3d (1839); 305 tons of Arthurlee at 9s (1839), and 500 at 8s (1840).

Little Lesmahagow enrichment used after 1839 despite fall in price. Heavy use of cheap coal from Wilson & Co. in 1839-41.

Sources - T.Henderson, accountant

H. Lords 1844 vol. 32 31/7/1844 pp.275-83

The activities of John Grieve, coalmaster, are discussed by B.F.Duckham in "The Emergence of the Professional Manager in the Scottish Coal Industry 1760-1815", Business History Review 1969 vol. 43 p.37

(6) Lesmahagow Coal Prices in Western Scotland 1825-72(A) Lesmahagow Prices (and Gas Price) at Paisley Gasworks 1825-70

Date	Coal s d	Gas s d	Date	Coal s d	Gas s d	Date	Coal s d	Gas s d
1825	21 0	11 4	1840	17 0	8 6	1855	24 8	5 5
1826	22 0	11 4	1841	18 0	8 6	1856	25 8	5 5
1827	20 0	11 4	1842	12 11	8 6	1857	25 0	5 0
1828	21 0	11 4	1843	16 0	8 6	1858	25 0	5 0
1829	18 0	11 4	1844	18 4	7 0	1859	25 0	5 0
1830	16 6	11 4	1845	20 0	6 6	1860	24 0	5 0
1831	13 6	11 4	1846	23 6	6 0	1861	23 6	5 0
1832	23 0	11 4	1847	26 3	6 0	1862	24 0	4 7
1833	20 0	11 4	1848	26 6	6 0	1863	23 6	4 7
1834	18 0	10 6	1849	20 0	6 0	1864	23 6	4 7
1835	16 0	9 6	1850	17 0	6 0	1865	23 6	4 2
1836	22 0	9 6	1851	17 0	6 0	1866	24 6	4 2
1837	28 0	8 6	1852	17 0	5 0	1867	22 6	4 2
1838	25 0	8 6	1853	16 10	5 0	1868	29 0	4 2
1839	18 0	8 6	1854	16 10	5 0	1869	27 0	3 9
						1870	25 6	3 9

Source - Paisley Ref. Lib. Abstract Statement of the Revenue and Expenditure of Paisley Gas Light Commissioners 1869-70
(1870, Paisley)

(B) Coal Prices at Glasgow Gaslight Company Works (1857-72)

Date	Lesmahagow Coals at -		Other Coals Carbonized				Gas					
	Townhead	Tradeston	Partick	Average Price Second-Class	Average Price All Coals	Price	Price					
	s	d	s	d	s	d	s	d				
1857	24	4	24	4	25	11	13	11	18	10	4	7
1858	21	6	21	6	23	0	16	0	19	4 $\frac{3}{4}$	5	0
1859	22	6	22	6	24	0	15	2	18	7 $\frac{3}{4}$	5	0
1860	22	6	22	6	24	0	12	4	17	5 $\frac{1}{2}$	5	0
1861	22	6	22	6	24	0	12	4	17	4 $\frac{3}{4}$	5	0
1862	22	6	22	6	24	0	12	5	16	3 $\frac{1}{2}$	4	7
1863	22	6	22	6	24	0	11	8	15	9 $\frac{3}{4}$	4	7
1864	20	0	20	0	21	6	12	2	14	10 $\frac{3}{4}$	4	7
1865	20	0	20	0	21	6	11	3	14	6 $\frac{3}{4}$	4	2
1866	25	0	25	0	26	6	12	2	14	11 $\frac{1}{2}$	4	2
1867	26	6	26	6	28	0	15	7	17	3	4	2
1868	24	6	24	6	26	0	16	0	19	1 $\frac{3}{4}$	4	7
1869	24	6	24	6	26	0	-		16	11		
1870	21	6	21	6	23	0	-		13	4		
1871	23	0	22	6	24	6	-		13	10		
1872	-		30	0	32	6	-		13	6 $\frac{1}{2}$		

Sources - Glasgow City Archives (D.-G.E.166);
Miscellaneous Papers vol. 15 (467)

(7) Price of Coals used by Chartered Scottish Gas Companies
1825-1865

(A) Best Quality Coals (shillings per ton)

Date	Paisley		Inverness		Dundee		Glasgow		Glasgow		Edinburgh		Edinburgh/ Leith	
	s	d	s	d	s	d	s	d	s	d	s	d	s	d
1825	21	0	-		17	5	18	0	-		-		-	
1826	22	0	22	0	17	5	18	0	-		-		-	
1827	20	0	20	0	14	9	16	0	-		-		-	
1828	21	0	20	0	14	3	16	0	-		-		-	
1829	18	0	20	0	-		16	0	-		-		-	
1830	16	6	22	0	13	6	16	0	-		-		-	
1831	13	6	22	0	13	1	16	0	-		-		-	
1832	23	0	22	0	13	1	16	0	-		-		-	
1833	20	0	22	0	13	1	16	0	-		-		-	
1834	18	0	22	0	13	4	15	0	-		-		-	
1835	22	0	22	0	13	1	16	0	-		-		-	
1836	22	0	23	6	15	4	18	0	-		-		-	
1837	28	0	30	0	24	1	20	0	-		-		-	
1838	23	0	28	0	25	0	17	0	-		-		-	
1839	18	0	30	0	22	6	17	0	-		-		-	
1840	18	0	23	0	16	3	18	0	-		-		19	0
1841	18	0	20	0	16	3	18	0	-		-		18	0
1842	17	0	20	0	15	9	18	0	-		-		18	0
1843	17	0	21	2	15	0	17	0	-		-		18	0
1844	18	4	19	0	15	0	16	6	16	0	-		18	6
1845	20	0	20	0	14	9	19	8	20	0	-		16	8
1846	23	6	23	3	22	6	22	6	20	0	-		21	0
1847	26	3	-		25	6	25	0	22	6	-		29	6

Note - Paisley obtained some deliveries of best coal at 21s in 1826, 20s in 1828, 22s in 1832, 18s in 1833, 16s in 1834, 18s in 1835 and 1836, 24s in 1837, 21s in 1838, 17s in 1840, 16s in 1843, 17s in 1844 and 18s in 1845.

Source - B.P.P. 1847 (734) XLIV 359

(B) Average Price of Coals Purchased (1847-65)

Date	Paisley		Inverness		Dundee Old		Glasgow Old		Glasgow C. & S.		Edinburgh Old		Edinburgh/ Leith	
	s	d	s	d	s	d	s	d	s	d	s	d	s	d
1847	16	8.5	23	1	23	6	19	2	19	2	19	1	20	8
1848	17	8.5	23	4	20	0	17	11	17	11.5	19	8	20	4
1849	12	9.75	24	4	18	6	14	11	14	11	17	10	18	6
1850	12	2	18	0	-		12	9.75	10	9	15	1	-	
1851	12	10	18	0	-		12	8	10	10	14	4	-	
1852	12	5.75	18	0	-		13	0	8	11	14	7	-	
1853	12	3.5	18	0	-		12	3	9	10	15	6.5	-	
1854	12	8.25	18	0	-		10	4.5	12	1	17	6	-	
1855	17	3.5	24	0	-		16	1.5	15	5	20	0	-	
1856	17	4.25	27	0	-		17	7.75	17	6	20	0	-	
1857	18	3.5	28	0	-		18	10	16	6	19	1	-	
1858	17	11.75	27	0	-		19	4.75	16	4	19	2	-	
1859	19	2	27	0	-		18	7.75	15	9	19	9	-	
1860	18	8.5	27	0	-		17	5.5	14	8	18	11.75	-	
1861	16	4.5	27	0	-		17	4.75	14	0	17	11	-	
1862	15	5.6	27	0	-		16	3.25	13	7	17	5.5	-	
1863	15	3.5	27	0	-		15	9.75	-		16	5.5	-	
1864	-		27	0	-		14	10.13	13	5	17	2.5	16	7.25
1865	-		26	6	-		14	6.75	13	0	18	8	16	10.5

Note - Hamilton (1864) 16s 2½d; (1865) 15s 11½d
 Kilmarnock (1864) 14s 4½d; (1865) 13s 0¼d

Sources - B.P.P. 1865 (55) L 733
 1866 (486) LXVI 519

(8) Scottish Gas Coal Prices (shillings.pence per ton)
 (Quoted in Journal of Gas Lighting)

<u>Coal</u>	April 1849	Jan 1850	July 1850	Jan 1851	June 1851	Jan 1852	June 1852	Feb 1853	June 1853	Jan 1854
Kirkness	23	23	23	23	23	23	23	23	23	23
Lothian	18	18	18	18	18	18	18	16	16	20
Lesmahagow (at Glasgow)	16	16	16	16.6	16.6	16.6	16	16	16	23
(at Leith)	-	-	-	18	18	18	18	17.6	17.6	25
Wemyss	15	15	15	15	15	15	15	14	14	25
Donibristle	12	12	12	12	10.6	10.6	10.6	10.6	10.6	10.6
Lethans	12	12	12	12	-	-	-	-	-	-
Bridgeness	11	11	11	11	11	11	11	11	11	17
Kinneil	11	11	11	11	11	11	11	11	11	17
Lochgelly	10	10	10	10	9.6	9.6	9.6	9.6	9.6	12.6
Lumphinian	10	10	10	10	9.6	9.6	9.6	9.6	9.6	12.6
Boghead	-	-	-	-	21	19	19	-	-	-
Capeldrae 1st Class	-	-	-	-	20	20	20	20	20	20
2nd Class	-	-	-	-	10	10	10	10	10	12.6
Arniston	-	-	-	-	-	16	16	16	16	22
Knightswood	-	-	-	-	-	-	10	10	10	18
Boghead (at Leith)-	-	-	-	-	-	-	-	21	21	25

<u>Coal</u>	July 1854	Feb 1855	June 1855	Jan 1856	June 1856	Dec 1856
Kirkness	23	23	23	23	23	23
Lothian	20	-	-	-	-	-
Lesmahagow (at Glasgow)	23	23	25	25	25	25
(at Grangemouth)	25	25	27.6	27.6	27.6	27.6
Wemyss (at pit)	16	16	16	16	20	20
Bridgeness	17	17	17	17	-	-
Kinneil	17	17	17	17	-	-
Lochgelly	12.6	12.6	12.6	12.6	-	-
Lumphinian	12.6	12.6	12.6	12.6	-	-
Boghead (at Leith)	27	27	28	28	28	32
Capeldrae 1st Class	20	20	20	20	20	20
2nd Class	12.6	12.6	12.6	12.6	12.6	12.6
Arniston (at pit)	22	22	22	22	22	22
Knightswood	18	18	18	18	18	18
Methil	-	11	11	11	11	13

<u>Coal</u>	Feb 1858	July 1858	Feb 1859	July 1859	Feb 1860
Boghead (at Leith)	32	32	32	40	45
Kirkness best	23	23	23	23	23
Capeldrae 1st Class	20	20	20	20	20
2nd Class	12.6	12.6	12.6	12.6	12.6
Lesmahagow (at Glasgow)	25	25	25	25	25
(at Leith)	27.6	27.6	27.6	27.6	-
Arniston	22	20	22	22	22
Wemyss	20	20	20	20	20
Knightswood	18	18	18	18	18
Pirnie	15	15	15	15	15

<u>Coal</u>	Feb 1861	Feb 1862	Feb 1863	Feb 1864	Feb 1865	Feb 1866	Feb 1867
Boghead (at Leith)	45	45	45	45	45	70	55
Kirkness best (at Burntisland)	23	23	23	23	23	23	28.6
Capeldrae 1st Class	20	20	20	20	20	20	28.6
2nd Class	12.6	12.6	12.6	12.6	12.6	12.6	18.6
Lesmahagow (at Glasgow)	25	25	25	24.6	24.6	29	29
(at Granton)	-	27.6	27.6	25.6	25.6	30	30
(at Leith)	27	-	-	-	-	-	-
Arniston (at Leith)	27.6	27.6	27.6	27.6	27.6	27.6	27.6
Wemyss (at pit)	20	20	20	20	20	20	20
Pirnie (or Methil)	15	14	14	14	14	14	15
Myles' cannell	-	-	-	-	21	21	23.6
Lothian's cannell (at Leith)	-	-	-	-	25	25	28
Haywood (or Wilsontown) at Granton	-	-	-	14	14	18	23
Cowdenbeath	-	-	-	-	-	-	11
Knightswood	18	18	18	-	-	-	-

<u>Coal</u>	Feb 1868	Feb 1869	Feb 1870	Feb 1871	Jan 1872	Jan 1873
Boghead (at Boness)	-	38	47.6	47.6	65	77.6
(at Leith)	42.6	38.8	48.2	48.2	65.8	-
Muirkirk	27	27	27	27	27	-
Kirkness (Burntisland)	28.6	28.6	28.6	22.6	22.6	-
Capeldrae 1st Class	28.6	28.6	28.6	22.6	22.6	45
2nd Class	18.6	18.6	18.6	17.6	17.6	-
Cowdenbeath (B'land)	12	12	12	12	12	-
Lochgelly (B'land)	-	-	-	12	12	-
Donibristle (B'land)	-	-	-	12	12	-
Donibristle (berlour)	-	-	-	12.6	12.6	-
Lesmahagow (Glasgow)	31.6	31.6	31.6	-	-	-
Auchinheath (Granton)	32.6	32.6	32.6	27	30	46
Duke of Hamilton (G'ton)	-	-	-	27	30	43.6
Arniston (Leith)	27.6	27.6	27.6	21	26	-
Wemyss (at pit)	27.6	22.6	22.6	20	20	45
Haywood (Granton)	23	23	23	20	23	-
Pirnie or Methil	17	17	17	17	17	26.6
Lothians cannel (Leith)	28	26	26	24.6	24.6	-
Grange (Bridgeness)	-	-	-	17.6	17.6	-
Kinneil (Boness)	-	-	17.6	17.6	17.6	-
Myles' cannel	23.6	23.6	23.6	23.6	23.6	-
Lochore (Burntisland)	28	28	28	22.6	27.6	45
Ianemark (Glasgow)	16	16	16	16	16	-
Elphinstone Tower (Leith)	-	20	20	20	20	-
Boness cannel (Boness)	-	19	19	-	-	-
Waverley (Burntisland)	-	-	-	16	19	-

Abbreviations: Duke of Hamilton's coal is Lesmahagow

Haywood also called Wilsontown

B'land - Burntisland G'ton - Granton

Auchinheath is Lesmahagow

During the very high prices of 1873, the Nitshill Company also offered Lesmahagow in Glasgow at 47s 6d, and the Duke of Hamilton's Wee Lesmahagow fetched 46s.

Source - contemporary lists in the Journal of Gas Lighting

(9) Regional Variations in Average Coal Cost Per Ton, 1911
(Old Pence)

Aberdeen	180	Dalbeattie	161	Kettle	156
Airdrie	106.52	Dalmellington	156	Kilmalcolm	143
Alexandria	142.75	Darvel	175.63	Kilmarnock	120.25
Alloa	119.25	Douglas	170	Kilsyth	125
Alva	111.75	Dundee	143.39	Kilwinning	153
Alyth	208	Dunfermline	101.66	Kinross	129.75
Annan	175.75	Dunlop	189.5	Kirkintilloch	107.5
Arbroath	135.5	Dunning	180	Lanark	130
Ardrossan	142.75	Dunoon	170	Langholm	196
Armadale	111	Dysart	142.5	Largs	141
Auchinleck	132	Buckie	222	Larkhall	109
Ayr	123	E. Kilbride	144	Lasswade	136
Baillieston	133	Edinburgh/ Leith	124	Laurencekirk	219
Banchory	330	Errol	177	Loanhead	144
Banff	237	Falkirk	113	Lochgelly	123
Barrhead	133	Ferryport	156	Lochwinnoch	141
Bathgate	108	Forfar	177	Lockerbie	169
Blairgowrie	195	Galashiels	155	Macduff	258
Boness	124	Girvan	160	Markinch	125
Bothwell/Uddn.	109	Glasgow	123.18	Mauchline	123.26
Bridge of Allan	130	Gorebridge	126	Maybole	150
Bridge of Weir	177	Gourock	143	Meikle	188
Broughty Ferry	142.3	Grangemouth	142.01	Methuen	216
Burntisland	171	Greenock	126.17	Moffat	176
Campbeltown	182.5	Haddington	150	Monifieth	156
Cardender	114	Hamilton	115	Muirkirk	144
Carnoustie	169.75	Holytown	111	Newmilns	167
Castle Douglas	158	Invergordon	300	Newton Grange	193
Catrine	156	Inverkeithing	171	Newport (Fife)	154.25
Coatbridge	100.9	Inverness	200	Newton Stewart	214
Coldstream	195	Inverurie	241	Nitshill	132
Comrie	162	Jedburgh	152	N. Berwick	156
Coupar Angus	170	Keith	234	Old Meldrum	252
Cowdenbeath	107	Kelso	168	Paisley	141.57
Craik	196	Kelty	108	Perth	128.61
				Peterhead	197

Average Coal Cost, 1911 (continued)

Pitlochry	192	Stevenston	160.5	Thornhill	156
Port Glasgow	135	Stewarton	123	Tranent	171.25
Renfrew	141	Stirling	126	Troon	162
Renton	144	Stonehaven	234	W. Calder	141
Rothesay	170	Strathaven	124	W. Kilbride	164.25
St. Andrews	162	Strathmiglo	189	Whitburn	108
Sanghar	120	Strichen	228	Wick	264
Selkirk	154	Tain	237	Wishaw	117.5
S. Queensferry	130				

(10) Gas Coals at Galashiels and Cupar Gasworks 1850-1900

(A) Coal Supplies and Prices at Galashiels (Incomplete Records) 1852-60

		1852	1853	1854	1855	1856	1857	1858	1859	1860
Newbattle	Tons	400	-	-	250	-	(£202)	-	-	300
	Price	19.6	-	-	25.10	-	-	-	28.7	28.0
Arniston	Tons	-	300	300	200	-	-	200	400	300
	Price	20.6	21.3	26.8	28.4	28.4	28.4	27.6	27.6	27.6
Torbanite	Tons	60	-	-	-	-	200	-	70	-
	Price	23.0	-	28.0	-	-	£32.0	-	-	-
Lesmahagow (Ferguson)	Tons	-	200	-	100	500	-	300	400	150
	Price	-	23.8	-	26.6	26.6	-	26.1	£27.5	32.6
Dalkeith (Buccleugh)	Tons	-	-	-	-	100	-	-	-	-
	Price	-	-	-	-	-	-	-	-	-
English (Whitwell)	Tons	-	-	?	?	200	-	-	209	-
	Price	-	-	15.0	?	16.4	-	-	-	-

Note - Prices given in (shillings.pence)

E. price f.o.b. Edinburgh

Source - Galashiels Minute Book op cit

(B) Coal Supplies and Prices at Cupar (Incomplete Records) 1856-69

Date	(1) Enrichment Coals						(2) Second-Class Coals					
	Capeldrae 1st Class		Lesmahagow		Other Best Coal		Lochgelly		Capeldrae (II)		Others	
	Tons	Price s d	Tons	Price s d	Tons	Price s d	Tons	Price s d	Tons	Price s d	Tons	Price s d
1856	75	25 6	-	-	75	25 3	150	13 9	160	15 6	-	-
1857	100	-	-	-	-	-	20	-	-	-	400	15 to 18
1858	100	27 6	150	20 6	50	32 0	150	13 0	-	-	100	-
1859	200	-	150	-	-	-	150	-	-	-	100	-
1860	200	-	150	-	50	-	-	-	-	-	100	-
1861	200	25 0	100	30 0	-	-	30	12 5	50	15 0	180	8 11 to 12 9
1862	200	-	100	20 0	100	27 0	-	-	50	-	100	8 11 to 12 6
1863	150	25 0	125	20 0	-	-	50	11 9	100	15 0	125	8 11 to 12 6
1864	175	25 0	150	19 0	-	-	60	10 9	100	15 0	75	8 11
1865	180	25 0	150	19 0	-	-	60	11 0	100	15 0	50	10 3
1866	150	30 6	200	32 0	-	-	-	-	200	20 6	230	10 10 to 12 0
1867	300	32 0	-	-	150	30 9 to 24 6	200	13 6	200	21 3	50	13 6
1868	270	27 0	-	-	-	-	-	-	-	-	200	9 6 to 12 0
1869	500	25 1	-	-	-	-	150	13 6	-	-	350	12 6 to 13 6

Note - Torbanite used for enrichment in 1858 and 1860; Arniston in 1862

Source - Cupar Minute Book op cit

(C) Coals used at Cupar (1871-92)

(i) Enrichment Coals

Date	Capeldrae (1st Class)			Dryden			Niddrie			Newbattle		
	Tons	s	d	Tons	s	d	Tons	s	d	Tons	s	d
1871	450	25	1	-	-	-	-	-	-	-	-	-
1872	-	-	-	-	-	-	-	-	-	-	-	-
1873	200	50	6	-	-	-	-	-	-	-	-	-
1874	200	40	0	-	-	-	-	-	-	200	47	6
1875	250	30	4	-	-	-	-	-	-	200	32	6
1876	200	30	4	-	-	-	-	-	-	100	31	2
1877	250	37	6	-	-	-	100	26	2	100	31	2
1878	100	32	0	250	24	4	150	24	8	-	-	-
1879	200	28	0	150	21	10	150	21	2	-	-	-
1880	250	27	6	300	21	10	150	21	2	-	-	-
1881	200	26	6	200	20	10	100	20	2	-	-	-
1882	200	25	6	200	20	10	200	20	2	-	-	-
1883	300	25	6	100	22	10	100	25	3	-	-	-
1884	200	26	6	200	23	9	-	-	-	-	-	-
1885	-	-	-	-	-	-	-	-	-	-	-	-
1886	-	-	-	-	-	-	-	-	-	-	-	-
1887	-	-	-	-	-	-	400	21	6	100	23	0
1888	200	20	6	-	-	-	350	19	0	150	22	0
1889	750	18	2	150	19	4	200	19	6	100	21	6
1890	-	-	-	-	-	-	300	29	9	-	-	-
1891	-	-	-	300	32	8	200	33	3	-	-	-
1892	-	-	-	-	-	-	150	32	0	-	-	-

Source - Cupar Minute Book op cit

(ii) Second Class Coals

Date	Lochgelly Tons s d	Donibristle Tons s d	Lumphinians Tons s d	Elgin/Wellwood Tons s d	Cowdenbeath Tons s d	Others Tons s d
1871	100	13 6	100	12 6	200	9 7
1872	-	-	-	-	-	-
1873	200	24 0	-	28 6	200	15 6
1874	100	19 0	150	20 0	100	21 9
1875	300	15 10	200	17 3	100	15 0
1876	200	13 6	500	13 11	-	50 15 0
1877	250	13 1	250	14 3	100	10 8
1878	250	12 1	-	-	150	12 0
1879	150	11 7	-	-	150	11 7
1880	300	11 7	-	-	100	11 7
1881	200	11 7	-	-	150	11 7
1882	-	-	200	11 1	-	-
1883	-	11 1	400	11 7	-	-
1884	-	-	200	12 7	-	50 10 2
1885	-	-	-	-	-	-
1886	-	-	-	-	-	-
1887	-	-	350	12 4	-	-
1888	-	-	600	12 3	-	-
1889	-	-	550	12 3	200	10 2
1890	200	11 5	-	17 0	-	-
1891	200	12 6	-	-	-	-
1892	-	-	-	-	-	-

Source - Cupar Minute Book op cit

(D) Coals used at Galashiels Gasworks (1870-1900).

Date	Best Coals		Shale Tons s d	Second Class Coals		Others Tons s d
	Newbattle Tons s d	Other Best Coals Tons s d		Ferniegair Tons s d	Allanshaw Tons s d	
1870	- 22 2	1,400 22 1	- -	- -	- -	- -
1871	1,500 23 4	- -	- -	- -	- -	600 15 7
1872	750 29 2	750 29 2	- -	- -	- -	800 19 7
1873	750 45 6	- -	- -	- -	- -	1,400 30 3
1874	900 38 10	- -	200 17 0	- -	- -	1,000 20 6
1875	900 28 9	200 27 10	200 12 0	- -	- -	2,000 14 0 to 15/6
1876	- -	- -	- -	- -	- -	- -
1877	1,200 27 6	- -	600 13 0	- -	- -	600 14 0
1878	1,200 26 6	- -	800 12 0	- 14 2	- -	500 13 9 to 15/-
1879	1,200 24 0	100 21 0	500 11 6	- -	- -	2,000 12 9 to 13/6
1880	1,200 24 0	- -	1,000 12 3	1,000 13 1	- -	1,500 13 1 to 18/0
1881	1,200 23 0	- -	- -	- -	- -	1,500 15 4 to 16/6
1882	1,000 21 10	- -	1,500 11 6	- -	- -	2,000 12 2
1883	- -	2,000 19 6	1,000 10 10	1,200 13 4	- -	1,000 13 2
1884	1,000 23 2	500 20 6	1,500 10 10	1,200 23 2	- -	700 10 8 to 13/6
1885	- -	500 22 6	1,500 10 10	2,500 13 4 to 14/4	- -	4,300 11 0 to 14/6
1886	700 23 2	- -	- -	- -	- -	700 10 9 to 11/-
1887	1,000 22 2	2,000 21 9	1,000 10 10	2,000 13 2	- -	1,000 13 3
1888	- -	- -	1,000 10 6 to 10/9	- -	2,000 12 0	1,300 10 0 to 13/4
1889	- -	- -	1,000 11 3	- -	2,500 12 0	500 13 4
1890	- -	500 26 0	3,000 12 6 to 14 6	2,000 16 4	- -	1,000 16 1
1891	- -	1,000 31 6	1,000 17 0	1,000 18 4	1,500 18 0	1,500 13 5 to 18/4
1892	- -	800 -	1,000 17 0	- -	3,000 16 0	500 21 0
1893	1,000 -	- -	- -	- -	1,000 13 3	400 13 6
1894	- -	- -	- -	2,000 14 2	1,500 13 8	1,500 13 11 to 14/2
1895	- -	- -	- -	500 13 7	1,000 13 1	2,000 12 3 to 13/3
1896	1,000 22 0	- -	500 13 8	- -	1,500 13 0	1,000 12 9
1897	1,500 19 11	500 20 0	500 13 8	- -	1,000 12 9	750 15 3 to 15/9
1898	1,500 19 11	1,000 19 3	250 14 0	- -	200 13 6	500 13 6 to 15/3
1899	1,000 21 11	- -	- -	- -	2,000 15 6	- -
1900	2,000 28 1	- -	1,000 19 4	- -	2,000 20 9	1,500 16 8 to 18/2

Note - Other best coals included Niddrie (Benhar Co.) in 1879, 1883-5, 1887, 1890-2 and 1899; Burghlea in 1883, 1887 and 1890; Muirkirk in 1875, and Arniston in 1897.

Source - S.R.O. Galashiels Minute Book op cit

(E) Galashiels Second-Class Coals - Variation in Supplies 1872-1900

Date	Coal	Tons	Price s d	Coal	Tons	Price s d	Coal	Tons	Price s d
1871	Donibristle	600	15 7						
1872	Skellyton	400	19 7	Milnwood	400	19 7			
1873	Donibristle	1,000	30 3	Skellyton	400	-			
1874	Skellyton	1,000	20 6						
1875	Skellyton	1,000	14 3	Auchlochan	500	15 6	Merryton	250	14 0
1876	-								
1877	Dykehead	1,000	13 0	Camp	200	13 4			
1878	Dykehead	400	13 9	Blanket Coal	200	15 6	Hartley	100	14 0
1879	Home Farm	800	13 6	Quarter	800	13 1	Calderhead	400	12 9
1880	Quarter	1,000	13 1	Thrashbrush	500	18 0			
1881	Woodbank	1,000	15 4	Thrashbrush	500	16 6			
1882	Quarter	1,000	12 2	Home Farm	1,000	12 2			
1883	Home Farm	1,000	13 2						
1884	Quarter	500	13 6	Haywood	200	10 8			
1885	Quarter	500	14 2	Haywood	500	11 0	Hartley	500	14 3
	Home Farm	500	14 6	Niddrie (III)	300	13 6	Calderhead	2,000	13 4
1886	Ravyards	200	11 0	Haywood	300	10 9	Rochsoles	200	10 9
1887	Rosie	1,000	13 3						
1888	Rosie cannel	300	13 4	Lushill	500	10 0	Rochsoles	500	10 3
1889	Rosie cannel	500	13 4						
1890	Caizow cannel	1,000	16 1						
1891	Bent Coal	500	18 4	Ravyards	1,000	13 5			
1892	Kethel	500	21 0						
1893	Blairhill splint	400	13 6						
1894	Fairhill	1,000	14 2	Parkhead	500	13 11			
1895	Redding	1,000	12 3	Home Farm	500	13 3	Cowdenbeath	500	13 0
1896	Benarty splint	500	10 6	(Lothian) Parrot			Earnock	1,000	12 9
	Fairhill	1,000	13 7	Bottoms	500	9 0	Kinnsil splint	500	11 3
1897	Earnock	1,000	12 9						
1898	Kethel	250	15 3	Bellhaven	250	13 6	Brown Coal	250	15 9
1899	-								
1900	Prestongrange splint	1,000	18 2	Prestongrange charls	500	16 8			

Note - Oil-gas enrichment in early 1890's.

Source - S.R.O. Galashiels Minute Book op cit

(11) Coals Carbonized and Output at Selkirk 1874-96

(A) Best Quality Coals used at Selkirk

Date	Best Coals	Tons	Price		Other Coals Tons	Coals Price Range	Average Total Cost per Ton	
			s	d			s	d
1874	Newbattle	500	40	7	500	22/9 to 23/-	31	8
1875	Muirkirk	500	28	6	300	14/- to 16/-	23	5
1877	Arniston	700	29	6	500	13/11 to 15/5	23	3
1880	Arniston	500	24	6	600	14/4 to 15/-	19	8
	Niddrie (I)	200	20	8				
	New Marlage	100	19	3				
1883	Arniston	300	23	8	800	14/3 to 17/3	18	4½
	Vogire	200	20	0	100	shale 12/1		
	Niddrie (I)	200	20	0				
1884	Niddrie	1,000	21	6	900	12/- to 17/10	18	10
	Vogire	300	22	0				
1891	Niddrie	?	32	0			28	0
	Burghlen	?	31	8				
1892	Niddrie	?	25	0			28	11½
	Newbattle	?	28	0				
1895	Newbattle	300	26	4	1,400	11/4 to 16/1	17	0
1896	Newbattle	500	22	2	1,100	12/- to 15/8	16	9

Source - S.R.O. Selkirk Minute Book op cit

(B) Production Statistics at Selkirk

Date	Output Thou cu ft	Sales After Leakage Thou cu ft	Gas Output per Ton Coal	Tons Coal Consumed	Average Price Coal per Ton	
					s	d
1882	16,390	14,458	10,486.5	1,563	17	1¾
1883	16,663	15,051	10,700	1,557	18	4½
1884	17,000	-	10,000	1,700	18	1
1885	15,934	14,312	10,253	1,554	18	6
1886	17,039	15,065	10,992	1,550	16	10
1887	18,234	-	10,302	1,770	16	10
1888	17,307	15,291	10,210.5	1,695	16	10
1889	17,717	16,282	9,843	1,500	16	3
1890	18,646	16,755	10,358.5	1,800	18	6
1891	18,153	16,316	10,170	1,785	28	0
1892	20,538	18,615	9,588	2,142	28	7½

Production Statistics at Selkirk (continued)

Date	Output Thou cu ft	Sales After Leakage Thou cu ft	Gas Output per Ton Coal	Tons Coal Consumed	Average Price Coal per Ton s d
1893	18,990	16,220	9,995.5	1,900	29 3
1894	17,820	15,991	9,988.5	1,784	20 11½
1895	18,869	17,167	9,000	1,906	20 1
1896	19,768	18,119	10,004	1,976	18 0

Source - S.R.O. Selkirk Minute Book op cit

(A)

(12) Coals Carbonized at Ayr - Increase of Variety in 1890's

Date	Coals	Tons	Cost		Coals	Tons	Cost	
			s	d			s	d
1889	Lanemark Gas	1,000	9	3	Lanemark cannel	3,000	14	0
	Bartonholm	300	7	0	Muirkirk II	300	15	0
1890	Bartonholm	600	9	9	Lanemark cannel	3,000	15	6
	Lanemark Gas	1,000	11	0				
1891	Lanemark Gas	1,000	11	6	Lanemark cannel	2,500	18	0
	Eglinton Park Gas	1,000	11	6	Muirkirk II	200	24	0
	Eglinton Park Splint	500	10	6				
1892	Eglinton Park Gas	500	11	6	Lanemark cannel	2,500	18	0
	Rosehall cannel	800	14	0	Bellfield cannel	500	17	3
	Markinch Splint	500	10	2	Bellhaven shale	200	15	9
1893	Markinch Splint	1,000	9	0	Lanemark cannel	4,000	14	6
	Glenclell shale	500	11	5	Bellhaven shale	1,000	14	3
	Bellfield W. Seam	500	11	5				
1894	Glenclell shale	600	11	1	Lanemark cannel	2,000	15	9
	Muirkirk splint	1,000	9	9	Whitehill cannel	500	14	3
	Dalquhandy Whole seam	1,000	12	0				
1895	Trabbock splint	1,000	8	3	Lanemark cannel	2,000	14	0
	Clelland shale	800	10	6	Whitehill cannel	1,500	12	9
	Dalquhandy W.S.	1,000	11	0	Springhill	600	8	3
1896	Clelland shale	800	11	6	Whitehill cannel	1,000	12	9
	Dalquhandy W.S.	1,000	9	7	Moss Park cannel	2,000	12	8
	Ayr splint	1,000	6	6	Earnock Bog cannel	700	12	7
	Eglinton Park cannel	500	8	6				
1897	Clelland shale	800	11	6	Lanemark cannel	2,000	13	0
	Eglinton Park cannel	600	8	6	Whitehill cannel	2,000	12	7
	New Bank cannel	1,000	12	10	Cadzow cannel	1,000	11	9
1898	Earnock Bog cannel	500	11	10	Whitehill cannel	2,000	13	0
	Cairntable	1,000	9	9	Cadzow cannel	2,000	12	0
	Bankend W.S.	500	10	8	Mansfield cannel	1,000	11	6

Source - Ayr Minute Book op cit

(B) Coals Carbonized at Ayr - Decrease in Variety in 1900's

Date	Coals	Tons	Cost		Coals	Tons	Cost	
			s	d			s	d
1899	Lanemark cannel	2,000	15	0	Whitehill cannel	1,000	15	9
	Cadzow cannel	1,000	14	9	Auchincruive	3,000	9	9
	Auchincruive nuts	800	7	3	splint			
1900	Lanemark cannel	3,000	17	6	Whitehill cannel	1,000	22	0
	New Bank cannel	1,000	17	0	Lanemark W.S.	1,000	15	0
	Cadzow cannel	1,000	20	11	Lanemark S. Bog	1,000	19	6
	Lanemark Gas Coal	500	14	0	Caprington cannel	500	16	2
	Lugar	500	16	0				
1901	Ayr splint	1,000	8	9	Whitehill cannel	500	19	5
	Cadzow cannel	500	19	5	Motherwell cannel	1,000	17	6
	Muirkirk splint	1,000	12	6	Bank cannel	500	15	6
	Fergushill	500	13	0				
1902	Ayr splint	2,500	8	6	Whitehill cannel	1,000	16	9
	Cadzow cannel	1,000	16	9	Clydesdale cannel	500	14	9
	Lugar W.S. (Bairds)	1,000	12	6	Allanshaw	500	16	7
	Bellfield West Seam	500	13	0	Ciarntable	500	12	3
1903	Ayr splint	3,000	9	2	Whitehill cannel	1,500	14	9
	Cadzow cannel	1,500	14	11	Lanemark Gas coal	1,000	11	5
	Lugar (Bairds)	1,000	13	2	Caprington cannel	500	10	5
1905	Ayr splint	2,000	8	0	Motherwell cannel	500	12	0
	Cadzow cannel	500	13	2	Clydesdale cannel	1,000	13	1
	Lugar W.S. (Bairds)	1,000	11	6	Bent cannel	500	12	11
	Trabbach Triples	500	7	5	Auchincruive Triples			
	Shieldsmain W.S.	500	9	5	(coking)	1,000	7	9
1906	Ayr splint	6,000	8	0	Lugar (Bairds)	1,000	11	6
	Shieldsmain W.S.	1,000	9	9				
1907	Ayr splint	2,200	12	0	Lugar (Bairds)	4,000	14	6
	Muirkirk splint	400	13	6	Lanemark 8-foot	6,000	11	0
1908	Ayr splint	6,000	10	0	Cawfin splint	1,000	11	6
1909	Ayr splint	6,000	9	0	Cawfin splint	1,000	10	6

(13) Sample of Coal Supplies for Various Scottish Gasworks
1885-1913

(A) Dumfries

Coal	1885		1888		1889	
	Tons	Price/ Ton s d	Tons	Price/ Ton s d	Tons	Price/ Ton s d
Lanemark	2,000	15 6	1,000	9 6	1,000	10 0
Muirkirk (I)	1,000	25 0	500	21 9	-	-
Muirkirk (II)	-	-	-	-	500	13 9
Haywood	500	22 0	-	-	-	-
Warwickhill	1,000	16 0	-	-	-	-
Niddrie	-	-	1,000	19 0	1,000	20 3
Sanzuhar splint	-	-	500	8 6	-	-
Morningside splint	-	-	500	10 0	1,000	9 9
Douglas	-	-	500	18 0	500	19 0
Hall Craig	-	-	-	-	500	15 9
N. Motherwell	-	-	-	-	1,000	13 0
Home Farm	-	-	-	-	1,000	11 6

Sources - J.G.L. 21/4/1885, 19/6/1888, 7/5/1889

(B) Port Glasgow (1885)

Muirkirk, Lanemark, Auchenstilloch, Douglas cannel

Source - J.G.L. 20/1/1885

(C) Lochgelly (Fife) 1886

Lochgelly, Cowdenbeath, Lumphinians

Source - J.G.L. 10/1/1886

(D) Aberdeen (1886)

Coal	Tons	Coal	Tons	Coal	Tons
Newbattle	1,000	Cairntable	2,000	Kinneil	5,000
Haywood	2,500	Grange	2,500	Muirkirk	1,500
Overdalsarf	1,000	Wilsontown	1,000	Brown Capeldrae	1,000
Rosewall	1,000	Shields	3,000	East Wemyss	500
Allanton	2,000	Coalburn	1,000	Pirnie	1,500
Lochgelly	3,500	Haywood splint	500	Grange splint	1,500

Source - J.G.L. 15/6/1886

(E) Rothesay (1890)

Pollok 500; Lanemark 800; Silkstone 500; Virtuewell 500; Udstone 500

Source - J.G.L. 22/7/1890

(F) Greenock

Greenock in the 1880's used Lanemark and Kirkwood enrichment coals, with poorer Provanhall and Allanton cannel, but by 1900 the variety of coals purchased had greatly increased to include a large number of poor coals and shales.

Varieties of Coal Carbonized at Greenock 1885-1900

Date	Main Coals	Agent/Supplier	Tonnage	Price/ Ton s d
1885	Lanemark	Lanemark Coal Co.	3,000	
	Kirkwood	J. & W. Wood	3,000	
	Provanhall	Provanhall Coal Co.	3,000	
	Greenhill Shale	J. & W. Wood	1,500	
	Rawyards	J. Miller & Co.	1,000	
	Bartonholm	Eglinton Iron Co.	500	
			<u>12,000</u>	
1890	Lanemark	Lanemark Coal Co.	2,000	
	Provanhall	Provanhall Coal Co.	1,000	
	Drumshangie	Drumshangie Coal Co.	1,000	
	Westburn cannel	-	1,000	
	Shields cannel	-	1,000	
	Parkhead cannel	-	1,000	
	Meiklehill Heading	-	2,000	
	Hillhouse cannel	-	1,000	
	Barnclith splint	-	1,000	
			<u>14,000</u>	
1899- 1900	Lanemark	Lanemark Coal Co.	2,000	14 0
				2,000
	Carbarns	J. & W. Wood	2,000	12 4
	Bellfield cannel	A. Russel	2,000	14 4
	Tannochside cannel	A. Russel	1,000	12 4
	Glenclelland shale	J. Horn	2,000	13 3
			1,000	15 0
	Clelland shale	C. Fulton	3,000	13 0
	Milton W. Seam	C. Fulton	2,000	12 3
	Darngavil Heading	J. Horn	2,000	11 5
	Silkstone	J. McKelvie	3,000	11 0
	Meiklehill caking	J. & W. Wood	1,000	12 4
	Bothin shale	Marks & Son	1,000	13 6
Others	-	679		
			<u>23,669</u>	

Sources - Greenock Ref. Lib. Police Board Minutes, J.G.L. 26/8/1890

(G) Wishaw

In the early twentieth century, Wishaw gasworks rarely purchased a single variety of coal for more than one or two years in succession.

Coal	Tons	Price		Coals	Tons	Price	
		s	d			s	d
1905 -							
Home Park Cannel	500	10	0	Broomside Cannel	500	9	7
Hartley Cannel	2000	10	8	Bent Cannel	750	11	3
Camp Cannel	250	10	0	Woodside Splint	500	8	6
Parkhead Splint	250	7	6	Chapel Washed Nuts	500	7	1½
Carfin Washed Nuts	1000	7	0				
1907							
Hartley Cannel	2000	14	3	Carfin Washed Nuts	500	10	6
Hamilton Palace Coal	1000	15	1	Ferniegair Cannel	500	14	2
Glenclelland Virtuewell	500	11	1	Shawfield Splint	1000	12	0
Camp Virtuewell	100	11	0	Greenhill Nuts	250	10	3
Brysknowe Shale	500	8	9	Glenclelland Nuts	250	10	1
1913							
Holytown Virtuewell	1000	13	3	Shawfield Double Nuts	500	13	0
Muirburn Cannel	1000	14	8	Milton Coking Coal	500	12	6
Shields Cannel	1000	13	3	Etna Cannel	500	14	6
Westhill Coking Gas Nuts	500	12	11	Glenclelland Double Nuts			
Quarter Double Nuts	750	12	11		500	12	5
Kiltongue Coking Coal	1000	14	0	Glenclelland Coking Dross			
Kiltongue Washed Double Nuts	1500	13	6		250	7	11

Source - Motherwell Ref. Lib. Wishaw Council Record (annual)

(14) Coal Consumption in Scottish Gasworks - 1891, 1901, 1911

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Aberdeen	32,968	61,490	-	71,390	1,272
Aberfeldy	-	160*	-	360*	-
Aberlour	360	90	-	130	-
Abernethy	-	62*	-	86*	-
Airdrie	4,155	6,341	-	9,200	-
Alexandria (V. Leven)	-	2,800	-	5,923*	1,218(B)
Alloa	3,200	6,370	160	15,069	1,100(B)
Alva	870	1,000	60	2,817	-
Alyth	400	400	?	600	400
Annan	743	1,113	-	1,860	-
Anstruther	500	850	-	1,500	-
Arbroath	4,443	6,623	-	10,511	7,800
Ardrossan	1,230	1,923	103	2,227	-
Armadale	-	400	-	1,237	-
Auchinleck	66*	130*	-	400*	-
Auchterarder	280	420*	-	620*	-
Auchtermuchty	-	98*	-	175*	-
Ayr	-	8,950	-	7,485	-
Ayton	-	78	-	78	-
Baillieston	420	618*	-	1,362	-
Balfron	42	-	-	-	-
Banchory	110	141*	-	286	-
Banff	679*	781	-	1,435	-
Bankfoot	-	56*	-	-	-
Barrhead	1,960	3,056	-	4,353	-
Bathgate	700	1,250	-	3,300	3,000(B)
Beith	750	830	-	1,122	-
Bellshill	-	1,870*	-	3,411*	-
Bervie	110	-	-	80*	-
Biggar	197*	275	-	400	-
Birnam	-	105	-	138	-
Blackford	-	-	-	90*	-
Blairgowrie	1,000	1,201	-	1,239	-
Blantyre	831	2,200*	-	2,900	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Boness	1,230	1,946*	-	2,827	-
Bothwell	1,800	4,420	-	7,400	-
Brechin	1,800	2,202*	-	2,750*	-
Bridge of Allan	1,399	2,450	-	2,800	-
Bridge of Earn	-	140*	-	-	-
Bridge of Weir	230	726	-	1,250	-
Broughty Ferry	2,469	5,659*	-	6,960	-
Burntisland	1,200	1,639*	-	2,712	-
Busby	-	500*	-	1,700	-
Callander	-	405*	-	465	-
Cambuslang	1,370	3,487*	-	5,780	-
Campbeltown	1,944	2,252	-	2,634	-
Cardenden	-	-	-	850*	-
Carluke	500	1,321*	-	1,790*	-
Carnoustie	550	1,368	-	2,633	-
Castle Douglas	260	717	-	1,091	-
Castlebar	-	-	-	-	-
Catrine	240	289	-	537	-
Coatbridge	8,101	17,999	-	22,748	-
Coldstream	340	440	-	609	-
Colinsburgh	(oil)	-	(oil)	170	-
Comrie	-	-	-	180	-
Costorphine	270	-	-	-	-
Coupar Angus	335	337	-	603	-
Cove/Kilcreggan	-	150*	-	173*	-
Cowdenbeath	-	45*	-	3,495	-
Crail	-	159	-	320	-
Crieff	-	1,800	-	2,600	-
Culler	210	200	-	265*	-
Cumnock	-	706*	-	-	-
Cupar Fife	-	1,983*	-	2,500*	-
Dalbeattie	150	225*	-	526	-
Dalkeith	?	1,810*	-	2,200	-
Dalmellington	-	109*	-	280	-
Dalry	600	854	-	1,130	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Darvel	475	800	-	1,245	-
Deanston	184	-	47 ton	140	30 ton
Denny	800	1,518	-	1,605	-
Dollar	250	252*	-	249	-
Douglas	-	180	-	210	-
Doone	-	-	-	176*	-
Dreghorn	-	200	-	410	-
Dufftown	80	-	-	-	-
Dumbarton	4,000	7,000	-	9,530	-
Dumfries	5,243	-	-	11,442	12,320
Dunbar	596	978	-	1,424	-
Dunblane	550*	930	-	930	-
Dundee	35,861	62,992	-	84,518	123,292
Dundonald	-	100	-	100	-
Dunfermline	6,050	8,916	-	16,251	-
Dunkeld	-	1,500*	-	1,666*	-
Dunlop	-	-	-	173	-
Dunning	70	80	-	80	-
Dunoon	1,420	2,631	-	4,259	-
Duns	-	474*	-	612*	-
Dysart	-	670*	-	922*	-
Earlston	-	160*	-	167*	-
Easter Buckie	291	355*	-	950*	-
E. Kilbride	166	230	-	350	-
E. Linton	-	100*	-	136*	-
E. Wemyss	-	869*	-	1,759*	-
Ecclefechan	-	-	-	-	-
Edinburgh/Leith	84,174	166,289	2,862	183,945	727
Edzell	-	-	-	108*	-
Elgin	1,700	2,600	-	3,650	-
Elie/Earlsferry	200	400	-	752	-
Ellon	360	(paraffin)	-	(paraffin)	-
Errol	-	32	-	55	-
Eyemouth	120	190	-	302	-
Falkirk	5,415*	13,014	-	21,682	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Falkland	-	160	-	62	-
Ferryport	291	576	-	1,060	-
Fochabers	-	135	-	-	-
Forfar	2,500	3,440	-	4,908	-
Forres	660	963	-	1,159	-
Fortrose	20	-	-	-	-
Fraserburgh	740	1,380	-	2,495*	-
Galashiels	5,290	5,700	-	8,050	-
Galston	598	800*	-	1,107	-
Gatehouse	418*	805*	-	70	-
Girvan	400	750	-	1,130	-
Glasgow	319,417	665,081	1,688	675,580	-
Golspie	65*	109*	-	-	(oil)
Gorebridge	-	150	-	180	-
Gourock	1,000	3,100	-	3,608	-
Grangemouth	-	1,770*	-	3,826	-
Greenock	20,437	32,657	-	35,113	14,869(B)
Haddington	750	930	-	1,500	-
Hamilton	5,486	14,879	-	15,486	500(B)
Hawick	4,684	6,637	-	8,160	-
Helensburgh	2,400	4,800	-	6,516	7,572(B)
Holytown	-	301*	-	900	-
Huntly	-	530*	-	843	-
Innellan	-	139*	-	-	-
Innerleithen	1,050	1,286	-	1,566	-
Inverary	157	126	-	85	-
Invergordon	-	113	-	191	-
Inverkeithing	89*	210	-	324	-
Inverness	4,500	7,500	-	10,032	-
Inverurie	-	290	-	600	-
Irvine	1,950	2,520*	-	3,600*	-
Jedburgh	697	700	-	871	-
Johnstone	2,181	4,657	-	8,183	-
Keith	320	474	-	1,086	-
Kelso	1,100	1,778	-	2,680	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Kelby	-	-	-	2,142	-
Kennoway	-	26*	-	455*	-
Kettle	450	600	-	720	-
Kilbarchan	440	780	-	1,086	-
Kilmalcolm	320	993	-	1,362*	-
Kilmarnock	7,500	14,500	-	18,860	-
Kilmaurs	50*	84*	-	300	-
Kilsyth	623	1,378	-	3,250	-
Kilwinng	750	950*	-	1,530	-
Kincardine	-	200*	-	300*	-
Kinghorn	-	-	-	423*	-
Kinross	450	724	-	997	-
Kirkcaldy	6,600	12,900	-	14,918	-
Kirkcudbright	-	300*	-	605	-
Kirkintilloch	2,371	4,857	-	7,503	-
Kirkwall	450	400*	-	472	-
Kirriemuir	658	859	-	990*	-
Lanark	1,000	1,780	-	2,669	-
Langbank	-	165*	-	120	-
Langholm	600	600	-	700	-
Largo	-	-	-	500	-
Largs	600	1,269	-	1,930	-
Larkhall	1,049	2,400	-	3,580	-
Lasswade	700	860	30 ton	1,163	-
Lauder	-	42*	-	109*	-
Laurencekirk	120	190	-	327	-
Lennoxtown	480	520*	-	600*	-
Lerwick	236	280	-	550	-
Leslie	220*	311*	-	808	-
Lesmahagow	120	274*	-	543	-
Letham	41	125*	-	200*	-
Leuchars	-	33*	-	33*	-
Leven	760*	1,758*	-	4,582*	-
Linlithgow	-	900	-	1,300	-
Loanhead	-	-	-	500	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Lochgelly	233	456	-	3,241	-
Lochgilphead	333	354*	-	354*	-
Lochmaben	-	83*	-	86*	-
Lochwinnoch	240	286	-	350	-
Lockerbie	-	668	-	852	-
Macduff	300	150*	-	357	-
Markinch	175	417*	-	720	-
Maryhill/Hillhead	36,000	-	-	-	-
Mauchline	-	350	-	589	-
Maybole	900	900	-	1,580	-
Meigle	50	50	-	50*	-
Melrose	500	711	-	825	-
Methven	-	39*	-	48*	-
Mid Calder	-	100*	-	80*	-
Millport	300	490	-	732	-
Milngavie	800	1,700	-	-	-
Moffat	-	750*	-	1,200	-
Monifieth	-	300*	-	1,135	-
Montrose	2,400	2,950	-	3,100	-
Motherwell	2,152	7,700*	-	10,962*	-
Muirkirk	315	322	-	534	-
Musselburgh	2,200	3,539	61 ton	5,034	-
Nairn	600	1,000	-	1,700	-
Neilston	-	572*	-	655*	-
Newburgh	-	200	-	300	-
New Cumnock	-	150*	-	700*	-
Newmains (Coltress)	-	-	-	1,600*	-
Newmilns	-	900*	-	1,633*	-
Newtongrange	-	-	-	1,008	-
Newport	-	1,100*	-	2,331	-
Newton Mearns	-	-	-	350	-
Newtown (Ayr)	-	3,950*	-	5,800*	-
Newton Stewart	-	400*	-	532	-
Nitshill	-	60*	-	120	-
North Berwick	-	2,014	-	2,710	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Oban	-	953	-	1,283	-
Old Meldrum	44	36*	-	66	-
Paisley	25,900	41,420	355 ton	42,463	7 ton
Peebles	1,099	2,230	55 ton	3,643	-
Penicuik	1,550	900*	-	1,067*	-
Perth	8,057	18,300	8,000(B)	20,882	8,406
Peterhead	1,414	2,518	-	5,074	-
Pitlochry	-	360	-	300	-
Pittenween	370	520*	-	780	-
Pollockshaws	2,866	-	-	-	-
Polmont	-	-	-	658*	-
Port Glasgow	2,670	4,483	-	5,906	-
Portobello	3,800	-	-	-	-
Portsoy	-	(acetylene)	-	(acetylene)	-
Prestonpans	500	500	-	-	-
Ratho	-	-	-	108	-
Renfrew	1,055*	3,200	-	4,900	-
Renton	743	1,380	-	1,650	-
Rosewell	-	335	-	380	-
Rothesay	3,670	6,000	-	8,300	-
St. Andrews	2,140	4,000	-	5,100	-
Saltcoats	1,122	1,906	-	2,743	-
Sanquhar	155	160	-	278*	-
Selkirk	1,800	2,577	-	4,113	-
Skelmorlie	-	462*	-	500*	-
Slamannan	-	110*	-	110*	-
S. Queensferry	-	-	-	600	-
Stane	-	-	-	760	-
Stevenston	346	475	-	1,190	-
Stewarton	600	903*	-	1,200	-
Stirling	5,400	7,556*	-	12,748	-
Stonehaven	-	1,084	-	1,759	-
Stonehouse	375	580	-	650	-
Stornoway	150	300*	-	700*	-
Stow	107	100*	-	150	-

Town	1891	1901		1911	
	Coal	Coal	Oil galls	Coal	Oil galls
Stranraer	852	1,262*	-	1,700*	-
Strathaven	-	1,400	-	1,350	-
Strathmiglo	100*	120*	-	170	-
Strichen	-	30*	-	51*	-
Stromness	-	-	-	-	-
Tain	150	337	-	483	-
Thornhill	-	130*	-	300	-
Thurso	270	310	-	530	-
Tillicoultry	-	1,050*	-	1,700*	-
Tranent	220	240	-	463	-
Troon	413	800*	-	3,296	-
Turiff	210	236	-	328	-
W. Calder	-	197*	-	450*	-
W. Kilbride	120	519	-	864	-
W. Linton	20*	20*	-	(acetylene)	-
Whitburn	175	260	-	220	-
Whithorn	100	100	-	(acetylene)	-
Wick	-	950*	-	1,402	-
Wigtown	160	160	-	160	-
Wishaw	1,900	4,250	-	7,579	-
Sum Totals	748,926	1,405,463	12,873 galls + 548 tons	1,631,431	182,476 galls + 37 tons
Total Scottish Coal Output	25,323,818	33,112,104		42,000,000 †	
% of Total	3.0	4.2		3.9	

Notes - * Under-estimate, calculated from gas output as 1 ton = 10,000 cu ft.

(B) benzol

† Scottish Coalfields - The Report of the Scottish

Coalfields Committee (1944, Edinburgh) p.56 (output graph 1873 - 1939)

(15) Scottish Shale Oil Production

Besides providing engineering training for many gas managers, excess capacity in the early 1890s led oil engineers to encourage the use of oil-gas to enrich coal-gas in Scotland .

Date	Scotland Tons Oil Shale	United Kingdom Tons Oil	Date	United Kingdom
1873	524,095	524,095	1892	2,089,937
1874	361,910	362,747	1893	1,956,520
1875	424,026	437,774	1894	1,986,385
1876	541,273	603,538	1895	2,246,865
1877	684,118	801,701	1896	2,419,525
1878	645,939	788,704	1897	2,223,745
1879	712,428	783,748	1898	2,137,993
1880	730,777	837,805	1899	2,210,824
1881	912,171	938,255	1900	2,282,221
1882	994,487	1,030,915	1901	2,354,356
1883	1,130,729	1,167,943	1902	2,107,534
1884	1,469,649	1,518,871	1903	2,009,602
1885	1,741,750	1,770,413	1904	2,333,062
1886	1,699,144	1,728,503	1905	2,496,785
1887	1,390,320	1,411,378	1906	2,546,522
1888	2,052,202	2,076,469	1907	2,690,028
1889	1,986,990	2,014,860	1908	2,892,039
1890	2,180,483	2,212,250	1909	2,967,057
1891	2,337,932	2,361,119	1910	3,130,280
			1911	3,116,803
			1912	3,184,826
			1913	3,280,143
			1914	3,266,666

Sources - Scottish figures from R.T.Moore "The Mineral Oil Industry in Scotland" Transactions of the Federation of Mining Engineers 1892-3 Vol IV p.44 (also map)

United Kingdom figures from H.S. Bell Oil Shales and Shale Oils (1948, New York)

Competition from imported United States oil after 1863, and Russian after 1884 is described in The Oil Shales of the Lothians (1927) 3rd Edn. -Memoirs of the Geological Survey (Scotland):pp. 248,249. Essays in this volume : R.G. Carruthers "The Geology of the Oil Shale Fields", based on research by H.M. Cadell in 1884-7, and J.S.G. Wilson; W. Caldwell "Methods of Working the Oil Shales"; E.M. Bailey "Chemistry and Technology of the Oil Shales"; H.R.J. Conacher "History of the Scottish Oil Shale Industry".

See also H.F. Williamson and A.R. Daum The American Petroleum Industry-The Age of Illumination 1859 - 1899 (1959, Evanston).

(16) MINERAL OILS CARBONIZED TO ENRICH COAL GAS -

Statistics for 1900, 1904, 1910

Town		1900		1904		1910	
		Amount*	Price s d	Amount*	Price s d	Amount*	Price s d
Aberdeen	Coal	T 52,869	14 10	T 67,131	17 0	T 69,424	15 3.5
	Oil	-	-	-	-	T 1,490	55 0
Alexandria	Coal	T 2,800	14 8.5	T 4,000	12 3	T 5,360	11 1.5
	Oil	-	-	G 5,000	0 9	G 1,600	0 5.5
Alloa	Coal	T 6,370	7 0	T 1,500	8 10	T 13,491	10 2.5
	Oil	T 162	60 0	G 15,000	0 7	G 3,778	0 9
Alyth	Coal	T 400	26 0	T 400	14 0	T 600	17 4
	Oil	-	-	G 800	0 9	G 400	0 9
Arbroath	Coal	T 6,623	19 0	T 7,558	14 8	T 10,177	10 8.5
	Oil	-	-	G 7,526	0 8	G 8,500	0 5.5
Ardrossan	Coal	T 1,923	9 3	T 2,573	13 9.5	T 2,227	12 5.5
	Oil	T 103	71 7.5	-	-	-	-
Boness	Coal	T 1,828	-	-	-	T 2,915	9 0
	Oil	-	-	-	-	G 2,187	0 5
Coatbridge	Coal	T 14,218	-	T 18,422	-	T 22,214	8 5.9
	Oil	-	-	G 35,648	-	G 36,788	-
Coupar Angus	Coal	T 337	24 9	T 540	16 6	T 600	14 2
	Oil	-	-	G 200	0 10.5	-	-
Dunfries/ Maxwelltown	Coal	T 7,975	15 8.3	-	17 9	T 11,442	13 9.39
	Oil	T 313	69 5	-	77 3	G 12,320	-
Dundee	Coal	T 61,440	14 10	T 68,411	13 9.75	T 89,194	11 5.98
	Oil	-	-	G 41,772	0 8	G 56,870	0 3.8
Dunfermline	Coal	T 8,592	11 4.6	T 7,600	-	T 15,000	-
	Oil	-	-	G 26,511	-	B	-
Edinburgh/ Leith	Coal	T 166,000	-	T 164,975	-	T 187,153	-
	Oil	T 2,860	-	T 3,835	-	T 1,029	-
Glasgow	Coal	T 665,081	11 1.8	T 705,388	11 2.1	T 686,311	9 10.8
	Oil	T 1,688	G 0 3	T 2,005	45 1.8	-	-
Greenock	Coal	T 32,600	16 4	T 31,389	12 1	T 33,272	11 6
	Oil	-	-	-	-	G 25,568	-
Helensburgh	Coal	T 4,654	15 1	T 5,062	19 10	T 6,516	-
	Oil	-	-	G 4,168	-	G 7,572	-
Kelso	Coal	T 1,778	16 1	T 2,100	14 0	T 2,608	14 0
	Oil	-	-	G 3,000	-	B	-
Kilsyth	Coal	T 1,347	-	T 2,000	8 9	T 3,067	10 0
	Oil	-	-	G 1,000	-	G 1,000	-
Lasswade/ Bonnyrigg	Coal	T 849	-	T 910	15 3	T 1,286	11 7
	Oil	T 23	-	T 27	40 0	-	-

Town	1900			1904			1910		
		Amount*	Price s d		Amount*	Price s d		Amount*	Price s d
Musselburgh	Coal	T 3,315	-	T 3,849	-	T 5,034	-		
	Oil	T 83	-	T 63	-	-	-		
Paisley	Coal	T 41,145	12 3.5	T 45,123	11 8.5	T 40,924	11 9.1		
	Oil	T 469	70 5	T 573	89 10.6	-	56 10.5		
Peebles	Coal	T 1,835	-	T 2,693	-	T 3,632	-		
	Oil	T 70	-	T 70	-	-	-		
Perth	Coal	T 16,630	17 2	T 17,949	13 6.5	T 21,616	10 5		
	Oil	-	-	G 27,500	-	G 7,091	-		

Note - * Quantities recorded in (T) tons or (G) gallons, and prices correspondingly.

B - Benzol

Banff, Bothwell, Falkirk, Golspie, Kirkintilloch, Newton Mearns
Stewarton and Stirling also used oil or benzol for enrichment
during this period, but statistics are not available.

Source- C.W. Hastings Gas and Water Works Statistics (1900, 1904, 1910)

APPENDIX X I I I

Data Relating to Gasworks By-Products

- (1) Comparative Value of Total By-Products Revenue at Dalkeith, Ayr, Muirkirk, Bathgate, Paisley, Edinburgh and Leith.
- (2) Chronological and Regional Variations in Gasworks Coke Sales : 1891, 1901, 1911
- (3) Chemical By-Products : Table of Manufacturers, Wholesale Outlets, and Competitors in the Boom of 1882
- (4) Chemical By-Products : Extant Scottish Statistics for 1891, 1901, and 1911.
- (5) By-Product Sales and Tenders - prices paid and offered by Scottish Manufacturers as Recorded in S.R.O. Gas Company Minute Books.

Appendix XIII - BY PRODUCTS(1) Comparative Value of Total By-Products Revenue at Dalkeith, Ayr, Muirkirk, Bathgate, Paisley, Edinburgh and Leith.(1) Value of By-Products at Dalkeith (1831-68)

Date	Gas Revenue £	Coal Costs £	Tar & Coke Revenue £	By-Product Revenue % Coal Cost	Revenue as % Gas Revenue
1831	333	-	5	-	1.5
1832	365	104	2	1.9	0.5
1833	520	121	2	1.9	0.4
1834	505	128	12	9.0	2.3
1835	601	137	19	13.7	2.3
1836	665	215	9	4.1	1.3
1837	656	328	21	6.1	3.1
1838	723	309	22	7.0	3.0
1839	825	295	43	14.7	5.3
1840	802	259	35	13.3	4.3
1841	845	300	37	12.2	4.3
1842	880	326	64	19.6	7.3
1843	892	319	26	8.2	2.9
1844	920	235	90	38.3	9.8
1845	828	372	42	11.3	5.1
1846	930	422	40	9.5	4.3
1847	1015	579	26	4.5	2.6
1848	1008	503	19	3.8	1.9
1849	1011	459	26	5.7	2.6
1850	1082	346	15	4.3	1.4
1851	1103	334	25	7.4	2.3
1852	1056	296	16	5.4	1.5
1853	1038	348	10	2.9	1.0
1854	1058	326	32*	9.8	3.0
1855	1298	446	23	5.2	1.8
1856	1407	619	79*	12.8	5.6
1857	1460	514	84	16.3	5.8
1858	1495	638	100	15.7	6.7
1859	1470	545	115	21.1	7.8
1860	1485	651	140	21.5	9.4
1861	1578	621	113	18.2	7.2

Date	Gas Revenue £	Coal Costs £	Tar & Coke Revenue £	By-Product % Coal Cost	Revenue as % Gas Revenue
1862	1641	716	158	22.1	9.6
1863	1707	626	133	21.2	7.8
1864	1895	688	131	19.0	6.9
1865	2003	820	152	18.5	7.6
1866	2060	898	183	20.4	8.9
1867	2170	983	235	23.9	10.8
1868	2299	932	177	19.0	7.7

Note - * including sales of scrap metal.

Source - S.R.O. Dalkeith Minute Book op cit

(ii) By-Products as % Total Revenue (Charge) and Coal Cost at Ayr and Muirkirk

Date	Ayr		Muirkirk		Date	Ayr		Muirkirk	
	% Total	% Coal	% Total	% Coal		% Total	% Coal	% Total	% Coal
1850	2.3	11.3			1883			14.0	46.6
1851	1.8	12.7			1884			15.9	56.7
1852	1.6	8.8			1885			13.0	33.0
1853	2.4	16.1			1886			8.7	19.4
1854	2.4	11.9			1887	8.0	17.3	3.6	12.6
1855	3.5	10.2			1888	5.0	13.4	4.7	17.1
1856	3.8	16.5			1889	6.2	18.5	6.8	29.6
1869	6.6	17.7			1890	10.7	32.0	12.8	47.6
1870	6.5	19.7			1891	13.0	36.9	11.0	31.5
1873			4.9	14.1	1892	13.8	33.1	12.2	32.7
1874			3.7	7.1	1893	9.6	21.2	3.5	10.2
1875			3.8	7.5	1894	6.5	16.7	3.7	12.7
1876			5.8	13.1	1895	9.3	23.5	5.3	14.3
1877			6.9	17.9	1896	10.3	26.0	3.8	15.3
1878			8.5	28.8	1897	7.9	21.3	4.0	14.1
1879			9.1	22.1	1898	7.9	19.3	2.2	7.5
1880			9.4	29.6	1899	12.8	22.3	5.0	17.4
1881			7.5	24.7	1900	11.3	25.7	4.5	13.0
1882			10.2	37.5	1901	13.7	28.9	4.5	11.6
					1902	11.6	26.6	4.7	14.3

Date	Ayr		Muirkirk		Date	Ayr		Muirkirk	
	% Total	% Coal	% Total	% Coal		% Total	% Coal	% Total	% Coal
1903	9.2	22.7	5.5	16.7	1909	12.3	34.9		
1904	10.0	26.7	5.9	18.3	1910	13.4	44.9		
1905	10.7	30.7	3.9	11.7	1911	13.8	46.9		
1906	9.6	29.0	5.6	18.7	1912	13.5	46.3		
1907	10.2	32.0			1913	15.3	47.0		
1908	13.3	35.8							

(iii) Value of By-Products at Ayr Gasworks (1850-70)

Date	Total Revenue £	Coal Expenditure £	By-Product Revenue			Total By-Products as	
			Coke £	Lime £	Tar £	% Coal Cost	% Total Rev.
1850	2,371	656	50	4	20	11.3	2.3
1851	2,542	558	38	3	30	12.7	1.8
1852	2,557	594	38	4	11	8.8	1.6
1853	2,566	633		102		16.1	2.4
1854	2,501	902		107		11.9	2.4
1855	3,306	1,711		174		10.2	3.5
1856	3,118	1,072		177		16.5	3.8
1869	5,035	1,879	76	23	234	17.7	6.6
1870	5,044	1,675	73	25	232	19.7	6.5

Source - S.R.O. Ayr Minute Book op cit

(iv) Value of By-Products at Bathgate (1855-67)

Date	Total Revenue £	Coal Expenditure £	By-Products (Lime, Tar, etc) £	By-Products as	
				% Coal Cost	% Total Rev.
1855	463	146	17.55	12.0	3.8
1856	543	163	24.55	15.1	4.5
1857	626	189	17.65	9.3	2.8
1858	823	131	25.95	19.8	3.2
1859	730	138	31.65	22.9	4.3
1860	835	275	16.30	5.9	2.0
1861	607	191	42.70	22.4	7.0
1862	624	142	32	22.5	5.1
1863	720	224	34.95	15.6	4.8
1864	732	301	46.80	15.5	6.4

Date	Total Revenue £	Coal Expenditure £	By-Products (Lime, Tar, etc) £	By-Products as % Coal Cost	By-Products as % Total Rev.
1866	904	255	100.65	39.5	11.1
1867	1,278	316	19.30	6.1	1.5

Note - By-Products may include waste metal and sundries at Bathgate.

(v) Value of By-Product Revenue at Paisley Gasworks (1860-1900)

Date	Coal Cost £	Lime Cost £	Revenue				Waste Lime £	All By-Products	
			Aml. £	Tar £	Coke £	Total Revenue £		Coal Cost %	
1860	5,817	127	334	567	178	41	1,120	19.3	
1861	5,603	119	371	581	163	48	1,163	20.8	
1862	5,173	158	338	555	182	45	1,120	21.7	
1863	5,395	202	376	633	187	39	1,235	22.9	
1864	5,310	133	341	668	161	37	1,207	22.7	
1865	5,608	161	332	725	149	48	1,254	22.4	
1866	5,886	168	489	900	132	52	1,573	26.7	
1867	6,531	246	592	879	145	40	1,656	25.4	
1868	5,873	256	663	793	100	51	1,607	27.4	
1869	6,516	247	656	846	78	76	1,656	25.4	
1870	7,021	349	663	905	112	73	1,753	25.0	
1871	7,285	381	763	891	148	136	1,938	26.6	
1872	8,256	269	640	1,009	374	87	2,110	25.6	
1873	11,000	257	880	1,016	781	69	2,746	25.0	
1874	16,712	436	1,184	1,260	612	76	3,132	18.7	
1875	15,060	336	1,217	1,210	302	46	2,775	18.4	
1876	13,581	316	1,171	1,205	292	144	2,812	20.7	
1877	11,166	316	1,089	1,292	263	16	2,660	23.8	
1878	12,596	177	1,114	1,300	267	-	2,681	21.3	
1879	10,943	iron oxide 156	981	1,554	338	-	2,873	26.3	
1880	10,804	92	1,296	1,613	335	-	3,244	30.0	
1881	10,538	8	1,420	1,586	366	-	3,372	32.0	
1882	11,759	52	1,506	1,789	415	-	3,710	31.6	
1883	11,774	-	3,458		495	-	3,953	33.6	
1884	12,101	195	3,413		461	-	3,877	32.0	
1885	10,563	-	4,011		441	-	4,452	42.1	

Date	Coal Cost £	Lime Cost £	Revenue			All By-Products	
			Aml. & Tar £	Coke £	Waste Lime £	Total Revenue £	Coal Cost %
1886	10,028	-	1,900	305	-	2,205	22.0
1887	9,568	-	1,333	450	-	1,783	18.6
1888	9,936	-	2,109	291	-	2,400	24.2
1889	10,509	-	2,349	443	-	2,792	26.6
1890	11,332	-	3,429	1,778	-	5,207	45.9
1891	-	-	-	-	-	-	-
1892	17,111	-	5,308	1,236	-	6,544	38.2
1893	16,471	-	3,221	927	-	4,148	25.2
1894	12,400	-	2,926	1,004	-	3,930	31.7
1895	16,501	-	4,313	1,284	-	5,597	33.9
1896	15,980	-	4,316	1,723	-	6,039	37.8
1897	17,646	-	4,053	1,003	-	5,056	28.7
1898	17,146	-	3,755	1,338	-	5,093	29.7
1899	20,219	-	4,173	2,021	-	6,194	30.6
1900	25,478	-	5,223	2,543	-	7,766	30.5

Note - Aml. - Ammoniacal liquor

Source - Paisley Council Records (Paisley Ref. Lib.)

(vi) Value of By-Products at Edinburgh and Leith Gasworks (1870-1913)

Date	Total By-Product Revenue £		By-Product Revenue as % Coal Cost	
	Edinburgh	Leith	Edinburgh	Leith
1870	7,042	2,986	20.4	17.6
1871	7,788	3,231	20.6	17.9
1872	8,373	3,313	22.4	18.5
1873	12,816	3,777	23.4	16.1
1874	12,529	3,761	20.1	12.5
1875	8,483	3,079	14.1	10.1
1876	9,818	2,947	18.8	10.9
1877	12,937	4,748	22.6	19.6
1878	13,272	4,926	24	20
1879	14,072	4,867	25.2	19.4
1880	15,121	4,774	28.4	22.3
1881	15,687	5,107	29.3	21.9
1882	14,552	5,629	29.2	22.1
1883	15,248	6,063	29.8	24.4
1884	20,051	7,604	37.4	31.5

Date	Total By-Product Revenue £ Edinburgh	Leith	By-Product Revenue Edinburgh	as % Coal Cost Leith
1885	20,560	8,968	34.9	35.8
1886	13,974	6,627	22.2	25.6
1887	14,176	5,853	22.2	24.4
1888	15,310	6,217	25	28.3
1889	12,948	5,369	27	28.5
1890	14,786	6,272	29.3	25.9
1891	21,915	7,341	26.6	23.9
1892	16,096	5,191	17.7	15.2
1893	10,457	4,451	13.5	12.7
1894	16,029	6,770	26	25.8
1895	18,722	7,660	30.7	25.6
1896	14,633	6,000	24.4	21.3
1897	16,610	5,778	26.7	21
1898	12,152	5,600	21.3	20
1899	15,295	7,428	26	24
	Total Nett Revenue		% Nett Profits	
1904	55,962		46.3	
1905	54,106		48	
1906	53,440		49.9	
1907	59,190		55.4	
1908	68,724		53.8	
1909	62,252		52.9	
1910	64,890		67.2	
1911	67,247		69.8	
1912	72,374		77.2	
1913	94,633		88.4	

Notes - Statistics from 1904 calculated.

Oil enrichment used from 1898

(2) Chronological and Regional Variations in Gasworks Coke Sale

Prices (per ton)

Town	1891	1901	1911	Town	1891	1901	1911
Aberdeen	6/-	9/-	-	Hawick	10/-	11/8	10/2
	&	&		Inverness	7/-	13/-	9/6
	13/-	13/4		Irvine	5/-	6/8	8/6
Airdrie	5/-	6/-	9/1			to	to
Alexandria	-	10/-	9/6			8/4	9/6
Alloa	8/-	-	8/11	Keith	-	15/-	18/4
Alva	5/-	10/6	10/-	Kelso	12/6	12/6	11/8
Alyth	-	10/6	10/-	Kilbarchan	6/10	6/8	8/4
Annan	-	16/8	15/-	Kilmalcolm	6/8	8/4	9/-
Anstruther	-	10/-	10/-	Kilmarnock	5/5	6/8	8/-
Arbroath	-	14/-	11/-				to
Ardrossan	9/-	6/6	9/2				10/3
Armadale	-	8/-	8/7	Kilwinning	3/4	-	7/6
Auchterarder	-	10/6	11/-	Kinross	5/-	10/-	10/-
Ayr	-	8/4	7/6	Kirriemuir	10/-	14/-	-
Banff	-	18/-	16/-	Lanark	5/-	10/-	8/4
Bathgate	5/-	8/4	9/2				to
Biggar	-	10/-	11/8				10/-
Blairgowrie	10/5	13/4	11/8	Langholm	10/-	10/-	13/4
Bothwell/ Uddingston	5/10	18/-	10/9	Larkhall	6/8	6/8	7/6
Bridge of Allan	6/8	10/-	10/-	Lasswade	7/6	10/-	8/4
Coatbridge	5/-	7/-	9/-	Newmilns	-	6/-	8/6
		to		N. Berwick	2/6	6/8	9/2
		12/-		Paisley	5/6	7/6	10/2
Coldstream	-	13/4	13/6	Peebles	8/4	11/8	10/-
Coupar Angus	10/-	14/-	12/9	Penicuik	6/8	10/-	10/-
Darvel	5/-	6/-	7/6	Perth	7/6	9/-	9/10.6
Douglas	-	6/8	10/-	Peterhead	13/-	16/6	14/-
Dumbarton	6/-	6/8	8/4	Port Glasgow	5/6	6/-	8/6
		to		Renfrew	4/-	10/-	9/1
		10/-	10/-	Renton	9/2	8/6	9/-
Dunfermline	4/-	10/-	10/6.3d	Rothesay	7/6	10/-	7/6
Galashiels	8/-	11/8	9/-	St. Andrews	10/-	13/4	11/8
Gourock	6/-	6/4	8/9	Saltcoats	3/6	10/-	-
Greenock	4/7	7/9	9/10	Selkirk	10/-	10/10	10/-
Hamilton	5/-	7/11	9/3	Stevenston	3/6	10/-	10/-

Town	1891	1901	1911	Town	1891	1901	1911
Stonehouse	8/4	8/4	-	Whitburn	5/-	6/8	9/-
Tain	13/-	15/-	15/-	Whithorn	5/-	5/-	-
Thurso	10/-	-	-	Wick	-	-	13/4
Tranent	2/6	10/-	12/-				

Source - C.W.Hastings Gas and Water Statistics (annually)

(3) Chemical By-Products - Table of Manufacturers, Wholesale Outlets, and Competitors in the Boom of 1882

(A) Ammonium Sulphate Producers

Town/Parish	Firm	Output*
Aberdeen	J. Miller & Co. (Sandilands)	AMS, SA
Arbroath	W. Briggs	AMS
Ayr	W. G. Walker & Sons (Hawkhill)	AMS
Ayton	J. Gibson & Co. (Eyecliffe)	AMS, SA
Burntisland	Burntisland Oil Co.	AMS
Calder	Springbank Chemical Co.	AMS, SA, MN
Carnwath	J. Allan (Victoria Works)	AMS
Carfin	David McQueen	AMS
Colessie	Wm. Briggs (Ladybank)	AMS, SA
Dumfries	W. Maxwell	AMS, SA
Dundee	Gas Commissioners	AMS
Dundonald	J. B. Lindsay & Co.	AMS, MN
Duffus	Wm. Adam	GL, MN
Dalmeny	Dalmeny Oil Co. Ltd.	AMS
Dysart	W. Briggs of Arbroath (Ravenscraig)	AMS
Falkirk	R. Orr & R. M. Sutherland	AMS, SA
Falkirk	J. Ross & Co. (Limewharf)	AMS, SA
Glasgow	R. Galloway (Victoria Works)	AMS, PT
Glasgow	George Miller & Co. (Calton)	GL
Govan	Alum & Ammonia Co. Ltd.	AMS
Greenock	Greenock Police Board	AMS
Inverness	P. S. Brown (Northern Gas Products)	AMS
Johnstone	J. & G. McFarlane	AMS
Kilmarnock	Corporation Gas Works	AMS
Kirkliston	Uphall Oil Co. Ltd. (Hopetown)	AMS
Kirknewton	Oakbank Oil Co. Ltd.	AMS
Kilbarchan	Walkinshore Oil Co. Ltd.	AMS
Kilbarchan	Clippers Oil Co. Ltd.	AMS
Lasswade	Clippers Oil Co. Ltd.	AMS
Liberton	Midlothian Oil Co. Ltd.	AMS
New Monkland	Stanrigg Oil Co.	AMS
New Kilpatrick	West of Scotland Chemical Co.	AMS

Town/Parish	Firm	Output*
Old Monkland	Galloway & Co. (Clifton Works)	AMS
Paisley	Exors. R.Smith (Craigielee Works)	AMS
Paisley	J. & G. McFarlane (Brediland Works)	AMS, MN
Paisley	Blackstone Mineral Co.	AMS
Paisley	Walkinshore Oil Co. Ltd.	AMS
Peterhead	Northern Gas Products Co.	AMS
Perth	Perth Gas Commissioners	AMS
Port Dundas	British Asphalte Co.	AMS
South Leith	William MacKenzie	AMS
Tabrax	British Oil & Candle Co. Ltd.	AMS
Uphall	Uphall Oil Co. Ltd.	AMS
Uphall	Broxburn Oil Co. Ltd.	AMS

(B) Sulphuric Acid Supplies -

Sulphuric acid was used to produce sulphate from gasworks' ammoniacal liquor.

Ayr Newton	Messrs Weir & Co.	SA, MN
Bathgate	Young's Paraffin Light Co.	SA
Camlachie	J.Napier & Co. (Vinegar Hill)	SA
Carnoustie	C.Tennant & Co.	SA, MN
Dunbar	J.B.Robertson (E. Lothian Works)	SA, MN
Falkirk	Nobel's Explosive Co. (Westquarter)	SA
Falkirk	H.C.Fairlie & Co. (Camelon Works)	SA
Falkirk	J.Wilson	SA
Forres	J.Burns (N. Scotland Works)	SA
Glasgow	A.Cross (Port Dundas Works)	SA, MN
Greenock	J.Poynter (Shaw's Water Chemical Works)	SA, MN
Kinnal	J.Stenhouse (Glasterlow Works)	SA, MN
Kirkcaldy	J.Cant (Orebridge Works)	SA
Leith	Hope & Co.	SA, MN
Leith	J.T.Wilson (Leith Works)	SA
Nitshill	J.Wilson & Sons	SA
Old Machar	Richards & Co. (Rubislaw Bleachfield)	SA
Port Dundas	J.Montgomerie & Co.	SA
Strathmartine	J.S.Rogers (Rosemill)	SA, MN

Notes - * AMS - Ammonium Sulphate

SA - Sulphuric Acid

Notes (continued) -

* GL - Concentrated Gas Liquor

MN - Manure

PT - Ashphalt

Many works producing 'Alkali' and 'Manure', which may also have utilized gasworks ammoniacal liquor (e.g. Alum & Ammonia Co. at Hurlet), are omitted from the above lists.

Source - Nineteenth Annual Report of the Alkali Inspectorate, 1882

(4) Chemical Byproducts - Extant Scottish Statistics 1891, 1901, 1911

1891 - Ammonium Sulphate

Town	Tons	Town	Tons
Coatbridge	90	Kilmarnock	75
Dundee	353	Kilwinning	68
Greenock	210	Perth	54
Inverness	42		

1901 -

Ammonium Sulphate - Alloa, Arbroath, Coatbridge, Dunfermline, Inverness, Kilwinning.

Naphtha - Arbroath, Coatbridge

Tar and Ammonia Liquor - Glasgow, Gourock, Falkirk, Dunbar, Broughty Ferry, Bothwell, Innerleithen, Kelso, Leslie, Mauchline, Port Glasgow, Saltcoats, Selkirk, Stevenston, Tranent, W. Kilbride.

Tar- Annan, Arbroath, Bervie, Dunfermline, Galston, Inverness, Kennoway, Wick

Town	Output	Town	Output
Beith	38,500 gal. L	Lasswade	235 ton T/L
Bridge of Weir	37,500 gal. T/L	Lochwinnoch	4,440 gal. T/L
Burntisland	£ 173 T/L	Newmilns	18,250 gal. T
Darvel	33,600 gal. L	Nitshill	5,000 gal. T/L
Forres	36,000 gal. L	Perth	222,412 gal. T; 112 ton S ; 60 gal. N
Greenock	345 ton S	Peterhead	25,000 gal. BT; 2000 gal. N; 24 ton S
Hamilton	958,751 gal. T/L	Renfrew	185,000 gal. T/L
Kilmalcolm	52,000 gal. T/L	Rothsay	75,000 gal. T ; 65 ton S ; 3000 gal. N
Kilmarnock	200,000 gal. T; 160 ton S		

Note - gal. - gallons

L - ammonia liquor

T - tar

T/L - tar and liquor

B T - boiled tar

N - naphtha

S - ammonium sulphate

C.W. T - carburetted water -gas tar

Town	Output	Town	Output
Alloa	+ S	Innerleithen	+ T/L
Annan	100 ton T	Inverness	126,920 gal. T ; 100 tons S
Arbroath	115,200 ga. T ; 138 tons S	Kelso	140,000 gal T/L
Ardrossan	24,678 gal. T ; 103,000 gal. L	Kilmalcolm	95,200 gal. T/L
Armadale	49,625 gal. T/L	Kilmarnock	197,230 gal. T/L 200 tons S
Banff	5,900 gal. T ; 15,000 gal. L	Kilwinning	+ S
Bervie	+ T	Lasswade	74,107 gal. T/L
Beith	45,400 gal. T/L	Leslie	33,120 gal. T/L
Boness	111,160 gal. T/L	Lochwinnoch	20,000 gal. T/L
Bothwell	84,065 gal. T ; 88 tons S	Mauchline	25,400 gal. T/L
Bridge of Weir	68,300 gal T/L	Nitshill	5,000 gal. T/L
Broughty Ferry	81,294 gal T ; 94 tons S	Dunlop	+ L
Burntisland	£375 T/L	Edinburgh	10,787 tons T ; 2,401 tons S
Catrine	£ 41 T/L	Gorebridge	9,900 gal T/L
Coatbridge	249,783 gal. T ; 204 tons S	Haddington	+ T/L
Cowdenbeath	35,639 gal. T ; 31 tons S	Kelty	118,700 gal T/L
Coupar Angus	4 tons S	Kilsyth	1,800 gal. T ; 29 tons S
Dalkeith	130,741 gal T/L	Kirkcudbright	+ T/L
Douglas	8,800 gal. T/L	Kirkintilloch	78,234 gal. T/L 87.5 tons S
Dumfries	155,800 gal. T ; 128 tons S	Laurencekirk	3,777 gal. T ; 760 gal. L
Dundee	895,744 gal T ; 40,000 gal C.W. T ; 1032 tons S	Musselburgh	297,320 gal T/L
Dunfermline	+ T/L	Newton Mearns	3,820 gal. T
Falkirk	1,016,676 gal. T/L	Paisley	499 tons S
Galashiels	+ T/L	Perth	200,450 gal. T ; 460 tons S
Galston	52,500 gal. T	Peterhead	+ T, S, N
Glasgow	+ T/L	Port Glasgow	+ T/L
Gourock	+ T/L	Renfrew	163,000 gal T ; 53 tons. S
Greenock	415 tons S	Rothesay	86,000 gal. T ; 3,900 gal. N ; 90 tons S
Hamilton	213,959 gal. T ; 226 tons S	Saltcoats	151,000 gal. T/L
		Stirling	556 tons T ; 113 tons S
		Whitburn	7,000 gal. T

Note - Selkirk, Stirling, Tain, Tranent, Troon, W. Kilbride, Whitburn
Whitburn and Wick also sold T/L

(5) BY-PRODUCTS : Prices and Tenders in S.R.O. Gas Company Minute BooksBy-Product Sales and Tenders taken by Ayr Gas Company

Date	Manufacturer	Price Offered
1858	Erskin Finlay, Bathgate J.Ross, Falkirk	6s per 100 gallons 5s 3d per 100 galls tar/liquor 8s per 100 galls tar* 2s 6d per 100 galls liquor
1859	J.Ross	£22 (past year)*
1860	J.Ross M.Cadell	£13 (past year)* £2 (past year)
1861	J.Ross	£14 (past year)*
1862	J.Ross	£20 (past year)*
1863	William Neilson, Glasgow J.Ross	7s per 100 galls £32 (past year)*
1864	J.Ross, Falkirk David Yound, Boness Messrs Henry & Geo. Alder, Newbattle	8s 4d per 100 galls 8s 6d per 100 galls 9s per 100 galls*
1867	Scottish Asphalt Co., Glasgow	6s per 100 galls tar*
1869	Scottish Asphalt Co. J.Ross	5s per 100 galls tar 4s tar/liquor*
1870	J.Ross	4s per 100 galls*
1871	J.Ross	4s*
1872	J.Ross	5s*
1873	J.Ross	5s*
1875	J.Ross Messrs G.W.Walker & Son, Ayr	6s (for 3 years) 10s per 100 galls; 6 years*
1881	Messrs Walker	10s, 2 years*
1886	Messrs Walker	1s 8d*
1887	Messrs Weir, Ayr	2s 9d, 1 year*
1888	Messrs Weir, Ayr	3s 3d, 1 year*
1889	Messrs Walker	6s 6d, 1 year*
1890	Glasgow Alum & Ammonia Co. Gas Residual Products Co., Irvine G.Walker, Ayr	8s 1d 7s 10d 7s 6d*
1891	G.Walker	7s 6d*
1892	G.Walker	2s*
1894	G.Walker	4s 4d, 2 years*

Date	Manufacturer	Price Offered
1894	Daneill Wyllie & Co.	4s
1896	G.Walker	3s 4d, 2 years*
1898	G.Walker	3s 4d*
1900	G.Walker	4s 4d*
1901	G.Walker	3s 10d
	D.Wyllie	4s 4d*

Note - 1864 Messrs H. & G. Alder may have been gas-meter manufacturers also.

Source - S.R.O. Ayr Company Minute Book op cit

By-Product Sales and Tenders taken by Bathgate Gas Company

1880	Galloway & Co., Pollok shaws	?*
1881	J.Ross, Falkirk	?, 3 years*
1884	J.Ross, Falkirk	6s 9d per 100 galls, 3 years
	Gas Residual Products Co. (formerly Messrs Galloway)	8s, 2 years*
1886	J.Ross, Falkirk	2s 6d*
1888	J.Dobbie, Leith	4s 6d*
		4s 9d, 5s in third year
1891	Glasgow Alum & Ammonia Co.	8s 1d*
	J.Ross, Falkirk	7s 3d
	Gas Residual Products Co.	8s
	White, Walker & Co.	8s 1d
	Dobie, Leith	5s
1892	J.J.Cunningham, Leith	2s 9d (3 ^o Twaddle)
	Gas Residual Products Co.	2s 10d
	J.Ross, Falkirk	3s*
	Arch. Eadie & Co.	2s 5d
1893	J.Ross, Falkirk	3s 6d*
	Gas Residual Products Co.	3s 3d
1894	J.Ross, Falkirk	4s 7d*
	Gas Residual Products Co.	3s 2d
1895	J.Ross	3s 7d*
	Gas Residual Products Co.	3s 5d
1896	J.Ross	4s 3d*
1897	J.Ross	4s*
1898	J.Ross	3s 3d*

Date	Manufacturer	Price Offered
1899	J.Ross	4s*
1900	J.Ross	4s*
1901	J.Ross	3s3d*
1902	J.Ross	3s9d*

Source - S.R.O. Bathgate Company Minute Book op cit

By-Product Sales and Tenders taken by Dalkeith Gas Company

1868		
-71	J.Ross, Falkirk	*
1871	J.Ross, Falkirk	10s 9d per ton for 3 years*
	Mackenzie & Samuel, Leith	10s 6d per ton
1875	J.Ross, Falkirk	3 years*
	Mackenzie & Samuel	
	J.A.McIntosh, Edinburgh	
1878	J.Ross, Falkirk	13s 6d per ton, 3 years
	Mackenzie, Leith	16s per ton, 3 years*?
1881	?	9s 3d per 100 galls*
1884	J.B.Robertson, Dunbar	13s 5d per 100 galls, 3 years*
1885	Ross, Falkirk	5s 6d, 1 year
	Gas Residual Products Co. ⁺	3s 6d, 1 year
	Mackenzie, Leith	6s, 6 months*
1885	Mackenzie, Leith	3s (100 galls)*
1886	Mackenzie, Leith	2s 6d
1887	J.Ross, Falkirk	3s 7d
1888	J.Dobbie, Sins & Co., Leith	6s*
	J.Ross	5s 7d
	Gas Residual Products Co. ⁺	4s 9d
1889	Dobbie, Leith	8s, 1 year*
	J.Ross, Falkirk	7s 3d
	Glasgow Alum & Ammonia Co.	6s 6d
1890	Gas Residual Products Co. ⁺	7s 9d*
1891	Gas Residual Products Co. ⁺	8s 6d*
	J.Ross, Falkirk	7s 9d
	Dobbie, Leith	8s 3d
1892	J. & J. Cunningham, Leith (the successor of Dobbie)	3s 9d*
	J.Ross, Falkirk	2s 7d

Date	Manufacturer	Price Offered
1892	Gas Residual Products Co. ⁺	2s 11d
1894	J. & J. Cunningham	4s 10d*
1898	Gas Residual Products Co. ⁺	2s 6d*
1899	Gas Residual Products Co. ⁺	3s 4d*
1901	Gas Residual Products Co. ⁺	3s 6d*
1902	J.Ross, Falkirk	4s 3d*
	Gas Residual Products Co. ⁺	3s 9d
1912	J.Ross, Falkirk	5s 3d
	Gas Residual Products Co. ⁺	5s 6d*

Notes - + of Glasgow

1884 J.B.Robertson later bankrupt.

Source - S.R.O. Dalkeith Company Minute Book op cit

By-Product Sales and Tenders taken by Dalry Gas Company

1871	Mr Lindsay (formerly works of Mr ++ Smith) at Irvine	
	British Asphalt Co.	++
	Mr Campbell, Burnside Chemical Works	£30 a year**
1872	Mr Campbell, Burnside Chemical Works	?**
	Messrs Walker, Kilmarnock	
	British Asphalt Co.	
1874	J.B.Lindsay & Co.	£50 a year*
1875	J.B.Lindsay & Co.	£61 a year (3 years)*
	Messrs Walker & Son, Ayr	
1878	W.G.Walker, Ayr	?*
1879	J.B.Lindsay, Irvine	£56 10s (3 years)*
	W.G.Walker, Ayr	£47 15s (1 year)
1882	G.W.Walker & Son, Ayr	£124 10s (1 year)
	Galloway & Co.	11s 6d*
	J.B.Lindsay	11s 3d
1885	Gas Residual Products Co.	2s 7d*
	W.G.Walker, Ayr	£52 10s per year
1886	Gas Residual Products Co.	{ 8d
		{ £9 12s 6d per year*
1889	Gas Residual Products Co.	£105 for 1 year*

Notes - ++ Gas company requested estimates.

** Smith made the only offer.

Source - S.R.O. Dalry Company Minute Book op cit

By-Product Sales and Tenders taken by Galashiels Gas Company

Date	Manufacturer	Price Offered
1856	R.Ford, Perth	*
1857	R.Ford, Perth	£35 per year*
1858	Shand & Co., Selkirk	5s, tar
	J.Ross, Falkirk	3s 9d, tar & liquor*
1859	R.Hall, Galashiels	£50 to £55 per year, tar*
1860	R.Hall, Galashiels	£55, tar*
1861	George Shand, Stirling	£85, 1 year
		£90, 2 years
		£95, 3 years
	J.Ross, Falkirk	£91 per year, 3 years, then £105 for 2 years*
1864	J.Ross, Falkirk	15s ton, 3 years*
	Henry Alder, Edinburgh**	13s 6d ton, 3 years
	Francis Forsyth, Leith	10s ton, 3 years
1868	J.Ross, Falkirk	2s ton
	Samuel & Geddes, Leith	5s ton, 1 year*
1869	MacKenzie & Samuel, Leith	8s
	J.Ross, Falkirk	15s 6d ton*
1870	J.Ross	9s 2d ton*
	MacKenzie & Samuel	9s
1871	J.Ross	10s ton*
1872	MacKenzie & Samuel	13s, 3 years*
1875	J.Ross, Falkirk	14s 6d ton, 3 years*
	Messrs Wm. MacKenzie, Leith	10s
1878	J.Ross	15s ton*
1880	J.Ross	16s 3d ton*
1884	J.Ross	18s ton*
1885	J.Ross	17s 9d ton*
1887	J.Ross	5s ton*
1888	John Dobbie, Leith	11s ton, 1 year*
1889	J.Ross	13s 4d ton*
1890	J.Ross	15s 1d ton*

Date	Manufacturer	Price Offered
1890	Glasgow Alum & Ammonia Co. Dobbie, Leith	14s 3d 12s 8d
1891	Glasgow Alum & Ammonia Co.	15s 9d*
1892	J.Ross	6s 4d*
1894	J.Ross	8s 6d ton, 1 year*
1895	J.Ross	8s 6d, 3 years*
1898	J.Ross	6s 6d ton*
1899	J.Ross W. Metcalf, Accrington	9s 6d, 3 years 9s, 1 year 9s 6d, 2 years 10s, 3 years*
1902	W.Metcalf	10s 6d, 3 years

Notes - ++ made the only offer.

** gas-meter maker.

Source - S.R.O. Galashiels Company Minute Book op cit

By-Product Sales and Tenders taken by Muirkirk Gas Company

1861	Walter Stewart, Burnside Chemical Works, Ayr	3s 6d, put into railway waggons*
1862	Walter Stewart	4s, put into railway waggons*
1863	Mr Walker, Kilmarnock	5s 6d, put into railway waggons*
1864	W.Stewart, Ayr Walker, Kilmarnock	8s, put into railway waggons 8s 6d, put into railway waggons*
1871	Messrs Stewart, Ayr	6s per barrel, put into railway waggons*
1872	Messrs Stewart, Ayr	6s per 100 gall barrel (tar/liquor)
1874	Messrs W. & J. Walker, Ayr Alex Weir, Ayr Chemical Works G.K.Lindsay & Co., Irvine	5s 3d, at the works, equal to 6s 3d at railway 5s 5s 9d
1881	J. & W. Walker & Sons, Ayr J.B.Lindsay & Co., Irvine	
1885	W. & J. Walker & Sons, Ayr	*
1887	W. & J. Walker & Sons, Ayr	2s 3d
1888	W. & J. Walker & Sons, Ayr Gas Residual Products Co., Glasgow	4s 1d 4s, 6 months*

Date	Manufacturer	Price Offered
1889	W. & J. Walker	4s 1d, 6 months*
1889	G.Walker & Sons, Ayr	6s 9d*
	Gas Residual Products Co., Glasgow	6s 1d
	Glasgow Alum & Ammonia Co.	
1892	Walker & Sons, Ayr	1s 6d tar/liquor*
1893	David McQueen, Carfin	2s 4d tar/liquor*
1894	David McQueen, Carfin	3s 4d*
1895	David McQueen, Carfin	2s 6d*
1896	David McQueen, Carfin	2s 6d*
1897	David McQueen, Carfin	2s 6d*
	Messrs Walker, Ayr	3s
1898	D.McQueen	2s*
1899	W.G.Walker, Ayr	3s 4d*
1900	Walker, Ayr	3s 7d*
	D.McQueen	3s 2d
1901	Walker, Ayr	3s 9d*
1902	Walker	4s 3d*
1903	Walker	5s 3d*
1904	Walker	2s 8d*
1905	Walker	3s 3d*
1906	Walker	3s*

Note - Until 1874 the prices quoted include cost of carriage to Railway Station which was then undertaken by Gas Company.

Source - S.R.O. Muirkirk Company Minute Book op cit

By-Product Sales and Tenders taken by Selkirk Gas Company

1864	J.Ross, Falkirk	£35 per year*
1876	J.Ross, Falkirk	?*
1881	?	£95 per year*
1894	J.Ross, Falkirk	£170 per year, 3 years*

Source - S.R.O. Selkirk Company Minute Book op cit

By-Product Sales and Tenders taken by Cupar Gas Company

1877	W.Briggs, Arbroath	£70*
1878	W.Briggs	£75*
1879	W.Briggs	£115*
1880	W.Briggs	£125*

Date	Manufacturer	Price Offered
1881	W.Briggs	£146*
1882	W.Briggs	£200*
1892	W.Briggs	£326
	Gas Residual Products Co.	£313
	White, Walker & Co.	£336*
	Glasgow Alum & Ammonia Co.	7s 5d

Source - S.R.O. Cupar Company Minute Book op cit

Waste 'Gas Lime' Sales and Tenders taken by Galashiels Gas Company

Date	Offers Made	Price Offered
1861	G.Ballantyne, farmer	1s ton, 1 year*
1863	Mr Brydon	£8 5s, 1 year*
1865	R.Brodie, Newtown	2s ton
	T.Gibson, Galashiels	3s 1d ton
	A.Lillie, Earliston	4s 7d ton*
	J.Smith, Leadfoot	3s 1d ton
1867	T.Elliot, Blackhale	5s 3d ton*
	R.Learmouth, Galashiels	5s ton
	A.Lillie, Yardale	3s 9d ton
1868	T.Elliot	3s 4d ton*
1869	T.Elliot	3s 6d ton
	A.Brydon, Netherton	4s 6d ton*
1870	W.Hogg, Sailston	4s ton*
1872	Various	5s ton
1873	Various	7s ton
1874	G.Forsyth, Glendearg	200 tons @ 7s 7d*
	Davidson, Colinshe	200 tons @ 7s 6d*
1878	J.Burns, Easterhouse	400 tons @ 4s 7d*
	Mr Scott, Mossilee	100 tons @ 4s 7d*
1880	Mr Bruce, Langlee	6s ton* ++

Note - ++ the only offer

Source - S.R.O. Galashiels Company Minute Book op cit

Notes - * contract awarded.

Prices quoted for liquid by-products (tar and ammonia) per
100 gallons (unless otherwise stated)

APPENDIX X I V

Data Relating to Gasworks Management and Labour

- (i) Salaries of Employees at Various Gasworks :
 - (1) Manager (Chief Engineer)
 - (2) Collector of Gas Rent
 - (3) Clerks and Secretaries
 - (4) Treasurer
 - (5) Auditor

- (ii) Total Wage Levels in Relation to Productivity at :
 - (1) Greenock 1829 - 1850
 - (2) Kilmarnock 1861 - 1874
 - (3) Dundee 1872 - 1881

- (iii) Biographies of Gas Managers &c.

- (iv) Chronology of Publications and Inventions by William Young
1866 - 1909

- (v) List of Presidents of the North British Association of
Gas Managers 1862 - 1913

- (vi) Membership List of the North British Association of Gas
Managers (1903) and (1869)

- (vii) Chronology of National Labour Trends to 1871 - Proposals
and Agitation over Working Conditions.

Appendix XIV (1) SALARIES OF EMPLOYEES

(1) Manager (Chief Engineer)

Date	Manager	Salary	Bonus	Note	Date	Manager	Salary	Bonus	Note
------	---------	--------	-------	------	------	---------	--------	-------	------

ANNAN COMPANY

1840	H. Smith	45	5	.	1859	W. Ewart	95	5	
1843	Roxburgh	43.50			1861	W. Ewart	105	10	
1845	Roxburgh	43.50	6		1864	W. Ewart	105	10	
1845	W. Ewart	50		A	1865	W. Ewart	100		C
1853	W. Ewart	55	5		1866	W. Ewart	100	20	D
1855	W. Ewart	70	5		1873	W. Ewart	110	10	
1857	W. Ewart	95	5	B	1881	W. Ewart	110	21	E

AYR COMPANY

1847	T. Clark	70			1904	W. Smith	300		
1848	T. Clark	82.60			1908	W. Purves	250	25	A
1897	W. Smith	200			1910	W. Purves	250	50	B
1898	W. Smith	250			1911	W. Purves	300		

BATHGATE COMPANY

1835	Houston	26		A	1886	Robertson	100		
1842	Anderson	?	3	B	1889	Robertson	100	2	G
1848	Anderson	40			1896	Robertson	90	10	H
1880	Robertson	?	5	C	1897	Robertson	90	10	I
1881	Robertson	80			1898	Robertson	90	10	
1883	Robertson	80	10	D	1899	Robertson	100		
1884	Robertson	80	20	E	1900	Robertson	110		
1885	Robertson	80	20	F	1901	Robertson	120		
					1903	Robertson	120	10	

BANFF COMPANY

1865	Watson	70			1889	P. Macdougall	90		
1866	Watson	100			1892	W. Marshall	90		
1870	Watson	120			1902	W. Marshall	90	10	A
1875	Watson	130			1912	W. Marshall	140		B
1878	Watson	150							

Managers' Salaries (continued)

Date	Manager	Sal.	Bon.	Note	Date	Manager	Sal.	Bon.	Note
BONESS COMPANY									
1844	J.Dunlop	31.20	10	A	1872	W.Drummond	80	5	
1845	J.Dunlop	10			1873	W.Drummond	83		
1846	J.Gardner	?			1874	J.Ambrose	80		
1855	M.Naismith	54.60		B	1875	J.Ambrose	85		
1864	W.Drummond	70			1876	J.Ambrose	85	5	
1868	W.Drummond	75			1877	J.Ambrose	85	7.50	C
1869	W.Drummond	80							
CUPAR COMPANY									
1842	Honeyman	110	10	A	1869	J.Gemlow	100	10	E
1844	Honeyman	95		B	1872	J.Gemlow	110		
1845	G.Buist	52		C	1873	J.Gemlow	120		
1846	G.Buist	60			1875	J.Gemlow	132		
1847	G.Buist	60	10		1878	J.Gemlow	132	5	
1847	R.Douglas	?			1880	J.Gemlow	132	5	
1849	R.Douglas	60			1881	J.Gemlow	132	5	
1852	R.Douglas	70	10		1882	J.Gemlow	132	5	F
1853	Mackenzie	70			1883	J.Gemlow	132	5	
1856	Mackenzie	70	10	D	1895	J.Gemlow	132	10	
1857	Mackenzie	80	10		1896	J.Gemlow	132	10	
1860	Mackenzie	110			1897	J.Gemlow	135		
1864	Mackenzie	120			1904	J.Gemlow	135	10	
1866	J.Gemlow	100							
DALKEITH COMPANY									
1830	D.Hunter	?		A	1840	Geo.Aitken	?		
1831	D.Hunter	?	2		1843	G.Aitken	100		
1833	D.Hunter	?	1.25	B	1850	G.Aitken	100	10	E
1834	D.Hunter	60			1852	G.Aitken	100	40	F
1836	D.Hunter	60	7.25		1853	Jhn.Young	110		G
1837	D.Hunter	75			1855	J. Young	110	20	H
1838	D.Hunter	75	2.50	C	1857	J.Young	110	10	I
1839	D.Hunter	75	5	D	1858	J.Young	120		
1840	D.Hunter	75	6		1860	J.Young	150		

Managers' Salaries (Continued)

Date	Manager	Sal.	Bon.	Note	Date	Manager	Sal.	Bon.	Note
DALKEITH COMPANY									
1862	Jhn. Young	150	20	J	1876	D.Young	130	10	
1864	J. Young	150	25	K	1880	D.Young	150		
1867	J.Cusitor	110			1890	Alex.Bell	120	10	L
1868	J.Cusitor	120	10		1893	A.Bell	140	20	M
1870	J.Cusitor	120	10		1896	A.Bell	150		
1871	J.Cusitor	130	10		1904	A.Bell	150	150	N
1872	J.Cusitor	140			1904	R.W.Cowie	130		O
1874	Dav. Young	120			1912	R.W.Cowie	150		
DAIRY COMPANY									
1834	A.Muir	39		A	1881	W.Mitchell	60		
1836	A.Muir	50			1883	W.Mitchell	65	5	
1840	R.Young	40		B	1890	W.Mitchell	65	5	
1844	W.Marshall	40			1891	W.Mitchell	65	5	
1871	A.Brown	60			1892	W.Mitchell	65	5	
1872	A.Brown	65	5		1893	W.Mitchell	65	10	D
1873	A.Brown	75			1894-7	W.Mitchell	65		
1879	A.Brown	70		C	1898	W.Mitchell	70	5	
GALASHIELS COMPANY									
1844-6	Kemp	84		A	1865	A.Scott	120		
1847	Kemp	90			1868	A.Scott	170		
1859	Kemp	90		B	1871	A.Scott	200		
1860	J.C.Adamson	90		C	1874	A.Scott	240		
1861	J.C.Adamson	100			1886	A.Scott	240	20	E
1863	J.C.Adamson	120			1894	A.Scott	150		F
1864	A.Scott	80		D	1903	F.Scott	300		G
LESMAHAGOW COMPANY									
1845	Wm. Miller	15			1860	Jas. Young	25		A
1847	R.Gordon	20			1862	J. Young	26		
1848	R.Gordon	21			1865	J.Young	27		
1849	J.Miller	20			1869	J.Young	27	1	
1850	J.Miller	20	2		1870	J.Young	36		
1851	J.Miller	25			1871	J.Young	45		

Managers' Salaries (continued)

Date	Manager	Sal.	Bon.	Note	Date	Manager	Sal.	Bon.	Note
LESMAHAGOW COMPANY									
1872	J.Young	36			1887	A.Bell	61		
1873	J.Young	36	5		1888	A.Bell	61	5	
1874	J.Young	36	10		1889	J.Miller	65		
1875	J.Young	54.60			1889	J.McKerracher	60		B
1877	J.Young	54.60	3		1891	J.McKerracher	70		C
1881	W.Marr	75			1893	J.McKerracher	70	5	
1882	W.Marr	75	2.10		1894	J.McKerracher	80		
1884	J.Weir	61			1900	J.McKerracher	80	5	
SELKIRK COMPANY									
1835	W.Murray	26			1870	W.Robson	130		
1840	Jhn.Young	?			1871	W.Robson	140		
1845	J.Young	?	5	A	1872	W.Robson	160		
1853	W.Robson	70			1881	W.Robson	160		
1856	W.Robson	80			1882	W.Robson	180		
c.1860	W.Robson	105			1893	R.D.Smith	150		
1863	W.Robson	110			1896	R.D.Smith	150	25	B
STORNOWAY COMPANY									
1851	J.Anderson	65		A	1862	R.Wilson	57		
1853	A.C.Fraser	70		B	1872	J.McPhail	31.20		D
1856	McFraser	50			1885	A.Ross	46.80		
1859	McFraser	65			1886	D.McCallum	65		
1859	R.Wilson	50		C	1889	D.McCallum	20		E
					1890	D.McCallum	20	5	F
STRANRAER COMPANY									
1840	Jhn. Young	50		A	1866	R.Morland	75	20	G
1845	R.Morland	35		B	1866	A.McPherson	75		H
1846	R.Morland	25		C	1867	A.McPherson	75	5	I
1847	R.Morland	45			1868	A.McPherson	90		
1852	R.Morland	50	5	D	1869	P.Stewart	75		J
1853	R.Morland	55			1871	P.Stewart	80	5	
1854	R.Morland	60			1872	P.Stewart	85		
1856	R.Morland	60	10	E	1876	P.Stewart	85	5	K
1857	R.Morland	75		F	1878	P.Stewart	85	10	L

Managers' Salaries (continued)

Date	Manager	Sal.	Bon.	Note	Date	Manager	Sal.	Bon.	Note
STRANRAER COMPANY									
1880	P.Stewart	90		M	1899	P.B.Watson	110		
1882	P.Stewart	90	10	N	1901	P.B.Watson	110	30.0	
1889	P.Stewart	90	10		1902	P.B.Watson	110	10	
1893	P.Stewart	100			1903	M.B.Watson	120		

VALE OF LEVEN COMPANY

1839	E.Christie	65		A	1854	T.Blair	?		F
1846	J.Peacock	65		B	1855	T.Blair	?	10	
1849	J.Peacock	90		C	1856	T.Blair	54.60		
1850	J.Blair	90			1857	T.Blair	65		
1851	J.Blair	95		D	1860	T.Blair	78		G
1853	J.Blair	110		E					

Note -

ANNAN A including assistants' wages; B also Secy./Treasurer
C Seperate wage paid to assistants;
D bonus for extensions, and (E) for extra work

AYR A bonus for removals expenses, and (B) for extending plant

BATHGATE A weekly wage; B manager termed 'Foreman';
Bonus for (C) extending works, (D) new coal shed,
(E,F,G) extending works, (I) new gasholder;
H manager R.Robertson succeeded by J.B.Robertson

BANFF A bonus for new gasholder ; B manager also Secretary

BONESS A bonus for advice during works construction;
B wage 6s per week also to manager's son;
C bonus for raising consumption by 12 per cent

CUPAR A,B. wage includes firemen's wage; C excludes firemen;
Bonus for (D) improved retort-bench, (E) designing new tank,
(F) designing equipment

DALKEITH A wage raised £5 . Bonus for (B) extending mains pipes,
(C) planning new gasholder house, (D) planning new dwelling
house, (E) mains pipe laying, (F) faithful service,
(H) extending gasworks , (J) visiting International
Exhibition, (K) designing new gasholder, (L) repairing
retort-bench, (M) installing Peebles Oil Gas,.
Bonus because company prosperous (I), and in lieu of a
pension (N).
Free house, gas and coal (L), (O) (G)

DALRY A manager paid weekly wage, and also acted as Collector.
B manager ceased to act as collector
C wage reduced because national fall in wages
D bonus for laying extra pipes

Managers' Salaries (continued)

- GALASHIELS** A free dwelling house, and (C) free gas and coal
 B Mr Kemp awarded £20 per year retirement pension
 D new manager less experienced, probably former stoker.
 E bonus for extending gasworks
 F manager's son paid £200 per year as assistant
 G A.Scott paid £100 bonus, plus £100 per year retainer as consultant engineer
- LESMAHAGOW** A free gas, and (B) coal; C no free gas or coal.
 A bonus 1s per barrel of tar sold
- SELKIRK** Bonus for (A) planning new gasholder, and
 (B) improved retort bench
- STORNOWAY** A manager employed by gas and water coys. (on weekly wage) c.1851-c.1859
 B manager also secretary, until (C) 1859
 D weekly wage instead of salary
 E wage reduced because coy. short of money
 F bonus for extending retort house
- STRANRAER** A free house, gas and coal
 Salary (B) reduced because inexperienced, (F) raised because also Collector, (H) includes for Meter Reading/Collecting, (J) reduced because inexperienced, (M) raised because poor accommodation.
 C wage in addition to 8 per cent of net profits.
 Bonus (D) for visiting International Exhibition, (E) designing new gasholder, (G) for past services, (H) for supervising new gasholder, (K) for extending retort house, (L) extending works, (N) supervising pipe laying, (O) extending plant.
- VALE OF LEVEN** A,B weekly wage, not salary
 C includes labourer's wages - £6 10s in summer months and £8 10s in winter months.
 D,E acting as Collector also
 F £ 6 per month May - Nov, £9 per month Nov.- May
 G excluding wages for labourers' assistance

Source - S.R.O. Company Minute Books op cit

(2) Collector

Date	Collector	Salary £.p	Bonus £.p	Note	Date	Collector	Salary £.p	Bonus £.p	Note
AYR COMPANY									
1880	J.Clark	50			1887	J.Clark	65		
1882	J.Clark	60			1894	J.Clark	75		
BATHGATE COMPANY									
1855	-	12			1872	R.Miller	52	5	A
1859	-	13.5			1890	D.Roberts	25		
1861	-	16			1899	J.Lindsay	30		
1863	-	18			1900	J.Lindsay	35		
1870	R.Miller	52		A	1901	J.Lindsay	40		
CUPAR COMPANY									
1884	T.Urquhart	60		A	1896	T.Urquhart	57.42		C
1885	T.Urquhart	57.42		B	1897	T.Urquhart	65		C
DALKEITH COMPANY									
1836	Mr Watson	15							
GALASHIELS COMPANY									
1856	-	20		A	1868	J.Allan	22.25		
1859	J.Allan	6		B	1889	J.Park	85.80		C
1860	J.Allan	8		B	1890	J.Park	86		D
1861	J.Allan	12			1902	J.Park	86		E
1862	J.Allan	15			1905	T.Hislop	91		B
1865	J.Allan	20							
SELKIRK COMPANY									
1875	G.Turnbull	50			1877	J.Dobson	70		B
1876	Mr Lockie	72.80		A	1881	J.Dobson	80		
STRANRAER COMPANY									
1844	Mr Guthrie	15		A	1856	Mr Guthrie	15		C
1849	Mr Guthrie	20			1898	W.Balford	50		B
1853	Mr Guthrie	25		B					

Collectors' Salaries (continued)

Date	Collector	Salary £.p	Bonus £.p	Note	Date	Collector	Salary £.p	Bonus £.p	Note
------	-----------	---------------	--------------	------	------	-----------	---------------	--------------	------

STORNOWAY COMPANY

1859	J.Macfarlane	25		A	1871	J.F.Macfarlane	40		
1865	J.Macfarlane	21			1878	J.F.Macfarlane	50		
1866	J.Macfarlane	26			1890	J.F.Macfarlane	30		

VALE OF LEVEN COMPANY

1848	J.Robertson	20		A	1849	W.McKinlay	20		
------	-------------	----	--	---	------	------------	----	--	--

Note -

BATHGATE A weekly wage

CUPAR A also Assistant Manager; B plus 5 tons coal, free house and gas; C weekly wage

GALASHIELS A reading meters, collecting rent; also Clerk
 B Collecting and reading meters 3 times per year
 C weekly wage
 D read meters, keep books, make out accounts
 E free house provided

SELKIRK A weekly wage; B also Clerk and Assistant Manager

STRANRAER A a Director; B also Treasurer; C also Gas Manager;

STORNOWAY A Also Clerk and Treasurer; and one third wages paid by Water Company

VALE OF LEVEN A also Treasurer

Source - S.R.O. Company Minute Books op cit

(3) Clerks and Secretaries

Date	Clerk/Secretary	Salary £.p	Note	Date	Clerk/Secretary	Salary £.p	Note
AYR COMPANY							
1848	A. Jamieson	10.40	A	1887	J. Cunningham	120	
1849	A. Jamieson	20.80	A	1893	J. Cunningham	140	
ANNAN COMPANY							
1842	A. Downie	20	A	1857	A. Downie	25	
BATHGATE COMPANY							
1835	T. Dick	5	A	1841	W. Johnstone	1	
1837	T. Dick	3	B				
BONESS COMPANY							
1845	M. Naismith	10		1864	J. McIntosh	25	A
1853	J. Dunlop	9		1872	J. McIntosh	25	A
1855	J. Dunlop	5		1873	J. McIntosh	30	A
1857	J. McIntosh	25	A				
DALKEITH COMPANY							
1830	-	5		1866	G. Watson	45	A
1846	-	10		1869	G. Gray	45	A
1865	G. Watson	35	A	1880	G. Gray	100	B
MUIRKIRK COMPANY							
1867	?	12.5		1892	T. Gibson	?	A
1868	?	15		1892	J. Jackson	15	
1870	J. Gibson	20					
SELKIRK COMPANY							
1851	-	2	A	1867	-	6	A
1866	-	4	A	1870	-	10	B
STRANRAER COMPANY							
1867	Mr Guthrie	25	A	1877	Mr Guthrie	40	A
1868	Mr Guthrie	30	A				
VALE OF LEVEN COMPANY							
1842	R. Mackenzie	5	A				

Clerk/Secretarys' Salaries (continued)

Note -

AYR A weekly wage

ANNAN A solicitor

BATHGATE A also Treasurer; B Clerk only

BONESS A also Collector

DALKEITH A also Collector; B also Collector and Treasurer

MUIRKIRK A Banker

SELKIRK A writing minutes only; B also auditing accounts

STRANRAER A also Treasurer

VALE OF LEVEN A writing minutes

Source - S.R.O. Company Minute Books op cit

(4) Treasurer

Date	Treasurer	Salary £.p	Bonus £.p	Note	Date	Treasurer	Salary £.p	Bonus £.p	Note
------	-----------	---------------	--------------	------	------	-----------	---------------	--------------	------

AYR COMPANY

1847	W.Pollock	52		A	1887	W.Pollock	105		D
1847	W.Pollock	41.60		B	1910	J.Wilson	60		E
1849	W.Pollock	20	10	C	1911	J.Wilson	75		

BANFF COMPANY

1913	G.Shearer	50		A					
------	-----------	----	--	---	--	--	--	--	--

BATHGATE COMPANY

1837	J.Fergusson	12			1850	J.Fergusson	17		
1843	J.Fergusson	8			1886	D.Simpson	20		A
1845	J.Fergusson	12			1901	D.Simpson	25		A
1846	J.Fergusson	15							

BONESS COMPANY

1872	Mr Thomson	10							
------	------------	----	--	--	--	--	--	--	--

DALRY COMPANY

1836	G.McCash	5.25		A	1873	Messrs J.&J.McCash	15		
1871	Messrs J.&J.McCash	12		B	1879	Messrs J.&J.McCash	15		

GALASHIELS COMPANY

1898	J.Chapman	85							
------	-----------	----	--	--	--	--	--	--	--

SELKIRK COMPANY

1873	-	8			1884	-	35		A
1874	-	13							

Note -

AYR A free house and coal; B weekly wage; C bonus for extra work; D also Secretary (Solicitor); E also Secretary

BANFF A also Secretary (Accountant)

BATHGATE A also Secretary

DALRY A also Clerk until 1844 (writer); B also Secretary (writer)

SELKIRK A also Secretary

Source - S.R.O. Company Minute Books op cit.

(5) Auditors

Date	Auditors	Salary £.p	Note	Date	Auditors	Salary £.p	Note
AYR COMPANY							
1886	R.C.Cowan	26.25	A	1898	J.J.Scott	21	B
1888				1902	J.J.Scott	26.25	B
-98	R.C.Cowan	31.50	A				
BANFF COMPANY							
1865	A.Duncan	2.10	A	1891	A.Polville	?	B
1877	McCulloch	4.20		1912	G.Shearer	4.20	A
BATHGATE COMPANY							
1874	D.Simpson	1.05	A	1882	Two Directors	?	
CUPAR COMPANY							
1903	D.George	?	A				
GALASHIELS COMPANY							
1865	Mr Stalker	?		1888	Mr Crammond	5.25	A
1878	Mr Crammond	3.15	A	1907	Mr Crammond	7.35	A
MUIRKIRK COMPANY							
1877	A.Brackenridge	5	A	1889	McKenridge	2.1	A
1888	A.Brackenridge	2.1	A				
SELKIRK COMPANY							
1887-8	Messrs Thomson	?	A				
	Jackson, Gourlay & Taylor						
VALE OF LEVEN COMPANY							
1856	Directors	1.05		1859	Greenlees	2.10	
	(each)				Directors (each)	1.52½	
1857	W.Greenlees	3.15	A	1860	Mr Bain	?	
Note -							
AYR	A	accountant of Edinburgh;		B	accountant of Ayr		
BANFF	A	accountant;		B	solicitor		
BATHGATE	A	banker					
CUPAR	A	accountant at Clydesdale bank					
GALASHIELS	A	writer					
MUIRKIRK	A	Solicitor/Accountant of Cumnock					

Auditors' Salarys (continued)**SELKIRK A accountants, Glasgow****VALE OF LEVEN A and three Directors; B of Clysdale Bank****Source - S.R.O. Company Minute Books op cit**

(ii) Wage Levels in Relation to Productivity

(A) Wages per Ton Coal

(1) Greenock 1829-50

Date	Wages per Ton (s)	Date	Wages per Ton (s)	Date	Wages per Ton (s)	Date	Wages per Ton (s)
1829	3.6434	1835	7.8638	1841	5.4532	1846	3.9112
1830	4.8044	1836	7.8528	1842	4.7161	1847	4.5434
1831	5.1549	1837	5.9373	1843	5.9335	1848	4.6767
1832	5.3175	1838	6.3390	1844	4.3311	1849	4.4050
1833	5.9625	1839	5.5192	1845	4.1270	1850	4.2217
1834	7.4056	1840	5.7880				

Source - Calculations based upon J.G.L. 10/5/1851

(2) Kilmarnock 1861-74

Date	Wages per Ton (s)	Date	Wages per Ton (s)	Date	Wages per Ton (s)	Date	Wages per Ton (s)
1861	4.9167	1865	4.6667	1869	4.6042	1872	4.6250
1862	4.4792	1866	4.7708	1870	4.3125	1873	4.6042
1863	4.6875	1867	5.0000	1871	4.0833	1874	5.1875
1864	4.7083	1868	5.0000				

Source - J.G.L. 20/10/1874

(B) Wages per 10,000 cu ft Gas Sold (roughly 1 ton coal equivalent)

(1) Dundee (Wages and Salaries) 1872-81

Date	Wages (s)	Date	Wages (s)	Date	Wages (s)	Date	Wages (s)
1872	1.4961	1875	1.5936	1878	1.5928	1880	1.4937
1873	1.5061	1876	1.5723	1879	1.5669	1881	1.4674
1874	1.5459	1877	1.5611				

Source - J.G.L. 3/1/1882

(iii) BIOGRAPHIES OF GAS MANAGERS &c.John Alan -

A powerful influence on the gas industry through his ownership of the Gas World journal, was born at Hamilton in 1844. He worked as an apprentice for the Hamilton Advertiser, and later for several Scottish newspapers including the Glasgow Herald for which he reported on legal cases, and on the meetings of the North British Association of Gas Managers. Through specialist knowledge thus gained of the industry, he founded an Edinburgh weekly magazine, the Journal of Artificial Light, but after two years resigned to become the Edinburgh correspondent of the Journal of Gas Lighting. He also continued law reporting. In 1884 he became the editor of Gas World, and later proprietor; he died in April 1894.

Source:- Gas World, 14/4/1894.

Hugh Bartholomew -

(1814-1885) Born at Lochwinnoch, Renfrewshire; son of a country joiner; poor school education. Moved to Glasgow to learn mechanical engineering with Messrs. Claud and Girdwood; also attended Anderson's College artizans classes in his free time. Taught by Professor Graham; became a friend of J.B. Neilson, and James Young to whom he later supplied a sample of Boghead 'coal' which became the basis of Young's success in paraffin manufacture. Before the age of 30, moved to Liverpool to train in gas engineering under Alfred King. In 1843 designed, and later managed, Glasgow City and Suburban gasworks, which employed the first self-regulating gas-pressure governors in Scotland; retained iron retorts; built a large by-products chemical works alongside the gasworks. Maintained strict control over the works, and personally supervised the awarding of all construction contracts. Leading promoter of Kelvin Valley Railway in 1840s, and Chairman until 1885. Partner to Ronald Johnstone in ownership of a coal mine in the Upper Ward of Lanarkshire. A founding member of the British Association of Gas Managers. Trained many new gas managers, including W. Ford who later became engineer of Stockton gasworks, and J. Macnie who took Londonderry.

Source:- J.G.L., 24/2/1885, p. 354; The Artizan, December 1843, p. 287.

Alex. Bell -

(1836-1910) Born at Dalkeith, where he was apprenticed as a plumber and gasfitter, and visited Dalkeith gasworks frequently to learn the process. Employed to superintend the erection of Lasswade gasworks, where John Young of Dalkeith was engineer. Then for 18 years engineer and manager of Gibraltar gasworks, which he reconstructed. Then assistant to William Young in building Pentland oilworks, which he was left to complete and run himself. Gas manager at Dalkeith (1889-1910). His eldest son, Alexander Bell, became gas manager at Peebles; and another son, Laurie Bell, was gas manager at Innerleithen before working "in the motor [car?] industry".

Source:- Gas World, 16/7/1910, p. 83 (photo); 31/7/1897.

Mr. Blair -

His grandfather, father and four uncles worked in the gas industry at Airdrie, Alexandria, Kilbarchan, and Girvan.
 1883-9 manager at E. Wemyss and Buckhaven.
 1889-99 succeeded Mr. Robb as manager at Haddington.
 From 1899, manager at Helensburgh.

Source:- Gas World, 22/4/1899.

Andrew Dougall -

(1835-1905) Born in Paisley, where taught by gas manager W. Foulis. Manager at Elgin (1868), Kidderminster (1870), Hull (1874-1901).

Source:- The Institute of Gas Engineers Transactions 1905, p. 358.

William Ewing -

Served apprenticeship at Hamilton gasworks; worked for Messrs. Laidlaw and Son; became foreman at Gibraltar gasworks; then superintendent of Para gasworks; then worked at Irish gasworks in Londonderry and Midleton. Manager at Hamilton from 1892.

Source:- Gas World, 28/7/1900, 29/7/1899.

William Foulis -

(1838-1903) Son of the gas manager at St. Andrews, who became manager at Paisley in 1850. At the age of 14 apprenticed to Messrs. Craig, Fullerton and Company, an engineering firm. In spare time attended University lectures in Glasgow given by Professors Rankine and Blackburn, and Dr. Penny. Became an engineer for Walter Montgomerie Neilson at Hyde Park Locomotive works, and later for A.A. Croll of London as a gas engineer in the Mediterranean region. Gas manager for Glasgow Corporation 1869-1903. Devised miniature locomotives for use in Dawsholm and Tradeston gasworks. 1896 designed oil-gas enrichment plant for Temple Farm works, Dawsholm. One of first British engineers to design plant for cyanogen recovery from coal gas. 1901 President of Institution of Engineers and Shipbuilders in Scotland. William's brother, Stuart Foulis, became a lawyer in partnership with C. McPherson, and through friendship with the Baird family of ironmasters, in 1903 became a Director of Wm. Baird and Company.

Sources:- J.G.L., 7/7/1903. R.D. Corrins, "The Bairds of Gartsherrie" (unpublished Ph.D. thesis, University of Strathclyde, 1974), p. 308.

T. D. Hall -

Son of J. Hall, manager at St. Andrews. Learned gas trade in St. Andrews before spending three years at Redruth works. Manager for one year of four gasworks in Hampshire, employed by John Douglas of Portsmouth. 1878-1885 settled in Adelaide, Australia. 1885 manager at Montrose.

Source:- Gas World, 16/4/1892.

W. R. Herring -

Served articles with a Birmingham firm of mechanical engineers. Assistant engineer at Hastings gasworks for 8 years. 1891 assistant engineer at Huddersfield, and in 1892 manager and engineer there. Took honours examinations with the City and Guilds of London Institute. 1897 engineer and manager to Edinburgh and Leith Gas Commissioners.

Source:- Gas World, 28/7/1900.

James Hislop -

(1832-1887) Born near Biggar. His father became manager at Lanark, where James and his brother George were apprenticed to him. George became manager at Paisley. James became superintendent of street mains for Edinburgh and Leith Company, and later worked for George Bower, gas engineer and contractor of St. Neots, for whom he built Athlow gasworks in Ireland. 1855 became manager at Falkirk, and later worked for the Turkish government, building gasworks at Constantinople, and at the Sultan's palace. 1859 manager at Ayr. 1871 designed, and subsequently managed gasworks for Partick, Hillhead and Maryhill Company. Resigned in 1886 when the Directors persistently refused new equipment, and assisted his sons with a mercantile business in Glasgow.

Sources:- "Biography of the late Mr. James Hislop", N.B.A.G.M. 1887; J.G.L., 26/7/1887, 22/6/1886.

George Rankin Love -

(1858-1908) Trained under G.R. Hislop at Paisley gasworks where he became assistant manager. Manager at Dundalk in Ireland (1891) and Guildford (1900-8).

Source:- The Institute of Gas Engineers Transactions 1908, p. 362.

William McCrae -

Born 1864 at Airdrie, son of Boyd McCrae the gas manager there. In 1866 Boyd became manager at Dundee. William and his brother John (who succeeded their father as Dundee manager, until his death in 1896), were trained by their father. William became assistant manager under his brother at Dundee (1896-1902) and then manager at Falkirk (1903-6) where he constructed the new gasworks at Thornhill.

Source:- The Institute of Gas Engineers Transactions 1907, p. 405.

James McGilchrist -

(1848-1906) Born in Falkirk; learned engineering under James Hislop when he was building Partick gasworks in 1871. Became manager at Dumbarton in 1874, and thereafter frequently acted as consulting engineer and gave evidence at many Parliamentary inquiries. Modernized many gasworks e.g. North Berwick and Gourock. Prominent civic figure. President of Dumbarton Philosophical and Literary Society, Secretary to the School of Art, Member of School Board, honorary Captain in Dumbarton Royal Scottish Artillery Volunteers. His son became gas manager at Gourock.

Source:- The Institute of Gas Engineers Transactions 1906, p. 350.

J. McLaren -

In 1885 commenced as a plumber at Melrose gasworks, under W. Smith. In 1888 became manager of a small gasworks in south Ireland; in 1892 manager at Warrenpoint, Ireland; 1893 manager at Tranent in Scotland; and in 1896 at Duns.

Source:- Gas World, 10/9/1888.

D. B. Mackenzie -

Manager at Dunoon from 1883; son of W. Mackenzie, manager at Dunfermline.

Source:- J.G.L., 19/6/1883.

Robert Mitchell -

Born at Lasswade in 1849. Educated at the parish school, learnt mechanics in his spare time and became an apprentice joiner. Travelled to London, and in 1871 worked under D. Hunter at the Greenwich station of Phoenix Gas Company. Became assistant to Wm. Young, manager of Straiton Oilworks, and employed frequently to supervise construction of Young's patent retorts at other oilworks. Later, assistant manager to Young at Clippens Oil Company. 1876 manager at Coatbridge gas company, where in 1879 he constructed an entirely new works. Then manager at Dawsholm, Glasgow, which he disliked and in 1881 became superintendent of Edinburgh Gas Light Company under J.K. Watson. 1888 appointed general manager under Edinburgh and Leith Gas Commissioners, where in 1895 he introduced Arrol-Foulis stoking machinery, and carburetted water-gas which he inspected in operation during a visit to the United States in 1893.

Source:- Gas World, 26/6/1886, p. 103, 29/5/1897, 15/6/1895.

David Coats Niven -

(1842-1909) Employed by Paisley Gas Commissioners (1858-74) as chief clerk, assistant treasurer and then Treasurer. Learned gas engineering under G.R. Hislop. Manager at Dunoon (1874-82) and at Calcutta for the Oriental Gas Company (1882-1903).

Source:- The Institute of Gas Engineers Transactions 1910, p. 459.

Hubert Pooley -

One of the few Englishmen to become a gas manager in Scotland. Son of Henry Pooley, J.P., of Messrs. Henry Pooley and Son, weighing-machine manufacturers of Liverpool; trained in his father's drawing office. Educated in Oxfordshire, and in engineering, chemistry and electricity at the Victoria University, Manchester. Served articles with T.O. Paterson, gas manager at Birkenhead, where he served a further 2 years. 1893-1900 manager at Dunfermline, and consulting engineer to many small local gasworks. Later, manager at Stafford (1900) and Leicester (1910).

Source:- Gas World, 29/7/1899, 10/9/1910.

John Reid -

Manager of Perth gasworks in succession to his father, who was manager there from 1827-1884 and introduced the first clay retorts

in Scotland. Worked as apprentice engineer and machine-maker at Dundee, and then in England and Holland, before becoming gas manager at Montrose. Employed also by Montrose council in 1856 to build a water supply from Kinnaber. 1860 became engineer and manager at Edinburgh and Leith gasworks when it was not prosperous or popular. 1868 president of N.B.A.G.M. Fellow of the Geographical Society and Royal Society of Arts. Invented a gas-governor, revolving gas Washer, and improved water-supply meter. Retired on medical grounds in 1878. Died 1889.

Source:- Gas World, 16/4/1892.

Alex Robb -

Apprenticed as a draper; learned gas engineering at Aberdeen when those works commenced; later built gasworks at Gothenburg in Sweden. Returned to Aberdeen in 1870 as Inspector of Weights and Measures.

Source:- J.G.L., 12/10/1886.

Robert Sharpe -

(d. 1910) Trained by Messrs. Laidlaw of Glasgow, and W. Foulis of Glasgow gasworks; worked abroad before becoming assistant manager at Belfast (1879), and then manager there (1906-10).

Source:- Institute of Gas Engineers Transactions 1910.

Samuel Stewart -

(1833-1906) Born in Glasgow, son of a civil engineer. Educated in London. Draughtsman for David Methven, manager of Imperial Gasworks, Kings Cross. 1857-62 Construction engineer and then manager for Pernambuco gasworks. Short return to Britain, then construction engineer and for two years manager of Bahia gasworks. Returned to Glasgow to assist his ill father, and became manager at Greenock (1865), where he designed and built the new Inchgreen gasworks.

Sources:- Gas World, 2/8/1890, p. 120; The Institute of Gas Engineers Transactions 1906, p. 351.

John Terrance -

(1874-1955) Born at Leven, Fife; educated in Glasgow. Son of David Terrance, who was gas engineer at Dawsholm, Glasgow, a member of the British Association of Gas Managers in 1881, Treasurer of the North British Association and President of N.B.A.G.M. in 1888. John trained as a civil and mechanical engineer with Ashmore, Benson, Pease & Co.; 1897 became water-gas engineer with Messrs. Humphreys and Glasgow Ltd., superintended new plant at Sydney, Australia; became resident engineer of Australian Gas Light Co.; 1902 assistant engineer at Tottenham and Edmonton; 1909-19 manager at Great Grimsby; 1919-31 chief engineer at London S. Suburban; then consultant, working abroad for Gas Purification and Chemical Co. and S. African Gas Undertaking.

Published "Terrance's Notebook for Gas Engineers and Students" (1948).

Source:- W.T.K. Braunholtz, The Institution of Gas Engineers (1963), p. 113.

R. B. H. Thompson -

(1865-1893) Born in Edinburgh, son of the manager of Tanfield works of the Edinburgh Gaslight Company and later manager at Inverness. Robert trained as a mechanical engineer with the Highland Railway Company in Inverness; then as assistant to his father when he helped to plan extensions to Inverness gasworks and those of several neighbouring towns. He obtained the science and arts certificates of the City and Guilds of London Institute, two technological certificates, and several others from the Science and Arts Department at South Kensington. With these, he obtained a life long post as manager at Broughty Ferry Gasworks.

Source:- Gas World, 16/12/1893.

Thomas Whimster -

(1818-1910) Employed as Collector by Perth gas company, and soon appointed Manager which he remained until 1895 when awarded a pension by the council. Founding member of North British Association of Gas Managers. Devised improved gas apparatus. His son James Whimster became manager at Armagh, and his grandson J.W. Whimster worked for the South Metropolitan Company in London. In 1901 Thomas opened the new Perth gasworks. Left £2665 estate.

Source:- Gas World, 10/9/1910, pp. 314 (photo), 343.
Improved Gas Governor, J.G.L., 31/8/1869, p. 696.

Alexander Wilson -

Trained as apprentice to Messrs. Henry Balfour and Company of Leven, Fife. Built a sodium nitrate works in Bolivia, and several gasworks for that company. Trained in gasworks management at Vauxhall works of Phoenix Company in London. Became assistant manager to Robert Morton of London Gas Company, and superintended the construction department at Nine Elms (1880-90). Manager at Dawsholm works (1890-1903) in Glasgow and general Manager for Glasgow Corporation from 1903-19.

Source:- J.G.L., 20/10/1903, pp. 143, 152, 161.

Thomas Wilson -

His father was manager at Stewarton for 40 years, and Thomas was trained there. At 21 he became manager at nearby Newmilns; at 24 became assistant to Mr. Oldfield of the Sutton, Southcoats and Drypool Company of Hull; then manager of Saltcoats for 4 years. He then became manager and Secretary at Coatbridge, where he pioneered prepayment meters in Scotland, and did much outside consultancy work. From 1890 at Coatbridge he abolished Sunday labour from 6 a.m. to 6 p.m. His son, A. Wilson, became an apprentice engineer, worked in a drawing office, then became assistant to his father at Coatbridge, then assistant at Carlisle, and in 1895 engineer and manager at Perth.

Source:- Gas World, 30/7/1898.

William Wilson -

Second son of T. Wilson, gas manager of Coatbridge. Studied science and technology at Glasgow and West of Scotland Technical College, and at Heriot-Watt College in Edinburgh. Assistant gas manager at Coatbridge (1895-6) and Perth (1896-8); assistant manager at

Messrs. Milne's gas meter works in Edinburgh (1898-1900); assistant gas manager at Coatbridge (1900-1) and manager at Kirkintilloch (1901-7) and at Falkirk (1907).

Source:- 4/4/1914.

David Young -

Younger son of John Young; manager at Dalkeith gasworks 1874-90. John Young was a director of Dalkeith gasworks by 1874 when he acted as interim manager after the death of manager J. Cusitor. The post was offered first to William Young, who declined, and then to David who had been trained by Andrew Scott at Musselburgh gasworks. Left Dalkeith after accusations of mismanagement and inebriation.

Source:- S.R.O. Dalkeith Minute Book, op. cit., 26/5/1874, 19/6/1874, 1/5/1890. A. Scott vide supra p.

John Young -

(1815-1886) Born in Edinburgh, but moved to Galashiels as an apprentice shoemaker to his uncle, in whose library he read descriptions of early London gasworks. A local tinsmith taught him to make pipes, and with a kettle 'retort', butter "firkin" gasholder and wash-tub tank, he lit the shoe shop. It was a good advertisement, and many people visited to observe the gaslight. On the basis of this experience he was appointed gas manager at Selkirk in 1840, where he became a consultant analytical chemist testing coal and water samples. In 1851 his model of a gasworks won a medal at the International Exhibition, whilst his technical improvements were awarded a silver medal by the Scottish Society of Arts.

He became manager at Dalkeith in 1852, and gave public lectures and evening tutorials on electricity, chemistry and optics. He designed an improved water-supply system, and in 1861 led the opposition to Flintoff's campaign. In 1868 he joined Wigan Coal and Iron Company to design ovens for coking slack for by-product recovery. He returned to Scotland in 1873, and worked as a consulting engineer from Bonnyrigg.

Source:- Gas World, 30/1/1886, p. 189.

William Young -

(1841-1907) Assisted his father in the lectures at Dalkeith, and in the mid 1850s obtained the patronage of Peter Brash, a soap, candle and oil manufacturer of Leith, who encouraged him to study science under Prof. Lyon Playfair in Edinburgh. Young then became an apprentice plumber (gasfitter) under Alex. Bell at Dalkeith, before succeeding Mr. Bell as gas manager at Lasswade in 1863. There he experimented with waste shale from local pits, and obtained up to 9000 cu.ft. gas per ton. He also tried distilling shale-oil, both at the gasworks and the pits.

With the help of Brash, he became manager of Straiton Oil Works about 1866. The Scottish oil-shale industry was losing momentum, and still used horizontal retorts which charred the oil and gave no ammonia by-products. Young and Brash in 1866 and 1867 developed a vertical retort which allowed the volatile oil to be swept rapidly downwards out of the retort without charring. In 1874 Young became engineer to the Clippens Oil Company with large new works near Paisley. For that company he later designed and managed a new works

at Pentland near Edinburgh, which processed 300,000 tons shale per year, and also ran an experimental plant at Straiton to develop low temperature carbonization for the recovery of ammonia.

In 1882, with G.T. Beilby a chemist of the Oakbank Oil Company in Mid Calder, W. Young designed a highly successful vertical retort which was almost universally adopted in Scotland. He retired in 1885 to Harehope estate at Priorsford, on the Tweed near Peebles. During 1892 the price slump in mineral oils led him to develop the 'Peebles process' to enrich coal gas with oil-gas, but the introduction of Welsbach mantles soon eclipsed the need for such enrichment.

Throughout his career, Young lectured to gas managers in an attempt to persuade them to make use of experimental results achieved in the oil industry. In the early 1860s his attempts to use paraffin oil to prevent wet gas-meters¹ freezing in winter resulted in the discovery that light oils could absorb the illuminating constituents out of coal gas. Those constituents could thus be recovered by volatilization and re-condensation, and this process was widely adopted for by-product recovery from waste shale-oil gases. In 1874 he advised the West of Scotland Gas Managers Association to use the process for analyzing the quality of coal gas, and with the help of Henry Aitken of Falkirk he devised a condenser which reduced the loss of illuminating power from coal gas (based on Young's 1874 patent, 2587). He also showed that naphtha, comprising 2 to 10% of gas tar; absorbed illuminating constituents, and gasworks were redesigned to minimize this. Previously condensed tar and ammonia liquor were allowed to flow in the retort house pipes against the direction of gas-flow, to increase the sulphur and naphthalene absorption, and this harmful practice was stopped.

Young was closely associated with Dr. Alfred Daniell, a Welshman educated at the University of Edinburgh, an Advocate of the Scots Bar and an English Barrister, who assisted his patents, and acted as junior Council in the major oil shale case of Young and Beilby v. Hermand Oil Company. Daniell was a skilled chemist also, and published A Textbook on the Principles of Physics (N.D.) used by the United States and Japanese navies, Physics for Students of Medicine, and several articles including "Gas and Gas Lighting" in Chambers' Encyclopaedia.

In 1887 Young experimented with "Purification in Closed Vessels", and the possibility of using ammonia itself to remove CO₂, H₂S, CS₂, and other sulphur compounds from coal gas. In the late 1880s he worked on by-product recovery from blast-furnace gases, and in the late 1890s with Thomas Glover at St. Helens on naphthalene problems which were increasing at the higher operating temperatures. They proved that this was due to a reduction in the production of creasols, higher olefines and "benzols", which previously condensed the naphthalene into normal tar, and suggested scrubbing the gas with mineral oil.

Sources:- "William Young", N.B.A.G.M. 1910. "Interview with William Young", Gas World, 26/1/1895. An Appreciation of Wm. Young by G. Beilby, N.B.A.G.M. 1912, pp. 76-81. On A. Daniell vide N.B.A.G.M. 1911, p. 144 (photo).

1. Probably inspired by the 1860-1 severe frost which caused havoc amongst Scottish gas-meters.

BEST COPY

AVAILABLE

Variable print quality

Data.	Description	Subject Matter.	References.
1877 27 Sept.,	W.S.A.G.M. ; discussion,	Construction of gasworks,	J.G.L. xxx. 721.
27 "	" "	Aitken and Young's process,	" xxx. 762.
18 Oct.,	J.G.L. ; letter,	Naphthalene,	" xxx. 641.
20 Nov.,	" "	Steam jet exhausters,	" xxx. 868.
19 Dec.,	" "	" "	" xxxi. 14.
21 "	Patent 4837/77 ; Wm. Young & Alex. Neilson,	Refrigerating liquids ; treating the same,	Printed Specification.
1878 8 Feb.,	" 522/78 ; Wm. Young,	Treating gases,	" "
8 March,	" 937/78 ; Wm. Young,	Cooling or refrigerating apparatus,	" "
20 April,	" 1591/78 ; William Young and George Robertson Hislop,	Revivifying spent lime,	" "
11 July,	N.B.A.G.M. ; discussion,	Value of gas,	N.B.A. <i>Trans.</i> 1878, p. 20 ; J.G.L. xxxii. 204.
11 "	" "	Pressure of gas,	J.G.L. xxxii. 240 ; N.B.A. <i>Trans.</i> 1879, p. 26.
11 "	" "	Bruce Peebles governors,	J.G.L. xxxii. 241 ; N.B.A. <i>Trans.</i> 1878, p. 30.
15 Aug.,	J.G.L. ; letter,	Causes and cure of naphthalene,	J.G.L. xxxii. 307.
26 Sept.,	W.S.A.G.M. ; paper by William Young,	"Notes on some of the physico-chemical laws relating to gas,"	J.G.L. xxxii. 715.
26 "	" discussion,	Drying of coal,	" xxxii. 751.
1879 29 May,	J.G.L. ; letter,	The analysis of gas coals,	J.G.L. xxxiii. 811.
25 June,	Patent 2537/79 ; Wm. Young,	Using mineral oil products for making gas,	Printed Specification.
10 July,	N.B.A.G.M. ; paper by William Young and discussion,	"The elimination of sulphur compounds from illuminating gas,"	N.B.A. <i>Trans.</i> 1879, pp. 10, 16 ; J.G.L. xxxiv. 181.
	N.B.A.G.M. ; paper by William Young and discussion,	"On the proportion of carbon present in gas in relation to its illuminating power,"	N.B.A. <i>Trans.</i> 1879, pp. 25, 33 ; J.G.L. xxxiv. 220.
	N.B.A.G.M. ; remarks,	Research fund,	N.B.A. <i>Trans.</i> 1879, p. 51 ; J.G.L. xxxiv. 257.
	" discussion,	Needle governors,	N.B.A. <i>Trans.</i> 1879, p. 21 ; J.G.L. xxxiv. 220.
	" "	Gas compressors,	N.B.A. <i>Trans.</i> 1879, p. 51 ; J.G.L. xxxiv. 259.
	" "	Lime in purifiers,	N.B.A. <i>Trans.</i> 1879, p. 61 ; J.G.L. xxxiv. 301.
31 "	J.G.L. ; letter,	Elimination of sulphur compounds from illuminating gas,	J.G.L. xxxiv. 211.
<hr/>			
1880 14 Jan.,	J.G.L. ; letter,	Hydraulic main,	J.G.L. xxxv. 91.
17 April,	Patent 1578/80 ; Wm. Young,	Distilling shale to obtain mineral oil,	Printed Specification.
8 July,	N.B.A.G.M. ; paper by Wm. Young,	"Jottings on the principles involved in gas manufacture,"	N.B.A. <i>Trans.</i> 1880, p. 23 ; J.G.L. xxxvi. 299.
	" discussion,	Spence's metal,	N.B.A. <i>Trans.</i> 1880, p. 16 ; J.G.L. xxxvi. 262.
	" "	Scrubbers,	N.B.A. <i>Trans.</i> 1880, p. 12 ; J.G.L. xxxvi. 224.
1881 12 April,	Patent 1587/81 ; William Young,	Making mineral oil, ammonia, and coal gas,	Printed Specification.
21 July,	N.B.A.G.M. ; discussion,	Gas service pipes,	N.B.A. <i>Trans.</i> 1881, p. 14 ; J.G.L. xxxviii. 264.
21 "	" "	Regenerative gas firing,	N.B.A. <i>Trans.</i> 1881, p. 23 ; J.G.L. xxxviii. 350.
21 "	" "	Malam's second system,	N.B.A. <i>Trans.</i> 1881, p. 36 ; J.G.L. xxxviii. 429.
21 "	" "	Valentine's purification,	N.B.A. <i>Trans.</i> 1881, p. 41 ; J.G.L. xxxviii. 470.
1882 21 March,	Patent 1377/82 ; Wm. Young and G. T. Beilby,	Obtaining ammonia from coal, shale, &c.,	Printed Specification.
21 July,	N.B.A. ; paper by Wm. Young and discussion,	"The fractional distillation of coal in connection with gas manufacture,"	N.B.A. <i>Trans.</i> 1882, p. 9 ; J.G.L. xl. 257.
21 "	" discussion,	Price of gas,	N.B.A. <i>Trans.</i> 1882, p. 58 ; J.G.L. xl. 399.
21 "	" "	Regenerative firing,	N.B.A. <i>Trans.</i> 1882, p. 63 ; J.G.L. xl. 437.
1883 25 Oct.,	Patent 5084/82 ; Wm. Young and G. T. Beilby,	Obtaining ammonia and gas from coal, &c.,	Printed Specification.
19 July,	N.B.A. ; paper by Wm. Young and discussion,	"Further notes on the fractional destructive distillation of coal for the recovery of bye-products in connection with gas manufacture,"	N.B.A. <i>Trans.</i> 1883, p. 9 ; J.G.L. xlii. 317 ; King's Repts. 1883, p. 135.
1884 8 April,	Patent 6094/84 ; Wm. Young and G. T. Beilby,	Distillation of mineral oils,	Printed Specification.
29 May,	" 8409/84 ; "	" "	" "
1885 31 Dec.,	" 16052/85 ; Wm. Young,	Purification of coal gas, &c.,	" "
1887 21 July,	N.B.A. ; paper by Wm. Young and discussion,	"Purification in close vessels and avoidance of nuisance in the manufacture of coal gas,"	N.B.A. <i>Trans.</i> 1887, pp. 20 and 39 ; J.G.L., vol. 50, pp. 202 and 242 ; G.W. 7, pp. 161 and 166 ; King's Repts. 1887, p. 143.

(iv) Chronology of Publications and Inventions by William Young

INDEX OF VARIOUS
CONTRIBUTIONS TO TECHNOLOGY

By MR. WILLIAM YOUNG.

1866—1909.

ABBREVIATIONS.

N.B.A.G.M. or N.B.A.	= North British Association of Gas Managers.
N.B.A. Trans.	= Transactions of the North British Association of Gas Managers.
W.S.A.G.M.	= West of Scotland Association of Gas Managers.
J.G.L.	= "Journal of Gas Lighting."
G.W.	= "Gas World."
King's Reps.	= King's Reports of Gas Associations (J.G.L. Office, Annually).

Date.	Description.	Subject Matter.	References.
1866 4 May,	Patent 1278/66; Wm. Young and Peter Brash,	Distillation of shale, &c.; re-distillation,	Printed Specification.
17 Sept.,	" 2380/66; Peter Brash and Wm. Young,	Oil from shale, &c.,	" "
1867 3 March,	" 650/67; Wm. Young and Peter Brash,	Distillation of bituminous substances,	" "
4 May,	" 1315/67; Peter Brash and Wm. Young,	Lamps for hydrocarbons,	" "
1870 4 April,	" 1014/70; Wm. Young and Peter Brash,	Manufacture of illuminating gas,	" "
1872 21 Aug.,	" 2487/72; Wm. Young, Peter Brash, and Andrew Scott,	Producing gas and oil from coal, &c.,	" "
1874 8 Oct.,	W.S.A.G.M.; paper by Wm. Young,	"The absorption of the illuminating con- stituents in coal gas by heavy hydro- carbons,"	J.G.L. xxiv. 571.
1875 2 March,	J.G.L.; letter,	Steam jet exhausters,	" xxv. 284.
23 "	" "	" "	" xxv. 401.
27 April,	" "	" "	" xxv. 597.
29 "	W.S.A.G.M.; discussion,	Malam's process,	" xxv. 769.
1875 29 April,	W.S.A.G.M.; paper by Wm. Young, (9th July, Mr. Young became a member of the N.B.A.G.M.)	"The condensation of crude gases,"	J.G.L. xxv. 803.
3 Aug.,	Patent 2725/75; Henry Aitken & Wm. Young,	Manufacture of gas,	Printed Specification.
28 "	W.S.A.G.M.; discussion,	Malam's process,	J.G.L. xxvi. 476.
7 Sept.,	Patent 3137/75; Wm. Young,	Obtaining hydrocarbon vapours from gases,	Printed Specification.
12 Oct.,	W.S.A.G.M.; discussion,	Malam's process,	J.G.L. xxvi. 584.
7 Dec.,	J.G.L.; letter,	Gas exhausters and deposit of carbon in retorts,	" xxvi. 828.
28 "	" "	Gas exhausters and deposit of carbon in retorts,	" xxvi. 941.
1876 27 April,	W.S.A.G.M.; discussion,	Steam jet exhausters,	J.G.L. xxvii. 734.
27 "	" paper by Wm. Young,	"The manufacture of illuminating gas,"	" xxvii. 778.
14 July,	N.B.A.G.M.; discussion,	Key's method of adjusting the seal on dip pipes, and otherwise reducing pressure in retorts,	N.B.A. Trans. 1876, p. 23; J.G.L. xxviii. 243.
14 "	" paper by Wm. Young,	"The utilisation of the gases resulting from the destructive distillation of shale in the manufacture of paraffin oil,"	N.B.A. Trans. 1876, p. 28; J.G.L. xxviii. 279.
11 Aug.,	Patent 3173/76; Wm. Young,	Carburetted air and gases,	Printed Specification,
23 Sept.,	W.S.A.G.M.; paper by Wm. Young, and discussion,	"Condensation,"	J.G.L. xxviii. 665, 703.
9 Oct.,	Patent 3894/76; Wm. Young, Alex. Wilson, and Alex. Young,	Distilling bituminous substances,	Printed Specification.
21 "	J.G.L.; letter,	Recovery of light oil in the distillation of shales,	J.G.L. xxviii. 594.
29 Nov.,	Provisional Specification 4613/76; Wm. Young,	Gas-making,	Printed provisional,
6 Dec.,	J.G.L.; second letter,	Recovery of light oil, &c.,	J.G.L. xxviii. 876.
1877 29 March,	Patent 1246/77; Wm. Young,	Distilling coal and making oil and gas,	Printed Specification.
26 April,	W.S.A.G.M.; discussion,	Aitken and Young's process,	J.G.L. xxix. 786.
26 "	" "	Peebles' gas governors,	" xxix. 834.
26 "	" "	20 and 25 candle standards,	" xxix. 835.
13 July,	N.B.A.G.M.,	Aitken and Young process,	J.G.L. xxx. 283; but this much revised in N.B.A. Trans. 1877, p. 15.
13 "	" paper by Wm. Young,	"The causes affecting the quantity of carbon deposited in retorts,"	N.B.A. Trans. 1877, p. 22; J.G.L. xxx. 221.
27 Sept.,	W.S.A.G.M.; discussion,	Steam jet exhausters,	J.G.L. xxx. 647.
27 "	" "	Sugg's illuminating power meter,	" xxx. 685.

Date.	Description.	Subject Matter.	References.
1889 16 March,	Patent 4597/89; Wm. Young and Geo. T. Beilby,	Distilling oils,	Printed Specification.
6 Nov.,	" 17673/89; Coltness Iron Co., Ltd., and Wm. Young,	Treating gases from blast furnaces, producers, &c.,	" "
1890 22 Feb.,	Provisional Specification 2684/90; Wm. Young,	Treating paraffin wax,	(Not printed).
1892 5 July,	Patent 12421/92; Wm. Young and Alex. Bell, (Mr. Young an Honorary Member of the N.B.A.G.M.: N.B.A. <i>Trans.</i> 1892, p. 6.)	Decomposing mineral oil gas,	Printed Specification.
1893 17 Jan.,	Provisional Specification 1017/93; Wm. Young and Robert Young,	Producing water gas, and hydrogen,	(Not printed).
23 June,	Patent 12355/93; Wm. Young,	Gas from mineral oils,	Printed Specification.
5 July,	" 13126/93; Wm. Young,	Producing illuminating gas,	
27 "	N.B.A.G.M.; paper and discussion,	"The principles of the production of illuminating gas from liquid hydrocarbons,"	N.B.A. <i>Trans.</i> 1893, pp. 29 and 61; J.G.L. lxii. 262 and 309; G.W., 19, pp. 123 and 184; King's Repts. 1893, p. 152.
1894 7 Nov.,	Provisional Specification 21123/93; Wm. Young,	Gas, benzole, &c., from liquid hydrocarbons,	(Not printed).
1 Jan.,	"Gas World"; letter,	Tatham and Peebles processes of gas enrichment,	G.W., 20, p. 9.
4 "	J.G.L.; letter,	Peebles process and Huddersfield oxy-oil plant,	J.G.L. lxii. 72.
17 "	N.B.A.G.M.; paper and discussion,	"Further developments" of the Peebles process,"	" lxii., 154.
26 July,	" discussion,	Incandescent gas lighting,	N.B.A. <i>Trans.</i> 1894, pp. 43 and 56; J.G.L. lxiv. pp. 236 and 326; G.W. 21, p. 101; King's Repts. 1894, pp. 176 and 191.
1895 15 Jan.,	"Gas World"; letter,	Oil gas enrichment at Huddersfield,	G.W. 22, p. 68.
17 "	J.G.L.; letter,	Carpenter's paper at Soc. Chem. Industry,	J.G.L. lxv. 178.
26 "	"Gas World"; interview,	The efficiency of luminous combustion,	G.W. 22, p. 98.
7 Feb.,	J.G.L.; letter,		J.G.L. lxv. 317.
1895 25 July,	N.B.A.; paper and discussion, [The last paper read personally by Mr. Young.]	"Notes on the chemical constitution of illuminating gas, and on some of the physico-chemical conditions which influence the luminosity of gas flames,"	N.B.A. <i>Trans.</i> 1895, pp. 20, 45; J.G.L. lxvi. 230, 236; G.W. 23, pp. 101, 132; King's Repts. 1895, p. 160.
4 Sept.,	Provisional Specification 16539/95; William Young,	Illuminating gas,	(Not printed).
1896 2 June,	Provisional Specification 11955/96; William Young & George Robertson Hislop,	Illuminating gas,	" "
22 July,	N.B.A.; paper by Wm. Young, (Read in his absence.)	"The permanency of illuminating gas,"	N.B.A. <i>Trans.</i> 1896, p. 33; J.G.L. lxviii. 166, 216; G.W. 25, p. 119; King's Repts. 1896, p. 187.
Aug.-Nov.,	Correspondence with A. F. Browne,	Permanency of illuminating gas,	J.G.L. lxviii. 320, 419, 598, 647, 795, 910.
11 Sept.,	Patent 20125/96; Wm Young, Samuel Glover, and Thomas Glover,	Gas,	Printed Specification.
1897 3 June,	" 13665/91; Wm. Young & John Fyfe,	Retorts,	" "
15 "	Incorporated Gas Institute; paper by Wm. Young and Thomas Glover, and further communication to Institute by Mr. Young.	"Naphthalene in modern gas manufacture, and the carburetting of illuminating gas,"	Incorp. Gas Inst. <i>Trans.</i> 1897, pp. 113, 154; J.G.L. lxx. 16, 26; G.W. 26, p. 1040.
3 Aug.,	Provisional Specification 18085/97; William Young and Alexander Bell,	Water gas,	(Not printed).
1898 3 Aug.,	Patent 8873/98; Wm. Young, W. R. Herring, and Alexander Bell,	Gases,	Printed Specification.
14 Sept.,	Provisional Specification 19529/98; William Young, Samuel Glover, and Thomas Glover,	Separating from gases suspended particles, &c.,	(Not printed).
25 Nov.,	Provisional Specification 24891/98; William Young and John Fyfe,	Retorts,	" "
Nov.-Jan.,	Correspondence with C. E. Botley,	Carburation of coal gas,	J.G.L. lxxii. 1167 (1231), 1298 (1362), 1420 (1478); lxxiii. 32 (85), 132.
1899 21 July,	J.G.L.; letter,	The naphthalene question,	J.G.L. lxxiv. 239.
25 "	Patent 15238/99; Wm. Young and John Fyfe,	Retorts,	Printed Specification.
31 Aug.,	" 17620/99; William Young and Samuel Glover,	Scrubbing and washing gases, &c.,	" "

Date.	Description.	Subject Matter.	References.
1899 Aug.-Oct.,	Correspondence with C. E. Botley,	The Hastings carburation process,	J.G.L. lxxiv. 490 (542), 602 (652), 705 (769), 825 (887), 944.
1900 31 March, 12 June,	"Gas World"; interview, The Incorporated Gas Institute; paper by Wm. Young,	Naphthalene in coal gas, "Naphthalene from retort to point of deposition,"	G.W. 32, p. 504. Incorp. Gas Inst. <i>Trans.</i> 1900, p. 144; J.G.L. lxxv. 1712; G.W. 32, p. 1041.
19 June, 4 July, 26 "	"Gas World"; letter, " " N.B.A.; paper (no discussion, Mr. Young ill),	The Institute discussion, The naphthalene question, "Jottings on the principles involved in the production of gas by different pro- cesses, and their relative values,"	G.W. 32, p. 1079. " 33, p. 13. N.B.A. <i>Trans.</i> 1900, p. 63; J.G.L. lxxvi. 282; G.W. 33, pp. 135 and 213; King's Repts. 1900, p. 222. (Not printed).
29 Dec.,	Provisional Specification 23765/00; William Young and Samuel Glover,	Treating refuse, &c.,	(Not printed).
31 "	Provisional Specification 23813/00; William Young, Samuel Glover, and Thos. Glover,	Removing naphthalene deposits,	" "
1902 6 June,	Provisional Specification 12918/02; William Young, Samuel Glover and Thos. Glover,	Gasification of bituminous coals, &c.,	" "
6 Nov.,	Southern District Association of Gas Engineers and Managers; paper by Wm. Young and Thomas Glover,	"Further suggestions for the elimination of naphthalene from coal gas,"	J.G.L. lxxx. 1272; G.W. 37, p. 742; King's Repts. 1902, p. 434.
1903 5 May,	J.G.L.; contributed article,	Utilising water gas in the production of illuminating and heating gases,	J.G.L. lxxxii. p. 285.
30 July,	N.B.A.; paper and discussion,	"Remarks upon the principles involved in the production of gases from coal, and suggestions as to their applications in future developments,"	N.B.A. <i>Trans.</i> 1903, p. 22; J.G.L. lxxxiii. 298 and 301; G.W. 39, pp. 177 and 181; King's Repts. 1903, p. 205.
1904 Oct.-Dec.,	"Gas World"; three letters,	The Leicester remedy for naphthalene,	G.W. 41, pp. 681, 1078 and 1176.
"	J.G.L.; four articles,	The removal of naphthalene,	J.G.L. vol. 88, pp. 241, 401, 464, 837.
20 Dec.,	Provisional Specification 27771/04; William Young and James Milne,	Removing naphthalene from coal gas,	(Not printed).
<hr/>			
1905 11 March,	J.G.L. and "Gas World"; article,	The removal of naphthalene from coal gas during the process of condensation,	J.G.L. vol. 89, p. 706; G.W. 42, p. 416.
20 "	"Gas World"; letter,	The removal of naphthalene,	G.W. 42, p. 501.
1 April,	" " article,	The naphthalene process at Leicester,	" 42, p. 551.
17 Nov.,	Patent 23650/05; Wm. Young and Samuel Glover,	Carbonising coals,	Printed Specification.
12 Dec.,	J.G.L.; article,	The removal of naphthalene,	J.G.L. vol. 92, p. 742.
1906 5 Jan.,	" " letter,	Naphthalene experiences at Sheffield,	" vol. 93, p. 114.
9 "	" " article,	Removal of naphthalene,	" vol. 93, p. 98.
	" " five articles and sketch,	Vertical retorts,	" vol. 93, pp. 560, 714, 851; vol. 94, pp. 95, 163, and 758; and vide vol. 93, p. 531.
1909 5 Jan.,	} " two posthumous contributions,	{ "Gasification of coal in the producer," "Purification of the resulting gases,"	" vol. 105, p. 17.
12 "			" vol. 105, p. 87.

PERSONALIA.

J.G.L., vol. 97, pp. 589 (editorial), 593 (biography), 637 (appreciation), 675 (funeral), 700 (*re* sanatorium).

vol. 98, pp. 159 (Mr. W. Young's remarks on his namesake at Waverley Association).

G.W., vol. 45, p. 1017 (illness).

vol. 46, pp. 83 (illness), 303 (biography and appreciation), 358 (will, 20 lines), 612 (will 10 lines), 645 (will).

Rep. Alkali Works Inspector, 1907; fine appreciation by Mr. R. Forbes Carpenter.

(v) List of Presidents of the North British Association of
Gas Managers (1862 - 1913)

Year	Name	Residence	Place of Assn. Meeting
1862	John Lowden	Leven, Fife	Cupar, Fife
1863	John Lowden	Leven, Fife	Broughty Ferry
1864	Robert Gray	Dunfermline	Perth
1865	Thomas Whimster	Perth	Perth
1866	William Proctor	Forfar	Perth
1867	{ William Proctor John Reid (Acting President)	{ Forfar Leith }	Edinburgh
1868	John Reid	Leith	Edinburgh
1869	George R. Hislop	Paisley	Glasgow
1870	Thomas Whimster	Perth	Edinburgh
1871	Hugh Bartholomew	Glasgow	Edinburgh
1872	John K. Watson	Edinburgh	Perth
1873	Boyd M. McCrae	Dundee	Edinburgh
1874	William Foulis	Glasgow	Glasgow
1875	George R. Hislop	Paisley	Dundee
1876	Samuel Stewart	Greenock	Edinburgh
1877	A. MacPherson	Kirkcaldy	Stirling
1878	J. Hall	St. Andrews	St. Andrews
1879	Alexander Smith	Aberdeen	Edinburgh
1880	James Robb	Haddington	Perth
1881	James McGilchrist	Dumbarton	Glasgow
1882	William McKenzie	Dunfermline	Edinburgh
1883	Thomas Whimster	Perth	Stirling
1884	F.T.C. Linton	Leith	Glasgow
1885	John McCrae	Dundee	Dundee
1886	{ James Hislop Robert Mitchell (Acting President)	{ Partick, Hillhead, Maryhill Edinburgh }	Edinburgh
1887	Robert Hitchell	Edinburgh	Stirling
1888	David Terrance	Dawsholm	Glasgow
1889	George R. Hislop	Paisley	Dunfermline
1890	Samuel Stewart	Greenock	Perth
1891	Robert Robertson	Bathgate	Edinburgh
1892	Adam MacPherson	Kirkcaldy	Stirling
1893	T.D. Hall	Montrose	Dundee
1894	James McGilchrist	Dumbarton	Glasgow
1895	Alexander Wilson	Dawsholm	Melrose
1896	Alexander Yuill	Alloa	Edinburgh
1897	Alexander Bell sen.	Dalkeith	Ayr
1898	Thomas Wilson	Coatbridge	Glasgow
1899	Hubert Pooley	Dunfermline	Stirling
1900	William Ewing	Hamilton	Edinburgh
1901	W.R. Herring	Edinburgh	Glasgow
1902	John Wilson	Tradeston, Glasgow	Perth
1903	Thomas Lightbody	Renfrew	Ayr
1904	David Robertson	Dunoon	Glasgow
1905	James Carmichael	Barrhead	St. Andrews
1906	William B. McLusky	Perth	Edinburgh
1907	Lawrence Hislop	Uddingston	Glasgow
1908	William Blair	Helensburgh	Edinburgh
1909	Jas. D. Smith	Stirling	Stirling
1910	Alexander Waddell	Dunfermline	Dunfermline
1911	George Keillor	Broughty Ferry	Glasgow
1912	Samuel Milne	Aberdeen	Aberdeen
1913	James MacLeod	Greenock	Greenock

(vi) Membership List of the North British Association of Gas

Managers (1903) and (1869)

(A) 1903

[91]

LIST OF MEMBERS.

ORDINARY MEMBERS.

Name.	Residence.	General Fund.		Benevolent Fund.	
		£	d.	£	d.
Alexander, Duncan, Gas Works,	Edinburgh,	0	5	0	2
Angus, John,	Newburgh,	0	5	0	2
Ballantyne, John,	Hamilton,	0	10	0	2
Baxter, James,	Forfar,	0	10	0	2
Bell, Alex., sen.,	Dalkeith,	0	7	0	2
Bell, Alex., jun.,	Peebles,	0	10	0	2
Bell, James,	Callander,	0	5	0	2
Bishop, Alexander,	Newtongrange, Dalkeith,	0	5	0	2
Black, James,	North Berwick,	0	7	0	2
Black, John F.,	Newport, Fife,	0	7	0	2
Blair, Peter,	Haddington,	0	7	0	2
Blair, William,	Helenburgh,	0	10	0	2
Brodie, James,	Omagh, Ireland,	0	5	0	2
Brown, J. V.,	Callao, Peru,	0	10	0	2
Brown, William,	Lasswade,	0	5	0	2
Bruce, John,	Lockerbie,	0	5	0	2
Carlow, Frank W.,	Lasswade,	0	7	0	2
Carlow, R. S.,	5 Viewlands Terrace, Perth,	0	10	0	2
Carmichael, James,	Barrhead,	0	10	0	2
Cay, John,	Keith,	0	5	0	2
Chalmers, Peter,	Kelso,	0	5	0	2
Chalmers, William,	Alva,	0	7	0	2
Clark, William,	Dalmellington,	0	5	0	2
Cochrane, James,	Darvel,	0	5	0	2
Cowie, Robert,	Tillicoultry,	0	5	0	2
Croll, Robert,	Castle-Douglas,	0	5	0	2
Cunningham, A. M.,	Kilmalcolm,	0	10	0	2
Currie, William,	Alexandria, N.B.,	0	5	0	2
Cuthbertson, Thomas	Neilston,	0	10	0	2
Deans, R. L.,	Johnstone,	0	10	0	2
Devine, Hugh,	Auchenleck,	0	5	0	2
Duncan, John,	Kirriemuir,	0	5	0	2
Eason, David,	Selkirk,	0	10	0	2
Ewing, William,	Greenock,	0	10	0	2
Fairweather, Wm.,	Kilmarnock,	0	10	0	2
Fox, William,	Lerwick,	0	5	0	2
Fraser, D.,	Gorebridge,	0	10	0	2
Fullerton, John,	Motherwell,	0	10	0	2
Galbraith, William,	Ardrossan,	0	5	0	2
Gammel, James,	Melrose,	0	10	0	2
Gibb, John,	Newton-Ayt,	0	5	0	2
Gibson, John,	Dalmellington,	0	5	0	2
Gilchrist, George,	Stewarton,	0	5	0	2
Gourlay, Henry,	East Wemyss,	0	5	0	2
Graham, George,	Leslie,	0	5	0	2
Guthrie, John,	Lochgelly,	0	5	0	2
Hall, Thomas D.,	Montrose,	0	10	0	2
Herring, Walter Ralph,	Edinburgh and Leith,	0	10	0	2
Histop, Lawrence,	Uddingston,	0	10	0	2

Name.	Residence.	General Fund.		Benevolent Fund.	
		£	d.	£	d.
Houston, William, Gas Works,	Kirkwall,	0	5	0	2
Houston, Walter L.,	Kilbarchan,	0	5	0	2
Ireland, John,	Tayport,	0	5	0	2
Irvine, David,	Kirkeudbright,	0	5	0	2
Johnstone, Andrew,	Armadale,	0	7	0	2
Keilor, George,	Nairn,	0	10	0	2
Keilor, George, jun.,	Peterhead,	0	7	0	2
Kellock, William,	Kilsyth,	0	5	0	2
Kelly, Hugh,	Busby,	0	10	0	2
Kincaid, James,	Kirkcaldy,	0	10	0	2
King, John,	Bo'ness,	0	5	0	2
Lauder, James,	Bridge of Weir,	0	5	0	2
Lawson, William,	Monifieth,	0	5	0	2
Leitch, Archibald,	Baillieston,	0	10	0	2
Lighbody, Thomas,	Renfrew,	0	10	0	2
Mackie, William,	Port-Glasgow,	0	10	0	2
Manwell, James,	Dalmarnock Rd., Glasgow,	0	5	0	2
Marshall, William,	Banf,	0	10	0	2
Masterton, Alex.,	Edinburgh,	0	5	0	2
Matthews, James,	Fraserburgh,	0	5	0	2
Melville, Peter,	Dysart,	0	7	0	2
Mitchell, William,	Dalry,	0	5	0	2
Muir, Robert,	Galston,	0	7	0	2
Munro, John,	Crail,	0	5	0	2
Myers, Charles P.,	Troon,	0	10	0	2
Myers, J. Napier,	Saltcoats,	0	10	0	2
MacPherson, Adam,	Kirkcaldy,	0	7	0	2
MacPherson, James,	Cupar-Fife,	0	10	0	2
M'Crae, William,	Falkirk,	0	7	0	2
M'Donald, John,	Denny,	0	5	0	2
M'Donald, John,	Catrine,	0	10	0	2
M'Ewan, James,	Gourock,	0	5	0	2
M'Farlane, James,	Maybole,	0	5	0	2
M'Giffen, William,	Huntly,	0	10	0	2
M'Gilchrist, James,	Dumbarton,	0	5	0	2
M'Laren, J.,	Duns,	0	10	0	2
M'Nair, R.,	Linlithgow,	0	5	0	2
M'Lusky, William B.,	Perth,	0	5	0	2
M'Pherson, John,	Beith,	0	5	0	2
Naismith, John,	Cove,	0	7	0	2
Napier, Andrew,	Crief,	0	10	0	2
Napier, J. W.,	Alloa,	0	5	0	2
Napier, Robert A.,	Comrie,	0	5	0	2
O'Neill, John,	Old Cunnock,	0	5	0	2
O'Neill, Thomas,	Dunbar,	0	5	0	2
Paterson, J. M.,	Langholm,	0	5	0	2
Peacock, Thomas,	Carlisle,	0	5	0	2
Peattie, William,	Dunblane,	0	5	0	2
Pollock, Robert,	Mauchline,	0	10	0	2
Pooley, Hubert,	Stafford,	0	7	0	2
Reddie, Peter L.,	Leven,	0	5	0	2
Reddie, William G.,	Anstruther,	0	10	0	2
Reid, Allan,	Brechin,	0	5	0	2
Renfrew, James,	Langbank,	0	5	0	2
Robertson, Andrew,	Alyth,	0	5	0	2

EXTRAORDINARY MEMBERS.

Name.	Profession.	Residence.	General Fund.		Beneficent Fund.						
			£ s. d.	£ s. d.	£ s. d.	£ s. d.					
Blackie, David,	- Meter Maker,	- Edinburgh,	10	0	0	0	0	0	0	0	0
Bowman, Arch.,	- Coalmaster,	- Buckhaven,	0	7	6	0	0	0	0	0	0
Briggs, William,	- Tar Distiller,	- Dundee,	0	7	6	0	0	0	0	0	0
Brown, James,	- Brickbuilder,	- Hamilton,	0	5	0	0	0	0	0	0	0
Brown, Thomas,	- Coalmaster,	- Lanemark,	0	10	0	0	0	0	0	0	0
Brown, W. S.,	- Tube Maker,	- Glasgow,	0	10	0	0	0	0	0	0	0
Burns, A. L.,	- Colliery Agent,	- Leith,	0	5	0	0	0	0	0	0	0
Callander, John,	- Sec. Lothian Coal Coy.,	- Dalketh,	0	10	0	0	0	0	0	0	0
Cameron, Alex.,	- Colliery Agent,	- Glasgow,	0	10	0	0	0	0	0	0	0
Carlow, Charles,	- Coalmaster,	- Leven,	0	10	0	0	0	0	0	0	0
Cowan, W. H.,	- Meter Maker,	- Edinburgh,	0	10	0	0	0	0	0	0	0
Creek, R. W. B.,	- Engineer, &c.,	- Leven,	0	10	0	0	0	0	0	0	0
Dennis, John,	- Brickbuilder,	- Dalketh,	0	10	0	0	0	0	0	0	0
Donald, William,	- Engineer,	- Paisley,	0	10	0	0	0	0	0	0	0
Duncan, Thomas,	- Colliery Agent,	- Glasgow,	0	10	0	0	0	0	0	0	0
Dunnachie, James,	- Retort Maker,	- Glenboig,	0	5	0	0	0	0	0	0	0
Gillespie, Andrew,	- Gas Engineer,	- Glasgow,	0	5	0	0	0	0	0	0	0
Goldie, James,	- Brickbuilder,	- Glasgow,	0	7	6	0	0	0	0	0	0
Gray, James,	- Coalmaster,	- Pathhead,	0	5	0	0	0	0	0	0	0
Griffiths, A.,	- Fire Brick Maker,	- Bonnybridge,	0	7	6	0	0	0	0	0	0
Hamilton, Arch. H.,	- Paint Manufacturer,	- Glasgow,	0	7	6	0	0	0	0	0	0
Harvey, Wm. Ure,	- Metal Merchant,	- Glasgow,	0	10	0	0	0	0	0	0	0
Hepworth, Joseph,	- Meter Maker,	- Edinburgh,	0	10	0	0	0	0	0	0	0
Hunter, Robert,	- Tar Distiller,	- Glasgow,	0	5	0	0	0	0	0	0	0
Hull, Peter,	- Retort Maker,	- Glasgow,	0	10	0	0	0	0	0	0	0
Laidlaw, Robert,	- Engineer,	- Glasgow,	0	5	0	0	0	0	0	0	0
Little, Gilbert,	- Engineer,	- Glasgow,	0	10	0	0	0	0	0	0	0
Main, R. B.,	- Gas Stove Maker,	- Birmingham,	0	10	0	0	0	0	0	0	0
Marks, Thomas,	- Colliery Agent,	- Glasgow,	0	10	0	0	0	0	0	0	0
Milne, James,	- Meter Maker,	- Edinburgh,	0	5	0	0	0	0	0	0	0
Mungall, Henry,	- Coalmaster,	- Cowdenbeath,	0	5	0	0	0	0	0	0	0
Munn, Alex.,	- c/o Stewarts & Lloyds, Ltd.,	- Glasgow,	0	7	6	0	0	0	0	0	0
Mackay, Alex.,	- Meter Maker,	- Edinburgh,	0	10	0	0	0	0	0	0	0
Mackay, John,	- Meter Maker,	- Edinburgh,	0	10	0	0	0	0	0	0	0
Mackay, Arch.,	- Colliery Agent,	- 100 Polwarth Grdns., Edin.,	0	10	0	0	0	0	0	0	0
Mackenzie, Andw.,	- c/o Alder & Mackay,	- Edinburgh,	0	10	0	0	0	0	0	0	0
MacPherson, D. D.,	- Paint Manufacturer,	- Manchester,	0	10	0	0	0	0	0	0	0
Macfie, Daniel,	- Meter Maker,	- Edinburgh,	0	10	0	0	0	0	0	0	0
M'Ar, Alexander,	- Lime Merchant,	- Glasgow,	0	5	0	0	0	0	0	0	0
M'Kelvie, James,	- Coalmaster,	- Edinburgh,	0	5	0	0	0	0	0	0	0
Orr, Robert,	- Manufacturing Chemist,	- Glasgow,	0	10	0	0	0	0	0	0	0
Peebles, W. C.,	- Meter Maker,	- Edinburgh,	0	10	0	0	0	0	0	0	0
Penman, D. A.,	- Coalmaster,	- Glasgow,	0	10	0	0	0	0	0	0	0
Robinson, Thomas,	- Tar Distiller,	- Glasgow,	0	10	0	0	0	0	0	0	0
Robertson, David,	- c/o Stewarts & Lloyds, Ltd.,	- Glasgow,	0	10	0	0	0	0	0	0	0
Russell, Alexander,	- Colliery Agent,	- Glasgow,	0	10	0	0	0	0	0	0	0
Stewart, Thos. C.,	- Tube Maker, 41 Oswald St.,	- Glasgow,	0	10	0	0	0	0	0	0	0
Sutherland, R. M.,	- Tar Distiller,	- Falkirk,	12	6	0	0	0	0	0	0	0
Walker, Hugh,	- Tar Distiller,	- Ayr,	10	0	0	0	0	0	0	0	0
Walker, John,	- Tar Distiller,	- Ayr,	10	0	0	0	0	0	0	0	0

Name.	Gas Works,	Residence.	General Fund.		Beneficent Fund.						
			£ s. d.	£ s. d.	£ s. d.	£ s. d.					
Robertson, David,	-	- Dumoon,	0	10	0	0	0	0	0	0	0
Robertson, John,	-	- Bathgate,	0	7	6	0	0	0	0	0	0
Ross, A.,	-	- Burntisland,	0	7	6	0	0	0	0	0	0
Rutherford, Henry,	-	- Aberlady,	0	5	0	0	0	0	0	0	0
Scott, Alexander,	-	- Markinch,	0	5	0	0	0	0	0	0	0
Scott, Francis,	-	- Galashiels,	0	10	0	0	0	0	0	0	0
Scott, William,	-	- Blantyre,	0	10	0	0	0	0	0	0	0
Scott, J. B.,	-	- Cowdenbeath,	0	5	0	0	0	0	0	0	0
Shiell, James,	-	- Innerleithen,	0	10	0	0	0	0	0	0	0
Simpson, James,	-	- Bellshill,	0	10	0	0	0	0	0	0	0
Simpson, Robert,	-	- Cambuslang,	0	10	0	0	0	0	0	0	0
Skea, John,	-	- Kinross,	0	10	0	0	0	0	0	0	0
Smith, Alexander,	-	- Aberdeen,	0	10	0	0	0	0	0	0	0
Smith, James,	-	- Annan,	0	10	0	0	0	0	0	0	0
Smith, J. D.,	-	- Stirling,	0	10	0	0	0	0	0	0	0
Smith, William,	-	- Ayr,	0	10	0	0	0	0	0	0	0
Speed, Thomas,	-	- West Wemyss,	0	5	0	0	0	0	0	0	0
Steven, David,	-	- Pittenweem,	0	5	0	0	0	0	0	0	0
Stevens, James,	-	- Elie,	0	5	0	0	0	0	0	0	0
Stewart, John,	-	- Lanark,	0	7	6	0	0	0	0	0	0
Taylor, George,	-	- Jedburgh,	0	5	0	0	0	0	0	0	0
Taylor, William,	-	- Forres,	0	7	6	0	0	0	0	0	0
Terrace, Andrew,	-	- Blairgowrie,	0	7	6	0	0	0	0	0	0
Terrace, David,	-	- Middlesbrough,	0	10	0	0	0	0	0	0	0
Thomson, William,	-	- Musselburgh,	0	10	0	0	0	0	0	0	0
Turner, James S.,	-	- Thurso,	0	5	0	0	0	0	0	0	0
Vass, David,	-	- Airdrie,	0	10	0	0	0	0	0	0	0
Vernon, W. Fred.,	-	- Coupar Angus,	0	5	0	0	0	0	0	0	0
Waddell, Alexander,	-	- Dunfermline,	0	10	0	0	0	0	0	0	0
Waddell, Forbes,	-	- Broughty Ferry,	0	10	0	0	0	0	0	0	0
Walker, Alexander,	-	- Irvine,	0	10	0	0	0	0	0	0	0
Ward, Thos. William,	-	- Stevenston,	0	5	0	0	0	0	0	0	0
Watson, Mountain B.,	-	- Auchterarder,	0	5	0	0	0	0	0	0	0
Watson, Peter B.,	-	- Stranraer,	0	7	6	0	0	0	0	0	0
Whimster, James,	-	- Armagh, Ireland,	0	10	0	0	0	0	0	0	0
Whyte, James,	-	- Seaham Harbour,	0	10	0	0	0	0	0	0	0
Whyte, William,	-	- Rothesay,	0	10	0	0	0	0	0	0	0
Wilson, Alexander,	-	- Dawsholm, Glasgow,	0	10	0	0	0	0	0	0	0
Wilson, John,	-	- Tradeston, Glasgow,	0	10	0	0	0	0	0	0	0
Wilson, Thomas,	-	- Coatbridge,	0	10	0	0	0	0	0	0	0
Young, Alexander C.,	-	- Arbroath,	0	10	0	0	0	0	0	0	0
Young, William,	-	- Penicuik,	0	5	0	0	0	0	0	0	0
Young, William M.,	-	- Newmilns,	0	5	0	0	0	0	0	0	0
Ynull, Alexander,	-	- Alloa,	0	10	0	0	0	0	0	0	0

Name.	Profession.	Residence.	General Fund.	Benevolent Fund.
			s. d.	s. d.
Wilson, John,	- Coalmaster,	- Glasgow,	10 0	2 6
Watson, James,	- Colliery Agent,	- 116 Hope St., Glasgow,	10 0	2 6
Wood, James,	- Coalmaster,	- Glasgow,	10 0	2 6
Wood, William,	- Coalmaster,	- Glasgow,	10 0	2 6
Young, John,	- Manufacturing Chemist,	Glasgow,	10 0	2 6

ASSOCIATES.

Name.	Residence.	General Fund.
		£ s. d.
Barker, John,	- Gas Works, Greenock,	0 5 0
Campbell, James,	- Dunfermline,	0 5 0
Donald, Samuel,	- Dundee,	0 5 0
Gracie, H. H.,	- Granton, Edinburgh,	0 5 0
Hislop, Robert F.,	- Paisley,	0 5 0
Keiller, John,	- Greenock,	0 5 0
Lang, John,	- Dumbarton,	0 5 0
Milne, Samuel,	- Aberdeen,	0 5 0
Orr, R. Dundas,	- Chemical Works, Falkirk,	0 5 0
Robb, David,	- Gas Works, Hamilton,	0 5 0
Rule, Henry,	- Falkirk,	0 5 0
Sharpe, Robert,	- Belfast,	0 5 0
Skae, Henry,	- Arbroath,	0 5 0
Smith, Alexander,	- Glasgow,	0 5 0
Webster, John,	- Provan Gas Works, Glasgow,	0 5 0
White, William A.,	- Gas Works, Kilmarnock,	0 5 0

HONORARY MEMBERS.

Name.	Residence.
Bray, George,	- Gas Lighting Engineer, Leeds.
King, Walter,	- <i>Journal of Gas Lighting</i> , London.
Myers, Geo. T.,	- Gasworks, Saltcoats.
Stewart, Samuel,	- Broompark, Cove, Dumbartonshire.
Watson, Peter,	- Gas Engineer, Stirling.
Whinster, Thomas,	- Gas Engineer, Perth.
Young, William,	- Priorsford, Peebles.

SUBSCRIPTIONS TO RESEARCH FUND.

Name.	Residence.	£	s.	d.
Blair, William,	- Gas Works, Helensburgh	0	2	6
Brown, Thomas,	- Lanemark Colliery, New Cumnock,	1	1	0
Carlow, Charles,	- Coalmaster, Leven,	1	1	0
Cochrane, James,	- Gas Works, Darvel,	0	5	0
Ewing, William,	- Gas Works, Greenock,	0	2	6
Kirkcaldy Gas Light Coy.,	...	2	2	0
Lighbody, Thomas,	- Gas Works, Renfrew,	0	2	6
Mackay, Alexander,	- Meter Maker, Edinburgh,	0	10	0
Main, R. & A.,	- Gas Stove Makers, Glasgow,	0	10	6
M'Gilchrist, James,	- Gas Works, Dumbarton,	0	7	6
M'Kelvie, James,	- Coalmaster, Edinburgh,	0	10	0
Perth Gas Corporation,	...	0	7	6
Robertson, David,	- Gas Works, Dunoon,	0	2	6
Robertson, J.,	- Gas Works, Bathgate,	0	2	6
Stewart, T. C.,	- Tube Manufacturer, Glasgow,	0	10	6
Sutherland, R. M.,	- Chemical Works, Falkirk,	1	1	0

(B)

Membership of the North British Association of Gas Managers 1869

Ordinary Members

Name	Gasworks	Name	Gasworks
John Adam	Pollockshaws	John Adamson	*
W.M. Airth	*	Duncan Alexander	Edinburgh
James Alexander	Corstorphine	John R. Ambrose	*
A.M. Anderson	West Wemyss	Hugh Baillie	*
James Barclay	Brechin	Hugh Bartholomew	*
Alexander Bell	Gibraltar	James Bett	Auchtermuchty
David Black	Falkirk	James Black	*
P.A. Black	Callao	Peter Blair	East Wemyss & Buckhaven
Thomas Blair	*	George Boyd	Alloa
Alexander Brown	Portobello	David Brown	*
Robert Brown	*	J. Buist	Halifax, Nova Scotia
Robert S. Carlow	Port Glasgow	William Clazy	Kelso
Robert Cowie	Callander	John Cuthbert	Wick
Thomas A. Dalzell	Anstruther	Samuel Dalziel	Kilmarnock
John Davidson	Dawsholm, Glasgow	James Dick	Kincardine-on-Forth
John Dick	Dunshalt	Andrew Dougall	British Gaslight Co., Hull
William Drummond	*	William Dunlop	*
James Dunn	Kilrush, Ireland	James Easson	Wolverhampton
D.B. Esplin	Forfar	William Ewart	Annan
William Fairweather	Barrhead	John Fleming	Grahamston, Falkirk
John Foster	Iquique, S. America	William Foulis	Glasgow
James Gemlow	Cupar, Fife	Joseph Gibb	Armagh
J. Hall	St. Andrews	John Hall	Berwick-on-Tweed
Thomas D. Hall	Cosham, Hants	David Harper	Dysart
George R. Hislop	Paisley	Lawrence Hislop	Bothwell & Uddingston
Walter Hogg	Melrose	Peter Innes	Lima, Peru
- Ireland	Tayport	William Key	Tradeston, Glasgow
David Kininmont	Leslie	George Leitch	*
D.B. Mackenzie	Dalmarnock, Glasgow	William Mackenzie	Dunfermline
A. Macpherson	Kirkcaldy	Boyd M. Macrae	Dundee
John Macrae	Bury St. Edmunds	A. Malam	Dumfries
J. Manwell	Dalmarnock, Glasgow	William Marr	Linlithgow
James McGilchrist	Dumbarton	Hugh McGillivray	*
Robert Miller	Innerleithen	William Miller	Dundee
Alexander Mitchell	Alyth	Alexander Mitchell	Dundee
Robert Mitchell	Coatbridge	Levi Monk	Lanark

Ordinary Members, cont.

Name	Gasworks	Name	Gasworks
T. Mossman	West Hartlepool	William Munro	Alva
George Murray	Coldstream	John Mutter	Larkhall
George T. Myers	Broughty Ferry	Andrew Napier	Crieff
David Coates Niven	Dunoon	David Page	Kinross
James Page	Strathmiglo	Robert Reddie	Leven
John Reid	Edinburgh & Leith	Robert Renton	Montrose
James Robb	Ayr	James Robb	Haddington
William Robson	Selkirk	A. Ross	Burntisland
Henry Rutherford	Aberlady	Alexander Scott	Galashiels
Alexander Scott	Markinch	Andrew Scott	Musselburgh
David Scott, jun.	Musselburgh	Frank Scott	Tillicoultry
Alexander Smith	Aberdeen	Joseph Smith	Hawick
William Smith	Darlington	R. Smith	Darlington
William Smith	Helensburgh	Peter Stewart	Stranraer
Samuel Stewart	Greenock	D. Steven	Pittenweem
David Stiven	St. Thomas, W. Indies	John Stiven	Kingston, Jamaica
William Stiven	Inverness	J. Swan	Leslie
John Swan	Maryport	George Taylor	Jedburgh
William Taylor	Forres	David Terrace	Arbroath
J. Thomson	Inverness	William Thomson	Dunse
David Tullis	Leuchars	James B. Watson	Wigan
John K. Watson	Edinburgh	Peter Watson	Stirling
James Webster	North Berwick	James Whimster	Perth
Thomas Whimster	Perth	James White	Seaham Harbour
A.F. Wilson	*	Alexander Winton	Grangemouth
Alexander Young	Blairgowrie	John Young	Ellen Villa, Bonnyrigg
John Young	*	William Young	*

Note - * not gasworks

Extraordinary Members

Name	Occupation	Town
Henry Aitken	Coalmaster	Falkirk
David Blackie	Meter Maker	Edinburgh
William Brodie	Engineer	Paisley
Robert Brown, jun.	Coalmaster	New Cumnock
George F. Darling	Coalmaster	Glasgow
James Donald	Engineer	Paisley

Extraordinary Members, cont.

Name	Occupation	Town
Alexander Donaldson	Meter Maker	Edinburgh
W.L. Dunn	Coalmaster	Glasgow
John Hurl	Retort Maker	Glenbeig
Ronald Johnson	Civil Engineer	Glasgow
John Z. Kay	Engineer	Glasgow
Robert Laidlaw	Engineer	Glasgow
Alexander Mackay	Meter Maker	Edinburgh
James Milne	Engineer	Edinburgh
John Milne	Meter Maker	Edinburgh
James McKelvie	Coalmaster	Edinburgh
Henry Mungall	Coalmaster	Cowdenbeath
Daniel M. Nelson	Engineer	Glasgow
Robert Orr	Manufacturing Chemist	Glasgow
Gavin Paul	Coalmaster	Wilsontown
D.B. Peebles	Meter Maker	Edinburgh
James Ross	Manufacturing Chemist	Falkirk
Andrew Stewart	Tube Maker	Glasgow
John Watson	Coalmaster	Lochore
Robert Watson	Engineer	Paisley
William Wood	Coalmaster	Glasgow

Honorary Members

Name	Occupation	Town
Dr. Stevenson Macadam	Lecturer on Chemistry	Edinburgh
Dr. William Wallace	Lecturer on Chemistry	Glasgow

Source - Reports of Proceedings of N.B.A.G.M. (1869-1880) Vol. I
Institution of Gas Engineers Lib.

(vii) National Labour Trends to 1871Date in J.G.L.

- 5/2/1856 } L.Gomme (Portsmouth) proposed a Provident Institution
13/5/1856 } for Gas Engineers in London, with lectures and a technical library, and a life assurance scheme for illness or old age pensions, and engineers' childrens education.
- 1/2/1859 Gas workers strike at Manchester.
- 15/2/1859 "On the existing Relations of the Gas Companies and their workmen". Loyal Stokers Protection Society threatened stikes in London.
- 19/7/1859 "The Gas Stokers' Appeal" (Stoker at Metropolitan Co.)
- 2/8/1859 "Strike of the London Gas Workmen"
- 25/10/1859 "Superannuation and Sick Funds" (Two articles - hypothetical).
- 8/11/1859 Superannuation and Sick Funds at Bristol United Company.
- 6/12/1859 Sickness and Superannuation Funds.
- 12/2/1861 "The Saturday half-holiday Movement"
- 11/2/1862 "Meeting of London Gas Workmen"
- 3/2/1862 "Suggested formation of a Gas Officers Pension Fund"
- 7/2/1865 Stokers strike at South Shields. Wages raised from 24s to 28s a week, but request 32s.
- 1/5/1866 Stokers stike at Newcastle-on-Tyne.
- 30/10/1866 The Movement for an increase in Gas Fitters wages.
- 3/9/1867 "Alleged Grievences of Gas Stokers" (Two articles).
- 17/9/1867 } "The Eight Hours Stokers' Movement"
1/10/1867 }
- 12/11/1867 } Strike at Preston Gasworks.
26/11/1867 }
- 21/12/1869 Strike at Birmingham Gasworks.
- 4/7/1871 British Association of Gas Managers. Report of Committee on Sunday Labour and Benevolent Funds.
- 10/10/1871 C.E.Jones "Reduction of Sunday Labour in Gasworks"
- 26/9/1871 G.Livesey "Sunday Labour in Gas Works" - need for reduction.
- 21/11/1871 North England, especially Leeds stokers, agitating for 56 instead of 84 hours a week.
- 5/12/1871 Strike at Darlington gasworks.

APPENDIX X V

Data Relating to the Marketing of Gas

(1) Price of Gas :

Time Contract Gas at Glasgow in (i) 1818, (ii) 1819;
 Time Contract Gas at Paisley 1826;
 Time Contract Gas at Dundee 1826;
 Time Contract Gas at Edinburgh c.1827;
 Comparison of Time Contract Rates in Thirteen Towns in 1829
 Comparison of Metered Gas Prices in Eight Towns in 1829-30 ;
 Gas Charges at Paisley 1824 - 1844;
 Time Contract Gas at Dunfermline in 1836;
 Glasgow Gas Prices 1836; Bathgate Gas Prices 1836;
 Vale of Leven Gas Prices 1839; Greenock Gas Prices 1840;
 Comparison of Contract and Meter Gas Prices in Various Towns
 1844;
 Comparison of Gas Price in Seven Towns 1844;
 Ayr Gas Prices 1845;
 Gas Prices Charged by Incorporated Scottish Gas Companies
 1825 - 1865;
 Comparison of Gas Prices in Nineteen Towns 1869 - 1873;
 Regional Variations in Gas Price and Output in 1891.

(2) Factors Directly Affecting Gas Prices at Dalkeith, Bathgate and Stranraer.

(3) Statistics on Gas Consumption at :

Aberdeen; Dunfermline; Coatbridge; Milngavie; Greenock;
 Kirkcaldy; Broughty Ferry; Ayr; Galashiels;

Growth of Gas Sales Reflected in Revenue and Number of
 Consumers at (i) Hamilton (1831-45), (ii) Paisley (1825-
 1883), (iii) Galashiels (1865-82).

Comprehensive Gas Production Statistics for Dundee (1826
 - 1885) and Glasgow (1827-69; 1857-96; 1900-14)

(4) Regulations Imposed Upon Consumers of Gas :

Leith 1821; Edinburgh 1827; Paisley 1826; Dundee 1826

(5) Gas Meter Suppliers and Meter Rent :

(i) Meter Manufacturers; (ii) Meter Rent Charges.

(6) Discounts Policy at Various Gasworks

(7) Public Lighting Arrangements

(8) Gas Fitting Services

(9) The Competition from Electricity : Early Installations 1897-91.

(10) Varieties of Consumers :

(A) Their Relative Importance at Paisley 1839-1843

(B) Varieties of Consumers at Ayr in 1896 and 1903

(1) Price of Gas -

Before gas-meters superseded time-contracts as the usual measurement of consumption, each company devised a table of charges based upon the type of burners in use. The complexity of these charges prevents comparisons between various companies, as shown by the following Tables of Charges.

Price of Time-Contract Gas in Glasgow 1818, 1819 (shillings. pence)

(i) 1818

Gaslight		Morning			Evening				
Jet	Arg.	A	B	C	D	E	F	G	H
1	-	8.6	5.6	4.0	12.0	19.0	24.0	28.6	32.0
2	-	16.6	10.6	6.6	22.6	31.6	39.0	45.0	50.0
3	-	23.0	14.6	8.6	30.6	42.0	51.6	59.0	65.0
4	1 no 1	29.9	18.6	10.6	37.0	50.6	60.0	69.0	76.0
6	1 no 2	38.0	25.6	12.6	49.0	63.0	75.0	86.6	97.0
8	2 no 1	46.0	31.6	16.6	58.0	74.6	89.0	103.6	117.0
9	1 no 3	49.6	34.0	18.6	61.6	79.0	95.6	111.6	120.6
12	1 no 4	58.0	41.6	24.0	72.6	94.0	115.0	135.0	155.0
18	2 no 3	75.0	53.0	32.0	92.0	123.0	153.0	183.0	214.0
24	4 no 2	86.0	62.6	39.0	110.0	150.0	190.0	230.0	270.0

(ii) 1819

1	-	6	4.3	3.6	8.9	13.6	18.0	22.0	25.6
2	-	11.6	6.10	4.9	16.6	25.0	23.0	39.6	45.0
3	-	17.0	9.8	5.9	24.0	36.0	46.6	55.6	62.3
4	1 no 1	23.3	13.2	6.10	30.9	45.6	56.6	66.9	74.0
6	1 no 2	22.0	19.0	8.2	44.0	60.0	73.0	86.0	97.0
8	2 no 1	40.6	25.0	11.6	54.6	72.0	89.0	103.6	117.0
9	1 no 3	54.0	27.9	13.2	58.0	77.0	95.6	111.6	126.0
12	1 no 4	54.6	35.0	18.0	70.6	94.0	115.0	135.0	155.0
18	2 no 3	70.9	49.0	25.6	92.0	123.0	153.0	183.0	214.0
24	4 no 2	86.0	58.9	33.0	110.0	150.0	190.0	230.0	270.0

Note - 1 jet = 1 candlepower (each candle lasting 40 hours)

3 no. 2 Argands (Arg.) = 2 no. 3 Argand = 6 no.1 Argands (for price). Charges for six days per week (one sixth extra for

Sundays).

Times - Morning: A 5 a.m. till daylight; B 6 a.m. till daylight;
C 7 a.m. till daylight.

Evening: dark till D. 8 p.m., E. 9 p.m., F. 10 p.m., G. 11
p.m., H. 12 p.m.

Prices reduced following threat of a new company in 1819

Source - Glasgow Chronicle 5/6/1819

Price of Time Contract Gas at Paisley 1826 (shillings.pence)

Burner	Sunset (6 days per week) up to				
	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.
J (jets) & A (Argands)					
1J	8.0	10.3	12.6	14.9	17.0
2J	16.0	20.6	25.0	29.6	34.0
3J or 1A no.1	24.0	30.9	37.6	44.3	51.0
1A no.1 & 1J	31.9	40.9	49.3	58.6	67.0
1A no.2	39.6	50.6	60.9	72.6	82.6
2A no.1	47.2	60.0	72.3	85.0	97.6
2A no.1 & 1J	54.9	69.6	83.6	98.3	112.3
1 Batwing	62.3	78.9	94.9	111.3	126.9
3A no.1	69.8	88.0	106.0	124.0	141.0
2A no.2	77.0	97.0	117.0	136.6	155.0
3A no.1 & 2J	84.3	106.5	128.0	149.0	168.9
4A no.1	91.5	115.6	138.9	161.3	182.3
4A no.1 & 1J	98.6	124.6	149.3	173.3	195.6
4A no.1 & 2J	105.6	133.4	159.9	185.0	208.6
5A no. or 3A no.2	112.6	142.0	170.0	196.9	221.3
2 Batwings	119.6	150.6	180.0	208.3	233.9
5A no.1 or 3A no.2 &					
2J	126.5	159.0	190.0	219.6	246.0
6A no.1	133.3	167.4	199.9	230.6	258.0
6A no.1 & 1J	140.0	175.8	209.3	241.3	269.9
4A no.2	146.9	183.10	218.9	253.9	281.3
7A no.1	153.5	192.0	228.0	262.0	292.6
7A no.1 & 1J	160.0	200.0	237.3	272.0	303.6
7A no.1 & 2J	166.6	208.0	246.3	281.9	314.3
3 Batwings	173.0	216.0	255.0	291.3	324.9

One sixth extra charge for Sundays.

Dwelling houses charged till 11 p.m., and public houses till 12 p.m.

Discounts 1% per £1 up to £20; then 20% on larger sums.

Note - Intrinsic discounts in gas prices e.g. one Argand no.2 to 8 p.m. 39/6d, but 2 Argand no.2 to 8 p.m. only 77/-. Large consumers therefore obtained large concealed discounts.

Gas Price by Time-Contract at Dundee (1826)

Burner	Price (shillings.pence) Six Days per Week, Sunset until				
	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.
1 jet	9.0	12.0	15.0	18.0	21.0
2 jets	18.0	24.0	29.0	35.0	40.0
Argand no 1	28.0	37.0	46.0	55.0	64.0
Argand no 2	42.0	55.0	68.0	80.0	92.0

Notes - One sixth extra for Sundays

Dwelling houses charged up to 11 p.m.

Morning lights, or irregular lighting, on separate terms

Annual payment on 1st March; shorter periods paid in advance

Discount 5% £5 19s; 10% above £20

Source - Dundee Ref. Lib. pamphlet 310(8) June 1826

Price of Time-Contract Gas at Edinburgh c. 1827 (shillings.pence)

Burner	Six Days per Week					Up to Sunrise from:			
	Sunset to:					4 a.m.	5 a.m.	6 a.m.	7 a.m.
	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.				
1 A no. 1	20.0	30.0	42.0	54.0	66.0	22.0	15.0	7.6	4.0
1 A no. 2	29.0	42.0	56.0	69.0	82.0	28.0	19.0	11.0	5.0
1 A no. 3	40.0	60.0	84.0	105.0	124.0	42.0	27.0	15.0	7.6
1 C & 1 J	10.6	15.0	21.0	27.0	33.6	9.0	6.0	3.0	2.0
1 C & 2 J	18.0	25.0	36.0	44.0	52.0	17.0	11.6	6.6	4.0
1 C & 3 J	24.0	35.0	48.0	60.0	72.0	23.6	15.6	9.0	4.0
Batswing	44.0	63.0	84.0	104.0	124.0	42.0	28.0	16.0	7.6

Note - A Argand burner; C Cockspur burner with (J) jets

Light for dwelling houses charged until 11 p.m.

One sixth extra charge for Sundays

Source - J.G.L. 1/9/1874 p.304

Comparison of Time-Contract Rates in 13 Towns in 1829

Town	Jets		Price (shillings.pence) for - Bats- wing	Argands			Per 1,000 cu ft	(I)
	No 1	No 2		No 1	No 2	No 3		
Perth -								
Old Co.	12.6	22.0	50.0	30.6	42.0	59.0	15.0	135.6
New Co.	12.0	20.0	45.0	27.6	35.0	50.0	12.0	117.0
Montrose	12.0	23.6	45.0	-	37.0	51.0	15.0	123.6
Arbroath	12.0	23.6	45.0	-	37.0	51.0	15.0	123.6
Greenock	15.0	24.6	64.0	-	34.6	42.6	12.6	116.6
Stirling	12.6	22.6	38.0	-	38.0	47.0	15.0	120.0
Edinburgh	15.0	25.0	63.0	30.0	42.0	60.0	12.0	142.0
Glasgow	11.6	23.0	-	-	34.6	52.0	10.0	130.0
Dundee	12.0	21.0	-	30.0	35.0	50.0	15.4	118.0
Leith	15.0	25.0	63.0	-	42.0	60.0	12.0	142.0
Berwick	25.0	33.0	48.0	-	56.0	88.0	-	202.0
Carlisle	20.0	22.0	-	-	45.0	63.0	-	160.0
Burnley	15.6	25.0	65.0	35.0	52.0	65.0	-	157.6
Manchester	20.6	31.0	-	41.6	45.6	50.6	-	147.6
Average	15.6	25.9	53.10	34.1	41.5	56.8	13.1	139.5

Note - (I) Total of all Burners except No 1 Argand, and Batswing, which were rarely used.

Source - Greenock Advertiser 30/6/1829 p.3

Comparison of Metered Gas Price in 8 Towns 1829-30

Town	Price		Price After		Town	Price		Price After	
	s	d	s	d		s	d	s	d
Dundee	10	0	9	9.5	Perth	12	0	12	0
Aberdeen	15	0	9	9	Glasgow	10	0	7	0
Montrose	15	0	12	9	Paisley	8	4	7	0
Arbroath	14	0	13	3.5	Edinburgh	11	5	11	5

Sources - C.Kerr, clerk to Dundee Old Company
H.Commons 1846 vol. 98.(23/3/1846)pp.130, 165

Gas Charges in Paisley 1824-44

Date	Per 1,000 cu ft		Per Jet		Date	Per 1,000 cu ft		Per Jet	
	s	d	s	d		s	d	s	d
1824-32	11	4	20	4	1834-6	9	6	19	2
1832-3	11	4	19	2	1836-43	8	6	18	4
1833-4	10	6	19	2	1843-4	7	0	18	0

Source - H.Lords 1844 vol. 31/7/1844 pp.212-90

Gas Prices by Time Contract at Dunfermline 1836

Burner	Six Days per Week, Price (shillings.pence) from sunset to				
	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.
Argand No 1	20.0	30.0	42.0	54.0	66.0
Argand No 2	29.0	42.0	56.0	69.0	82.0
Argand No 3	40.0	60.0	84.0	104.0	124.0
Cockspur No 1	10.6	15.0	21.0	27.0	33.0
Cockspur No 2	10.0	25.0	36.6	44.0	52.0
Cockspur No 3	24.0	35.0	48.8	60.0	72.0
1 Batswing	44.0	63.0	84.0	104.0	124.0

Notes - Gas by meter 8s 4d per 1,000 cu ft
Dwelling houses charged to 11 p.m.; Sunday prices one sixth extra.

Source - The Edinburgh Almanac (1836)

Glasgow Gas Prices 1836

One jet, 6 nights per week, sunset to - (shillings.pence)					
	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.
	5.10	7.8	9.6	11.3	13.1

Extra charge of one sixth to use gas on Sundays.

Other burners charged as their equivalent in 'jets'

Burner	'Jet' Equivalent Price	Burner	'Jet' Equivalent Price
Swallow-tail	2	Argand No 3	7
Argand No 1	3	Argand No 4	9
Argand No 2	5		

Note - Gas by meter 9s per 1,000 cu ft; with discounts of 5 to 30% according to consumption

Source - J.Cleland Rise and Progress of the City of Glasgow 1841-1862 (1862, Glasgow) p.53

Bathgate Gas Prices (1836)

Workshops gaslight: sunset to 10 p.m. 1 Sept. to 1 April 7s

6 a.m. to daylight 2s 6d

Kitchen gaslights: 7 nights per week and early mornings 15s/jet

Dwelling Houses and Merchants Shops: one jet from sunset to -

(shillings.pence) 8 p.m. 9 p.m. 10 p.m. 11 p.m. 12 p.m.

8.0 10.0 12.0 13.6 14.6

Swallow-tail burners priced as $1\frac{1}{2}$ jets.

Gas by meter - 9s per 1,000 cu ft.

Note - Expensive coal in 1837 led to all rates being raised equally by 1s.

Source - S.R.O. Bathgate Minute Book op cit 12/5/1836, 2/5/1837

Vale of Leven Gas Prices (1839)

6 nights per week from sunset to - (shillings.pence)

8 p.m. 9 p.m. 10 p.m. 11 p.m. 12 p.m.

1 jet 8.6 12.0 15.0 17.6 20.0

2 jets 16.0 23.0 29.0 34.0 39.0

Notes - Sundays were one sixth extra, and "the other descriptions of burners according to the rates charged in the Dumbarton tables of rates and prices"

Gas by meter - 11 s per 1,000 cu ft.

Scale of charges based upon "a great many tables of rates charged by other companies in similar circumstances"

Source - S.R.O. Vale of Leven Minute Book op cit 26/11/1839

Greenock Gas Prices (1840)

Gas by meter - 10s per 1,000 cu ft.

Gas by contract, for a single jet six days a week, from sunset to -

(shillings.pence) 8 p.m. 9 p.m. 10 p.m. 11 p.m. 12 p.m.

10.0 12.0 16.0 19.6 22.6

Morning light - 6 a.m. to sunrise: 2s 9d; 7 a.m. to sunrise: 1s 3d

Sunday evening light - sunset to 10 p.m.: 2s

Source - Greenock Advertizer 10/4/1840

Comparison of Contract and Meter Gas Prices, 1843

Town	Height of Flame Allowed (inches)	GAS BY CONTRACT					GAS BY METER	
		Price of Single Jet from Sunset to -					Highest Rate	Lowest Rate After Discount
		8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 p.m.		
s d	s d	s d	s d	s d	s d	s d	s d	
Glasgow	3	5 10	7 8	9 6	13 1	15 3	7 2	5 7½
Edinburgh	3	7 6	10 9	15 0	22 6	27 5	7 6	7 6
Edinburgh & Leith	3	7 6	10 9	15 0	22 6	27 5	7 6	7 6
Paisley	4	7 6	9 8	11 10	16 4	18 10	7 8	6 9½
Greenock	4	10 0	12 0	16 0	21 6	24 6	9 9	7 6
Perth	-	9 0	12 0	14 9	20 1	22 9	11 0	11 0
Dundee	4	9 0	12 0	14 6	19 10	22 9	7 10½	6 2½
Kilmarnock	3½	7 0	10 0	13 6	19 10	23 4	12 0	12 0
Ayr	3½	8 6	12 4	16 8	24 6	29 4	10 0	9 0
Liverpool (Old)	-	-	-	-	-	-	7 0	7 0
Liverpool (New)	-	-	-	-	-	-	7 0	7 0
Manchester (Municipal)	5	9 6	14 0	18 6	27 4	32 9	6 0	5 0
Leeds (Old)	5	14 0	18 0	22 0	30 6	35 0	6 8	5 4
Leeds (New)	None	No contract lights					6 8	5 4

In 1843 the Glasgow company estimated that, with the quality of gas they supplied, one jet consuming 1 cu ft per hour, gave a light equal to 3.3 candles. The average for one jet in eight other large Scottish towns was equivalent to 2.89 candles, and with five English companies 2.24 candles.

Source - Glasgow Chronicle 1/5/1842

Comparison of Gas Price in 7 Towns (1844)

Town	Highest Rate	Lowest Rate	Town	Highest Rate	Lowest Rate
Aberdeen	7.6	5.0	Perth	8.0	8.0
Montrose	8.4	6.5½	Paisley	6.6	5.4½
Arbroath	8.4	6.8	Edinburgh	6.9	6.9
Glasgow	6.8	5.0	Average	7.5	6.2

Note - prices in shillings.pence per 1,000 cu ft

Source - Evidence of J.Russell, H.Commons 1846 vol. 98 25/3/1846 p.110

Gas Prices at Ayr (1845)

By meter - 6s 8d per 1,000 cu ft

By contract - each jet from sunset to - (shillings.pence)

8 p.m. 9 p.m. 10 p.m. 11 p.m. 12 p.m.

6.8 10.0 13.6 16.6 20.0

Source - S.R.O. Ayr Minute Book op cit 17/11/1845

Gas Prices Charged by Incorporated Companies

Date	Glasgow Old		Glasgow C & S		Hamilton Normal		Paisley Normal		After Discount		Dundee After Discount		Inverness Normal			
	Normal		After Discount		Normal		Normal		Discount		Discount		Normal			
	s	d	s	d	s	d	s	d	s	d	s	d	s	d		
1825	-	-	-	-	-	-	11	4	10	4.5	14	2	-	-		
1826	-	-	-	-	-	-	11	4	9	9.25	14	2	15	0		
1827	-	-	-	-	-	-	11	4	9	9.25	13	3.5	15	0		
1828	10	0	7	0	-	-	11	4	9	7.25	13	3.5	15	0		
1829	10	0	7	0	-	-	11	4	9	4	11	6.25	15	0		
1830	10	0	7	0	-	-	11	4	9	5.75	11	1.25	15	0		
1831	10	0	7	0	-	10	0	11	4	9	5	11	1.25	15	0	
1832	10	0	7	0	-	10	0	11	4	9	6.5	10	4.5	15	0	
1833	10	0	7	0	-	10	0	11	4	9	9.5	9	5.25	15	0	
1834	10	0	7	0	-	10	0	10	6	8	11	9	0	15	0	
1835	10	0	7	0	-	10	0	9	6	8	4	8	4	15	0	
1836	9	0	6	4	-	9	0	9	6	8	2.5	7	10.5	15	0	
1837	9	0	6	4	-	9	0	8	6	7	1	7	5.25	15	0	
1838	9	0	6	4	-	9	0	8	6	7	1.5	7	10.5	15	0	
1839	9	0	6	4	-	9	0	8	6	7	0.5	7	10.5	15	0	
1840	9	0	6	4	-	9	0	8	6	7	1	7	5.25	15	0	
1841	9	0	6	4	-	9	0	8	6	7	0	7	2.5	15	0	
1842	8	0	5	7.5	-	9	0	8	6	7	1.5	7	2.5	15	0	
1843	8	0	5	7.5	-	8	0	8	6	7	1.75	7	2.5	12	6	
1844	6	8	5	0	6	8	6	6	7	0	6	7.75	6	9.25	12	6
1845	6	8	5	0	6	8	6	6	6	6	2.25	6	0	10	0	
1846	5	0	5	0	6	8	-	6	0	5	9.5	6	0	10	0	
1847	5	0	5	0	5	0	-	6	0	5	9.75	5	5	10	0	
1848	5	0	5	0	5	0	6	6	6	0	5	9.75	5	5	10	0
1849	5	0	5	0	5	0	6	0	6	0	5	9.75	5	5	10	0
1850	5	0	5	0	5	0	5	0	6	0	-	-	-	-	10	0
1851	5	0	5	0	5	0	5	0	6	0	-	-	-	-	10	0
1852	5	0	5	0	5	0	5	0	5	0	-	-	-	-	10	0
1853	4	7	4	7	4	7	5	0	5	0	-	-	-	-	8	4
1854	4	7	-	-	4	7	4	7	5	0	-	-	-	-	8	4
1855	4	7	-	-	4	7	5	10	5	5	-	-	-	-	8	4
1856	4	7	-	-	4	7	5	10	5	3	-	-	-	-	8	4
1857	5	0	-	-	4	7	5	10	5	0	-	-	-	-	8	4
1858	5	0	-	-	5	0	5	10	5	0	-	-	-	-	8	4
1859	5	0	-	-	5	0	5	10	5	0	-	-	-	-	8	4
1860	5	0	-	-	5	0	5	10	5	0	-	-	-	-	7	6
1861	4	7	-	-	4	7	5	0	5	0	-	-	-	-	7	6
1862	4	7	-	-	4	7	5	0	4	7	-	-	-	-	7	6
1863	4	7	-	-	4	7	5	0	4	7	-	-	-	-	7	6
1864	4	7	4	2	-	-	5	0	-	-	-	-	-	-	7	6
1865	4	2	4	2	-	-	5	0	-	-	-	-	-	-	7	6

Note - Hamilton Old, unchartered company is shown for 1831-45

Sources - H.Commons 1846 vol. 102 7/5/1846

B.P.P. 1847 (734) LXIV 359

B.P.P. 1865 (55) L 733

B.P.P. 1866 (486) LXVI 519

Comparison of Gas Prices in 19 Towns 1869-73

Town	Population	Gas Price per 1,000 cu ft					Discounts	Meter Rent per Year
		1869 s d	1870 s d	1871 s d	1872 s d	1873 s d		
Aberdeen	88,108	5 10	5 10	5 5	5 0	5 0	3.3 to 8.3%	1s to 25s
Airdrie	13,480	4 2	4 2	4 2	4 7	5 0	None	2s
Arbroath	19,973	5 10	5 10	5 10	5 5	5 5	None	2s & upwards
Dumbarton	11,404	5 0	4 7	4 7	4 7	4 7	2½ to 10%	1s
Dundee	118,977	5 4	5 0	4 6	4 2	4 2	5%	1s6d & upwards
Dunfermline	14,963	4 7	4 6	4 4	4 2	4 2	2½ to 10%	1s6d & upwards
Dumfries	15,435	6 0	6 0	6 0	6 0	7 6	10%	2s6d
Edinburgh	196,979	4 10	4 6	4 6	4 2	5 8	1½ to 5% above £100	2s6d
Leith	44,280	4 10	4 6	4 6	4 2	5 8	1½ to 5% above £100	2s6d
Falkirk	9,547	5 10	5 5	5 5	5 5	6 8	None	2s
Glasgow	566,000	4 7	4 7	4 2	4 0	4 0	5% above £100	None
Greenock	57,146	4 2	4 2	4 2	4 2	5 0	None	None
Inverness	14,469	7 6	7 6	7 6	7 6	10 0	None	3s
Kilmarnock	22,963	5 0	5 0	5 0	5 0	5 10	None	8½% cost
Kirkcaldy	12,422	5 2	4 7	4 2	3 9	4 4½	None	7½% cost
Kontrose	14,548	5 10	5 10	5 0	5 0	6 3	5 to 15%	2s
Faisley	48,240	3 9	3 9	3 9	3 9	3 9		1s6d
Perth	25,585	6 8	6 8	5 10	5 10	5 10		7½% cost
Stirling	14,279	5 0	4 7	4 7	4 2	5 0	None	5% cost

Note - Table prepared by Glasgow Corporation to assess the effect of Coal famine in 1873.

Source - Glasgow City Archives Miscellaneous Papers (1873) p.507

Regional Variations in Gas Price and Output in 1891

Town	Old Pence	Output Thou. cu. ft.	Town	Old Pence	Output Thou. cu. ft.
Aberdeen	44	337,886	Burntisland	60	12,000
Aberfeldy	88	-	Cambuslang	47.5	13,000
Aberlour	120	360	Campbeltown	50	16,927
Airdrie	40	36,706	Carluke	48	4,950
Alloa	40	32,755	Carnoustie	67.5	5,000
Alva	70	8,374	Castle Douglas	90	26,000
Alyth	70	4,000	Castlebar	80	-
Annan	50	7,032	Catrine	80	1,557
Anstruther	50	6,000	Coatbridge	40	70,275
Arbroath	46.5	45,434	Coldstream	80	2,450
Ardrossan	50	10,513	Colinsburgh	70	-
Armadale	70	-	Costorphine	82	2,100
Auchinleck	80	663	Coupar Angus	72.5	-
Auchterarder	80	2,300	Crief	70	-
Baillieston	50	3,360	Cullen	90	1,967
Balfron	64	375	Dalbeattie	100	1,250
Banchory	110	894	Dalkeith	48	17,000
Banff	75	6,790	Dalry	60	5,237
Barrhead	52.5	164,146	Darvel	60	4,000
Bathgate	55	7,000	Deanston	90	1,700
Beith	52.5	6,700	Denny	50	7,815
Bervie	110	370	Dollar	80	2,200
Biggar	70	1,970	Dufftown	126	800
Blairgowrie	72	10,650	Dumbarton	39	40,000
Blantyre	45	7,500	Dumfries	42	53,592
Boness	47.5	11,300	Dunbar	-	5,333
Bothwell/ Uddingston	50	19,386	Dunblane	70	5,500
Brechin	52.5	20,445	Dundee	44	385,209
Bridge of Allan	60	12,300	Dunfermline	43	61,100
Bridge of Weir	65	2,000	Dunoon	60	13,300
Broughty Ferry	50	26,985	Dunning	120	260
			Dysart	54	-
			East Kilbride	70	1,325

Town	Old Pence	Output Thou cu ft	Town	Old Pence	Output Thou cu ft
Easter			Johnstone	52.5	19,303
Buckie	85	2,297	Keith	80	3,500
Ecclefechan	100	-	Kelso	55	11,431
Edinburgh/ Leith	42	828,220	Kilmaurs	75	500
Elgin	60	17,000	Kettle	70	4,200
Elie/ Earlsferry	80	1,500	Kilbarchan	60	4,050
Ellon	130	-	Kilmalcolm	70	3,126
Eyemouth	100	1,000	Kilmarnock	40	72,000
Falkirk	40	54,149	Kilsyth	50	5,000
Ferry Port on Craig	80	2,815	Kilwinning	50	6,000
Forfar	52	25,000	Kinross	70	3,620
Forres	70	7,190	Kirkcaldy	40	70,000
Fortrose	168	120	Kirkcudbright	80	-
Fraserburgh	60	7,400	Kirkintilloch	50	22,624
Friockheim	90	-	Kirkwall	80	3,000
Galashiels	35	52,968	Kirriemuir	65	6,874
Galston	60	5,170	Lanark	50	10,000
Gatehouse	100	4,189	Langholm	60	5,378
Girvan	70	3,000	Largs	70	-
Glasgow	30	3,058,277	Larkhall	45	9,336
Golspie	120	650	Lasswade	52.5	6,400
Gourock	55	9,245	Laurencekirk	97	1,225
Greenock	40	203,827	Lennoxton	60	4,400
Haddington	70	7,260	Lerwick	90	2,416
Hamilton	40	48,983	Leslie	60	2,200
Hawick	37.5	47,000	Lesmahagow	75	1,100
Helensburgh	70	21,423	Letham	140	321
Innerleithen	65	8,169	Leven	50	7,600
Inverary	100	1,360	Lochgelly	62.5	1,803
Inverkeithing	80	891	Lochgilphead	110	1,717
Invergordon	120	-	Lochwinnoch	80	1,526
Inverness	50	45,000	Lockerbie	74	-
Irvine	45	19,500	Macduff	95	2,500
Jedburgh	70	6,584	Markinch	60	2,240
			Maryhill/ Partick	30	350,000

Town	Old Pence	Output Thou cu ft	Town	Old Pence	Output Thou cu ft
Maybole	65	4,500	Renton	48	7,575
Meigle	140	400	Rothesay	45	30,166
Melrose	62.5	4,800	St. Andrews	43	22,142
Milngavie	52.5	7,173	Saltcoats	47.5	10,000
Millport	70	2,880	Sanquhar	80	1,645
Montrose	50	25,400	Selkirk	40.5	18,000
Motherwell	43	20,480	Stevenston	65	2,757
Muirkirk	55	1,721	Stewarton	50	5,000
Musselburgh	53	22,310	Stirling	45	54,000
Nairn	80	5,675	Stonehouse	60	35,000
Newburgh	90	-	Stornoway	120	1,400
New Cumnock	70	1,030	Stow	85	980
Newton on Ayr	55	17,500	Stranraer	60	8,994
North Berwick	70	6,500	Strathmiglo	75	1,000
Old Meldrum	120	400	Stromness	90	-
Paisley	34	248,800	Tain	108	1,500
Peebles	55	10,787	Thurso	80	2,700
Penicuik	57	15,000	Tranent	65	1,480
Perth	42	85,716	Troon	70	3,522
Peterhead	70	14,418	Turriff	95	2,260
Pittenweem	60	3,770	West Kilbride	70	1,250
Pollockshaws	36	28,026	West Linton	120	200
Port Glasgow	50	24,100	Whitburn	70	1,500
Portobello	53	32,627	Whithorn	110	600
Portsoy	90	-	Wigtown	90	1,230
Prestonpans	60	4,700	Wishaw	50	17,600
Renfrew	50	10,554			

Gas Prices (Old Pennies per 1000 cu.ft.)

Date	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1831	-	144	135	-	180	-	-	-	-	-	-	-	-	-	-	-
1832	-	144	135	-	180	-	-	-	-	-	-	-	-	-	-	-
1833	-	126	135	-	180	-	-	-	-	-	-	-	-	-	-	-
1834	-	126	135	-	180	-	-	-	-	-	-	-	-	-	-	-
1835	-	126	135	-	180	-	-	-	-	-	-	-	-	-	-	-
1836	-	126	135	-	180	-	-	-	-	-	-	-	108	-	-	-
1837	-	108	135	-	180	-	-	-	-	-	-	-	120	-	-	-
1838	114	108	135	-	180	-	156	-	-	-	-	-	120	120	-	-
1839	-	102	135	-	180	-	156	-	-	-	-	-	120	108	-	-
1840	-	102	135	-	180	-	156	-	138	-	-	144	120	102	-	-
1841	-	102	120	-	180	-	144	-	138	-	-	144	120	102	-	-
1842	-	102	120	-	180	-	132	-	132	-	-	144	120	96	-	-
1843	-	93	120	-	150	-	132	-	132	-	-	144	120	96	-	-
1844	-	80	120	-	130	102	120	-	120	-	-	144	110	84	-	-
1845	48?	80	110	-	130	80	108	-	108	-	-	126	100	84	80	-
1846	84	72	100	72	150	80	108	-	108	-	-	126	90	84	80	-
1847	84	72	100	90	150	70	100	-	108	120	-	126	-	84	80	-
1848	84	72	90	90	130	70	100	-	108	120	-	126	-	84	80	-
1849	84	72	80	90	130	80	100	-	105	96	-	126	-	84	80	-
1850	84	72	80	90	100	80	100	-	105	96	-	126	-	84	80	100
1851	84	72	-	-	100	80	100	-	105	84	-	126	-	78	80	100
1852	78	72	-	90	100	80	90	-	105	72	-	96	-	72	72	100
1853	78	72	-	80	90	80	80	-	90	72	-	96	-	72	72	100
1854	78	72	-	-	90	80	80	-	90	72	-	96	-	72	72	100
1855	78	72	-	-	100	80	80	-	-	72	-	96	-	72	72	100
1856	78	66	-	-	100	80	60	-	-	72	-	96	-	72	72	100
1857	78	66	-	-	100	80	60	-	-	80	-	96	-	72	68	100
1858	78	66	-	100	100	80	60	-	-	90	-	96	-	70	68	100
1859	78	66	-	100	100	80	70	-	-	90	-	90	-	70	68	100
1860	78	66	-	90	95	70	65	-	-	90	-	80	-	70	68	100
1861	70	58	-	90	90	70	65	108	-	77	-	80	-	60	65	100
1862	65	58	-	90	85	70	65	95	-	77	-	75	-	60	65	100
1863	65	58	-	85	80	70	65	95	-	70	-	70	-	60	65	100
1864	65	58	-	85	74	70	60	95	-	70	100	70	60	60	65	100
1865	65	56	37	85	70	70	60	95	-	65	100	65	60	60	60	100
1866	65	56	38	85	70	70	60	95	-	65	80	65	60	60	60	100
1867	70	56	38	85	70	70	60	95	-	65	80	65	60	60	60	100
1868	70	62	36	85	70	70	60	95	-	70	80	65	55	60	60	100
1869	70	64	-	-	70	65	60	95	-	70	65	65	55	60	60	100
1870	70	60	-	-	65	65	60	95	-	65	65	65	50	55	60	100

Note - A Aberdeen B Dundee C Greenock D Lesmahagow
 E Selkirk F Ayr G Cupar H Banff
 I Vale of Leven J Galashiels K Muirkirk
 L Stranraer M Bathgate N Dalkeith O Kilmarnock
 P Milngavie

Greenock charged 150d in 1829, 1830; Kilmarnock 100d in 1822; Dundee 102 and 99d in 1841, 72 and 66d 1856-9, 60 and 58d 1861-3, 50 and 56 d 1866, 64 and 56d 1867, 60 and 62d in 1868, 56 and 60d in 1870. Dundee gas sold at 180d from 1825-7, 160d in 1828, and 144d 1829-32.

Up to 1828 gas in Glasgow was sold "wholly by contract or time", not by meter, but metered gas in Edinburgh was 144d in 1821-9; Vide J.G.L. 1/9/1874 p.303.

Gas Prices (Old Pennies per 1000 cu.ft.)

Date	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1871	60	54	55	-	65	65	60	90	-	60	60	65	50	55	60	100
1872	60	50	55	-	60	65	60	100	-	60	80	85	50	65	70	100
1873	60	50	55	-	80	65	80	115	-	75	90	90	50	75	70	100
1874	60	72	55	-	90	75	70	100	-	65	80	90	65	75	70	100
1875	60	68	55	-	80	70	60	100	-	55	65	80	65	70	56	80
1876	58	60	55	110	70	70	60	90	100	45	65	75	65	70	56	70
1877	55	53	50	110	70	70	60	85	100	45	65	75	60	70	56	70
1878	53	50	50	110	65	60	60	85	90	45	60	70	60	55	56	70
1879	51	47	50	110	60	60	60	85	90	42	60	70	60	55	56	70
1880	51	44	50	110	55	60	60	80	90	40	60	70	60	55	56	70
1881	49	44	50	110	55	60	60	80	80	40	60	70	60	50	50	70
1882	48	44	-	110	50	60	60	78	65	38	55	70	55	50	50	70
1883	48	44	-	102	50	60	60	75	60	38	55	65	55	50	50	70
1884	46	42	-	90	50	55	55	75	-	38	50	65	55	50	-	65
1885	46	42	-	80	45	60	55	75	-	38	55	65	50	50	-	65
1886	48	-	-	80	42	60	55	75	-	38	55	65	50	50	-	65
1887	48	-	-	80	42	55	55	75	-	38	55	60	50	48	-	57.5
1888	46	-	-	80	42	55	55	75	-	35	55	60	50	48	-	57.5
1889	42	-	-	75	40	50	55	75	-	35	55	60	50	48	-	57.5
1890	-	-	-	75	40	50	55	75	-	37	55	60	55	55	-	52.5
1891	-	-	-	70	50	50	55	75	-	42	55	60	55	55	-	52.5
1892	-	-	-	70	50	50	55	75	-	45	55	60	55	55	-	-
1893	-	-	-	65	50	50	55	75	-	42	55	60	55	48	-	-
1894	-	-	-	65	47	45	50	73	-	40	55	60	55	50	-	-
1895	-	-	-	65	45	45	50	71	-	40	60	60	50	50	-	-
1896	-	-	-	60	45	40	50	75	-	40	60	60	50	48	-	-
1897	-	-	-	55	-	40	47	75	-	40	60	55	50	48	-	-
1898	-	-	-	45	-	40	47	75	-	40	55	55	50	48	-	-
1899	-	-	-	45	-	40	47	75	-	40	55	55	45	48	-	-
1900	-	-	-	45	-	45	47	82	-	45	60	60	50	53	-	-
1901	-	-	-	55	-	45	47	-	-	45	60	60	45	53	-	-
1902	-	-	-	55	-	40	50	-	-	42	55	51	45	48	-	-
1903	-	-	-	50	-	40	47	-	-	40	55	-	-	48	-	-
1904	-	-	-	45	-	40	47	-	-	-	55	-	-	45	-	-
1905	-	-	-	45	-	35	-	-	-	-	50	-	-	42	-	-
1906	-	-	-	45	-	35	-	-	-	-	45	-	-	42	-	-
1907	-	-	-	45	-	37	-	-	-	-	-	-	-	46	-	-
1908	-	-	-	45	-	37	-	-	-	-	-	-	-	46	-	-
1909	-	-	-	45	-	37	-	-	-	-	-	-	-	46	-	-
1910	-	-	-	45	-	35	-	-	-	-	-	-	-	42	-	-

Note - A Aberdeen B Dundee C Greenock D Lesmahagow
 E Selkirk F Ayr G Cupar H Banff
 I Inverness J Galashiels K Muirkirk L Stranraer
 M Bathgate N Dalkeith O Kilmarnock P Milngavie

Coatbridge charged 102d in 1842-52, 75d 1853, 70d 1854-69, 55d in 1870 vide A. Miller Rise and Progress of Coatbridge (1864 Glasgow)
 Ayr charged 102d in 1844, 80d 1845-6, 72d 1847, 70d 1848, 80d 1849, 35d 1911-14 vide S.R.O. Ayr Minute Book op cit.
 Edinburgh charged 55 to 45d in 1864 and 52 to 43d in 1865; Edinburgh and Leith charged 55 to 45d in 1864 and 1865; Kilmarnock charged 65d in 1864 and 60d in 1865. Glasgow old company in 1865 supplied "the public with meters and stair fittings etc, free of charge" equivalent to 5d reduction per 1000 cu.ft. Vide B.P.P. 1866 LXVI 519 (486)

(2) Factors Directly Affecting Gas Prices at Dalkeith, Bathgate and Stranraer

The interaction of external factors and company decisions upon gas-prices varied from one company. Apart from the cost of coal, the prosperity of a company was reflected in the price of gas. Consumption and ultimately profits, normally rose as the price was reduced; these profits could then be partly reinvested in the enlarged equipment necessitated by the growth in consumption. This growth motivated and facilitated each company to make further price reductions.

During the early years of a company's operations, gas prices were ^{more} closely affected by factors like coal price than at a later date. The initial price was frequently excessive, in order to cover all contingencies of the experiment; thus in response to many complaints Dalkeith gas company, for example, was able to reduce gas from 12s to 10s 6d per 1,000 cu ft in 1836 despite the very high coal prices at that time.

(A) Dalkeith

Date	Price per 1,000 cu ft s d	Associated Factors and Results
1838	10 0	-
1839	9 0	Great fall in price of cannel coal
1840	8 6	-
1842	8 0	Caused rapid growth of consumption. New purifiers and 10,000 cu ft gasholder (£740)
1844	7 0	Rapid increase in consumption, and in excess profits, during the 1840's
1851	6 6	Reduced without consumers' pressure for lower rates
1852	6 0	1852 mains extensions; 1854 new £479 gasholder; 1855 £528 extensions
1858	5 10	-
1859	5 10	Threatened consumers company defeated
1861	5 0	Price reduced to same rate as in Musselburgh
		1863 £2,000 extensions, including £1,430 gasholder & £228 street mains; 1867 £217 pipes to Eskbank

Date	Price per 1,000 cu ft s d	Associated Factors and Results
1870	4 7	1870 £121 new mains in Newbattle Road
1872	5 5	Coal crisis (gas price raised to same level as in Edinburgh); 1873 dividend boosted to 10% by cash from reserve fund. 1874 profits down to £461, 7½% dividend paid using £600 from reserve funds
1873	5 10	Later raised to 6s 3d because of expensive coal
1878	4 7	1879 500 yards new mains; 1881 £200 new mains laid
1881	4 2	1882 £1,921 capital extensions, especially pipes
1887	4 0	Same rate as in Musselburgh and Portobello
1890	4 7	Coal costs rose £200 (Gas price 4s 6d in Edinburgh, 4s 5d in Musselburgh). Gas price caused decrease in demand, and revenue rose only £180 instead of £400
1893	4 0	Richer gas from 'Peebles' Oil Gas enricher caused consumption to unexpectedly fall by £200 despite cheaper price
1894	4 2	Coal scarcity after Miners' Strike. 'Peebles' plant failed to stabilize gas prices
1896	4 0	Cheaper coal
1900	4 5	Coal price rose £100 in 1899, and £200 in 1900
1901	4 2	Best cannel reduced from 31s or 33s 6d to 25s a ton. £600 increased coal costs offset by continued £300 rise in consumption
1902	4 0	1902 £5,700 extensions to gasworks
1904	3 9	-
1905	3 6	Marked fall in profits. Excessive rate of price cuts to maintain competition with electricity
1907	3 10	Expensive coal
1910	3 6	-

Source - S.R.O. Dalkeith Company Minute Book op cit

(B) Bathgate

1836	9 0	-
1837	10 0	High coal prices; 1842-3 consumption grew regardless of high price. New purifiers
1844	9 2	-

Date	Price per 1,000 cu ft s d	Associated Factors and Results
1845	8 4	Initially caused a reduction of £80 in annual revenue
1846	7 6	Additional buildings and mains (£85) because increased demand
1864	5 0	Boom in consumption; dividend raised from 5% to 10% £550 gasholder, tank and purifiers
1868	4 7	(For consumers of over £1 gas per year)
1870	4 2	(For consumers of over £10 gas per year)
1874	5 5	-
1877	5 0	1880 £2,000 plant renewals to convert to coal-gas
1882	4 7	-
1885	4 2	1885-6 regenerative retorts installed and several extensions to works
1890	5 0 (Later 4/7)	High coal costs, but agitation by consumers forced a reduction from the 5s rate within 2 months. Coal costs increased £260, dividend reduced to 7½%; decreased consumption; slump in by-product revenue since 1887
1895	4 2	Profits doubled. Prosperity in late 1890's; new 40,000 cu ft gasholder (£1,149)
1899	3 9	Mains pipes enlarged
1900	4 2	Gas coal price increased by 5s a ton
1901	3 9	Profits restored; 1902 major extensions (£1,015)

Source - S.R.O. Bathgate Company Minute Book op cit

(C) Stranraer

1840	12 0	Poor management; excessive debts
1845	10 6	Improved management, greater consumption. Reduction achieved despite expensive alterations and extensions and coal prices increased up to 5s per ton. 1849 great increase in consumption and lower costs because cheaper coal and improvements in manufacturing. 1851 cheap coal and high profits, but Directors refused to reduce gas price because heavy debts, and extensions necessary
1852	8 0	Low price of coal, iron and brickwork. Great

Date	Price per 1,000 cu ft s d	Associated Factors and Results
		increase in consumption, but high freight costs in 1853 increased coal prices. 1855 extensions (£160); 1855 new gasholder (£190)
1859	7 6	1861 new mains (£150)
1860	6 8	} Impact of Consumers' "Cheap Gas Movement" and the threat of competition
1862	6 3	
1863	5 10	
1865	5 5	Increased consumption, and hence purchase of new gasholder and tank (£740) in 1866
1872	7 1	Great increase in coal prices. 1873 profits fell to £175, dividend reduced to 6%
1873	7 6	Nevertheless consumption continued to rise because boom in other industries. 1874 profits £62
1875	6 8	Low coal prices but rising wages
1876	6 3	-
1878	5 10	-
1883	5 5	Initially income reduced by £140
1887	5 0	-
1897	4 7	-
1900	5 0	High coal prices
1902	4 3	Lower coal prices

Source - S.R.O. Stranraer Company Minute Book op cit

(3) Statistics on Gas Consumption

Apart from Glasgow and Dundee (vide infra pp.1768-72), comprehensive records on gas-output and consumption are not readily available before the 1880's when C.W.Hastings' Gas and Water Companies Directory published statistics. The following examples provide only a partial illustration of the growth in demand for gas.

Gas Consumption in Aberdeen

Date	Gas cu ft	Date	Gas cu ft	Date	Gas cu ft
1832	8,848,700	1872	146,256,000	1879	236,855,000
1833	9,747,600	1873	164,648,000	1880	245,585,000
1834	9,971,700	1874	172,171,000	1881	259,191,000
1835	13,073,900	1875	188,125,000	1882	260,743,000
1836	17,435,500	1876	198,908,000	1883	275,995,000
1837	20,633,500	1877	216,186,000		
1838	22,873,000	1878	234,128,000	1889	323,515,000
1839	23,700,000				
1840	25,000,000				
1841	26,000,000				

Source - New Statistical Account vol. XII ;

J.H.Wilson Bon Accord Repository of Local Institutions
(1842, Aberdeen)

J.G.L. 6/11/1883 ; The Scotsman 20/1/1887

Municipal Affairs in Aberdeen Since 1833 (1889, Aberdeen)

Gas Consumption in Dunfermline

Date	Gas cu ft	Date	Gas cu ft	Date	Gas cu ft
1841	6,227,900	1881	37,413,400	1883	45,305,000
1861	14,585,000	1882	39,375,600		

Source - J.G.L. 28/8/1883

Gas Consumption at Coatbridge

Date	Gas cu ft	Divi. on Shares %	Date	Gas cu ft	Divi. on Shares %
1843	96,000		1858	6,000,000	10
1854	3,780,000	8	1859	6,600,000	10
1855	4,600,000	8.5	1860	7,500,000	10
1856	5,000,000	9	1861	7,409,209	8
1857	5,700,000	10	1862	7,884,150	10

Date	Gas cu ft	Divi. on Shares %	Date	Gas cu ft	Divi. on Shares %
------	-----------	----------------------	------	-----------	----------------------

1863	9,289,000		1879	40,000,000	
------	-----------	--	------	------------	--

Source - A. Miller The Rise and Progress of Coatbridge (1864,
Glasgow)

J.G.L. 25/2/1879

Gas Consumption at Milngavie

Date	Gas cu ft	Date	Gas cu ft
1860	2,437,000	1880	4,589,040
1870	3,266,250	1890	7,330,490

Source - J.G.L. 17/6/1890

Gas Consumption at Greenock

Date	Gas cu ft	Total Revenue £	Date	Gas cu ft	Total Revenue £
1827	3,200,000	-	1870	116,496,100	19,399
1850	26,256,000	7,953	1886	184,000,000	31,700

Source - J.G.L. 5/7/1887

Gas Output at Kirkcaldy

1877 38,968,000 cu ft

Source - J.G.L. 24/7/1877

Gas Output at Broughty Ferry

1854 1,900,000 cu ft 1876 17,158,200 cu ft

Source - J.G.L. 3/7/1877

Gas Output at Ayr Gasworks

Date	Gas cu ft	Leakage %	Date	Gas cu ft	Date	Gas cu ft
1864	14,619,000	17.75	1892	48,843,000	1903	64,160,000
1867	15,850,000	13.75	1893	52,000,000	1904	66,900,000
1868	17,156,000	14	1897	59,461,000	1905	63,496,000
1869	19,277,000	17	1898	61,004,000	1906	61,750,000
1888	40,950,000		1899	61,941,000	1907	59,980,000
1890	43,235,000		1900	64,840,000	1912	56,882,000
1891	44,699,000					

Source - S.R.O. Ayr Minute Book op cit

Gas Output at Galashiels Gasworks

Date	Gas cu ft	Date	Gas cu ft
1898	51,396,000	1902	56,177,000
1899	51,561,000	1904	59,340,000
1900	55,090,000	1906	67,000,000
1901	56,964,000	1907	70,683,000

Source - S.R.O. Galashiels Minute Book op cit

Growth of Gas Sales Reflected in Revenue and Number of Consumers

(A) Hamilton Old

Date	Gas Revenue £	Divi %	Date	Gas Revenue £	Divi %
1831	-	0	1839	887	6
1832	118	0	1840	942	10
1833	333	0	1841	975	30
1834	391	7	1842	1101	10
1835	334	6	1843	1159	12.5
1836	517	5	1844	1161	7.5
1837	698	5	1845	1260	-
1838	729	5			

Source - H. Commons 1846 vol. 102 7/5/1846 pp. 49,59

(B) Paisley

Date	Number of: Consumers	Public Lamps	Date	Number of: Consumers	Public Lamps
1825	568	180	1855	7510	-
1830	1338	-	1860	8326	794
1835	5777	-	1865	9157	-
1840	7728	637	1870	9618	-
1842	6088	-	1875	10720	-
1845	6846	-	1880	12052	1171
1850	6867	659	1883	12066	1250

Source - Paisley Ref. Lib. W.B.Watson Abstract Statement (1870) op cit

R.Brown The History of Paisley from the Roman Period Down to 1884 (1886, Paisley) vol. II pp. 288-91

(C) Galashiels

Date	Number of Consumers
1865	1394
1872	2198
1882	3550

Source - S.R.O. Galashiels Minute Book op cit

Gas Production at Dundee 1826-1885

Date	Consumption cu. ft.	Gas Price per 1000 cu. ft.		Per centage Leakage	Sale price when 5 per cent discount allowed
		s	d		
1826	1,328,000	15	0	-	-
1827	3,949,000	15	0	-	-
1831	9,805,000	12	0	-	-
1841	30,848,000	8	3	-	-
1856	96,878,100	5	6	19.36	-
1857	107,589,300	5	6	18.63	-
1858	112,127,600	5	6	19.65	-
1859	111,423,600	5	6	20.58	-
1860	122,373,600	5	6	23.55	-
1861	129,659,900	5	6	26.87	-
1862	135,013,500	4	10	24.04	-
1863	137,943,600	4	10	21.87	-
1864	155,386,300	4	10	22.15	-
1865	175,025,500	4	10	23.3	-
1866	189,599,200	4	8	23.25	-
1867	202,495,400	4	8	21.8	-
1868	212,226,400	5	2	24.79	-
1869	210,500,000	5	4	23.5	-
1870	200,838,200	5	0	24.25	4s 9d
1871	214,295,100	4	6	20.41	4 3
1872	234,224,000			18.34	3 11 $\frac{1}{2}$
1873	252,294,300	4	2	18.7	3 11 $\frac{1}{2}$
1874	265,994,800	6	0	18.5	5 8 $\frac{1}{2}$
1875	268,945,600	5	8	18.24	5 4 $\frac{1}{2}$
1876	285,313,300	5	0	18.54	4 9
1877	292,604,700	4	5	16.55	-
1878	316,054,900	4	2	15.93	-
1879	322,807,700	3	11	15.21	-
1880	340,489,600	3	8	15.16	-
1881	349,334,600	3	8	16.65	-
1882	342,182,500	3	8	11.73	-
1883	356,888,200	3	8		-
1884	370,558,200	3	6	10.66	-
1885	389,012,500	3	6	10.51	-

Note - Dundee Old company commenced 1826, faced opposition from a Consumers' Company in 1846 - 52 ; purchased by municipal authorities in 1868. Rapid reduction in prices, and increase in output 1841 - 56. Consumption fell 10 million cu.ft. and high gas prices in 1867-8 preceeded municipal action. High prices in 1874 - 5 due to coal famine.

Sources - J.G.L. 1/2/1876 p.164, 5/6/1883 ;

Gas World 4/7/1885 p.10, 11/7/1885 p.45, 18/7/1885 p.76

Total Gas Production in Glasgow 1827-69 (Thousands cu. ft.)

Date	Glasgow Gas Light Co.	Glasgow City & Suburban Co.	Total Output of Both Companies from 1845	Per Cent increase (or decrease(-))
1827	79,235	-		
1828	76,424	-		- 3.54
1829	79,250	-		3.69
1830	82,039	-		3.517
1831	90,527	-		10.346
1832	100,068	-		10.539
1833	106,690	-		6.617
1834	120,680	-		13.112
1835	134,800	-		11.703
1836	125,624	-		- 6.807
1837	162,606	-		29.438
1838	178,996	-		10.079
1839	173,367	-		- 2.977
1840	173,864	-		0.286
1841	189,308	-		8.883
1842	198,523	-		4.867
1843	216,963	-		9.288
1844	276,525	-		27.452
1845	257,617	75,393	333,010	20.405
1846	244,415	96,770	341,185	2.454
1847	266,168	125,185	391,353	14.704
1848	263,832	117,141	390,973	- 0.097
1849	279,138	126,867	406,005	3.844
1850	302,223	148,833	451,056	11.096
1851	313,619	160,390	474,009	5.088
1852	343,555	161,730	505,285	6.598
1853	361,442	187,526	548,968	8.645
1854	394,172	194,737	588,909	7.276
1855	384,460	203,721	598,181	0.725
1856	406,089	223,197	629,286	6.086
1857	456,228	241,150	697,378	10.820
1858	457,325	223,536	680,861	- 2.368
1859	438,531	271,641	710,172	4.305
1860	470,457	298,784	769,241	8.317
1861	491,289	320,639	811,928	5.549
1862	495,885	325,964	821,849	1.222
1863	503,379	339,597	842,976	2.270
1864	538,138	376,544	914,682	8.506
1865	574,975	415,119	990,094	8.244
1866	599,639	449,275	1,048,914	5.941
1867	628,637	491,205	1,119,842	6.762
1868	656,996	515,877	1,172,873	4.735
1869	690,980	515,941	1,206,921	2.903

Note - The Companies passed under Municipal control in 1869

Source - Glasgow City Archives (D.G.E. 164)

Glasgow Gasworks continued :

These were the largest gasworks in Scotland. Further statistics and diagrams are given elsewhere.

<u>Vide supra</u> :	p. 737	Fig. 4.9
	p. 795	Table. 4.38
	p. 811	Fig. 4.49
	p. 812	Fig. 4.50
	p. 825	Fig. 4.59
	p. 1042	Fig. 5.35
	p.p. 1075-7	
	p. 1261	Fig. 6.51
	p. 1267	Fig. 6.54

Total Gas Consumption in Glasgow 1857-96 (Thousands cu. ft.)

Date	Gas Sold	Per Cent increase (or decrease)	Meters in Use	Increase in Number of Meters (%)
1857	563,599	-	58,784	
1858	553,131	- 1.9	61,436	4.5
1859	579,028	4.6	63,696	3.7
1860	624,993	8.0	66,451	4.3
1861	642,436	2.8	70,436	6.5
1862	668,564	4.7	73,263	3.5
1863	684,491	2.3	76,409	4.3
1864	752,766	10.0	82,396	7.8
1865	807,529	7.3	84,131	2.1
1866	867,227	7.4	86,378	2.7
1867	916,227	5.6	87,595	1.4
1868	967,731	5.6	89,430	2.1
1869	978,323	1.1	92,131	3.0
1870	1,010,117	3.3	93,349	1.3
1871	1,116,612	10.5	96,781	3.6
1872	1,227,229	9.0	101,380	4.8
1873	1,310,100		106,025	4.6

*

*

*

Date	Gas Sold	Leakage %	Candlepower
1874	1,305,811	18.6	26.3
1875	1,339,169	18.8	26.4
1876	1,415,489	18.5	26.3
1877	1,487,789	18.1	26.9
1878	1,481,329	16.6	26.8
1879	1,533,219	16.3	26.7
1880	1,577,456	15.1	26.7
1881	1,682,700	14.4	26.4
1882	1,807,851	12.0	26.1
1883	1,939,991	10.9	26.4
1884	2,051,219	11.7	26.1
1885	2,115,804	10.6	26.3
1886	2,166,000		
1887	2,285,000		
1888	2,427,000		
1889	2,611,000		
1890	2,752,000		
1891	3,125,000		
1895	4,525,265	} (output - not sales)	
1896	4,811,884		

Sources - Glasgow City Archives (D.G.E. 165)
 J. Nicol Statistics of Glasgow (1885, Glasgow)
 J. Nicol Statistics of Glasgow 1885 - 1891 (1891, Glasgow)
Gas World 4/6/1887, 24/10/1885

Total Gas Output in Glasgow 1900-14 (Thousands cu. ft.)

Date	Gas Output	Leakage %	Increase in Sales %	Output per Ton Coal cu. ft.
1900	5,969,111	-	-	-
1901	6,121,368	10.55	1.39	9026
1902	6,364,068	10.62	3.89	9045
1903	6,431,878	11.25	0.34	9092
1904	6,641,891	11.24	3.27	9396
1905	6,449,539	8.70	0.1	9481
1906	6,704,891	9.72	2.8	9416
1907	6,953,968	9.82	4.22	9391
1908	7,033,893	7.97	2.6	9522
1909	6,820,962	9.29	4.41	10015
1910	6,977,904	8.64	3.03	10167
1911	7,051,165	8.74	0.96	10437
1912	7,207,621	9.02	1.87	10483
1913	7,732,914	8.56	7.83	10424
1914	8,112,616	7.92	5.63	10386

Source - Glasgow City Archives Reports 1912-13 p. 875, 1913-14 p.760

(4) Regulations Imposed Upon Consumers of Gas

Edinburgh Gaslight Company

Regulations to be observed, and Conditions on which Gas is supplied to the Consumers.

1. Lighting not to commence till the sun has set. Argand burners not to be used without cylindrical glasses. The flame to be regulated so as not to exceed 8 inches in height. The cockspur flame also not to exceed 3 inches. *N.B.*—When the above is not attended to, smoke and smell are produced, and is otherwise injurious, without adding to the brilliancy of the light.
 2. The charges to be paid half yearly in advance, one-third at Whit-Sunday, and two-thirds at Martinmas.
 3. All contracts with the company to be held as for one year—viz., from Whit-Sunday to Whit-Sunday, and none can be supplied for a shorter period, unless by a special agreement made at the office. Persons commencing between the above periods, to be charged from the date their premises are lighted, and pay up in full till Whit-Sunday following. After the burners are delivered, a notice annexed to the conditions and regulations will be filled up, stating the same, and delivered to the consumer; any alteration required must be signified within two days after the date of the notice.
 4. The service-pipes branching from the mains will be laid at the expense of the company, provided the length does not exceed 20 feet. If a greater length be necessary, a charge will be made for laying the same, according to a scale exhibited at the office; but the whole of the pipe must be held the company's property notwithstanding.
 5. Before the gas is supplied, the inspecting officer of the company must be satisfied that the interior fittings are correctly made; one day's previous notice is required when fittings are to be examined. And, in case of getting into disrepair, so as to occasion an escape of gas, the supply will be discontinued until put into proper order.
 6. No burners to be used but those furnished by the company, and to be paid for on delivery, and none sold after three o'clock p.m.
 7. Burners are not to be changed at any other period of the year than at Whit-Sunday, and such must take place within ten days thereafter.
 8. At or before the term of Whit-Sunday, the surveyor will take an account of the number of burners each consumer of gas will require for the year ensuing, and will deliver to him or her a copy of these conditions and regulations, and on the other side thereof, a notice specifying such number, with the hours to which he or she is entitled to burn, which notice will be held as the terms of the agreement, unless objections are made to it within ten days after it is delivered.
 9. The officers of the company to have free access at all times to check the height of flame and examine the burners.
 10. Should the apertures or holes of the burners be widened, from use or otherwise, the inspectors are authorized to take them away, and to turn off the gas until replaced by new ones, to be paid for by the consumer; but if any one is detected wilfully enlarging them, the company will discontinue to supply him or her with gas altogether, and the charge for the light which may have been paid in advance, will be forfeited to the company.
 11. The lights must be extinguished within a quarter of an hour after the time contracted for, except on Saturdays, when they may be used till twelve o'clock.
 12. Any deviation from the above regulations and conditions will oblige the company to discontinue the supply, and the charges which the consumer may have paid in advance become forfeited to the company.
- Note.*—Consumers already supplied, who are desirous of adopting the gas-meter at any time during the year, are required to give a fortnight's notice by letter to the company's manager; but should the consumer have previously paid the half-yearly or whole charge for the light, then the meters are only allowed to be adopted at the terms 11th of November or 15th of May, as the case may be. The charge for gas by the meter is 12s. per 1000 cubic feet.
- May 15, 1827.

CONDITIONS ON WHICH THE LEITH GAS LIGHT COMPANY ENGAGE TO SUPPLY THE PUBLIC WITH OIL GAS.

1. For every 100 Cube Feet registered on the Meter, the Consumer is to pay £0 5 0
 2. For the Use of the Meter, quarterly on the Meter, the Consumer is to pay 0 2 0
- [This is one of the smallest size, and will be sufficient to register from one to nine argand burners.]
3. The Payments to be made on the 1st February, 1st May, 1st August, and 1st November, of such sums as shall be due on those respective days.
 4. The Meter will be provided and kept in repair by the Company, so far as regards tear and wear; but should it be injured by inattention or want of care, the repairs must then be at the Expense of the Person using it, and such repairs to be done under the Company's Inspector.
 5. The Company will lay the outer Service Pipes, and maintain the same at their Expense.
 6. The Pipes and the Fittings-up in the Houses and Shops, to be put up and maintained at the Expense of the Consumer, but the work to be done under the superintendence of the Company's Engineers.
 7. The Burners will be supplied by the Company only, and the Pipes and other interior Fittings, to be supplied by such Persons as their Engineers shall find qualified, and they shall be paid by the Consumer.
 8. If any Reparations of the outer Pipes or inner Fittings should be necessary, the same shall, upon notice thereof, be done forthwith.
 9. The Company's Inspector is to be allowed occasional access to such Premises as are supplied with Gas, for the purpose of ascertaining the quantity consumed, and the state of the Fittings.
 10. The Consumer may discontinue the use of gas, on giving the Company One Month's Notice; and if payment is not regularly made, the supply to be withdrawn.
 11. Where Argand Burners are adopted, it is recommended, on every occasion, that they be used with a Cylindrical Glass, and that the Flame should not exceed Two Inches in length, as the brilliancy of the Light is thereby impaired with a longer Flame, and a greater quantity of Gas consumed than is necessary. In Jet or Thistle Burners, where no glass is necessary, the length of Flame should be the same.

All Persons requiring Gas from the LEITH GAS LIGHT COMPANY, will please to fill up and Sign the following Letter of application.

SIR, LEITH, 1821

As desirous of being supplied with Gas, by the LEITH GAS LIGHT COMPANY, agreeably to the above Prices and Regulations, request you will cause the Service-Pipes to be laid to Premises, at give directions to in furnish the necessary Fittings therein. To Mr. WM. FORREST, MANAGER

For the LEITH GAS LIGHT COMPANY, LEITH.

Sources - Leith J.G.L. 25/8/1874 P.275
Edinburgh J.G.L. 1/9/1874

PAISLEY GAS COMPANY

MAY 18 26

CONDITIONS ON WHICH GAS WILL BE SUPPLIED.

I.—Before Gas be supplied, the Company's Manager must be satisfied the interior fittings are correctly made; in case of their running into disrepair, so as to occasion an escape of Gas, the supply will be cut off until repaired.

II.—All regular Consumers of Gas by the Table, when applied to, will give the Surveyor an account of the quantity of Light required for the current year, and will be served with accounts, specifying such quantity, and the price to be paid for the same, which shall be held as the terms of the agreement, unless objected to within 14 days from the time of being delivered.

III.—The Annual Charge to such Consumers is from Whitsunday to Whitsunday, or a-half payable on 15th September, and the other half on 15th January, without any deduction in respect of the Gas being cut off for undue payment, for infringing these conditions, or for not being used. No contract for additional lighting can be made for a more limited period than to Whitsunday following.

IV.—All Lights used in the same apartments or Shops, without a Gas Meter, are to be extinguished at the same hour.

V.—If used more than fifteen minutes after expiry of the hour specified and agreed on (excepting on Saturdays, when they may be used till 12 o'clock) an additional hour for each day in the whole year or time agreed for, will be charged for every successive or other hour in which the Gas shall be so found burning. If used in the day-time, when not agreed for, an additional charge will be made for the whole year or time agreed for, from sun-rise to sunset.

VI.—No Burners or Gas Meters to be used but those which are furnished by the Company;—they are to be paid for on delivery.

VII.—Burners may be changed at Whitsunday only, or within ten days thereafter.

VIII.—The Flames of the Argands, which must always be used with Glasses, and of the Jets, to be regulated so as not to exceed for

- The No. 1, Argand, 12 Inches in height,
- The No. 2, do. 2
- The Jets, 3

IX.—If used at higher flames than the above, an extra charge, for the additional height of flame, will be made for the whole year or whole time agreed for, corresponding to the extra quantity of Gas consumable by such additional height of flame.

X.—All charges in terms of the V. and IX. conditions are payable within one month after an account thereof has been delivered to the consumer; but all who are served with such accounts, may be relieved of the same for the unexpired term of their agreement by providing themselves with Gas Meters within one month from the date of such accounts being delivered; after which they will be charged for the precise quantity of Gas consumed by them, as the same shall be indicated by the Meter.

XI.—Should any repairs be requisite upon or below the Consumer's Stop Cock, immediate notice must be sent to the Company's Office, before such repairs be commenced, that the Service Stop Cock may be shut.

XII.—Should the apertures of the Burners be enlarged from use or otherwise, the Inspectors are authorized to take them away, and to turn off the Gas until replaced by new ones, to be paid for by the Consumer.

XIII.—The Inspector to have free access at all times, to measure the height of the flame and examine the Burners and Gas Meters.

XIV.—Gas will only be supplied on the above conditions being agreed to and observed; if they are not observed, the supply will be cut off and no discount given from the terms of the agreement.

It is earnestly requested, whenever any unexpected smell of Gas is felt, immediate notice thereof be given at the Company's Office, and wherever Gas is accumulating, that every precaution be taken to prevent any one approaching with a Light.

J. Newson, Printer.

Dundee Regulations - June 1826

"The Company having experienced considerable inconvenience and loss, from an undue Consumption of Gas, NOTICE IS HEREBY GIVEN, that if the lights are not extinguished at the time agreed upon, they will be held as used for an additional hour each night for the year, and be liable to be charged accordingly. And also, if the flame is allowed to burn higher than is permitted by the Regulations, an additional price corresponding to the additional height, will be charged for the year.

CONDITIONS AND REGULATIONS

1. The Service Pipes, from the mains to the interior of the premises to be lighted, will be laid at the expense of the Company, when the length of pipe necessary does not exceed 15 feet. When a greater length is required the extra expense must be defrayed by the Consumer of Gas, and paid for when the work is completed.
2. No burners to be used but those furnished by the Company, which are to be paid for on delivery; and when the apertures or holes of the burner are found to be enlarged by use, or otherwise, they must be replaced by others.
3. Argand burners must be used with plain cylindrical glasses of 6 inches in height; and the flames of No. I Argand must not exceed $1\frac{3}{4}$ inches; and those of No. II 2 inches; the flames of Jet burners not to exceed 3 inches. When the flames are allowed to rise above this height, the Gas escapes unconsumed - the brilliancy of the light is diminished - smoke is produced, and it is otherwise offensive and injurious.
4. The lights must be extinguished within a quarter of an hour of the time contracted for, except on Saturdays, when they may be used until 11 o'clock.
5. Before Gas is supplied, the Company must be satisfied that the interior fittings are correctly made. One day's previous notice is required when fittings are to be examined. It is of considerable importance that intending Consumers of Gas should employ tradesmen to put up their premises who understand what size of pipes to use, and who can be depended on for making good work; for when pipes of too small a bore are fitted up, or if the work is carelessly performed, it is difficult to obtain a

sufficient supply of Gas, and expense is incurred in making alterations".

Source - Dundee Ref. Lib. Pamphlet 310 (8) June 1826

(5) Gas Meter Suppliers, and Meter Rent(i) Meter Manufacturers

The "wet" gas meter¹ devised by Clegg in 1815 used a complex circling drum, powered by the gas inflow under water, to measure gas consumption at the premises of consumers. Samuel Clegg, with Samuel and John Crossley, opened a meter factory in London in 1816. Clegg retired in 1824, and was replaced by Wm. Parkinson² who took over the business in 1847. Several Scottish gas companies commenced using Crossley meters, and whereas a number of English gasworks manufactured their own meters, Scottish works continued to rely entirely upon accurate meters produced independently by the large meter-manufacturing industry which developed in Scotland.

Wm. and Benjamin Cowan at Glasgow in 1825, inaugurated the earliest gas meter factory outside London³. The first "dry" gas meter, using a flexible membrane to measure gas, was devised by a Scotsman, Alexander Croll⁴ with Wm. Richards⁵, both employees of the Chartered Company in London, in 1844. But the slide valves and the reciprocating mechanism which improved the dry meter were inspired by Thomas Glover⁶, an engineer and brass-founder at Leith, who had repaired gas meters and gas apparatus since the 1820's. He travelled to London to explain the improvements, and when Richards retired following the initial setbacks, Croll and Glover developed a very large meter Company. The dry meter did not require frequent watering; neither did it freeze solid in winter, and the severe

-
1. Gas Journal Centenary 1849-1949 (1949) pp. 159, 162, 165.
J. Robb (Haddington) "Notes on Meters, Wet & Dry" J.G.L. 15/9/1868 p.687.
Obituary of Alex. Wright, Meter Manufacturer, vide J.G.L. 8/9/1874 p.337
 2. In 1887 Messrs Parkinson obtained a licence to manufacture the first pre-payment meters.
 3. By 1830, rivals included West and Gregson at Oldham, and J. Bent at Birmingham.
 4. A leading member of the Gas Consumers Movement.
 5. "Wm. Richards - Inventor of the Dry Gas Meter" Gas World 10/12/1887 p. 753
King's Treatise 1882 op cit vol. 11 p. 27
 6. John Glover, Wright, a Director of Leith Gas Company in 1830, was possibly a relative of Thomas.

frost of 1853 proved a boon to sales. From 1893 Croll and Glover manufactured many pre-payment meters and in 1897 merged with the Glasgow Gas Cooker firm of R. & A. Main. Messrs W. & B. Cowan built a subsidiary works in Edinburgh and a Manchester factory in 1874, but merged with Messrs Parkinson in 1900.

Messrs D. Grant & Co. of Edinburgh¹ pioneered an over-flow device for wet gas meters to safeguard against over filling which produced inaccurate readings; in 1840 water entrance tubs were first placed at the water line; and from 1842 an overflow water box was placed below the meter. They supplied the first station meter with an over-flow device to Preston Gasworks in 1845. Edinburgh became the most important centre of meter manufacture after London², with firms like Fullerton & Co., Laidlaw & Son³, P. & J. Nimmo, and D. Bruce Peebles. James Milne & Son⁴ produced the earliest Edinburgh meter. Glasgow with J. Hamilton, and Aberdeen with J. Blackie & Sons, also produced meters.

Fullerton & Co.⁵ began in 1850 with a partnership between John Fullerton and Henry Alder, the commercial traveller and principal clerk respectively of a firm of Edinburgh gas engineers, Cochran & Co. By inducing other skilled workmen to also leave Messrs Cochran, they developed a very successful factory in which the foreman, M. G. Manson, in 1864 devised the first dry meter in a cast iron case. Alexander Mackay a former banker at Forres, who had developed a very popular "fiddle-case" dry meter, joined the firm in 1871. The company won first prize for dry meters at the Glasgow Exhibition of 1880 and for wet meters a medal at the 1883 Calcutta International Exhibition.

1. J.G.L. 9/11/1858 p.631

2. The Architects, Engineers & Building Trades Directory (1868) (Nat. Lib. Scot.) In 1861, London had 18 meter makers (including offices), with eight in the remainder of England, especially at Leeds and Manchester, compared to eight in Edinburgh, and one in both Aberdeen and Glasgow.

3. Vide supra p. 140

4. Vide supra p. 142

5. Gas World 1885 p. 403

Gas Journal Centenary 1849-1949 (1949) p. 153

By 1859 British manufacturers, especially from London, Glasgow and Edinburgh¹, exported about 280,000 meters a year, worth £420,000, mainly to Canada, India, Australia, Europe and America. Scottish consumers had the benefit of using the most accurate meters available.

1. J.G.L. 1/2/1859

(ii) Meter Rent Charges

(A) Early Records

Company	Date	Large Meter	Small Meter	Medium Meter	Other Sizes or Unspecified
Ayr ¹	1847	4/-	2/6		5/- on meters costing over 45/-
Cupar ²	1861	4/-	1/6	2/-	
Bathgate ³	1860				2/6
Bathgate	1872				2/-
Stranraer ⁴	1850		2/6		5/- 'London' and 3- light meters
Cupar ⁵	1881				Meter rent abolished

Sources - S.R.O. Minute Books, (1) Ayr 8/1/1847, 30/8/1847; (2) Cupar 9/7/1861; (3) Bathgate 5/6/1860, 7/6/1872; (4) Stranraer 25/6/1850; (5) Cupar 14/8/1881

(B) Records from Journal of Gas Lighting

Town	Date in <u>J.G.L.</u>	Price of Gas	Annual Rent of Meters	Note
Crieff	31/7/1877	7/6	2/-	
Auchterarder	2/7/1878	7/11	1/-	
Insch New	23/8/1881	-	1/6	Was 2/- (small meters)
Dumbarton	3/1/1882	4/2	none	
Dundee	3/1/1882	3/6½	1/6	
Galashiels	3/1/1882	3/4	-	Consumers own meters (= 4d per 1000 cu ft)
Port Glasgow	3/1/1882	5/-	2/-	
Ayr	3/1/1882	5/-	1/6	
Helensburgh	3/1/1882	5/-	-	Consumers own meters
Coatbridge	3/1/1882	4/2	2/-	
Saltcoats	9/10/1883	-	2/-	Total meter rent £70
Inverness	6/11/1883	-	none	Rent abolished

Town	Date in <u>J.G.L.</u>	Price of Gas	Annual Rent of Meters	Note
Stirling	24/6/1884	3/11	1/3	
Pollokshaws	27/9/1887	-	none	Was 1/6
Milngavie	19/6/1888	-	none	Was 1/6
Denny Cons.	18/6/1889	-	none	Rent abolished
Grangemouth	26/6/1889	3/9	2/-	
Brechin	9/7/1889	-	1/6	Was 2/-
Stonehaven	10/6/1890	-	none	

(6) Discounts Policy

The allowance of discounts to large consumers was both a usual encouragement to the adoption of gas-light by commercial premises, and a recognition of the power of large consumers who could use private gasworks or promote a rival gas company. Dunfermline¹ gas company in 1829 charged 12/- per 1000 cu ft for quantities under £10 per year, 11/- for £10 to £15, 10/6 for £15 to £20, and 10/- for amounts above £20. Aberdeen² in 1839 charged 10/- and gave discounts of 5 to 25%. Later examples are given below -

(i) Bathgate (1868-70)

5d off 5/- for quantities above £10 per year

Source - Bathgate Minute Book op cit 11/6/1868, 7/6/1870

(ii) Boness (1851)

5% on quantities above £5 per year

Source - Boness Minute Book op cit 9/5/1851

(iii) Dundee -

(A) Old Company (1832)

3% on £3 to £10, 10% on £10 to £20, 15% on £20 and above

(B) Old Company (1844-6)

5% on £10 to £20, 10% on £20 to £40, 15% on £40 to £100, 20% on £100 and above

(C) Dundee Companies (1859-68)

2.5% on £30 to £40, 5% on £40 to £69

7.5% on £70 to £99, 10% on £100 and above

(D) Dundee Municipal Gasworks (1870)

Maximum 5% discount

Source - Gas World 18/7/1885 p.76

H. Commons 1846 vol. 98 23/3/1846 pp. 130, 165

B.P.P. 1866 LXVI 519(486)

(iv) Glasgow

(A) Old Company (1836)

1. Dunfermline Ref. Lib. Dunfermline Minute Book op cit 24/7/1829
 2. New Statistical Account vol. XII

Thousands cu ft Gas	% Discount	Thousands cu ft Gas	% Discount
1-12	5	20-25	17½
12-14	7½	25-30	20
14-16	10	30-40	22½
16-18	12½	40-50	25
18-20	15	50-60	27½
		over 60	30

Note - Gas by meter 9/6d

(B) Old and C. & S. Companies (1861-5)

5% on £4 to £20, 10% on £20 to £100

15% on £100 and above

Note - average discount 4% on total sales.

Sources - J.G.L. 12/2/1861 p.97

B.P.P. 1866 LXVI 519(486)

Aberdeen Journal 1/6/1836 p.2

(v) Greenock

(A) Discount Rates in 1840

Gas	% Discount	Gas	% Discount
£2 up to £10	2½	£70 up to £100	15
£10 up to £20	5	£100 up to £150	20
£20 up to £40	7½	over £150	25
£40 up to £70	10		

Note - Gas by meter 10/-

(B) Discount Rates in 1851-2

Gas	% Discount	Price Paid for Gas
£1 up to £10	2½	4/10½
£10 up to £30	5	4/9
£30 up to £60	7½	4/7½
£60 up to £100	10	4/6
£100 up to £150	15	4/3
£150 and above	20	4/-

Note - Gas by meter 5/-

Sources - Greenock Advertizer, 10/4/1840

J.G.L. 10/5/1851, 10/9/1852

(vi) Kilmarnock (1866)

5% on £10 to £20, 10% on £20 to £100, 15% on £100 and above

Source - B.P.P. 1866 LXVI 519(486)

(vii) Rothesay Council (1877)

2.5% on £1 to £10, 4% on £10 to £20, 5% on £20 and above

(viii) Selkirk (1896)

2.5% on £20 to £50, 5% on £50 and above

Note - based upon rates in neighbouring towns. Reduced company revenue by £52.

Source - S.R.O. Selkirk Minute Book op cit 19/11/1896

(ix) Various Examples from Journal of Gas Lighting

<u>J.G.L.</u>	Date	Town	Gas by Meter		Discounts
			s		
	10/7/1877	Banff	7	1	5% on £15 and above
	29/6/1880	Perth	4	2	5% maximum
	3/6/1884	Leven, Fife	5	0	20% on 200,000 cu ft and above
	4/8/1885	Coatbridge	3	9	5% to 10%
	18/6/1889	Barrhead	4	4.5	5% on 150,000 cu ft and above
	18/6/1889	Milngavie	4	4.5	5% on 20-800,000 cu ft; 15% on 800,000 cu ft and above
	16/7/1889	Hawick	3	1.5	7.5% maximum

(7) Public Lighting Arrangements -

Street lighting was not an important source of gas revenue,¹ but it was a very significant aspect of company organization. To obtain municipal favour, and way-leave, gas companies made considerable effort to supply and increase the number of public lamps which provided an important advertisement of the advantages of gas lighting.

A new gas company at Dalkeith² in 1827, for example, soon obtained a contract to supply public lamps for the Town Trustees - this involved supplying oil before the gasworks commenced, and then gas "at the Edinburgh rates and prices", besides increasing the number of lamps from 96 to 100 at the Company's expense. The gas company paid for adapting the oil lamps, and for lighting and cleaning over 7 months a year beginning in mid September. Half were alight until 1 a.m. and the remainder until daylight, eighteen moonless nights per month. Local blacksmiths and tinsmiths altered the lamps, and 50 globes were bought from Edinburgh Glass House company³. By 1832, the number of lamps⁴ had risen to 131 at £120 per year, but from 1835 a new agreement allowed the Trustees a discount of 10% below other consumers. The amount of discount later varied, however. In 1871 normal consumers paid 4/7d per 1000 cu ft, but public lamps paid 4/-, as low as Edinburgh and Leith, but less than Portobello and Musselburgh at 4/9d. The discount⁵ was 4% in 1878, and in 1881 rose from 5 to 10%, which remained in 1891.

The total value of gas consumed in public lights was small compared with initial expectations by gas companies, and was a source of frequent disagreement⁶ despite the use of meters on some lamps.

-
1. J. Rutter "Street Lights" J.G.L. 10/1/1851, 25/3/1862, 22/4/1862 ;
B.P.P. 1847 XXII p.95
 2. S.R.O. Dalkeith Minute Book op cit 17/9/1827, 22/10/1827
 3. Globes 6/- each or 18 for £1 ibid 15/10/1827
 4. ibid 28/8/1832, 1/9/1835
 5. ibid 25/9/1832, 1/9/1835
 6. e.g. Selkirk Town Council in 1844 paid £19 instead of the agreed price of £21. S.R.O. Selkirk Minute Book op cit 21/9/1844

Cupar¹ company began to supply public lamps, as well as lighting and extinguishing them, in 1839. By 1842 the season lasted 7 months, with lamps burning up to 12 p.m. for 17 nights in a month. In 1846 at the Provost's suggestion, four meters were fitted to lamps in various districts, and 10% discount allowed, but during 1848 a prolonged quarrel over prices occurred between the Company and Police Commissioners. At Stranraer² in 1846, meters to measure consumption were placed on public lamps located near the gasworks, and gas charged at 8/- instead of the normal rate of 10/6d; but in 1853 the gas manager complained that the Council lamplighter always lit those without meters first. Galashiels³ company was in frequent disagreement with the local Police board. By 1873 Galashiels had 209 public lamps, but refused to allow regulators by D. Bruce Peebles (£14 for 100) to be fitted for the Company to control the gas supply to lamps, although they were already used at Glasgow, Greenock, Arbroath and Kirriemuir; moreover, the Police allowed meters to be placed only on five 11 p.m. lamps and one all-night lamp. Selkirk council in 1880 was thwarted in an attempt to sue a gas company employee for altering burners on the street lamps after they had been lit by the Council lamplighter. The company proved extensive financial loss caused by the lamplighter who turned lamps with meters to half-pressure, and all others to full pressure. From 1884 the company took over all maintenance and lighting of lamps.

By the 1870's, several towns employed mineral-oil street lamps wherever gas prices appeared too high. Maxwelltown⁴ took oil from Young's Paraffin Oil Company until 1876, when higher prices led the town to purchase gas from Dumfries. Whitehorn⁵ changed from gas to mineral oil for street lights in 1877, and Ayr⁶ threatened to do so in 1885 when gas lamps at 22/- each cost £689 per year, whilst

-
1. S.R.O. Cupar Minute Book op cit 23/9/1839, 15/9/1848
 2. S.R.O. Stranraer Minute Book op cit 17/12/1846, 22/6/1853
 3. S.R.O. Galashiels Minute Book op cit 24/6/1873, 2/6/1874
Note - Cupar company in 1895 purchased 72 Peebles governors (21/- per dozen), and Banff purchased 110 the same year, for street lamps
 4. J.G.L. 19/9/1876
 5. J.G.L. 4/8/1885
 6. J.G.L. 4/8/1885, 18/8/1885

mineral oil at 8/8d was expected to cost only £271.

Variations in discounts for public gas lighting as shown in the following table.

Discounts for Public Lights (1890)

Town	Normal Price		Discount for Public Lights %
	s	d	
Hawick	3	1.5	7.5
Musselburgh	4	0	8.75
Dalkeith	-		5
St. Andrews	4	2	24
Bathgate	4	2	28
Linlithgow	4	7	20
Kirkcaldy	3	1.5	33.3
Cupar	4	7	0
Kelso	4	2	0

Source - J.G.L. 20/5/1890

Besides obtaining discounts, municipal authorities insisted upon a complex timing system whereby street lights were extinguished on moonlit nights, and possibly also in summer. This increased the peak demands for gas, but greatly reduced each company's revenue, as did the early extinction of lights each night in small towns.

Public Lighting Regimen at Edinburgh (1820)

Burner	Time per Day (from sunset)	Lighting Schedule	Time Lit (weeks)	Gas Cost	Lighting*
				s.d	s.d
Single jet	To 3 a.m.	s.m.	34	13.5	5.9
Cockspur	To sunrise	w.y.	52	26.9	8.8
	To sunrise	s.m.	47	20.11	5.9
	To sunrise	s.j.	39	25.5	6.6
Batswing	To 3 a.m.	s.m.	34	101.0	5.9
	To sunrise	w.y.	52	160.5	8.8
	To sunrise	s.m.	34	125.4	5.9
	To sunrise	s.j.	39	134.9	6.6

Notes - * Lighting and Cleaning Costs

Schedules - s.w. 1 September to 1 May

w.y. whole year

s.j. 1 September to 1 June

Source - Edinburgh City Archives - Lighting Committee Minutes 31/
10/1820 p.76

Annan¹ company in 1838 replaced public oil lamps by 40 gas burners which were only used during six winter months, for 8 hours on each of 18 days per month. The flat-flame burners each used only 2,000 cu ft per season, for which the Company charged 20/- and also £10 for supplying a lamplighter. The lighting season at Bathgate² in 1835-6 was only 7 months, and during that period the 16 swallow-tail lamps were lit only up to 11 p.m. each night except for one week of moonlight per month.

Public Lighting Regimen at Annan 1838-41 (Hours per night)

Month	1838	1841	Month	1838	1841
Sept.	0	4	Jan.	10	9
Oct.	6	5	Feb.	8	7
Nov.	8	7	March	6	4
Dec.	10	9	April	0	3

Note - Lamps lit 18 nights per month; 48 hours per lamp per season

Source - S.R.O. Annan Minute Book op cit, 15/10/1838, 10/9/1841

Three systems of payment were used in various towns for street lighting - payment out of the Common Good or Police Tax of the burgh; Voluntary subscriptions; and surcharges imposed upon all gas consumers. In the 1830's the Common Good, or revenue of all lands and activities by a burgh, was used for public lighting at several towns like Ayr, Maybole, Irvine, and Peebles³, whereas Kilmarnock, Paisley⁴ and other large towns were allowed by Act of Parliament to charge a Police tax for lighting and cleaning.

The success of voluntary schemes varied considerably. In 1860 Lesmahagow⁵ company agreed to supply street lamps at 6/- each, but subscriptions soon ceased and the lamps were not restored until

-
1. Street lamps designed by A. Liddel of Glasgow
S.R.O. Annan Minute Book op cit 6/6/1838, 9/11/1838
 2. S.R.O. Bathgate Minute Book op cit 6/10/1835, 12/10/1836
 3. S.R.O. Stranraer Minute Book op cit 11/2/1836
New Statistical Account vol. III Part II p.16
 4. R. Brown A History of Paisley (1836, Paisley) vol. II p.33
 5. S.R.O. Lesmahagow Minute Book op cit 14/12/1860, 19/4/1878,
21/4/1882

1878. Town councils¹ at Annan in 1850 and Boness in 1865, refused to pay for gas and only voluntary subscriptions kept the streets lit. Public subscriptions financed the first street lights² at Menstrie near Alloa in 1876, Mossend and Bellshill near Motherwell in 1878, Acrum in Roxburghshire in 1884, and Monifieth in 1885. However, at Kilmalcolm³ in 1884 only three quarters of the inhabitants paid the voluntary rate of 1½d in £1, so this had to be raised to 2d. The same year, failure of voluntary schemes led to the cessation of street lighting⁴ in Cambusbarron and Barrhead.

Surcharges were far more successful, but placed the entire burden of operations upon gas companies. At Carnoustie⁵, a committee of residents purchased 30 street lamps, and paid a surcharge of 2d per 1000 cu ft (9/2d) to pay for the gas consumed; by 1886 this system financed 60 street lamps costing £70 per year (including the lamplighter and repairs) by charging consumers 5/10d for gas. Similar schemes⁶ operated in 1875 at Bothwell/Uddingston (5/-) and Barrhead, in 1876 at Auchterarder (8/4) and Markinch (6/8), and in 1878 at Carnoustie (7/11). Gas companies⁷ at Stonehouse and Catrine ceased to provide "free gas" to public lights only in 1885 and East Wemyss⁸ company still did so in 1887. At Doune⁹ in Perthshire, "free gas" was provided for public lights up to 1884 when most private consumers used paraffin oil lamps.

For several districts, municipal lighting minute books are extant although they have not been used in this study, e.g. S.R.O. RHP/10254 Inveresk Special Lighting District (1896); S.R.O. CO 11/9/3/1 Renton Special Water Supply/Drainage/Lighting District (1890-1913) S.R.O. CO2/79/1 Costorphine Lighting and Cleansing Committee Minutes.

-
1. S.R.O. Annan Minute Book op cit 11/10/1850
S.R.O. Boness Minute Book op cit 6/4/1865, 12/10/1865, 24/6/1867
 2. J.G.L. 19/12/1876, 22/10/1878, 20/10/1885, 30/8/1884
 3. J.G.L. 7/10/1884
 4. J.G.L. 25/11/1884, 2/12/1884
 5. J.G.L. 12/1/1886
 6. J.G.L. 13/7/1875, 20/7/1875, 4/7/1876, 18/7/1878, 2/7/1878,
8/7/1884, 14/7/1885
 7. J.G.L. 16/6/1885, 29/11/1887
 8. J.G.L. 12/7/1887
 9. J.G.L. 7/10/1884

(B) Gas Fitting Services

Commercial Directories¹ did not classify gas-fitters separately, but referred inquiries to "Plumbers and Tinsmiths", since gas-fitting was merely an adjunct to those trades, or a side-line for 'ironmongers, brass-founders and bell-hangers. Interior gas-fittings, pipes and meters thus reached consumers through a heterogeneous distribution system, which produced a variety of standards of workmanship and many complaints. Gas undertakings did little to improve the system until faced with the competition from electricity.

Examples of Gas Fitters' Occupations

Date	Town	Fitter	Occupations	Source
1846	Montrose	W.Bowman	tin-plate work, ironmonger, oil-dealer, gas-fitter	(A)
1851	Kilmarnock	E.Kerr	plumber, naphtha-agent, naphtha lamp maker, gas-fitter	(B)
1851	Kilmarnock	J.Hepburn	Brass-founder, bell-hanger, gas-fitter, manufacturer of "gas-holders and apparatus"	(B)
1851	Glasgow	W.Bryden	bell-hanger, window-blinds, gas-fitting	(B)
1856	Dundee	J.Murdoch	plumber, gas-fitter, brass-founder, manufacturer of gas-heaters.	(C)
1866	Stirling	J.Steel	plumber, brass-founder, gas-fitter, bell-hanger	(D)
1866	Galashiels	J.Nisbet	plumber, gas-fitter, zinc-worker, supplier of gas-fittings	(E)
1866	Hawick	J.Guthrie	plumber, gas-fitter, slater, glazier	(E)
1866	Edinburgh	W.Grieve	plumber, gas-fitter, slater glazier	(E)

1. e.g. D.D.Chalmers The Dundee Directory for 1856-7 (1856, Dundee) p.170
 Worrall's Directory of the North Eastern Counties of Scotland (1877, Oldham) p.87
 The New Edinburgh, Leith and County Directory 1867-8 (1867, Edinburgh) p.414

Date	Town	Fitter	Occupations	Source
1866	Kelso	J.Hunter	plumber, gas-fitter, zinc-worker, supplier of gas fittings	(E)
1868	Paisley	J.Thomson	ironmonger, plumber, tin-smith, bell-hanger, gas-fitter	(F)
1877	Aberdeen	J.Blaikie	braziers, bell and brass founder, plumber, gas-fitter	(G)
1877	Kirkcaldy	Barnet & Morton	ironmongers, iron and oil merchants, smiths, tinsplate worker, nailmakers, bell-hangers, gas-fitters.	(G)

- Sources - (A) J.Watt Angus and Mearns Directory for 1846 (1845, Edinburgh)
- (B) Ayrshire Directory 1851-2 (1851, Ayr), advertizing supplement.
- (C) D.D.Chalmers Dundee Directory for 1856-7 (1856, Dundee)
- (D) Threpenny Guide and Directory for Stirling (1866, Stirling)
- (E) The Southern Counties Registered Directory (1866)
- (F) Worrall's Directory for Paisley 1868-9 (1868, Paisley)
- (G) Worrall's Directory for the North Eastern Counties of Scotland (1877, Oldham)

1. cont. Westwood's Parochial Directory for the Counties of Fife and Kinross (1862, Edinburgh) pp. 66, 73-85, 143-51, etc.

(9) The Competition From Electricity - Early Installations 1879-91

Date	Installation	Notes
1879	Messrs Garvie's Works, Aberdeen ¹	By Messrs Mawson & Swann, Newcastle-on-Tyne
1879	St. Enoch Station, Glasgow ²	By J.Horton, of British Electric Light Co., using 4 Gramme's magneto generators.
1880	Yards & Stores of Messrs Robert Napier & Son, Glasgow	
1880	Messrs Elder & Co., Shipyards ³	
1880	Gourlay's shipyards ⁴	} Dundee
	Messrs Cox's Works, Albert Institute	
1881	Many Scottish Mills ⁶	Equipment by Crompton & Co.
1881	Cathcart Square, Greenock ⁷	
1881	Swan's Light, Glasgow ⁸	At College of Arts & Sciences; & Messrs D. & G. Graham, telegraph engineers.
1881	Earnock Colliery, Hamilton ⁹	With 21 Swan Lamps
1881	Mansfield Mill, Hawick ¹⁰	32 Swan Lamps for stocking-frame light.
1881	Messrs G.Roberts & Co., Selkirk ¹¹	300 Lights at Forrest and Philiphaugh Mills.
1881	J.Turnbull & Sons, Hawick ¹²	
1881	Messrs Anderson & Munroe, Glasgow ¹³	Kelvin Street Works
1881	Glasgow Fine Arts Institute ¹⁴	
1882	Argyleshire Hall, Oban ¹⁵	c.f. gas 8s 4d
1882	Queen Street Station, Glasgow ¹⁶	By Messrs Crompton & Co., (arc lamps)
1889	Messrs T.P.Miller, Cambuslang	Dyeworks
1891	Peebles Mill	One of three largest mills in Peebles used electricity.

Note - Electricity was well adapted for lighting shipyards, and was used during construction of the S.S. 'Great Eastern' in 1857 vide J.G.L. 27/10/1857, p.515

Sources - J.G.L. (1) 21/1/1872, (2) 3/2/1880, (3) 6/7/1880, (4) 6/1/1880, (5) 22/2/1881 & 18/12/1888, (6) 8/3/1881, (7) 17/5/1881, (8) 17/5/1881, (9) 16/8/1881, (10) 29/11/1881, (11) 29/11/1881, (12) 4/1/1881, (13) 4/10/1881, (14) 22/11/1881, (15) 21/2/1882, (16) 15/2/1882

(10) Varieties of Consumers(A) Their Relative Importance at Paisley 1839-43

Date	Time-Contract		Consumption By Meter		Weavers		Police Lamps	
	Number of Persons		Number of Persons; Meters		Number of Persons		Number	
1839	2702		993	1096	3894		641	
1840	2851		1094	1192	3437		651	
1841	2889		1111	1231	3099		639	
1842	2728		1108	1220	1962		644	
1843	2379		1104	1243	2108		666	
	£	% Total	£	% Total	£	% Total	£	% Total
1839	2832	27.9	5249	51.8	1653	16.3	409	4.0
1840	2919	27.8	5654	53.9	1457	13.9	466	4.4
1841	2876	26.3	6279	57.5	1312	12.0	458	4.2
1842	2754	28.8	5591	58.5	731	7.6	478	5.0
1843	2296	25.1	5586	61.0	849	9.3	430	4.7

Date	Total Value of Gas Consumed (as above) £	Discounts Allowed £	Gas Revenue £	Meter Revenue £	Average Discount %
1838	-	-	-	358	-
1839	10,142	939	9204	313	9.3
1840	10,495	976	9519	248	9.3
1841	10,924	1121	9802	190	10.3
1842	9,555	948	8607	138	9.9
1843	9,160	950	8210	108	10.4

Note - Minimal importance of public lamps paid by Police Commissioners.
 1842 slump of weaving trade which reduced total consumption.
 Value of consumption and percentage importance is stated before deduction of discounts.

Source - H. Lords 1844 Vol 8 31/7/1844 pp. 212-45

(A) Varieties of Consumers at Ayr (1896, 1903)

(i) Categories of Consumers above £5 per year (1896)

Category £	No. Consumers	Gas Thou. cu ft	Revenue £
5-10	26	267	1,300
10-15	109	533	1,090
15-20	30	800	450
20-25	14	106.7	280
25-30	9	133.4	225
30-40	7	160	210
40-50	17	213.3	680
50-60	9	266.7	450
60-70	3	320	180
70-80	1	373.4	70
Above 80	1	426.7	80
Burgh		3,930	737
Railway Co.		2,048	384
Asylum		1,493	280
Bell Isle		933.4	175
Barracks		733.4	145

(ii) Categories of Consumers (1903)

Category	No. Consumers	Gas Revenue £	% Discount	Revenue Loss by Discount, £
Under £5	2,553	-	-	-
5-10	261	1,957	5	98
10-15	94	1,175	5	59
15-20	29	558	5	25
20-30	17	425	5	21
30-40	13	455	5	23
40-50	6	270	5	14
50-60	7	385	7.5	29
60-70	4	260	7.5	20
70-80	5	375	7.5	28
80-90	4	340	7.5	20

Category	No. Consumers	Gas Revenue £	% Discount	Revenue Loss by Discount, £
90	1	90	7.5	25
200	1	200	10	7
215	1	215	10	22
225	2	225	10	23
560	1	560	10	56
635	1	635	10	64
Total	<u>3,000</u>	<u>8,130</u>		<u>532</u>

Source - S.R.O. Ayr Minute Book op cit 21/9/1896, 26/10/1903

APPENDIX X V I

Data Relating to the Consumers Movement

(1) Plans by W.Neilson for New Gasworks at Paisley (1843) and at Hamilton (1846)

(2) George Flintoff and the Consumers Movement :

References from the Journal of Gas Lighting 1853-69

(3) Membership of Consumers Action Committees :

(A) Glasgow 1819

(B) Edinburgh 1828

(C) Edinburgh 1839

(D) Edinburgh 1844

(E) Edinburgh 1845

(F) Edinburgh G.L.Assn. 1845

(G) Flintoff's Campaign Action Committees -

(i) Dundee 1861 (ii) Alyth 1861

(iii) Forfar 1861 (iv) Carnoustie 1861

(4) Flintoff's Financial Estimates for New Gasworks in 1861 at

Alyth

Blairgowrie

Broughty Ferry

Carnoustie

Dundee

Forfar.

(1) Plans by W.Neilson for New Gasworks at Paisley (1843) and
Hamilton (1846)

(A) Paisley

Estimate by W.Neilson (verbatim)

	£
Estimated expense of work for Paisley including nearly 19 miles of mains	16,115
Additional small mains to make 27 miles	<u>1,520</u>
	17,635
2,000 meters, average £2 including cost of fitting	<u>4,000</u>
Gross expense of work for Paisley	21,635

Produce (cu.ft.)

Take the present consumption of gas at Paisley to be:	27,000,000
It is assumed that the increase arising in various ways and by competition may be:	<u>10,000,000</u>
	37,000,000

Of this allow to the Old Company	20,000,000
and to the new Company	17,000,000

To enable the new Company to sell 17,000,000 of Gas, they should produce about 19,000,000 being an allowance of above 10% for waste. Gas produce say 19,000,000. To give this quantity of Gas, will require 1,900 tons of coal producing 10,000 cubic feet per ton, say Lesmahagow 2/3rds at 18s 6d and 1/3rd Skaterigg, or Kilburnie at 11s, this is 16s per ton.

	£	s	d
Expense of Coal	1,520	0	0
95 tons of Lime @ 9s per ton	42	15	0
Wages and Salaries, etc.	859	2	6
Ordinary charges for wear and tear of apparatus	250	0	0
Sundries	150		
Gross cost of producing 19,000,000 cubic feet at 2s 11d per 1,000	2,821	17	6
Return			
Take 17,000,000 at 5s 9d is:	4,882	10	0
Rent of meters, say:	100	0	0
Products arising from manufacture of gas say:	<u>100</u>	0	0
Gross Receipts	5,082	10	0

Gross Receipts Bt. Fwd.	£5,082 10 0
Deduct	
Bad debts at 5%	<u>254 0 0</u>
Gross Annual Reserve	4,828 10 0
Gross Cost of Producing	<u>2,821 17 6</u>
Nett Profit	2,006 12 6
Deduct for contingency fund at 5%	<u>100 6 6</u>
	1,906 6 6
Dividend of 6% on sum expended i.e.	1,298 0 0
Leaving for Discounts to Consumers and interest on extra costs	608 6 0

Source - H.Lords, 1844 vol. 8 1/8/1844, p.317

Three sub-stations were required as follows, at a total cost of £29,825, or £25,825 excluding meters:

- i. Paisley Gasworks - £16,115 15s (out of the town on Lough Street) including 19 miles of mains at 14" to 1" dia. (c.f. 27 miles owned by Old Company)
- ii. Barrhead-Neilston Gasworks and Mains - £3,872
- iii. Johnstone district Gasworks and Mains - £4,306 18s

Large mains, like those of Glasgow City and Suburban Company, would have enabled the supply pressure to be far lower than the 3 inches used by Paisley Old Company which thereby suffered 36-52% leakage. The Paisley population was expected to soon reach 60,000, and gas consumption to rise to 30 million cu.ft. per year. The new works could have produced up to 17 million cu.ft. for sale at 5s 9d; giving a revenue of £4,887. 1,700 tons of coal per year, costing £1,298 would have given 10,000 cu.ft. per ton at a prime manufacturing cost of 3s per 1,000 cu.ft. Neilson aimed to use two-thirds Lesmahagow coal at 18s per ton; and one third of other coals which averaged 10s, including Skaterigg at 12s, Woodside coal at 10s 3d, and Kilburnie coal at 11s. He allowed £350 for 1½ acres of land; £859 for annual wages and salaries (but no allowance for the Directors); and an annual depreciation of only £250 compared to the £500 to £600 taken by the Old Company on £21,635 capital.

W.Neilson described his previous engineering experience as that of assisting his father J.B.Neilson "in making out plans for

different apparatus, and setting up a few works" to make gas.

Source - H. Commons 1844, vol. 8, 'The Paisley Gas Bill', 31/7/1844
pp. 317, 343, 344, 1/8/1844, p.31

(B) Hamilton

Built at an estimated cost of £1,927, Hamilton new gasworks was much larger than the old works and aimed to supply 3,169 jets with gas at 5s per 1,000 cu.ft. They incorporated many technical improvements devised since 1831, especially larger pipes and apparatus.

Fixed Capital Expenditure:

Mason work	£488	Gasholder Tank	£180
Gas apparatus	£485	Gasholder	£355
Carpenter and Joiner work	£217	Retort-house roof	£46
Brickwork of Ovens	£217		

Source - H.Commons 1846, vol. 102 7/5/1846 p.202

The total town consumption was estimated at 3.8 million cu.ft. a year, but the works were designed to produce over 4.7 million cu.ft., and W.Neilson admitted that if the Old Company had not collapsed under competition, then the profits of the new Company could only be "a very small percentage!" This was the start of the gamble by the New Company, though, "I understood from the people, they did not care about the profits at all if they could make the gas cheaper to them". Neilson planned the works to carbonize 437 tons coal a year; $\frac{1}{2}$ Lesmahagow and $\frac{1}{2}$ inferior coals, which would average 10,000 cu.ft. per ton. The Lesmahagow cost 16s a ton; and coals like those of Nethingfoot pit only 10s.

Extra pipes to supply Motherwell would have cost £1,175, and if the population there rose to 1,200, Neilson planned to supply that town:- the extra gas could be manufactured for £45 17s and at 6s 8d would have given £183 7s; the expected profit of £137 10s allowed $7\frac{1}{2}\%$ dividend and £49 8s for contingencies and the maintenance of pipes. Bothwell with a population of 855 could have given an estimated revenue of £116 13s, sufficient for $7\frac{1}{2}\%$ dividend and £28 14s for maintenance of the necessary supply pipes.

For the new Hamilton gasworks as a whole, Neilson estimated an annual gas revenue of £350 14s, raised to £962 14s by reserve from

ammonia and naphtha. Working costs would have been £582 10s, giving a profit of £380 4s, sufficient for 7½% dividend and £68 15s for "contingencies and maintenance of works" (initially a depreciation fund). The total works, including working capital, were to have cost £4,150, and "the main pipes are more costly than the works [apparatus] generally!"

In the annual accounts, Neilson allowed 15% for leakage, condensation and bad debts; it was normal gasworks practice to allow 5% for bad debts. £186 was allowed for wages and salaries; £18 for hire of test pumps; and £79 for incidentals, varying from stationary to repair of the retorts. He excluded the cost of meters (at 25s each) from the capital expenditure, in the false belief that they should remain a separate account, since the Company could recover that expenditure in full by selling them to consumers. Some companies allowed 3½% for depreciation, but the practice varied greatly and Neilson believed "the fact of the matter is they lay aside as much as they can lay aside" Such reserves taken out of surplus profits, were later capitalized.

W.Neilson's calculations were verified before Parliament by John Haswell, lessee of Ayr Gasworks.

George Miller, a chemical manufacturer from Glasgow made the most informed criticisms of Neilson's estimates. The Company failed to budget for meters, which would cost £7-800, and thus raise the capital required to £5,000. They had allowed an inadequate amount for contingencies, and for depreciation since the deterioration of underground pipes and the re-building of retort benches were a heavy burden. "The usual course of some of the other gas works is to lay aside every year 1% upon the capital for deterioration and 5% upon the profits for a contingent fund to run to a few thousand pounds!"

Miller believed that the cheapest second-class coal at Hamilton was 13s 9d; not 10s as Neilson stated. The Old Company used 500 tons of coal a year, entirely Lesmahagow, but they only obtained 8,500 cu.ft. per ton and lost 15% by leakage, making total annual sales 3,612,500 cu.ft. At 6s 6d it gave that Company a revenue of £1,173 15s, or £1,157 4s 3d when 1.25d was allowed for bad debts per 1,000 cu.ft.

Miller estimated the real capital outlay by the New Company

would be £4,150 for the works, £750 for meters, and £600 for the Parliamentary Bill. 4% of that £4,900 should have been allowed annually for depreciation, thereby raising annual expenses by £196 to £893. If gas was sold at 6s 6d, as the old Caompany charged, the revenue would only be £1,157 4s 3d; by subtracting £893 this left a low profit of £265 9s 3d, equivalent to a dividend around 5%. Miller insisted that a gas company was not viable if profit fell below 7%.

Although the New Company was prepared to restrict its gas price to 5s in the Bill, Miller maintained that the public would inevitably suffer from a duplication of capital outlay in Hamilton, and that gas sold at 5s would be of such poor quality it would "run through the meter like a race horse". Parliament at that time never imposed quality standards upon the gas produced by Chartered companies.

On the question of a depreciation fund, Miller's statement may have been correct for large city works like Glasgow and Paisley; but Neilson's description of capital arrangements was far more typical of a small town like Hamilton.

Source - H. Commons, 1846 vol. 10 7/5/1846, p. 202, 11/5/1846 p.104

(2) George Flintoff and the Consumers' MovementDate in J.G.L.

- 11/7/1853 p.191 Flintoff or Sec., Sheffield Consumers Co. - active promoting other consumers companies.
- 10/1/1855 p.4 Fraud Claims within Sheffield Consumers Co.
- 10/2/1855 p.345 Flintoff's attempted Consumers Co. at Boston.
- 10/11/1855 } Flintoff and "The Meter Hubbub in Liverpool";
 8/1/1856 } where he accused the Company of using inaccurate
 5/2/1856 } meters.
 19/2/1856 }
- 8/7/1856 Flintoff agitating in Bristol.
- 23/12/1856 p.702 suggestion for Flintoff to become engineer of Great Central Gas Consumers Co.
- 20/1/1857 } Flintoff agitating in Dublin.
 23/6/1857 }
- 1/9/1857 Cork Gas Consumers Co.
- 4/1/1859 Flintoff agitating in Dublin.
- 26/2/1861 p.115 Glasgow Cheap Gas Movement.
- 7/5/1861 p.286 Flintoff in Edinburgh.
- 13/8/1861 p.579 Flintoff in Scotland.
- 10/9/1861 p.636 Flintoff's campaign in Newcastle newspapers.
- 8/10/1861 p.691 Flintoff's agitation in Perth and Dundee.
- 22/10/1861 Flintoff advised Dundee Council to purchase Gas Company.
- 31/12/1861 Flintoff's renewed campaign in Sheffield.
- 11/3/1862 p.141 Flintoff agitating in Aberdeen.
- 25/3/1862 p.172 Flintoff opposed Aberdeen Improvement Bill as paying too much for Gasworks.
- 17/6/1862 p.391 } Flintoff in Cardiff.
 1/7/1862 p.438 }
- 16/12/1862 p.806 Flintoff v 'Stirling Observer'
- 10/2/1863 } Flintoff in Bristol.
 10/3/1863 p.121 }
- 21/4/1863 p.252 Flintoff at Weston-Super-Mare.
- 6/9/1864 p.623 Cheap gas agitation at Preston.
- 1/11/1864 } Flintoff at Brighton.
 15/11/1864 }
 29/11/1864 }
- 29/11/1864 p.805 Flintoff at Paddington.

Date in J.G.L.

- 13/12/1864 p.841,854 Flintoff at Maidstone.
- 27/12/1864 p.871,878 Flintoff at Leamington.
- 24/1/1865 p.35 "Gas Agitation in the Provinces"
- 21/2/1865 } Flintoff agitating in London.
- 18/4/1865 p.371 } .
- 16/5/1865 p.404 "The Cheap Gas Movement at Gravesend"
- 22/8/1865 p.629 Failure of Flintoff's Gas Co. in Perth.
- 23/1/1866 } Flintoff in Dorchester and Weymouth.
- 6/2/1866 }
- 21/8/1866 p.645 Flintoff's planned second Scottish tour.
- 19/3/1867 p.171 Flintoff at Newbury.
- 29/10/1867 p.898 Flintoff at Brighton and Worcester.
- 12/11/1867 p.966 Flintoff at King's Lynn.
- 17/8/1869 p.659 Flintoff rejected by his converts, but gas agitation continuing.

(3) Membership of Consumers' Action Committees

(A) Interim Committee of Glasgow New Gas Company (1819)

John Geddes	Thomas Buchanan	Robert Humphreys
Thomas Alston	William Dickson jr.	Andrew Liddell
Dr George Hendry	John Muir	John Russell
John McAsland	James Edington	James Cook
Colin Gillespie	Robert Hastie	John Hunter
John McNair jr.	Robert McIndoe	Thomas Graham
James Lumsden jr.	John Scruton	William Lang
Daniel Chisholm	William Dick	Robert Hannan
George Lewis	William Hutchison	James Taylor
James Dawson	John Thomson	George Duncan
Thomas Lennox	George Young	William Harley
Alex. Aitkenhead	Andrew Zuill	William Young
Thomas Douglas	John Bryce	John Lilburn

Source - Glasgow Chronicle 12/6/1819 p.3

(B) Edinburgh (1828)

The Edinburgh Union Gas Light Company (1828) distributed printed information, and accepted subscriptions through -

Robert McLaren, St. Andrews St.	R.Alexander, Frederick St.
Adam Stewart, Howe St.	J.Ker, Nicholson St.
Messrs R.Richardson & Co, West Bow	Messrs Oliver & Boyd, Tweedale Court
R.Falkner, Blair St.	
Messrs Alexander Allen & Co, bankers	Wm. Alexander, Windsor St.
	Mr Wright, Greenside Place

Source - Edinburgh Evening Courant 19/4/1828

(C) Provisional Committee of Edinburgh New Gas Light Company, 1839

The Lord Provost	R.Clark, merchant
Bailies Grieve, Ramsay, Richardson	C.D.Campbell, bookseller
J.Clark, Convener of Trades	Councillors Dobson & Ponton
J.Anderson, Baron Bailie of Portsburgh	T.Edmonstone, ironmonger
W.Alexander W.S.	J.B.Gracie W.S.
J.Richardson jr., bookseller	George Grant, advocate
G.H.Bell M.D.	G.Hewat, wine merchant
G.Bookless, glazier	Bailie Hill of Portsburgh
Bailie Campbell	T.Ireland, merchant
	W.Johnston, engineer

(C) Edinburgh (continued)

J.Learmouth of Dean	W.Cooper, stained-glass manufacturer
J.Lees, tobacconist	G.Duncan, bootmaker
Professor Lizars	J.R.Dymnock, grocer
W.Lindores, grocer	P.Forbes, merchant
James Mitchell S.S.C.	A.Grierson, clothier
W.Malcolm S.S.C.	A.Hill, printseller
W.Macalpin, furniture-printer	E.Henderson, seedsman
J.McGregor, accountant	D.R.Hay, painter
A.Park, grocer	A.Jamieson, Dept. Chairman Chamber of Commerce
F.Richardson, dry-salter	Professor Kelland
J.Robertson, muslin seller	J.Laing, bookseller
W.Richardson, seedsman	C.Lawson, seedsman
D.E.Sandeford, advocate	A.Longmore of Coates Cresc.
Geo. Sinclair of George St.	J.McLachlan, wine merchant
W.Scoon, grocer	P.McGregor, merchant
J.Smith, architect	J.McDonald, shawl manufacturer
J.Spittal, merchant	Andrew Millar, merchant
W.Tait, bookseller	D.S.Reddie, accountant
J.Taylor, wine merchant	D.B.Reid, lecturer in Chemistry
G.Turnbull W.S.	Captain Ross, R.N.
J.White, furrier	W.Rutherford, spirit merchant
J.Weddell, hosier	R.Richardson, tobacconist
W.Whitehead, hosier	C.Smith, bookseller
Lord Dean of Guild	Bailie Scott of Portsburgh
A.Adams, wine merchant	J.Stewart, wine merchant
J.Hill, Master of Merchant Co.	J.Steuart S.S.C.
W.K.Aitchison, brewer	H.Scott jr., hat manufacturer
T.L.Abernethy, wool spinner	J.Tait, bookseller
R.Alexander, wine merchant	A.Thomson, merchant
A.Black, bookseller	D.J.Thomson, leather merchant
J.Burke, upholsterer	Dept. Commissary-General Wemyss
P.Crooks W.S.	A.Wright, seedsman

Source - The Scotsman 20/3/1839

(D) Promoters of Edinburgh Union Gas Light Company (1844)

V.C.Baird, merchant	James White, merchant
G.Tibbets, merchant	D.Baswall of Wardie, Captain R.N.
J.Anderson, merchant	R.Blyth, merchant
Charles Dick, brewer	Thomas Duncan, gent.
Andrew Falkner, gent.	Alex. Ferguson, gent.
George Hewat, merchant	Peter Howden, merchant
David Ridpath, gent.	A.Sclanders, gent.
Thomas Stevenson, merchant (Leith)	A.Symington, merchant
James Weddell, gent.	W.Whitehead, merchant

Source - The Scotsman 14/2/1844

(E) Promoters of Edinburgh New Gas Light Company (1845)

Bailie Gray	Convener Banks
John Mitchell, merchant (Leith)	Richard Miller
David Cormack, accountant	Councillor Thomas Russell
F.Ranken, glass manufacturer	James McLean
Dr Thomas Fairbairn	Thomas Gilbert

Source - Edinburgh Evening Courant 22/3/1845, The Scotsman 19/3/1845

(F) Promoters of Edinburgh Gas Light Association (1845)

James O. Mack, magistrate	Alex. Sinclair, merchant
Councillor Scott	Thomas Swanston, merchant
Robert Philip of Leith	Councillor Lindsay
William Cowan, merchant	E.Macglashan, bookseller
Robert Laidlaw S.S.C.	George Crichton
Alex. Jamieson, accountant	C.D.Young, ironmonger
Charles McCaul	G.R.Ogilvy, advocate of Westhall
Alex. Banks jr., stationer	John Boyd
Ed. Piper, coach contractor	

Source - The Scotsman 19/3/1845 p.3

(G) Flintoff's Campaign Action Committees

(i) DUNDEE 1861

David Hunter of Blackness	R.H.Isdaile, hatter
J.Thomson, gas-fitter	J.Alexander, bookseller
F.Henderson, leather merchant	P.Fleming, agent
J.A.Gloag, writer	A.Smith, shoemaker

Source - Dundee Advertizer 4/10/1861

(ii) ALYTH 1861

Bailie Japp	Wm. Pattullo	Wm. Buick
John Fenton	Isaac Peterkin	Robt. Munro
James Shaw	James Fenton	Wm. Molison
Wm. Duffus	John Howie	James Cameron

Source - Dundee Advertizer 22/10/1861

(iii) FORFAR 1861

P.Webster	Bailie Anderson	R.Tosh, merchant
James Grant, merchant	John Laird jr, manufacturer	Bailie Webster
C.Norrie, bleacher	R.Thornton, writer	Mr Alan of W.&J.Don & Co.
J.Grant, writer		J.Carnegie, draper

Source - Dundee Advertizer 25/10/1861

(iv) CARNOUSTIE 1861

W.Gibson, mason	R.Millar, grocer	D.Anderson, tailor
J.Lawson, grocer	R.Stephen, baker	W.Morrison, wright
W.Hogg, flesher	J.Mill, druggist	J.Rea, manager
J.F.Alexander, artist	T.Dewar, draper	J.Winter, bootmaker
W.Anderson, manager	J.Hutcheson, overseer	A.Scott, resident

Source - Dundee Advertizer 26/11/1861

(4) Flintoff's Financial Estimates for New Gasworks in 1861Flintoff's Estimate for Alyth Gasworks (3 million cu ft per year)(1861)

	£	s	d
Gasometer and Tank	480	0	0
Retort House and other Buildings	150	0	0
Retorts, condensers, purifiers, scrubber, valves, working tools	185	0	0
Pipes (3,600 yards)	641	13	4
Irregular pipes and services	50	0	0
Repairing roads	30	0	0
Legal expenses	20	0	0
Engineer's time and expenses during construction	75	0	0
Trading capital, extension of works, etc.	108	6	8
Sundries	60	0	0
	<hr/>		
Total cost	1800	0	0

Annual Accounts

278 tons coal (28/- per ton)	389	4	0
278 bushels lime (6d per bushel)	6	19	0
Labour, management, wear and tear (6d per 1000 cu ft)	75	0	0
Meter inspector and collector	30	0	0
Rents, taxes, feu duty	25	0	0
Stationery, etc.	8	0	0
	<hr/>		
Total expenditure	534	3	0

Revenue -

Coke, tar, ammonia liquor (2/6d per ton coal)	34	15	0
Gas (prime manufacturing cost)	499	8	0
	<hr/>		
Total revenue	534	3	0

Cost of Gas

Prime manufacturing cost	3	4	
Losses, leakage and bad debts	0	8	
5% interest on £1800 capital	0	7½	
	<hr/>		
Selling price	4	7½	

At only 2 million cu ft per year, gas would cost 4/10¹/₂d, and at one million cu ft, 5/7¹/₂d. G. & W. Flintoff were willing to guarantee the supply of gas at those prices. Although Alyth gas company refused to reduce the normal gas rate from 10/- to 6/- like neighbouring towns, the Consumers Company was never formed.

Source - Dundee Advertizer 22/10/1861 p.3, 8/11/1861 p.5

Flintoff's Estimate to Supply 7 million cu ft per year at Blairgowrie

(1861)

	£	s	d
Gasholder and tank	750	0	0
Purifiers	105	0	0
Retort house, chimney and other buildings	220	0	0
Retorts, hydraulic main, and connections	125	0	0
Puddle for tank and labour	55	0	0
Valves and connections	75	0	0
Station meter and governer	95	0	0
Boundary wall	50	0	0
Pipes (6,800 yards)	1,300	0	0
Irregular pipes and services	130	0	0
Road repairs (6,800 yards at 6d)	170	0	0
Legal expenses, registration for Limited Liability	25	0	0
Engineer's time and expenses, and plans	100	0	0
Sundries	50	0	0
Trading capital, contingencies, extensions	255	0	0
Total Capital Cost	3,500	0	0

Expenditure

637 tons coal (28/- per ton)	891	16	0
637 bushels of lime (6d per bushel)	15	18	6
Labour, wear and tear, management	175	0	0
Salaries of meter inspector and collector	35	0	0
Rents, taxes, feu duty	40	0	0
Stationery, printing, sundries	15	0	0
Total Expenditure	1,172	14	6

Revenue

Coke, tar, ammonia (3/- per ton coal)	95	11	0
Prime cost gas (7 million cu ft)	1,077	3	6
Total Revenue	1,172	14	6

Price of Gas	s	d
Prime manufacturing cost	3	1
Losses, leakage and waste	0	4½
5% interest on capital	0	6
	3	11½

Source - Dundee Advertizer 1/11/1861

Flintoff's Estimate of Capital Costs to Supply 10 million cu ft per
year in Broughty Ferry (1861)

	£	s	d
Registration for Limited Liability, and expenses	50	0	0
Gasometer and tank	850	0	0
9 retorts, connections and hydraulic main	210	0	0
Condensor	80	0	0
Purifiers	130	0	0
Retort house and buildings	300	0	0
Valves, weighing machine, etc.	40	0	0
Engineer's time and expenses during construction	100	0	0
Pipes (13,900 yards)	2,699	11	8
Irregular pipes	134	0	0
Repair of roads	100	0	0
Trading capital, contingencies, extensions	146	8	4
	<hr/>		
Total Cost	5,000	0	0

Annual Working Costs

910 tons coal (25/- per ton)	1,137	10	0
910 bushels lime (6d per bushel)	22	15	0
Labour, wear and tear, inspection	250	0	0
Salaries to meter inspector and collector	50	0	0
Rent, taxes and feu duty	80	0	0
Stationery, printing, and sundries	50	0	0
	<hr/>		
Total Expenditure	1,590	5	0

Revenue

Coke, tar, ammonia (2/6d per ton coal)	113	15	0
10 million cu ft gas at prime cost	1,476	10	0
	<hr/>		
Total Revenue	1,590	5	0

Potential Gas Price at Broughty Ferry

	s	d
Prime manufacturing cost	2	11½
Losses, leakage, etc.	0	5
5% interest on capital	0	6
	<hr/>	
Sale Price	3	10½

Note - Capital cost of Gas Meters was excluded because it came under a separate account, being covered by an annual rent of 7.5% i.e. 5% interest and 2.5% depreciation.

Estimate signed "G. & W. Flintoff, Gas Engineers"

Source - Dundee Advertiser 18/10/1861 p.3

Flintoff's Estimate for Carnoustie Consumers Gas Company (1861)

(3 million cu ft per year)

	£	s	d
Legal expenses and registration for Limited Liability	15	0	0
Gasholder (20,000 cu ft) and Tank	520	0	0
Retorts, hydraulic main and connections	67	10	0
Condenser, purifiers, scrubber, valves, governor, weighing machine and tools	122	0	0
Retort house, coal shed, and chimney	175	0	0
Boundary wall	35	0	0
8100 yards pipes (including repair of streets)	679	3	4
Irregular pipes and services	35	0	0
Engineer's time and expenses, and plans	75	0	0
Sundries	25	0	0
Trading capital, contingencies, extensions	51	6	8
	<hr/>		
Total Capital Cost	1800	0	0

Annual Expenditure

300 tons coal (21/- per ton)	315	0	0
300 bushels lime (6d per bushel)	7	10	0
Wear and tear, labour, etc. (6d per 1000 cu ft)	75	0	0
Gas rent collection, meter inspectors, etc.	12	10	0
Rents, taxes, feu duty	7	10	0
Stationery and sundries	4	10	0
	<hr/>		
Total Expenditure	422	0	0

Revenue

Tar, coke, ammonia (1/- per ton of coal)	15	0	0
Prime cost of gas	407	0	0
	<hr/>		
Total Revenue	422	0	0

Price of Gas - prime manufacturing cost	2	8 $\frac{3}{4}$
interest on capital	0	7 $\frac{1}{4}$
losses, leakage and waste	0	8
	<hr/>	
Selling Price	4	0

Note - For 3 million cu ft the price rose to 4/8 $\frac{1}{2}$ d, and 1 million would cost 5/7d per 1000 cu ft.

Source - Dundee Advertiser 26/11/1861 p.3

Flintoff's Estimate for Dundee Gas Consumers' Company (1861)

To supply 120 millions cu ft per year

	£	s	d
Gasholder (420,000 cu ft) and Tank	5800	0	0
50 double-ended retorts, ascension pipes, hydraulic mains, fitted up	1500	0	0
6 purifiers (15 feet square), valves, and lifting apparatus	1125	0	0
2 scrubbers (6 feet square, 9 feet deep)	296	10	0
Governors, valves and connections	280	0	0
Condenser (10 rows of 36 inch annular pipes in 65 foot long box)	386	0	0
Tar well, pumps, syphons	80	0	0
Exhauster, engine, and duplicate boilers	520	0	0
Weighing machines	80	0	0
Stocks, dies, fitter's tools	120	0	0
Pump and fixing	25	0	0
Ladders, coke barrows, stoker's tools	45	0	0
Experimental meter and testing apparatus	27	0	0
Pressure guages	12	0	0
Meter testing apparatus	55	0	0
Retort house and buildings	800	0	0
Boundary wall	240	0	0
Chimney stalk	140	0	0
Mains pipes (78,400 yards)	21805	0	0
Repairing roads (78,400 yards at 1/- per yard)	3920	0	0
Irregular pipes	500	0	0
Consumers' meters (10,000 various sizes)	14250	0	0
Legal expenses	350	0	0
Engineer's fees for supervising construction, and designs	600	0	0
Trading capital, contingencies, extensions	7043	10	0
	<hr/>		
Total Capital Cost	60,000	0	0

Source - Dundee Advertiser 15/10/1861 p.5

Flintoff's Estimate of Annual Manufacturing Costs (1861) of 120

Million cu ft in Proposed Dundee Consumers Company

	£	s	d
10,920 tons coal (25/- per ton)	13,650	0	0
10,920 bushels lime (at 6d)	273	0	0
Labour, wear and tear, Inspectors (6d per 1000 cu ft)	3,000	0	0
Collectors, meter-inspectors, and book keepers	650	0	0
Manager	250	0	0
Feu duty	300	0	0
Rents, rates, taxes, etc.	350	0	0
Stationery, printing, sundries	240	0	0
Wear and tear of meters	368	15	0
	<hr/>		
Total Expenditure	19,081	15	0
Revenue			
By-products (5/- per ton coal)	2,730	0	0
Meter rent (5% on 10,000)	1,106	5	0
Gas (11,000 cu ft per ton coal) prime cost	15,245	10	0
	<hr/>		
	19,081	15	0

Sale Price of Gas

	£	d
Prime manufacturing cost	2	6½
4½% interest on £60,000 capital	0	5¾
Losses, leakage and bad debts	0	4½
	<hr/>	
	3	4¾

Note - Although 25/- was allowed for coal, Parliamentary statistics showed the average price for Dundee Old Company up to 1850 as 19/8½d, at which price gas should have been 5½d cheaper. If the new company sold only 80 million cu ft per year, gas would cost 3/7½d.

Source - Dundee Advertiser 15/10/1861 p.5

Flintoff's Estimate for New Gas Works at Forfar (1861)

To produce 15 million cu. ft. per year

Capital Costs -	£	s	d
Registration for Limited Liability	30	0	0
Gasometer (80,000 cu. ft.) and Tank	1115	0	0
Purifiers, condenser, scrubber	465	0	0
Retort House and Chimney Stalk	290	0	0
Retorts, hydraulic main and connections	240	0	0
Boundary wall	60	0	0
Roof for Coal Shed	60	0	0
Puddle for Tank, and Labour	75	0	0
Valves and Connections	85	0	0
Station Meter and Governor	130	0	0
Pipes (22,000 yards)	4025	0	0
Engineer's Time and Expenses in construction	200	0	0
Repairing Roads (22,000 yards at 6d)	550	0	0
Irregular pipes and Sundries	150	0	0
Working costs, extensions, &c	525	0	0
	<hr/>		
	8000	0	0
 Annual Costs -			
1365 Tons cannel coal (30s per ton)	2047	0	0
1365 Bushels lime (5d per bushel)	34	2	6
Wear and Tear, Labour, Management (6d per 1000 cu. ft.)	375	0	0
Collector, Book-keeper, Meter Inspector	100	0	0
Rents, Taxes, Feu Duty	75	0	0
Stationary	20	0	0
Sundries	25	0	0
	<hr/>		
Total Expenditure	2676	0	0
 Annual Revenue -			
By-products (3s per ton coal)	204	15	0
Gas at Prime manufacturing cost (15 million cu. ft.)	2471	5	0
	<hr/>		
Total Revenue	2676	0	0
 Cost of Gas -	s	d	
Prime manufacturing cost	3	4	
Losses and Leakage	0	4	
5 % "interest" on £8000 capital	0	6.5	
	<hr/>		
Selling Price	4	2.5	

Source - Plans by G. and W. Flintoff Dundee Advertizer 25/10/1861

APPENDIX X V I I

Limited Scottish Gas Companies -

Bibliography and Statistics

- (1) Index to Sample of Scottish Gas Companies which Registered
with the Board of Trade under the Company Acts
- (2) English Share Owners in Scottish Limited Gas Companies
- (3) Preference Shares in Limited Gas Companies
- (4) Share Values -
Nominal and Called-Up Shares in Sample of Limited Gas
Companies
- (5) Total Nominal Capital Stock of Sample of Gas Companies at
the Date of Their Registration for Limited Liability.

SCOTTISH GAS COMPANIES WHICH REGISTERED WITH THE BOARD OF TRADE UNDER
THE COMPANIES ACT

Company	Record Number (B.T.2/)	Date Commenced	Date Registered	Nominal Capital £	Nominal Shares £ s	
Dumfries	22	1825	1857	12,000		
Lochgilphead	24	1844	1857	2,400	5	0
Cumbernauld	26	pre 1849	1857	1,000	2	10
Lasswade & Bonnyrigg	25	1849	1857	1,600	1	0
Newport	32	1856	1858	1,300	1	0
Lochmaben	41	1858	1858	800	5	0
Dalbeattie	45	1858	1858	900	5	0
Bothwell & Uddingston	44	1858	1858	2,500	1	0
Carnwath	43	1858	1858	1,200	1	0
Falkirk J.S.	6	1845	1859	4,000	2	0
Aberlour	48	1859	1859	650	1	0
Bridge of Earn	46	1859	1859	900	1	0
Ecclefechan	61	1860	1860	750	1	0
Lanark Consumers	58	1860	1860	2,500	1	0
Meigle	86	1861	1861	700	2	0
Gorebridge	80	1861	1861	600	1	0
Denny Consumers	70	1861	1861	1,500	1	0
Perth Consumers	84	1861	1861	25,000	1	0
Blantyre	120	1862	1862	1,500	1	0
Stow	115	1862	1862	1,000	1	0
Kirkwall Consumers	105	1862	1862	2,000	1	0
Airdrie	237	1830	1862	10,000	10	0
Kamesburgh	98	1862	1862	1,000	1	0
Baillieston	6249	1862	1862	1,200	1	0
Stonehaven Consumers	107	1862	1862	2,000	1	0
Armadale	143	1863	1863	1,000	1	0
Peterhead	144	1833	1863	4,200	10	0
Grantown	168	1864	1864	700	1	0
Coatbridge	191	1843	1865	6,591	3	0
West Kilpatrick	208	-	1865	4,000	10	0
Errol	241	1866	1866	3,000	1	0

Company	Record Number (B.T.2/)	Date Commenced	Date Registered	Nominal Capital £	Nominal Shares £ s	
Aberlady	272	1867	1867	700	1	0
Slamannan	275	-	1867	1,000	2	0
Lockerbie	269	1855	1867	1,200	5	0
Kirkintilloch	288	1839	1868	6,000	5	0
Inverkeithing	290	pre 1849	1868	1,500	1	0
Langbank	301	1868	1868	1,200	1	0
Fortrose	305	1869	1869	600	2	10
Buckie	310	1869	1869	1,000	1	0
Inverkip	315	1869	1869	800	1	0
Innellan	323	1870	1870	1,000	2	0
Mearns (Newton)	5685	1871	1871	1,200	5	0
Kilmalcolm	363	1871	1871	1,000	1	0
Buckpool	332	1870	1871	1,000	1	0
Partick/H./M.	351	1871	1871	50,000	5	0
Invergordon	404	1872	1872	1,500	1	0
Cove/Kilcreggan	394	1872	1872	5,000	5	0
Strichen	466	1872	1872	700	1	0
Newmilns New	521	1873	1873	2,000	1	0
Ardrossan G./W.	561	1840	1874	9,750	10	0
Helensburgh Consumers	260		1874	10,000	1	0
New Pitsligo	585	1844	1874	400	1	0
Nairn	625	1839	1875	3,500	5	0
Stromness	627	-	1875	2,000	5	0
Penicuik	755	1830	1877	8,000	10	0
Falkirk Lighting	869	1829	1879	12,000	10	0
Gourock	878	1849	1879	1,400	2	0
Banchory	928	1854	1879	2,400	1	0
Insch New	901	1855	1879	501	1	10
Costorphine	911	1879	1879	1,700	1	0
Barrhead	1032	1833	1880	12,500	2	10
Buckhaven	939	1880	1880	2,500	1	0
Kirriemuir	987	1835	1881	7,740	5	0
Pollokshaws	1132		1882	6,000		
Helensburgh J.S.	1123	1844	1882	13,840	5	0
Kirkcaldy	1200	1829	1883	20,500	10	0

Company	Record Number (B.T.2/)	Date Commenced	Date Registered	Nominal Capital £	Nominal Shares £ s	
Stromness	1389	1884	1884	500	1	0
Moffat	1360	1837	1884	2000	5	0
Letham	1389	1884	1884	500	1	0
Tranent	1358	-	1884	2000	1	0
Kinross / M.	1481	1835	1885	3004	5	0
Lochgelly	1539	1860	1886	1800	1	0
Musselburgh	1589	1831	1886	15000	5	0
Cambuslang	1554	-	1886	12000	1	0
Ayr	1536	1825	1886	40000	5	0
Earlston	1689	1887	1887	2500	5	0
Dunblane	1649	1841	1887	8000	10	0
Busby	1706	1888	1888	5000	10	0
Kilwinning	1764	1836	1888	5000	10	0
Largs	1809	1837	1888	5600	20	0
Stornoway	1766	1848	1888	5000	1	0
Forres	1858	1837	1889	6840	12	0
Beith	1835	pre 1849	1889	4800	10	0
Portobello	1886	1845	1889	20000	1	0
Grangemouth	2026	1834	1890	10000	10	0
Dysart	2003	1843	1890	1500	5	0
Dunfermline	2245	1828	1891	36375	25 & 12	0 0
Kinghorn	2170	-	1891	12000	1	0
Cowdenbeath	2195	1891	1891	2000	10	0
Dunoon	2585	1852	1893	10000	2	0
Melrose	2634	1836	1894	2974	1	0
Eaglesham	2731	-	1894	400	1	0
Mid/E. Calder	3068	-	1895	1000	1	0
W.Kilbride	2977	1858	1895	2500	1	0
Edzell	3286	1896	1896	1000	1	0
Cupar	3117	1830	1896	8000	10	0
Loanhead	3087	1896	1896	5000	5	0
Bridge of Weir	3265	1846	1896	5000	1	0
Elie / E.	3696	1843	1897	3050	1 & 10	10 0
Dalry	3497	1834	1897	3539	10	10
Larkhall	3509	1844	1897	6005	1	0

Company	Record Number (B.T.2/)	Date Commenced	Date Registered	Nominal Capital £	Nominal Shares £ s	
Carluke	3915	1836	1898	10000	1	0
Innerleithen	3998	1846	1898	3333	3	0
Monifieth	3927	1898	1898	5000	1	0
Catrine	4027	-	1898	1225	1	10
Strathaven	4212	1831	1899	2709	0	15
Doune	4709	-	1900	1000	0	10
Stonehouse	5167	1849	1902	3045	1	0
Bellshill	5215	1863	1902	10500	1	0
Whitehorn	5248	1862	1903	400	5	0
Stane/Dykehead	5451	1903	1903	3500	5	0
Crieff	5442	1841	1903	14000	1	0
Brechin	6012	1834	1905	25000	10	0
Kelty	5842	1905	1905	7000	1	0
Harthill	6317	-	1906	700	1	0
Turiff	6284	1838	1906	1625	1	0
Crail	6400	-	1907	1000	1	0
Motherwell	6654	1849	1907	60000	1	0
Girvan	6554	1840	1907	8457	1	0
S. Queensferry	6847	pre 1849	1908	10000	1	0
Dundonald	6857	1908	1908	3000	1	0
Irvine	6880	1838	1908	25000	1	0
Cumnock	6824	-	1908	5000	1	0
Fraserburgh	7084	1840	1909	27000	2	0
Holytown	7241	1857	1909	3000	1	0
Cardenden	7022	1909	1909	20000	1	0
Fauldhouse	7046	1909	1909	6000	1	0
Strathmiglo	7557	1840	1910	1000	1	0
St. Andrews	7690	1834	1910	16960	10	0
Tillicoultry	7689	1867	1910	6900	5	0
Abernethy	7777	1911	1911	1000	1	0
Inverurie	7868	1839	1911	2250	1	5
Kilmaurs	8867	1859	1913	2000	1	0
Leuchars	8651	-	1913	750	1	0
Prestonpans	9153	1845	1914	10000	1	0

(2)

English Share-Owners in Scottish Limited Gas Companies

English and Irish participation in Scottish gas companies was negligible, and largely confined to industrialists and merchants who probably had trading contracts with Scotland.

Viz:

- 1829 Dunfermline - Langhorn of Manchester 10; John Miller of Manchester 10
- 1830 Cupar - Agnes Balfour, Otherington, Yorkshire 2
- 1834 Bathgate - J.Turnbull, merchant, Blackburn 4
- 1835 Dunse - John Gibb, Berwick 2; D.Taylor, Huntingdon 2
- 1845 Dumfries/Maxwelltown - Janet Burn, Liverpool 5
- 1856 Newport - Margt. Farquharson and Wm. Farquharson, Houndsditch, London, 2 and 4; J.Gibson, saddler, London 5
- 1857 Lochgilphead - J.Campbell, landed proprietor, Rugby 20 and 20 quarter-shares
- 1858 Cumbernauld - Col D.Laird, Kinsdale, Ireland 50
- 1865 Coatbridge - J.Walker, contractor, Dublin 16; M.Warnock, spinster, Dublin 30
- 1876 New Pitsligo - Lord Clinton, Bedford, N. Devon 100; P.Murray, teacher, Norwich 2
- 1857 Dumfries - Mrs W.Walker, Liverpool 5; Agnes Reddish, Manchester 3
- 1869 Kirkintilloch - J.Inglis, merchant, and Mrs Inglis, London 25 and 10
- 1863 Meigle - E.M.S.Wortly-McKenzie, Wortly Hall Sheffield 50
- 1874 New Milns - George Morton, merchant, Birmingham 10 (cf. John Morton, clerk, Glasgow 5)
- 1873 Strichen - P.Tocher, meat salesman, London 40; J.Trees, merchant, Walsall 5; Alex Raeburn, New York 4
- 1898 Monifieth - P.Ure, brewer, Chipping Norton, Oxfordshire 60
(Preference)

Note - The "Lancashire interest", so important in Scottish railway finance, and the "London interest" groups are represented, but no more so than other English regions, and were not a significant group in Scottish gasworks finance.

Source - S.R.O. Board of Trade records.

(3)

Preference Shares in Limited Companies

MOFFAT

Date	Nominal Capital	Shares
1884-7	£2,000	400 Ordinary £5, 200 Preference £2 10s
1888-1907	£3,500	400 Ordinary £7 10s, 200 Preference £2 10s
1908-14	£4,500	Ordinary £10

The rise in nominal value of shares shows that surplus profits re-ploughed had doubled the capital.

BRECHIN

1904	£12,000	700 Ordinary £10, 500 Preference £10
1906	£19,000	2,000 Ordinary £10, 500 Preference £10
1907-14	£20,000	2,100 Ordinary £10, 500 Preference £10

In 1914 the Edzell Gas Co. Ltd with 1,000 £1 shares, was purchased by the Brechin Company in return for 1,000 3% Cumulative Preference £1 shares.

BRIDGE OF EARN

1884-1901	£1,000	200 Ordinary £5, Received £1,000
1902-13	£3,000	200 Ordinary £5, 400 Preference (5%) £5

ABERLADY

1872-1908	£870	870 Ordinary £1
1909-11	£1,670	870 Ordinary £1, 800 Preference £1

Aberlady company commenced in 1867, but did not use preference shares until 1909.

BUCKIE

1892	£2,000	2,000 Ordinary £1, Received £2,000
1893-1910	£3,000	2,000 Ordinary £1, 830 Ordinary (nil) Received £2,000
1911-1914	£5,500	2,170 Ordinary £1, 830 Ordinary (nil), 2,500 Preference £1

Stornoway gas company registered in 1888 with a nominal £5,000 in 400 Ordinary shares of £1, and 1,000 5% Preference shares of £1. The Preference shares were not issued.

Monifieth gas company commenced in 1898, with a nominal capital of £5,000 in 4,000 Ordinary £1 shares, and 1,000 Preference 4% shares of £1. By 1899 all was subscribed and called up, and the

unpaid amount fell from £243 in 1899 to £5 in 1900.

Dundonald gas company formed in 1908 with a nominal £3,000 in £1 shares, and operated up to 1914 with 2,000 fully paid Ordinary shares and 7 Preference shares.

Sources - Board of Trade Records (S.R.O.) - Moffat (BT2/1360); Brechin (BT2/6012); Stornoway (BT2/1788); Bridge of Earn (BT2/46); Aberlady (BT2/272); Buckie (BT2/310); Monifieth (BT2/3927); Dundonald (BT2/6859)

(4) Share Values - Nominal and Called Up Shares in Sample of Limited Companies

Company	Dates	Nominal £.s	Called Up £.s	Company	Dates	Nominal £.s	Called Up £.s
Aberlour	1859-1914	1	1	Bridge of Weir	1897-1914	1	1
Ardrossan G & W	1876-1886	10	10	Carluke	1898-1914	1	1
Abernethy	1911-14	1	1	Coatbridge	1865-77	3	3
Busby	1888-89	10	5	Cumbernauld	1857-76	2.10	2.10
"	1890-2	10	10	Crieff	1903-14	1	1
"	1893	{ 10	10	Carnwath	1858-1902	1	1
		{ 10*	1	Cove/Kilcreggan	1874-1900	5	5
"	1894	{ 10	10	Cardenden	1909-14	1	1
		{ 10	2	Dumfries	1858-66	10?	14
"	1895-7	{ 10	10	"	1867-8	?	19.8
		{ 10	3	Dundonald	1908-14	1	1
"	1898	10	10	Dunblane	1887-8	10	5
"	1899-1900	{ 10	10	"	1889-95	10	7
		{ 10*	5	"	1896-1905	10	8
"	1901-6	10	10	"	1906-14	10	10
"	1907	{ 10	10	Dysart	1890-1914	5	5
		{ 10*	4	Elie & Earlsferry	1898-1914	{ 1.10	1.10
"	1908	10	10			{ 10	10
Bothwell/ Uddingston	1859-1914	1	1	Ecclefechan	1861-1901	1	1
Bridge of Earn	1859-1865	1	1	Errol	1866-1914	1	1
"	1866-82	6	6	Edzell	1897-1914	1	1
"	1883-1914	5	5	Eaglesham	1894-7	1	1
Banchory	1880-94	1	17s 6d	Earlston	1888-9	5	4
"	1895-1914	1	0.19	"	1890	5	4.10
Blantyre	1863-1907	1	1	"	1891	5	4.15
"	1908-13	{ 1	1	"	1896-1914	5	5
		{ 1*	0.13	Falkirk	1880-87	10	10
"	1914	1	1	Fauldhouse	1909-14	1	1
Aberlady	1868-1911	1	1	Fortrose	1870-77	2.10	2.10
Armadale	1863-1897	0.10	0.10	"	1878-9	{ 2.10	2.10
Baillieston	1906-1914	1.10	1.10			{ 2.10*	1
Buckie	1869-83	1	1	"	1880-2	2.10	{ 2.10
"	1884-91	{ 1	1				{ 2
		{ 1*	0.10	"	1883-6	2.10	2.10
"	1892-1914	1	1	Forres	1889-1914	12	12
Bellshill	1903-14	1	1	Fraserburgh	1909-11	2	1.10
Barrhead	1881-98	2.10	2.10	Grangemouth	1890-1914	10	10
"	1899-1914	1	1	Gourock	1880-86	2	2

Share Values (continued)

Company	Dates	Nominal £.s	Called Up £.s	Company	Dates	Nominal £.s	Called Up £.s
Girvan	1908-14	2.10	2.10	Melrose	1894-1914	1	1
Gorebridge	1862-1914	1	1	Loanhead	1896	5	5
Holytown	1909-14	1	1	"	1897-1912	5	5
Helensburgh	1882-93	5	5	"	1913	{ 5	5
Inverurie	1910-14	1.5	1.5	"		{ 5*	2.10
Irvine	1908-14	1	1	"	1914	5	5
Innerleithen	1846-74	2		Monifieth	1899-1905	1	1
"	1874-1914	3	3	Mearns (Newton Mearns)	1873-1903	5	5
Inverkeithing	1886-1908	1	1	"	1904-14	1	1
"	1909	{ 1	1	Meigle	1863-1914	2	2
"		{ 1*	2s 6d	New Pitsligo	1874-84	1	12s 6d
"	1910	{ 1	1	Newport	1858-1901	1	1
"		{ 1	0.10	Prestonpans	1914	1	1
"	1912-14	1	1	Strathmiglo	1910-14	1	1
Insch New	1880-94	1.10	1	South Queensferry	1910-14	1	1
"	1895-1911	1.10	1.10	Strichen	1874-1914	1	1
"	1911-14	1.10	1.10	Stane/ Dykehead	1903-4	5	2.10
		1.10	1	"	1905-14	5	5
Innellan	1870-93	2	2	Slamannon	1868	2	0.10
Kirkintilloch	1868-80	5	5	"	1870-1912	2	1
Kelty	1905-14	1	1	"	1912-14	1	1
Kilnaurs	1913-14	1	1	Stornoway	1888-1914	1	1
Kamesburgh	1862-1914	1	1	Stonehouse	1902-14	1	1
Kilmalcolm	1871-1914	1	1	Turiff	1838-61	2.10	2.10
Kilwinning	1888-1914	10	8	"	1862-1905	3.15	3.15
Kirriemuir	1881-1914	5	5	"	1906-14	1	1
Largs	1888-1901	20	20	Tillicoultry/ Devonside	1910-14	1	1
"	1902-7	5	5	West Kilbride	1895-1914	1	1
Lasswade/ Bonnyrigg	1857-1914	1	1	Whithorn	1903-14	5	5
Larkhall	1897-1914	1	1	West Kilpatrick	1865-83	10	10
Lochmaben	1859-1908	5	5	Tranent	1884-5	1	0.10
Langbank	1870-1914	1	1	"	1886-97	1	12s 6d
Lochgelly	1886-1902	1	1	"	1898-1909	1	0.13
"	1903	{ 1	1	"	1910	1	16s 6d
"		{ 1*	7s 6d	"	1912-14	1	1
"	1904	{ 1	1	Note - * New Shares issued. Because Limited Companies allocated stock as "paid up" to the Old Company they succeeded, this sum was not necessarily paid as cash by the shareholders.			
"		{ 1	0.15				
"	1905-14	1	1				
Lockerbie	1867-71	5	5				
"	1872-91	{ 5	5				
		{ 1*	1				

(5)

Total Nominal Capital Stock of Gas Companies at the Date of Their
Registration for Limited Liability

Date	Number of Companies	Total Capital £	Date	Number of Companies	Total Capital £
1857	5	17,000	1885	1	3,004
1858	5	6,700	1886	4	68,800
1859	3	5,550	1887	2	10,500
1860	2	3,250	1888	5	19,000
1861	4	27,800	1889	3	31,640
1862	7	18,700	1890	2	11,500
1863	2	5,200	1891	3	50,375
1864	1	700	1893	1	10,000
1865	2	10,591	1894	2	3,374
1866	1	3,000	1895	2	2,500
1867	3	2,900	1896	4	19,000
1868	3	8,700	1897	3	12,594
1869	3	2,400	1898	4	19,558
1870	1	1,000	1899	1	2,709
1871	4	53,200	1900	1	1,000
1872	3	7,200	1902	2	13,545
1873	1	2,000	1903	3	17,900
1874	3	20,150	1905	2	3,200
1875	2	5,500	1906	2	2,325
1877	1	8,000	1907	3	69,457
1879	5	18,001	1908	4	43,000
1880	2	15,000	1909	4	56,000
1881	1	7,740	1910	3	24,860
1882	2	19,840	1911	2	3,250
1883	1	20,500	1913	2	2,750
1884	4	5,000	1914	1	10,000

Total Companies in sample - 137

Paid Up Share Capital in Scottish Limited Gas Companies (nearest £)

Date	Blantyre	Lillicolm	Airdrie	Bridg. o. Earn	Aberlour	Botwell	Newport Cove /Kl.	Penicuik	Lochmaben
1858							1300		
1859				900		2228	"		219
1860				1000	447	2407	"		445
1861				"	471	3000	"		591
1862			10000	"	-	"	"		824
1863	854		"	"	481	"	"		869
1864	1352		"	"	491	"	"		969
1865	1500		"	"	"	"	"		1000
1866	"		"	1200	484	3600	"		"
1867	"		"	"	483	4400	2635		"
1868	1800		12000	"	477	"	2952		"
1869	"		"	"	-	"	"		1200
1870	"		"	"	482	"	"		"
1871	"	1000	"	"	"	5500	"		"
1872	"	"	"	"	486	"	3300		"
1873	"	"	"	"	"	"	4300		"
1874	2000	1340	"	"	"	"	"	4956	"
1875	"	1750	"	"	"	"	"	5000	"
1876	3500	"	"	"	"	7000	"	"	"
1877	"	1930	13200	"	"	"	"	"	200
1878	"	2165	"	"	483	"	6300	"	4786
1879	"	2325	"	"	"	9000	"	"	6000
1880	"	2425	"	"	"	"	"	"	"
1881	"	3000	"	"	"	"	"	"	"
1882	"	3300	"	"	"	"	"	"	"
1883	"	"	"	"	"	"	"	"	"
1884	"	3930	"	1000	"	"	"	"	"
1885	"	"	14520	"	"	"	"	"	"
1886	"	"	"	"	"	"	"	"	"
1887	"	3944	"	"	"	"	"	"	"
1888	"	3960	"	"	"	"	"	"	"
1889	"	"	"	"	"	"	"	8000	"
1890-2	"	"	"	"	"	"	"	"	"
1893	6000	"	18876	"	"	13487	"	"	"
1894	"	"	"	"	"	13500	"	"	"
1895	"	"	"	"	"	"	"	"	"
1896	"	"	"	"	"	15750	"	"	"
1897	"	"	"	"	"	"	"	"	"
1898	"	"	20691	"	"	18000	"	"	"
1899	"	"	"	"	"	"	"	"	"
1900	"	7578	22547	"	"	"	"	"	"
1901	"	"	24664	2265	"	23000	"	-	"
1902	"	"	27838	"	"	"	-	"	"
1903	"	"	-	"	"	"	"	"	1500
1904-7	"	"	"	"	"	"	"	"	"
1908	10000	"	"	"	"	"	"	"	"
1909-13	"	"	"	"	"	"	"	"	"
1914	12000	"	"	"	"	32634	"	"	"

Note - " amount unchanged from previous year
 - records absent

Absence of any definite periodicity in enlargement of share capital amongst several companies as a group.

Paid Up Share Capital in Scottish Limited Gas Companies (nearest £)

Date	Inne- llan	Inve- rkip	Lang- bank	Lass- wade	Lock- erbie	Forres	Stri- chen	Slam- annon	Mear- ns	Inver- keithing
1867					1200					
1868					"			82		788
1869		400	215		"			"		800
1870	733	639	917	1420	"			271		"
1871	1000	639	1175	1365	"			"		"
1872	1020	697	1600	1360	1440			305		"
1873	1250	698	1600	"	"			313	1200	"
1874	"	700	"	"	"		628	"	"	"
1875	"	756	"	"	"		-	314	"	"
1876	"	"	"	"	"		638	332	"	"
1877	"	"	"	1682	"	200	643	"	"	"
1878	"	"	"	2205	"	4786	653	"	"	"
1879	"	"	"	"	"	6000	"	"	"	"
1880	2490	"	"	"	"	"	723	"	"	"
1881	"	"	1800	"	"	"	"	340	"	"
1882	"	"	"	"	"	"	"	"	"	"
1883	"	"	"	2500	"	"	"	"	"	"
1884	"	"	"	"	"	"	"	"	"	"
1885	"	"	"	"	2440	"	"	"	"	"
1886	"	"	"	"	"	"	"	349	"	900
1887	"	"	"	"	"	"	"	"	"	"
1888	"	"	"	"	"	"	"	"	"	"
1889	"	"	"	"	"	8000	"	"	"	1100
1890-3	"	"	"	"	"	"	"	"	"	"
1894	"	"	"	3000	"	"	"	"	"	"
1895	"	"	"	"	"	"	"	"	"	"
1896	"	"	"	"	"	"	"	355	"	"
1897-8	"	"	"	"	"	"	"	"	"	"
1899	"	"	"	"	"	"	"	362	"	"
1900-3	"	"	"	"	"	"	"	"	"	"
1904	"	"	"	"	"	"	"	"	1000	"
1905-9	"	"	"	"	"	"	"	"	"	"
1910	"	"	"	"	"	"	"	"	"	3410
1911	"	"	"	"	"	"	"	"	"	3663
1912	"	"	"	"	"	"	"	"	"	4400
1913	"	"	"	"	"	"	"	1500	1300	4950
1914	"	"	"	"	"	"	1013	"	"	5838

Many small gas companies which were formed and registered in the 1860s, made little alteration to their share capital until after 1914, or until their dissolution.

Date	Eccle- fechan (750)	Mei- gle (700)	Stow (1000)	Gran- town (700)	Kames- burgh (1000)	Arma- dale (1000)	Gore- bridge (600)	Errol (3000)	Carn- wath (1200)
1858									1005
1859									1050
1860	710								"
1861	750						132		"
1862	"						505		"
1863	"	647	754		369		524		"
1864	"	684	800		"	982	"		"
1865	"	694	"	589	"	"	"		"
1866	"	"	"	660	"	"	"	3000	"
1867	"	700	"	"	"	1000	"	"	"
1868-	"	"	"	"	"	"	"	"	"
1914									
				closed 1898		closed 1897			

() indicate initial nominal capital stock.

Paid Up Share Capital in Scottish Limited Gas Companies (nearest £)

Date	Loan-head	Banch-ory	Ins-ch	Tran-ent	Moffat	Kinross/M.	Kirri-muir	Helens-burgh	Lochg-elly
1880		1544	319						
1881		"	"						
1882		"	334				7740	13840	
1883		"	"				"	"	
1884		"	"	906	2000	3004	"	"	
1885		"	"	"	"	"	"	"	
1886		"	"	1132	2000	3004	"	"	1110
1887		"	"	"	"	"	"	"	1575
1888		"	"	1176	3500	"	"	"	"
1889-		"	"	"	"	"	"	"	"
94									
1895		1676	480	"	"	"	"	"	"
1896	1800	1677	490	"	"	"	"	"	"
1897	3000	"	492	"	"	"	"	"	1800
1898	"	"	"	"	"	"	"	"	"
1899	"	"	"	"	"	"	"	"	"
1900	"	"	"	"	"	"	"	"	"
1901	"	"	"	829	"	"	"	"	2700
1902	"	"	"	"	"	"	"	"	"
1903	"	"	"	"	"	"	"	"	3938
1904	"	"	"	"	"	"	"	"	5175
1905	"	"	"	"	"	"	"	"	6000
1906	"	"	"	"	"	"	"	"	"
1907	"	"	"	"	"	"	"	"	10000
1908	"	"	"	"	4500	"	"	"	"
1909	"	"	"	"	"	"	"	"	"
1910	"	"	"	1052	"	"	"	"	17000
1911	"	"	"	1275	"	"	"	"	"
1912	"	"	"	"	"	"	"	"	"
1913	3600	"	"	"	"	"	"	"	"
1914	4200	"	"	"	"	"	"	"	"

Town	Dates	£	Dates	£
Dumfries (Old)	1858 - 66	5600	1867	7802
	1868	7970		
Kirkintilloch	1868 - 73	5000	1874 - 75	5980
	1876 - 77	7000		
Invergordon	1873 - 77	759.5s		
Falkirk (Old)	1880 - 86	8000	1887	8400
Ardrossan	1876 - 86	9750		
West Kilpatrick	1867	3727	1868 - 83	3955
Dalry	1897 - 1914	3539		
Kelty	1905 - 14	7000		
Stonehouse	1902 - 14	3045		
Larkhall	1897 - 1914	6005		

Paid Up Share Capital in Scottish Limited Gas Companies (nearest £)

Date	Earl- ston	Dun- blane	Rusby	Storn- oway	Kilwinn- ing	Larga	W.Kil- bride	Bdg.of Weir	Stane/ Dykehead
1887		3000							
1888	1600	"	1250	1752	1720	5600			
1889	"	4200	"	1904	2560	"			
1890	1800	"	2500	1954	"	"			
1891	1900	"	"	"	"	"			
1892	2000	"	"	2529	"	"			
1893	"	"	2750	"	"	"			
1894	"	"	3250	"	"	"			
1895	"	"	"	"	"	"	2500		
1896	"	4800	4000	"	"	"	"		
1897	"	"	"	"	"	"	"	2225	
1898	"	"	6250	"	"	"	"	"	
1899	"	"	"	"	"	"	"	"	
1900	"	"	7500	"	"	"	"	3225	
1901	"	"	"	"	"	"	"	"	
1902	"	"	"	"	"	7000	"	"	
1903	"	"	"	"	"	"	"	"	1750
1904	"	"	"	"	4000	"	"	"	3450
1905	"	"	"	"	"	13295	4700	"	"
1906	"	"	"	"	"	"	"	"	"
1907	"	"	8500	"	"	"	"	6000	3500
1908	"	"	10000	"	"	"	5000	"	"
1909	"	6000	"	"	"	"	"	"	"
1910	"	"	"	"	"	"	"	"	5000
1911	"	"	"	"	"	"	"	"	"
1912	"	"	"	"	"	"	"	"	"
1913	"	"	"	"	"	"	"	"	8000
1914	"	"	"	"	"	"	"	"	"

Town	Dates	£	Dates	£
Beith	1889 - 1914	4800		
Grangemouth	1890 - 98	5730	1899 - 1906	8600
Dunfermline	1891 - 92	36375	1893	38878
	1894	47838	1895	50338
Montrose	1894 - 1910	2794	1911 - 14	4974
Monifieth	1899	4757	1900 - 02	4997
	1903 - 04	4998	1905	5000
Strathaven	1899 - 1914	2709		
Edzell	1896	400	1897	995
	1898 - 1914	1000		
Whithorn	1903	200	1904	300
	1905 - 14	310		
Bellshill	1903 - 08	13000	1909 - 14	15500
Eaglesham	1894 - 95	133	1896 - 97	153
Aberlady	1868 - 71	700	1872 - 1910	870
	1911 - 14	1670		
Nairn	1876 - 87	3500	1888 - 1914	4500

APPENDIX X V I I I

General Bibliography -

Excepting Limited Gas Companies Records

- (1) Alphabetical List of Gas Company Dates and Data Sources.
- (2) General Acts of Parliament Affecting Gas Undertakings.
- (3) Private and Local Acts of Parliament Regulating Scottish Gas Undertakings (Companies and Municipal Gasworks)
- (4) General Acts of Parliament Incorporated into Private Gas Acts
- (5) Company Minute Books : Extant Gas Company Minute Books Commencing Before 1900.
- (6) Additional Manuscript and Archive Sources.
- (7) British Parliamentary Papers.
- (8) Bibliography of Books and Important Articles.
- (9) Periodicals
- (10) Commercial Directories

(1)

Appendix XVIII ALPHABETICAL LIST OF COMPANY DATES

Company	Date Began	1849 (A)	1949 (B)	Muni- cipal	Data Source and Notes
Aberdeen	1824	}	+	1871	C.W.H., T.S.A. Co.s. merged in 1846
Aberdeen New	1844				
Aberfeldy	c1884		+		F.H.G.
Aberledy	1870				T.S.A.
Aberlady	1867		+		B.T.2.; T.S.A. (1870)
Aberlour	1859				B.T.2.
Abernethy	-				Limited co. (1911)
Aberuthven	1857				J.G.L. 14/8/1877. Closed 1877.
Airdrie	1830	+	+	1904	C.W.H.; B.T.2.
Alexandria	1839				G.B.1. Vale of Leven Co.
Alloa, Cambus, Sauchie & Clackmannan	1829		+	1877	J.G.L. 4/4/1882(1832); C.W.H.
Alva	1844	+		1876	C.W.H.. Previously private
Alyth	1847	+	+		C.W.H.
Annan	1838		+		T.S.A. ; G.B.1.
E. & W. Anstruther & Cellardyke	1841		+		C.W.H.
Arbroath	1825	+	+	1871	C.W.H.
Ardrossan	1840	+	+	1886	J.G.L. 7/8/88; C.W.H. (new co. 1875)
Armadale	1863		+		C.W.H.; B.T.2.
(Auchinblae)	1840				A.M.D.
Auchterarder	1841		+		C.W.H.
Auchtergavan	1864				J.G.L. 4/7/1876 (also called Bankfoot)
Auchtermuchty	1838		+		T.S.A.
Ayr	1825	+	+		G.B.1.
Ayr Newton	1845	+	+		C.W.H.
Bailliestown	1862				T.S.A.; B.T.2.
(Balfroon)	1819				C.W.H.
Ballator	c1863				
Banchory	1845		+		Construction in 1854. B.T.2
Banff	1830	+	+		N.S.A. (1831)
Barrhead	1833		+		C.W.H.; B.T.2.
Bathgate	1834		+		C.W.H.

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Beauly	1860				C.W.H.
Bellshill	1863				T.S.A.
Beith	1831	+	+		J.G.L. 7/8/1888
Bervie	c1850				J.G.L. 10/7/1850
Biggar	1839		+		Biggar Museum
Blairgowrie	1835		+		C.W.H.
Blantyre	1862				C.W.H.; B.T.2
Boness	1843	+	+		C.W.H.; G.B.1
Bothwell and Uddingston	1858				C.W.H.; B.T.2
Brechin	1835	+	+		A.M.D.
Bridge of Allan	1841				C.W.H.
Bridge of Earn	1859				B.T.2
Bridge of Weir	1846		+		B.T.2; T.S.A.
Broughty Ferry	1840		+	1870	C.W.H.
Buckhaven	1880				Ceased 1880. B.T.2
Buckie (Easter)	1869		+		C.W.H.; B.T.2
Buckpool	1870				Ceased 1881
Burntisland	pre 1849	+	+		C.W.H.
Busby	1888				B.T.2
Callander	1859		+		U.A.P. (S.R.O.)
Cambuslang	?				New co. 1886. C.W.H.
Campbeltown	1830	+	+	1876	Act.
Campsie					vide Lennoxtown
Cardenden	1909				B.T.2 ; T.S.A. (Kinglassie)
Carluke	1836		+		C.W.H.
Carnoustie	1855		+	1910	C.W.H.
Carnwath	1858				B.T.2
Castle Bar	1865				C.W.H.
Castle Douglas	1843		+		T.S.A.
Catrine	1838		+		C.W.H.
Clackmannan	pre 1849	+			
Clippens	?				C.W.H.
Coatbridge	1843	+	+		B.T.2 ; C.W.H.
Coldstream	1840	+	+		C.W.H.
Collinsburgh	1841	+			C.W.H.

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Comrie	1851		+		J.G.L. 10/6/1852
Costorphine	1879				C.W.H.
Coupar Angus	1836	+	+		C.W.H.
Cove and Kilcreggan	1871		+		B.T.2 ; T.S.A.
Cowdenbeath	1891		+		T.S.A.
Crail (Fife)	pre 1849	+			
Crieff	1841	+	+		H.C.
Cullen	1841		+		N.S.A.
Cumbernauld	pre 1849	+			New co. 1857
Cumnock (Old)	1837				
Cupar (Fife)	1836	+	+		G.B.1
Dalbeattie	1858		+		B.T.2 ; C.W.H.(1859)
Dalkeith	1826	+	+		G.B.1
Dalry (Ayr)	1834		+		C.W.H.; B.T.2 (1835)
Darvel	1853		+	1876	C.W.H.
(Deanston)	?				C.W.H.
Denny (old)	c1852				J.G.L. 10/2/1852
Denny consumers	1861		+	1885	C.W.H.; B.T.2
Dingwall	pre 1847	+	+		S.L.
Dollar	pre 1885		+		F.H.G.
Douglas	c1850				J.G.L. 10/7/1850; F.H.G
Doone	pre 1885		+		F.H.G.
Dornoch	c1850				J.H.L. 10/7/1850
Dreghorn	1878 ?				J.G.L. 20/10/1888
Dufftown	1854				Ceased 1892. C.W.H.; T.S.A. The Builder 1853 p.347
Dumbarton	1832	+	+	1873	C.W.H.
Dumfries	1824	+	+	1876	N.S.A.; B.T.2; C.W.H.
Dumfries and Maxwelltown	1845				B.T.2
Dullator	1877				J.G.L. 18/12/1877
Dunbar	1836	+	+	1886	T.S.A.
Dunblane	1841		+		New co.1887. J.G.L.3/5/1887
Dundee	1823	+	+	1868	C.W.H.
Dundee New	1846				Act.
Dundonald	1908				B.T.2

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Dunfermline	1828		+	1896	C.W.H.; T.S.A.(1829)
Dunkeld	pre 1849	+			F.H.G.; new co. 1851
Dunkinfield	1853				The Builder 1853 p.347
Dunning	-		+		F.H.G.
Dunoon	1852		+	1895	B.T.2; T.S.A.; J.G.L.11/10/52
Dunse	1835	+	+		G.B.1.
Dunshalt	1851				J.H.L.
Dysart	1843		+		B.T.2
Eaglesham	1894				B.T.2; ceased 1897
Earlston	1887		+		B.T.2; private works 1883
East Kilbride	1851				C.W.H.
East Linton	-		+		
E. Wemyss and Buckhaven	1846				T.S.A.
E./W. Anstruther & Cellardyke	1841				C.W.H.
Ecclefechan	1860				B.T.2
Edinburgh	1817	+	} +	1888	C.W.H.
Edinburgh/Leith	1840	+			See also 'Leith'
Edzell	1896				B.T.2
Elgin	1830	+	+	1877	C.W.H.; T.S.A.
Elie/Earlsferry	1843	+			B.T.2 ; C.W.H.
Ellon	1827				J.Gadsman <u>Hist. of Ellon</u>
Errol	1866				B.T.2
Eyemouth	1845		+		G.B.1; C.W.H.
Falkirk Lighting	1829	+	} +	1894	C.W.H.
Falkirk Joint- Stock	1845	+			
Falkland	pre 1849	+	+		J.G.L.
Fauldhouse	1909				B.T.2
Ferry Port on Craig (Tayport)	1845			1909	C.W.H.; T.S.A.
Fettercairn	pre 1885				F.H.G.
Fochabers	c.1850				J.G.L. 10/7/1850; F.H.G.
Forfar	1832	+	+	1871	A.M.D.
Forres	1837		+		B.T.2; T.S.A.
Fortrose	1869				B.T.2; C.W.H.

Company	Date Began	1849 (A)	1949 (B)	Muni-cipal	Data Source and Notes
Fort William	pre 1849	+			J.G.L.
Fraserburgh	1840	+	+		B.T.2
Froickham	1834				C.W.H.
Galashiels	1834	+	+		G.B.1; C.W.H.
Galston	1843				C.W.H.
Gamrie [Macduff & Gardenstown]	pre 1845				N.S.A.
Gatehouse on Fleet	1846				C.W.H.
Garmouth/Kingston	1857				B.D.
Girvan	1840	+	+		B.T.2; C.W.H.
Glasgow G.L.	1817	+	}	1869	C.W.H.
Glasgow City & Suburban	1843	+			
(Golspie)	1862				C.W.H.; Duke of Sutherland
Gorebridge	1861		+		B.T.2
Gourock	1845		+	1876	C.W.H.; B.T.2 (1849)
Grahamstown	c1851				J.G.L. 10/3/1851
Grangemouth	1834	+	+	1906	B.T.2; T.S.A. (1836)
Grantown	1864				B.T.2; C.W.H.
Greenock	1829	+	+	1830	C.W.H.; T.S.A. (1828)
Haddington	1835	+	+		C.W.H.; T.S.A.
Hamilton	1831	}	+	1868	C.W.H. Ceased 1846 Act.
Hamilton New	1846				
Hamilton Consumers	1868				
Harthill	-				B.T.2
Hawick	1830	+	+		C.W.H.
Helensburgh	1844	+	+	1899	C.W.H.
Helensburgh Consumers	1875				B.T.2; Ceased 1876.
Holytown	1857				T.S.A.
Huntly	1837		+		F.H.G.
Innellan	1870				C.W.H.; T.S.A. (1850's); 1912 acquired by Dunoon council
			+		
Innerleithen	1846		+		B.T.2
Insch New	1855				B.T.2
Inverary	1839	+	+		C.W.H.

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Invergordon	1872			1877	B.T.2; C.W.H.
Inverkeithing	pre 1849	+	+		C.W.H. New co. 1872
Inverkip	1869				B.T.2; C.W.H.
Inverness	1826	+	+	1876	C.W.H.; Act.
Inverurie	1839		+		F.H.G.
Irvine	1829	+	+	1881	B.T.2; J.G.L.7/8/1888
Jedburgh	1834	+	+		C.W.H.
Johnstone	1823		+	1876	W.D.
Johnshaven	-				C.W.H.
Kamesburgh	c1862				B.T.2 . Port Bannatyne. 1881 New Co. J.G.L. 11/10/1881
Keith	1840	+	+		N.S.A.
Kelso	1830	+	+		C.W.H.
Kelty	1905				B.T.2
Kennoway	pre 1885				F.H.G.
Kettle/Freuchie/ Ladybank	1849				C.W.H.
Kilbarchan	1846				C.W.H.
Kilbirnie	pre 1885		+		F.H.G.
Kilmalcolm	1871		+		B.T.2; C.W.H.
Kilmarnock	1822	+	+	1871	C.W.H; J.G.L. 25/3/1884
Kilsyth	1835		+	1876	C.W.H.
Kilmaurs	1859				C.W.H.
Kilwinning	1836		+		C.W.H.
Kincardine on Forth	pre 1849	+			J.G.L.
Kinghorn	pre 1849	+	+		New co. 1891 Kingskittlo
Kingskettle, Fife	c.1849	+			F.H.G.; J.G.L. 10/3/1849
Kinross/ Milnathort	1835		+		B.T.2 .
Kirkcaldy	1830		+	1876	C.W.H; B.T.2 (1829)
Kirkcudbright	1839	+	+	1884	C.W.H; N.S.A.
Kirkliston	-				J.G.L. 6/6/1882. Ceased 1882
Kirkintilloch	1839		+	1876	C.W.H.
Kirkwall, Orkney	1838	+	+		Mechanics Mag. Vol 30 p.208
Kirkconnel	1911				T.S.A.
Kirriemuir	1835	+	+		C.W.H; B.T.2 (1836)

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Lanark	1833	+	+		C.W.H.
Lanark Consumers	1861				B.T.2
Langbank	1868				B.T.2
Langholm	pre 1885		+		F.H.G.
Largo	pre 1849	+	+		J.G.L.
Largs	1837	+	+		J.G.L. 7/8/1888
Larkhall	1844				C.W.H.
Lasswade	pre 1849	+	+		C.W.H. New co. 1857
Latham	1854				J.G.L. 21/10/1884
Lauder	1842	+	+		C.W.H.
Laurencekirk	pre 1846		+		A.M.D.
Leith	1822				Act.
Lennoxtown	1852				C.W.H.
Lerwick	1854		+		C.W.H.
Leslie (Fife)	1841	+	+		G.B.1
Lesmahagow	1846	+	+		G.B.1; C.W.H.
Leuchars	pre 1885				F.H.G.; T.S.A. Ceased 1934
Leven (Vale of)	vide 'Alexandria'.				
Leven (Fife)	1837	+	+		C.W.H.; T.S.A.
Linlithgow	1831		+		C.W.H.
Linton	pre 1849	+		1902	C.W.H. West Linton new co. 1854
Lochgelly	1860		+		T.S.A.
Loanhead	1896				B.T.2. Works previously private.
Lochgilphead	1844	+			B.T.2
Lochmaben	1858				B.T.2
Lochwinnoch	1836	+	+		C.W.H.
Lockerbie	1855		+	1891	B.T.2; T.S.A.
Macduff	vide 'Gamrie'.				
Markinch	pre 1849	+	+		J.G.L.
Maryhill	c1850				J.G.L. 10/7/1850
Maryhill/Partick/Hillhead	1872				C.W.H.; B.T.2 (1871)
Mauchline	pre 1849	+			J.G.L.
Maxwelltown	vide 'Dumfries'.				

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Maybole	1834		+		C.W.H.
Mearns	1871				B.T.2. Newton Mearns
Meigle	1861				B.T.2; C.W.H.
Melrose	1836	+			C.W.H.
Mid & E. Calder	pre 1849	+			J.G.L.
Millport	1851		+	1896	J.G.L. 25/7/76. Cumbrae Co.
Milngavie	1850				C.W.H.
Moffat	1837	+	+	1885	B.T.2
Monifieth	1898			1905	B.T.2
Montrose	1827	+	+		C.W.H.
Motherwell	1849		+		C.W.H.
Muirkirk	pre 1849	+	+		C.W.H. New co. 1859
Musselburgh	1831	+	+		B.T.2
Nairn	1839	+	+		N.S.A; T.S.A.
Neilston	pre 1849	+	+		J.G.L.
Newburgh (Fife)	1836	+			C.W.H.
New Cumnock	1849		+		C.W.H.
New Keith	c1845		+		N.S.A.
Newmills (near Kilmarnock)	c1850			1901	J.G.L. 10/7/1850
Newmilns	1873		+		B.T.2; C.W.H.
(Newmains)	-				Coltness Iron Co.
New Pitsligo	1844				C.W.H.
Newport (Fife)	1856			1902	B.T.2; T.S.A.; J.G.L. 12/10/1875
(Newton Grange)	1890				C.W.H. Lothian Coal Co.
Newton Ayr	1845				C.W.H.
Newton Stewart	pre 1849	+	+		C.W.H.
Nitshill/ Hurlett	1884				J.G.L. 13/5/1884
North Berwick	pre 1849	+	+	1893	J.G.L.
N. Queensferry	pre 1849	+			J.G.L.
Oban	1848	+	+		N.S.A.
Old Cumnock	1837				A.M.
Old Kilpatrick	vide 'West Kilpatrick'.				
Old Meldrum	1854		+	1904	C.W.H.

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Paisley	1823		+	1870	C.W.H; C.W.H.
Peebles	1829	+	+		C.W.H.
Penicuik	1830		+		N.S.A; Jo.A.L. 24/1/1880
Perth	1824	+	}	1871	C.W.H.
Perth New	1846	+			J.G.L. 28/6/1887
Perth Consumers	1861				B.T.2
Peterhead	1833	+	+	1878	C.W.H; B.T.2 (1834)
Pittenweem	1831	+			Served St.Monance from 1844. Taken over by St.Andrews in 1936. C.W.H; T.S.A.
Pollokshaws	1836	+			
Port Glasgow	1830	+	+	1830	C.W.H.
Portobello	1845				Gas World 16/12/1893
Portsoy	c1839			1876	J.G.L. 30/10/1888
Prestonpans	1845	+	+		C.W.H; T.S.A.(1846)
Renfrew	pre 1849	+	+	?	C.W.H.
Renton	1860				J.G.L. 7/7/1877
Roths	1850				B.D.
Rothsay	1840		+	1843	C.W.H.; T.S.A..(1843)
Rutherglen	c1850			1874	J.G.L. 10/7/50, 27/6/1882
St. Andrews	1835	+	+		C.W.H; T.S.A.
Saltcoats	1836	+	+		C.W.H.
(Sanquhar)	1832		+		New co. 1868. T.S.A. J.G.L. 10/7/1850
Selkirk	1835	+	+		C.W.H.
Skelmorlie	-		+		C.W.H.
Slamannan	1867				B.T.2. Ceased 1912
S. Queensferry	pre 1849	+			J.G.L.
Stane/ Dykehead	1903				B.T.2
Stevenston	1856		+		J.G.L. 7/8/1888
Stewarton	1832	++	++		C.W.H.
Stirling	1825	+	}		C.W.H.
Stirling Consumers	1845	+			
Stonehaven	1837	+	}		C.W.H.
Stonehaven Consumers	1862				

Company	Date Began	1849 (A)	1949 (B)	Municipal	Data Source and Notes
Stonehouse	1849				C.W.H.
Stornoway	1848		+		G.B.1, C.W.H.
Stow	1862				B.T.2
Stranraer	1836	+	+		G.B.1; C.W.H.
Strathaven	1831	+	+		T.S.A.
Strathmingo	1840		+		C.W.H.
Strichen	1872				B.T.2
Stromness	1875		+		C.W.H.
Tain	pre 1885		+	1891	F.H.G.
Thornhill	c1844				T.S.A. Ceased 1932
Thurso	c1842	+	+		Jo.A.L. 25/10/1879
Tillicoultry	pre 1849	+			B.T.2 New co. 1867
Torryburn (near Dunfermline)	pre 1849+				J.G.L.
Tranent	c1844	+			T.S.A. New co. 1884
Troon	pre 1849	+	+		J.G.L.
Tullibody	-				C.W.H.
Turriff	1838		+		C.W.H.
Uddingston	vide 'Bothwell'.				
West Calder	1871		+		Private works from 1866 by Young's Paraffin oil co. J. Butt "James Young" p.300
West Kilpatrick	1865				B.T.2
West Kilbride	1856		+		B.T.2; J.G.L. 7/8/1888
West Linton	vide 'Linton'				
West Wemyss	pre 1849	+	+		J.G.L.
Whitburn	pre 1885				F.H.G.
Whitehorn	1862				C.W.H.
Wick	1840	+	+		S.L.
Wigtown	1846	+	+		C.W.H.
Wishaw	1843			1877	Private works from 1836. C.W.H; J.G.L. 10/4/1881

NOTES - (A) Companies noted in the Journal of Gas Lighting in 1849
(B) Gas works noted at the time of Nationalisation

Municipal - Date of municipal takeover of Companies (either date of decision for takeover or date of transference)

Notes (continued)

Company - brackets around name indicate plant which commenced as a private works, and only that original date is known.

Data Sources - alternative possible dates of origin given in brackets adjoining appropriate reference.

Abbreviations -

- A.M. A. Murdoch Light Without a Wick (1892) op cit.
 A.M.D. Watt's Angus and Mearns Directory (1846) op cit
 B.D. Black's Morayshire Directory (1863) op cit
 B.T.2 Board of Trade Records (S.R.O.)
 C.W.H. C.W.Hastings Gas and Water Companies' Directory
 1883 et seq
 F.H.G. F.H. Groome The Ordnance Gazetteer of Scotland
 1882 op cit
 G.B.1 Gas Company Minute Book (S.R.O.)
 H.C. A. Porteous A History of Crieff (1912) op cit
 J.G.L. Journal of Gas Lighting
 Jo.A.L. Journal of Artificial Light
 N.S.A. New Statistical Account of Scotland
 S.L. S. Lewis Topographical Dictionary (1847) op cit
 T.S.A. Third Statistical Account of Scotland
 U.A.P. Unextracted Process (S.R.O.) Currie Dal.T. 8/29
 W.D. Watson's Paisley Directory (1868) op cit

Towns/Villages Supplied From Other Locations in 1901

Place	Gas Supplied From	Place	Gas Supplied From	Place	Gas Supplied From
Ashfield (Perthshire)	Dunblane	Larbet	Falkirk	Dalziell	Hamilton
Barnsford	Falkirk	Portobello	Edinburgh	Duniplace	Denny
Bishopbriggs	Glasgow	Rutherglen	Glasgow	Govan	Glasgow
Maryville/ } Fallside } Cambus	Bothwell/ Uddingston	Tayport	Ferryport on Craig	Hunter's Quay	Dunoon
Carfin	Motherwell	West Barns	Dunbar	Kinbuck	Dunblane
Clackmannan	Alloa	Balloch	Alexandria	Kirk	Dunoon
Drybridge	Dundonald	(Dumbartonshire)		Port	Inverurie
Eastwood	Glasgow	Belhaven	Dunbar	Elphinstone	
Grahamston	Falkirk	Bishopwill	Elgin	Ranfurley } Sauchie	Bridge of Allan
Kennet	Alloa	Buckhaven	E. Wemyss	Walkerburn	Innerleithen
Kirkton	E. Kilbride	Camelon/ } Carron }	Falkirk		
		Ceres	Cupar		

Source: C.W. Hastings Gas and Water Works Statistics (1901)

(2) - General Acts Affecting Gas Undertakings(1) 1847 (10-11 Vict Ch. XV) Gasworks Clauses Act

Gas undertakers forbidden to enter private land or buildings without consent. To give 3 days advance notice of excavations, to Officials in charge of streets, bridges, drains, etc.; to fence and guard trenches and repair any subsidence for one year after re-filling - subject to a fine of £5 and £5 per day until remedied. Gas officials empowered to enter buildings using gas "at all reasonable times", with £5 penalty against anyone hindering them. Consumers with unauthorized pipes or meters, fraudulent meters, fined £5 and thereafter £2 per day until desisted; penalty of £5 for wilful damage of fittings. Pollution of streams, etc., by gasworks residues carried a penalty of £200, plus £20 per day after complaints made, to be paid to the person whose water had been despoiled. Gas leakage from pipes to be repaired within one day (or £5 per day penalty); gas contamination of water carried a penalty of £20, plus £10 per day until ceased. Maximum annual dividend 10% (unless otherwise stated in Private Act) unless to make good previous deficiencies. Excess profits into a reserve fund (maximum 10% nominal capital). Annual abstract of accounts to be deposited with Sheriff Clerk. Any two gas ratepayers could petition the Sheriff to investigate the Company books and officials on suspicion of taking excess profits; but entire cost had to be paid by complainants if this was not proved.

(ii) 1871 (34-5 Vict Ch. 41) Gasworks Clauses Act

Applicable to Companies registered under the Gas and Water Works Facilities Act (1870) and to chartered gas companies. By-product manufacture forbidden until consent received from all leasees and owners of premises within 300 yards. Mortgagees with over £1000 owing could appoint a Judicial Factor (i.e. 'Receiver'). Gas quality to be prescribed in Acts. Compulsory supply upon request to street lights within 50 yards of main pipes; and to individuals within 25 yards of mains, who received 30 ft service pipe gratis, provided they gave security for payment and took 2 year contract for gas equal annually to 20% cost of the service pipe. Consumers to keep meters maintained at own expense. Gas officers given right of entry "at

reasonable times". Justices could order the seizure and sale of goods of consumers who failed to pay gas rent. Gas undertakers to provide quality-testing apparatus at the works, which Local Authorities, or five consumers (applying through a Justice) could appoint an examiner to use. An annual abstract of accounts to be presented to the Local Authority. Penalties £2 for refusing a lawful gas supply; £20 for sub-standard gas quality.

(iii) 1876 (39-40 Vict Ch. 49) The Burghs Gas Supply (Scotland) Act

Incorporated the Lands Clauses Consolidation (Scotland) Act 1845, 1860; Commissioners Clauses Act 1847 (on mortgages); and the Gasworks Clauses Act 1847 (excepting profits). The Act empowered a local authority to purchase or construct gasworks. This had to be approved first by a special meeting of the Town Council or Commissioners of Police, and electors informed by letter of the proposal during the annual municipal elections. If two thirds of the authority approved the Act after the elections, it was adopted unless 20 rate-payers remonstrated in which case a plebiscite was required. In the event of defeat, another proposal to use the act was forbidden for three years.

If successful, registration in the Sheriff Court Books imposed the Act. A Gas Committee, representing the councillors of one or several towns, had to organize special Minute and Cash books for the undertaking. Their Treasurer had to balance the books annually, and they were checked by an auditor appointed by the Sheriff. Annual abstracts of accounts were to be published in newspapers.

To purchase an existing unincorporated gas company, the Commissioners required the consent of shareholders holding 75% of the stock; Limited Companies had to comply with the 1862 Companies Act. The price had to be mutually agreed upon. However, if an unincorporated company refused to negotiate, the Sheriff could enforce a compulsory purchase of the gasworks.

The commissioners could pay a lump sum, or annuities. They could borrow mortgages guaranteed against the gas-rates; or cash credit from a Banking company. Loans could be re-borrowed provided they were repaid other than through the Sinking Fund. A Gas Contingent Guarantee Rate could be levied to pay annuities and interest on

loans. A Sinking Fund to redeem mortgages and annuities was to be formed within two years of adopting the act, at a rate above 2.5% on loans borrowed.

Price of Gas to be the "same to all consumers under like circumstances", including the charge for public lights. Revenue to be just sufficient to meet estimated expenditure on running costs, interest, sinking funds, and "a depreciation and renewal fund sufficient to maintain the works in perpetuity".

Empowered to supply other towns, but not in competition with pre-existing gas companies, partnerships or municipal gasworks. Compulsory supply to persons within 100 yards of mains pipes provided payment made in advance. Minimum quality 14 candlepower. Penalty £20 for sub-standard gas; any five consumers empowered to appoint a person to test gas quality. All penalties, for wilful damage etc., under the Act to be recovered before the Sheriff under the Summary Procedure Act (1864).

(The only alteration made in 1893 was to allow the Sheriff to over-rule any person withholding permission for gas or by-products to be held within 300 yards of a dwelling house vide 1893 (25 Vict Ch. 52) The Burghs Gas Supply (Scotland) Amendment Act).

- (iv) 1859 (22-3 Vict. Ch. LXVI) An Act for Regulating Measures Used in Sales of Gas.
- (v) 1860 (23-4 Vict.Ch. CXLVI) An Act to Amend the Act for Regulating Measures Used in Sales of Gas.
- (vi) 1864 (27-8 Vict. Ch.XCVI) An Act to Enable Certain Royal and Parliamentary Burghs in Scotland to avail themselves of the Provisions of the Acts 22 and 23 Victoria Ch. 146 for Regulating the Sale of Gas.
- (vii) 1870 (33-4 Vict. Ch.70) An Act to Facilitate in Certain Cases the Obtaining of Powers for the Construction of Gas and Water Works.
- (viii) 1873 (36-7 Vict. Ch.89) An Act to Extend and Amend the Provisions of the Gas and Water Works Facilities Act 1870

(3) - Acts of Parliament Regulating Scottish Gas Undertakings(Companies and Municipal Gasworks)

(1) Aberdeen

- 1871 (34-5 Vict. ch. CXLI) Municipality Extension
 1881 (44-5 Vict. ch. LXXII) Corporation Act
 1893 (56-7 Vict. ch. CXCIV) Corporation (Gas/Water)

(2) Airdrie

- 1904 (4 E.VII ch. CXXXVII) Corporation Gas Order Confirm.
 1913 (3-4 Geo.V ch. CLXI) Corporation Gas Order Confirm.

(3) Arbroath

- 1871 (34-5 Vict. ch. XCIII) Corporation Gas
 1899 (62-3 Vict. ch. XLIII) Corporation Gas
 1912 (2-3 Geo.V ch.) Corporation Gas Order Confirm. (Secy. Scot.
 CXLVII under P.L.A. 1899)

(4) Ardrossan

- 1886 (49-50 Vict. ch. XCVIII) Gas and Water Company Ltd.
 1901 (1 E.VII ch. XLVIII) Gas/Water Order Confirm. (Secy. Scot. under
 P.L.A. 1899)

(5) Ayr

- 1873 (36-7 Vict. ch. CC) Burgh Act (a. 54; Corporation permitted to
 purchase Ayr and Newton Gas Companies)

(6) Bothwell/Uddingston

- 1902 (2 E.VII ch. CIII) Gas Order Confirm. (Board of Trade under
 G./W.F. Act 1870)

(7) Bridge of Earn

- 1902 (2 E.VII ch. CLXXXVIII) Gas Order Confirm. (Board of Trade under
 G./W.F. Act 1870)

(8) Broughty Ferry

- 1870 (33 Vict. ch. XIV) Commissioners Gas
 1880 (43-4 Vict. ch. XXXIX) Police/Improvement Order Confirm. (under
 G.P.I.'s Act, 1862)
 1899 (62-3 Vict. ch. XXX) Gas/Paving Order Confirm.

(9) Busby

- 1911 (1-2 Geo.V ch. CLXIX) Co. Ltd. Gas Order Confirm. (Board of Trade

under G./W.F. Act 1870)

(10) Campbeltown

1876 (39-40 Vict. ch. CLXVII) Burgh and Harbour

(11) Coatbridge

1877 (40-1 Vict. ch. CXL) Incorporating Gas Light Co.

1898 (61-2 Vict. ch. LXXXVI) Gas Order Confirm. (additional capital)

1902 (2 E.VII ch. LXXII) Gas Order Confirm. (Secy. Scot. under P.L.A.
1899)

1909 (9 E.VII ch. CXLII) Gas Order Confirm. (Secy. Scot. under P.L.A.
1899)

(12) Dumbarton

1873 (36-7 Vict. ch. CLXIV) Corporation Gasworks etc.

(13) Dundee

1830 (2 Geo.IV ch. XXXVI) Gas Light Company

1846 (9 Vict. ch. L) Dundee New Gas Company

1867 (30-1 Vict. ch. CVII) Gas Light Co. - Further capital

1867 (30-1 Vict. ch. CVII) New Gas Co. - Further capital

1868 (31-2 Vict. ch. XCIV) Corporation Gas

1872 (35 Vict. ch. XVII) Gas Amendment Act

1877 (40-1 Vict. ch. XLIII) Gas (Additional powers)

1882 (45-6 Vict. ch. CLXXXIV) Gas (Debenture Stock)

1894 (57-8 Vict. ch. LXXIV) Corporation Act

1899 (62-3 Vict. ch. LXXVI) Gas/Streets/Tramways

1914 (4-5 Geo.V ch. LXIX) Boundary Extension/Gas Order Confirm.

(14) Edinburgh

1818 (4 Geo.III ch. LXVII) Gaslight Company

1824 (5 Geo.IV ch. LXXVI) Oil-Gas Company

1829 (10 Geo.IV ch. II) Gaslight Co. - additional capital

1840 (3 Vict. ch. XIII) Gaslight Co. - additional powers

1840 (3 Vict. ch. XII) Edinburgh/Leith Gas Company (see below, Leith)

1888 (51-2 Vict. ch. CXXIX) Edinburgh/Leith Corporations Gas

1894 (57-8 Vict. ch. IV) Gas - additional powers

1896 (59-60 Vict. ch. CCIII) Edinburgh Extension Act

1897 (60 Vict. ch. XXXII) Edinburgh Corporation Act

1898 (61 Vict. ch. XV) Edinburgh/Leith Corporations Gas

1817 (37 Geo.III ch. XXXII) Town/Harbour Improvement (Gas)

1840 (3 Vict. ch. XXVII) Town Improvement/Water Supply

1865 (28-9 Vict. ch. CCC) Police/Town Improvement

1871 (34 Vict. ch. XLIV) Police/Improvement/Gas

1882 (45-6 Vict. ch. CLIV) Burgh Improvement

1909 (9 E.VII ch. CXXIX) Corporation Act

(20) Hamilton

1846 (9-10 Vict. ch. CXVIII) New Gas Company

1878 (41-2 Vict. ch. CXXXVII) Burgh Act

1902 (2 E.VII ch. II) Gas Order Confirm.

1904 (4 E.VII) ch. CLXIII) Gas Order Confirm. (secy. Scot. under B.P.
S.A. 1892, and T.C.S.A. 1900)

(21) Inverness

1826 (7 Geo.IV ch. CXII) Gas/Water Company

1847 (10 Vict. ch. XXVIII) Gas/Water Co. - additional powers

1874 (37-8 Vict. ch. LXXXVII) Gas/Water Order Confirm. (Board of Trade
under G./W.F. Act 1870)

1875 (38-9 Vict. ch. LXXXIX) Corporation Gas/Water

1879 (42-3 Vict. ch. IV) Police/Improvement Order Confirm. (secy.
State Home Dept.)

1892 (55-6 Vict. ch. CCXXI) Police/Improvement Order Confirm. (Secy.
State Scotland)

1905 (5 E.VII ch. CXVIII) Gas/Water Order Confirm. (Secy. State Scot-
land under B.P.S.A. 1892)

(22) Irvine

1881 (44-5 Vict. ch. LXXI) Burgh Act

(23) Kilmarnock

1855 (18 Vict. ch. LV) Gaslight Company

1871 (34-5 Vict. ch. LXXI) Municipal Extension/Improvement

1901 (1 E.VII ch. CLXXXVI) Corporation Order Confirm.

1912 (2-3 Geo.V ch. XXIV) Gas Order Confirm.

(24) Kirkcaldy

1876 (39-40 Vict. ch. CLXXIX) Burgh and Gas Act

(25) Leith

1822 (3 Geo.IV ch. XXXII) Gaslight Company

(26) Musselburgh

1887 (50-1 Vict. ch. CXXV) Co. Gas Order Confirm. (Board of Trade
under G./W.F. Act 1870)

(27) Paisley

1823 (4 Geo.IV ch. LXXII) Gaslight Company

1832 (2 Geo.IV ch. XI) Gaslight Co. - additional capital

1845 (8-9 Vict. ch. XVIII) Gas Commissioners

1870 (23-4 Vict. ch. XXXV) Corporation Gas

1874 (37-8 Vict. ch. CLXXI) Corporation Gas Order Confirm. (Board of
Trade under G./W.F. Act 1870, 1873)

1879 (42 Vict. ch. III) Police/Improvement Order Confirm. (Secy.
State Home Dept.)

1899 (62-3 Vict. ch. CLIII) Corporation Gas Order Confirm. (under B.P.
S.A.)

1900 (63-4 Vict. ch. CXIV) Gas Order Confirm. (under E.L.A. 1882, 1890)

1901 (1 E.VII ch. II) Gas Order Confirm. (under B.P.S.A. 1892)

1906 (6 E.VII ch. CXXVII) Gas Order Confirm. (under B.P.S.A. 1892)

1910 (10 E.VII ch. LXXIV) Gas Order Confirm. (under B.P.S.A. 1892)

(28) Perth

1871 (34-5 Vict. ch. LXXVIII) Corporation Gas

1888 (51 Vict. ch. XIX) Water/Gas

1897 (60 Vict. ch. XLIX) Harbour/Improvement/Gas

1899 (62 Vict. ch. XIII) Water/Police/Gas

1900 (63-4 Vict. ch. CXCIV) Gas Order Confirm.

1904 (4 E.VII ch. CXC) Gas Order Confirm. (Secy. Scot. under P.L.A.
1899)

1906 (6 E.VII ch. CXL) Gas Order Confirm. (Secy. Scot. under P.L.A.
1899)

(29) Stirling

1898 (61-2 Vict. ch. CXLI) Gaslight Company incorporated

1904 (4 E.VII ch. CLXVI) Gas Order Confirm. (Board of Trade under G./
W.F. Act 1870)

(30) Tolcross

1836 (6-7 Geo.IV ch. XCI) Gaslight Company

(31) Wishaw

1908 (8 E.VII ch. LXXIV) Burgh Electricity/Gas etc.

Abbreviations - P.L.A. 1899 - Private Legislation Procedure (Scotland)
Act

G./W.F. Act 1870 - Gas and Water Works Facilities Act
Confirm. - Confirmation Act

G.P.I.S. Act 1862 - General Police and Improvement
(Scotland) Act

B.P.S.A. 1892 - Burgh Police (Scotland) Act 1892

T.C.S.A. 1900 - Town Councils (Scotland) Act 1900

E.L.A. 1882, 1890 - Electric Lighting and Electric
Lighting (Scotland) Acts

(4) General Acts Incorporated in Gasworks (Private) Acts(i) General Acts -

Lands Clauses Consolidation (Scotland) Act 1845 (A)
 Lands Clauses Consolidation Amendment Act 1860 (B)
 Commissioners Clauses Act 1847 (C)
 Gasworks Clauses Act 1847 (D)
 Gasworks Clauses Acts 1847, 1871 (E)
 Waterworks Clauses Acts 1847, (1863) (F)
 Titles of Land Consolidation (Scotland) Act 1868 (G)
 Railway Clauses Consolidation (Scotland) Act 1845 (H)
 Companies Clauses Consolidation (Scotland) Act 1845 (I)
 Companies Clauses Acts 1863, (1869) (J)

(ii) Gas Companies Which Adopted Them (wholly or partially)

Date	Undertaking	Acts	Date	Undertaking	Acts
1846	Hamilton New	A, I	1877	Coatbridge	E, I, J
1846	Dundee New	A, I	1886	Ardrossan	A, B, E, F, H, I
1847	Inverness	A, D, F, I			
1855	Kilmarnock	A, D, I	1896	Fort William	A, B, E
1867	Dundee Old	I, J	1898	Stirling	E, I, J

(iii) Municipal Authorities Which Adopted Them (wholly or partially)

Date	Undertaking	Acts	Date	Undertaking	Acts
1868	Dundee	A, C, D	1871	Perth	A, C, D
1870	Broughty Ferry	A, B, D, E	1873	Dumbarton	A, B, C, E
1871	Aberdeen	C, D	1875	Inverness	A, B, D, E, F, H
1871	Arbroath	A, B, D			
1871	Forfar	C, D	1876	Campbeltown	A, B, E
1871	Greenock	A, B, C, D	1894	Falkirk	A, B, C, E

(5) GAS COMPANY MINUTE BOOKS :
Extant Company Minute Books Commencing Before 1900

Company	Source	Dates
Annan	S.R.O. (G.B. 1/1/1)	1836-1945
Ayr	S.R.O. (G.B. 1/4/1)	1845-1945
Banchory	S.R.O. (G.B. 1/5/1)	1845-1949
Banff	S.R.O. (G.B. 1/6/1)	1859-1914
Barrhead	S.R.O. (G.B. 1/7/1)	1868-1949
Bathgate	S.R.O. (G.B. 1/8/1)	1834-1903
Boness	S.R.O. (G.B. 1/11/1)	1843-1946
Coatbridge	S.R.O. (G.B. 1/20/1)	1877-1917
Cupar	S.R.O. (G.B. 1/23/1)	1839-1940
Dalkeith	S.R.O. (G.B. 1/24/1)	1826-1924
Dalry	S.R.O. (G.B. 1/25/1)	1833-1949
Dunfermline	Dunfermline Ref. Lib.	1828 et seq.
Duns	S.R.O. (G.B. 1/27/1)	1835-1882
Edinburgh/Leith	S.R.O. (G.B. 1/29/1;	1888-1913
Gas Commissioners	G.B. 2/25/1)	
Edzell	S.R.O. (G.B. 1/30/1)	1896-1914
Eyemouth	S.R.O. (G.B. 1/31/1)	1845-1949
Galashiels	S.R.O. (G.B. 1/33/1)	1844-1946
Hawick	S.R.O. (G.B. 1/37/1)	1858-1930
Innerleithen	S.R.O. (G.B. 1/38/1)	1847-1949
Inverkip	Ardgowan Estate Office, Greenock	1869 et seq.
Kelso	S.R.O. (G.B. 1/41/1)	1870-1918
Kilmalcolm	S.R.O. (G.B. 1/45/1)	1899-1945
Kirkcudbright (Municipal)	S.R.O. (G.B. 1/47/1)	1886-1914
Kirriemuir	S.R.O. (G.B. 1/48/1)	1881-1919
Langholm	S.R.O. (G.B. 1/49/1)	1887-1949
Lasswade/Bonnyrigg	S.R.O. (G.B. 1/50/1)	1857-1949
Leslie	S.R.O. (G.B. 1/53/1)	1865-1949
Lesmahagow	S.R.O. (G.B. 1/54/1)	1844-1948
Linlithgow	S.R.O. (G.B. 1/56/1)	1880-1949
Muirkirk	S.R.O. (G.B. 1/62/1)	1859-1949
Nairn	S.R.O. (G.B. 1/63/1)	1875-1949
Newton on Ayr	S.R.O. (G.B. 1/65/1)	1869-1949

Company	Source	Dates
Penicuik	S.R.O. (G.B. 1/68/1)	1877-1939
Selkirk	S.R.O. (G.B. 1/72/1)	1835-1897
Stornoway	S.R.O. (G.B. 1/77/1)	1847-1949
Stranraer	S.R.O. (G.B. 1/78/1)	1836-1949
Tranent	S.R.O. (G.B. 1/81/1)	1872-1934
Vale of Leven	S.R.O. (G.B. 1/82/1)	1839-1937
West Calder	S.R.O. (G.B. 1/83/1)	1891-1921
West Kilbride	S.R.O. (G.B. 1/84/1)	1892-1948

(6) ADDITIONAL MANUSCRIPT and ARCHIVE SOURCES

Edinburgh City Archives :

Edinburgh Council Record. Leith Police Scroll Sederunt Book.

General Minute Book of Leith Police.

Minute Book of Edinburgh Lighting Committee.

Glasgow City Archives :

D.G.E. 10 (15/3/1821) Contract between J.B.Neilson and Glasgow Gaslight Company. (Glasgow Old Gas Co.)

D.G.E. 22 (1836) Contract between G.Sutherland and Glasgow Old Co.

D.G.E. 25 (1847) Contract between J.Ritchie and Glasgow Old Co.

D.G.E. 1 (1817) Bond of Caution to Glasgow Old Co. from H. Monteith and A. Templeton. (D.G.E. 3, draft of same)

D.G.E. 31 (1860) Bond of Caution by D.Hamilton to Glasgow Old Co.

D.G.E. 31 (1817) Contract for Tar Removal from Glasgow Gasworks

D.G.E. 4 (also 64,65,68) Documents on Tar Contract between C. Macintosh and Glasgow Old Gas Company.

D.G.E. 66 (also 67) (1849) Ammonia Liquor Contract between J. Wilson and Glasgow Gas Light Co.

D.G.E. 59 (1818) Coal Contract between W.Dixon and Glasgow Old Co.

D.G.E. 166 Lesmahagow Coal Prices at Glasgow Gasworks (1857 - 72)

D.G.E. 164 (also 165) Table of Gas Consumption at Glasgow from 1827 - 1872

D.G.E. 130 Insurance of Glasgow Gasworks.

D.G.E. 49 (also 50) Papers on proposed New Glasgow Gas Co.(1825)

D.G.E. 24 List of Proprietors of Glasgow Gaslight Co. (1839)

D.G.E. 181 (to 199) Share Certificates of Partners in Glasgow Gas Companies at date of Municipal Takeover (1869) with dates of purchase and names of former owners.

D.G.E. 122 (also 126,127,134,138,143,144) Glasgow Gaslight Company Accounts (1825 - 35), Charges of Mismanagement (Mc.Gavin), and Company Replies.

D.G.E. 54 Papers on Glasgow Gas Bill (1857) with short history of Glasgow Gaslight Company.

D.G.E. 169 Statement of Glasgow Gasworks Accounts 1866-8

D.G.E. 174 (also 175) Gas Prices in Small Scottish Towns 1873, etc.

Minute Book of Tolcross Gas and Water Company (1836)

Glasgow Burgh Minutes (M.S.S.)

Extracts From the Records of the Burgh of Glasgow (printed)

Statistics of Glasgow (annual 1871 - 80, printed)

Miscellaneous Papers (M.P.) - Volumes of Pamphlets and printed
Miscellanea : Vol.10 (p.267), 15 (435,467,511,515), 18 (252,
254,258), 19 (713); 6 (644);

18 (215) First Report of the Commissioners for the
Examination of Glasgow Gaslight Company Books;

18 (231) Cheap Gas Movement in 1861;

18 (244) Letter from Paisley Gas Trust;

9 (592) The Fifth Ward and the Gas Question;

15 (465,467,474) Documents on Greenock Gasworks;

15 (459) Glasgow Gasworks Bill (1869);

15 (471,473) Gas Coals for Glasgow Municipal Gasworks(1869);

9 (528,533,584) Gas Committee in 1882, and Petitions
against Gas Bill, including those by Swan's Light.Co.

22 (207,306) Corporation Opposition to Partick, Hillhead
and Maryhill Gas Co. Bill in 1891

22 (205) Notes on Purchase of Pollokshaws Gas Co.

22 (279) Notes on Visit of Institute of Gas Engineers

Glasgow Corporation Reports Vol 9 (927), 10 (1025, 1039, 1040);

6 (644) Notes on Provan Gasworks.

Glasgow Corporation Reports 1904-5 (p.731), 1906-7 (7),

1907-8 (706,708), 1909-10 (543), 1910-11 (869), 1913-14(759)

N. Monroe Ed. 'Collected Glasgow Gas Acts and Incorporated Acts.'

House of Lords Record Office :

House of Lords Committee on Paisley Gas Bill	1844	Vol. 8
House of Commons Committee on Paisley Gas Bill	1844	Vols. 32-4
House of Commons Committee on Dundee Gas Bill	1846	Vol. 98
House of Lords Committee on Dundee Gas Bill	1846	Vol. 10
House of Commons Committee on Hamilton Gas Bills	1846	Vol.102
House of Lords Committee on Hamilton Gas Bills	1846	Vol. 10

Scottish Record Office, Edinburgh (S.R.O.) :

Board of Trade Records (B.T.2/) -

- 461 Air Burning Co.Ltd.
- 500 Patent Gas Coal Compound Co.Ltd. (Mackenzie's Process)
- 846 Irvine Chemical Co.Ltd.
- 1118 Adams Patent Gas Heating and Stove Co.Ltd.
- 1303 Patent Gas Fumes Neutralizer Co.
- 1348 Gas Residual Products Co.Ltd.
- 1415 Glasgow Gas Engine Co.Ltd. (1884)
- 2544 Oil Gas Enrichment Co. Ltd.
- 2801 Patent Gas Kiln Co.
- 3585 British Acetylene Gas Generator Co.Ltd (1897)
- 4239 James Milne and Son Ltd.
- 4309 Home and Colonial Acetylene Gas Syndicate Ltd. (1899)
- 4856 R. Laidlaw and Son Ltd.
- 5383 Bruce Peebles and Co. Ltd.
- 5583 Gas Power and By Products Co.Ltd. (1904)
- 6304 Globe Gas Engine Co.Ltd.
- 6353 Grice's Gas Engine Co.Ltd.
- 7634 Victor Gas Machine Co.Ltd.
- 7938 R.Laidlaw and Son Ltd.

Sasine Records - a guide to gas company partners, and property :

'Persons Edinburgh' Index to Edinburgh Sasines at Court of Council and Session.

Edinburgh Oil Gas Company - 4673 (P.R. 1019.244) dated 9/6/1824 ;
4921 (P.R.1026.34) 16/7/1824.

Paisley Gaslight Company - 2015 (P.R.369.47) 25/2/1825; 2355
(P.R.682.142) 11/2/1835; 5382 (P.R.822.97) 3/4/1839; 427
(P.R.1393.258)9/6/1856; 2412 (P.R.1494.190) 29/9/1858.

Greenock Gas Trust 4624 (P.R.475.3)22/10/1827.
Airdrie Gas Co. 3948 (P.R.106.144) 22/9/1830

Sheriff Court Records :

Bathgate District Small Debt Court Book (S.c.41/46/)

Edinburgh Union Gas Light Co. : Sheriff Court of Midlothian
(S.C. 39/7/1635, also 1891, 3222)

Falkirk Gas Company Contract of Copartnery : Stirling Sheriff
Court Book Vol. 19 (1834)

Feu Contract between Inverary Gas Co. and the Duke of Argyll:
Argyll Sheriff Court Book (S.C.51/50/6) Folio 27 (rrbij)

Sheriff Court Records (continued)

Inventories of Deeds - e.g. W.Foulis, Paisley Gasworks
 Manager, : Renfrewshire Sheriff Court Book Vol.32 (174)
 Inventories Index to Sheriff Court Records

Court of Council and Session Records :

Index to Deeds Recorded by Court of Council and Session.
 Dundee Gas Company Contract of Co-Partnery (1824) - Deeds Vol.265
 S.Reid v. Governors of Gas Light Company [Edinburgh] (1822) -
 Unextracted Process, McNeill R.16/2.
 T.Turnbull v. Callander Gas Light Company (1860) -
 Unextracted Process, Currie Dal.T. 8/29.
 W.Black v. Hamilton New Gas Light Co. (1852) (c.s.275/121)

Patent Specifications :

J.Maiben : Improved Gas Apparatus (1810) C.20/10/25
 D.Gordon : Portable Gas Lamp (1819) [9] C.19/3 (168)
 J.Grafton : Carburetted Hydrogen for Illumination (1819) [1]
 C. 19/3 (109)

Miscellaneous Documents :

Letters concerning Edinburgh Oil Gas Company : Papers of
 W.Mackenzie W.S. (North West Securities) G.D. 271/4 (also 5,
 6,7,9,11,12,14,21,38)
 Index to Roxburgh Papers 10542 p.24
 Shotts Iron Company Sederunt Books (G.D. 1/3/-)
 W.Spittal "Heads of a Plan for Lighting Alloa with Gas" :
 Coal Board Records (C.B. 10/13)
 Plan of Lochgilphead Gasworks by Patent Paraffin Gas Light
 Co. (1887) (R.H.P. 10398)
 Plan of Troon Gasworks (c.1850) (R.H.P. 16917)
 Plan of Methven Gasworks and Bullhill Gardens (1857) (R.H.P.
 6195)
 By-Products Revenue at Gartsherrie Ironworks 1887-1919
 (C.B. 4/521) 953/67

National Monuments Record of Scotland :

Index to Industrial Archaeology Photographs of Scottish Gasworks
 Plans and Photographs of Inverary Gasworks (AGD /50/1)
 Photographs and Notes on Musselburgh Stone Gasometer-House
 (M.L.R./2/1)

Unpublished Theses :

J. Butt "James Young, Scottish Industrialist and Philanthropist"
 (1963, Ph.D. Thesis, University of Glasgow)
 R.D. Corrins "William Baird and Company, Coal and Iron Masters
 1830 - 1914" (1974, Ph.D. Thesis, University of Strathclyde)
 A.M.C. MacEwan "The Shotts Iron Company 1800 - 1850"
 (1972, M.Litt. Thesis, University of Strathclyde)

Other Archive Sources :

Andersonian Institution Minute Book : University of Strathclyde
 Library, Glasgow
 Biggar Gas Company - List of Shareholders (1839) : Courtesy of
 Mr. B. Lambie, Gladstone Court Museum, Biggar.
 Dunfermline Gas Company Minute Book (1828 - 1845) : Dunfermline
 Ref. Lib.
 Duplicate Minutes of the Town Council of Wishaw (1905 - 1914) :
 Motherwell Ref. Lib.
 Edinburgh Portable Gas Company Minute Book (1827 - 1831) :
 Edinburgh Ref. Lib.
 Hamilton Burgh Accounts (1900 - 1914) : Hamilton Ref. Lib.
 Inverkip Gas Company Ltd. Minute Book : Ardgowan Estate Office,
 Greenock, Courtesy of the Factor, Mr. Pollock.
 Inverness Town Council Records (1824-34) : Inverness Town
 Clerk's Office.
 Paisley Burgh Financial Statements (1867 - 1890) : Paisley
 Ref. Lib.

Paisley Police Board Reports (annual, 1845-55) : bound in Paisley
Miscellaneous Documents (scrapbook) Paisley Ref. Lib.

"Records of the Minutes of Committees appointed by the Town Council
of Stirling" : Stirling Town Clerk's Office (ref.1/3/2).

Soho M.S.S. - the Boulton and Watt Collection : Birmingham Ref.
Lib. (especially Boxes 19, letters from William Creighton, and
30; Letterbooks, etc.)

Minutes of Evidence Taken Before a Committee of the House of Commons
on the London and Westminster Oil Gas Bill (1824) Institution of Gas
Engineers Lib.; London.

North British Association of Gas Managers - Reports of Proceedings
1869 - 1886 (bound as two volumes) Institution of Gas Engineers Lib.

(7) BRITISH PARLIAMENTARY PAPERS (B.P.P.)

- B.P.P. 1809 (220) VIII Report of Select Committee on the Gas Light and Coke Company Bill.
- B.P.P. 1817 (102) VIII 325 Estimate of Expenses of Lighting Dublin with Gas.
- B.P.P. 1821 (706) V 1 Report of the Select Committee on the Supply of Water to the Metropolis.
- B.P.P. 1822 (515) XXI Standing Orders Respecting Gas Light Bills.
- B.P.P. 1823 (193) V 303 Report to the House of Commons from the Select Committee on Gas Light Establishments.
- B.P.P. 1824 (51) V 1 Select Committee on the Law Respecting Artizans leaving the Kingdom to Reside Abroad, and on the Exportation of Tools and Machinery (First Report)
- B.P.P. 1824 (289) XVIII 183 Returns Relating to Lighting, with Gas, the General Post Offices of Great Britain and Ireland. (See also B.P.P. 1851 (456) LI 39)
- B.P.P. 1830 (9) VIII Report of the Lords Select Committee on Coal Trade.
- B.P.P. 1833 VI Select Committee on Manufacture, Commerce and Shipping (Fall in whale oil prices Q 8416 - 21)
- B.P.P. 1836 (40) XXXIV 126 (601) Report from Commissioners for Inquiry into the Conditions of the Poor in Ireland - Appendix G. Report on the State of the Irish Poor in Great Britain.
- B.P.P. 1838 (475) xv. 1 Report of Select Committee on the Coal Trade (Port of London) Bill.
- B.P.P. 1841 VII 1 First Report of the Select Committee to Inquire into the Operation of the Existing Laws affecting the Exportation of Machinery.
- B.P.P. 1847 (734) XLIV 359 Abstract of Statistics respecting Chartered Gas Companies in the United Kingdom (see also B.P.P. 1865 (55) L 733; B.P.P. 1866 (519) LXVI 486)
- B.P.P. 1847 XXII 95 Local Acts - Preliminary Inquiries 9 and 10 Vict. c.106. Observations or General Report on the Existing System of Lighting Towns with Gas, by Messrs Jones and Clegg, Surveying Officers under the Act 9 and 10 Vict. c.106, for the Towns of Wolverhampton, Ashton-under-Lyne, Shipley, Bingley and Wakefield.

- B.P.P. 1847 XXXIII 87 Local Acts - Preliminary Inquiries. Instructions to Surveyors appointed to institute Preliminary Inquiries under 9 and 10 Vict. c.106 in cases of Application for Local Acts for Lighting. (To exercise powers granted to the Commissioners of Her Majesty's Woods)
- B.P.P. 1847 LIX 232 Reports of the Registrar of Joint Stock Companies (see also B.P.P. 1852 LI 531)
- B.P.P. 1867 (471) X 1 Report of Select Committee on the Protection of Life and Property against Fire in the United Kingdom.
- B.P.P. 1868-9 (2410) LV 329 Gas for Oil Substitution (maritime lighthouses)
- B.P.P. 1871 XVIII 204 (1024) Report of Royal Commission on Coal Supplies - Section 10, Gas Manufacture.
- B.P.P. 1884 (c.3981.IV) XXXI (1) Royal Commission on Technical Instruction (Second Report) Vol V (Education - Scientific and Technical Vol 8 1970 Irish University Press)
- B.P.P. 1886 [c.4621] XXI First Report of the Royal Commission Appointed to Inquire into the Depression of Trade and Industry.
- B.P.P. 1887 (c.5172) LXXXIX 349 Wage Rates in the United Kingdom. (Industrial Relations, 1970 Irish University Press, Vol 20 p.349)
- B.P.P. 1892 Return of the Rates of Wages Paid by Local Authorities, and Private Companies, to Police and to Workpeople Employed on Roads, and at Gas and Water Works (Industrial Relations, 1970, Irish University Press Vol 20, p.890)
- B.P.P. 1893-4 (c.6894 - IX) XXXIV Minutes of Evidence Before Group C of the Royal Commission on Labour. (Industrial Relations, 1970, Irish University Press, Vol 33)

(8) BIBLIOGRAPHY - BOOKS and IMPORTANT ARTICLES

Abridgments of the Specifications Relating to the Production and Applications of Gas (Excepting Gas Engines) (1860, London) Commissioners of Patents.

Abstract of Revenue of Paisley Gas Light Commissioners May 1869 - May 1870 (1870, Paisley) Pub. Paisley Herald. Paisley Ref. Lib.

Abstract State of the Affairs of the Burgh of Inverness 1880-1 (1881, Inverness) Glasgow Mitchell Lib.

"Account of the Method of Illuminating the Clock Dial on the Steeple of the Tron Church in Glasgow" Quarterly Journal of Science, Literature and the Arts (Royal Institute) 1821 Vol XII p.229.

F. Accum A Practical Treatise on Gas Light (1815)

F. Accum Description of the Process of Manufacturing Coal Gas Now Employed at the Gas Works in London (1820) 2nd Edn.

A Century of Gas Supply 1831-1931. (1931, Hamilton) Pub. Hamilton Advertiser. Hamilton Ref. Lib.

W.M. Ackworth The Railways of Scotland (1890)

T. Adams Ed. Edinburgh 1329 - 1929 (1929 Edinburgh)

'A.G.M.' Municipal Hamilton (no date) Hamilton Ref. Lib. ref. 21164/155 L.352

A History and Description of the Town of Inverness (1847, Glasgow) Eds. K. Douglas, J. Smith, D. Fraser

W. Aiton General View of the Agriculture of Ayr (1811, Glasgow)

D.H. Aldcroft "The Entrepreneur and the British Economy 1870 - 1914" Economic History Review 1964 Second Series Vol. XVII

D.H. Aldcroft and H.W. Richardson The British Economy 1870 - 1939 (1969)

Alkali Inspector : Fourteenth and Fifteenth Reports of Proceedings 1877/8

H. Allen Modern Power Gas Producers : Practice and Applications (1908)

'Altruism' Gas Consumers' Manual and Trade Directory for Gas Fittings (1882., Manchester) Birmingham Ref. Lib.

R. Anderson A History of Kilsyth (1901, Edinburgh)

R. Ardrey The Social Contract - A Personal Inquiry into the Evolutionary Sources of Order and Disorder (1970)

Ardrossan Burgh Centenary 1846 - 1946 (1946) Nat. Lib. Scot.

H. Arnott The History of Edinburgh from the Earliest Accounts to 1780 (1816, Edinburgh)

- T.S. Ashton Iron and Steel in the Industrial Revolution (1924; 3rd. Edn. 1963, Manchester)
- T.S. Ashton and J. Sykes The Coal Industry of the Eighteenth Century (1929, Manchester)
- G. Atkins "The Origin and Progress of Gas Lighting" The Repertory of Patent Inventions (1827) Vol III pp. 84, 157, 226, 272
- C. Babbage On the Economy of Machines and Manufactures (1832)
- G. Baird "Gas" St. Cuthbert's Monthly Journal (April 1959, Edinburgh) Edinburgh Ref. Lib.
- H.A. Balston "Fidelity Guarantee" Journal of the Insurance Institute of Great Britain and Ireland (1911) Vol 14
- A. Bannatyne Memoir of Dugald Bannatyne (1896, Glasgow) Glasgow Mitchell Lib.
- M. Barash and W.J. Gooderham Gas (1971)
- H. Barclay ('Nestor') Rambling Recollections of Old Glasgow (1890 Glasgow) Glasgow Mitchell Lib.
- A.B. Barty The History of Dunblane (1944, Stirling)
- H.L. Beales "The 'Great Depression' in Industry and Trade" Economic History Review 1934 Vol. V
- K. Beaton "Dr. Gesner's Kerosene : The Start of American Oil Refining" The Business History Review (1955, Harvard) Vol. 29
- J.J. Beer The Emergence of the German Dye Industry (1959, Urbana) Illinois Studies in the Social Sciences, Vol. 44
- G. Beilby "Young and Beilby's Process for the Treatment of Coal" Transactions of the Mining Institute of Scotland 1883-4 Vol. 5
- H.S. Bell Oil Shales and Shale Oils (1948, New York)
- J. Bell and J. Paton Glasgow- Its Municipal Organization and Administration (1896, Glasgow)
- P. Bell "Essay on Economising Fuel and Lighting in Private Dwellings" Prize Essays and Transactions of the Highland and Agricultural Society of Scotland (1835) Vol. X
- J.M. Bellamy and J. Saville Dictionary of Labour Biography (1972)
- G.P. Bevan Ed. British Manufacturing Industry - Tobacco, Hides, India Rubber and Cordage (1877) 2nd Edn.
- W. Beveridge The Trade Cycle in Britain Before 1850 : A Postscript (Oxford Economic Papers) 1940
- Bibliography "Books on Gas Lighting" Mechanics Magazine 1842 Vol 36 p. 387
- M. Biot "On Lighting with Gas" The Analectic Magazine 1818 Vol. XI

- A. Bird Roads and Vehicles (1969, Newton Abbot)
- D.D.Black The History of Brechin to 1864 (1867, Edinburgh) 2nd Edn.
- S.H.Blackwell "A New Process of Open Coking" Proceedings of the Institute of Mechanical Engineers 1857
- F. Boase Modern English Biography (1965)
- M.F. Bond Guide to the Records of Parliament (1971, H.M.S.O.)
- W.A. Bone Coal and Its Scientific Uses (1918)
- W.R. Bowditch On Coal Gas (1860)
- A.L. Bowley Wages in the United Kingdom in the Nineteenth Century (1900, Cambridge)
- A.A. Bowman "The Royal Philosophical Society of Glasgow" Proceedings of the Royal Philosophical Society of Glasgow 1932-4 Vol. LXI
- W.T. Brande "Observations on the Application of Coal Gas to the Purposes of Illumination" The Journal of Science and the Arts 1816 Vol I p. 71
- W.T. Brande A Manual of Chemistry (1819)
- W.T. Brande and J. Cauvin A Dictionary of Science, Literature and Art (1841)
- W.T.K. Braunholtz The Institution of Gas Engineers - The First Hundred Years 1863 - 1963 (1963) National Central Lib., London
- D. Bremner The Industries of Scotland (1869, Edinburgh)
- A. Briggs Victorian Cities (1963)
- Britain in Depression - A Record of British Industries Since 1929 (1935, British Association)
- British Association - Notices of Some of the Principal Manufactures of the West of Scotland (1876, Glasgow)
- W.H. Brock "The London Chemical Society, 1824" - part of the Mechanics Institute movement AMBIX 1967 Vol XIV
- T. Brooke Modern Retort Settings - Their Construction and Working (1912)
- T.C.F. Brothie History of Govan (1905, Govan)
- A. Brown History of Glasgow (1795, Glasgow)
- A. Brown History of Glasgow, and of Paisley, Greenock and Port Glasgow (1795, Glasgow)
- R. Brown A History of Paisley from the Roman Period Down to 1884 (1886, Paisley) Vol. II Paisley Ref. Lib.
- R. Brown "Early English Joint Stock Companies" Transactions of the Royal Philosophical Society of Glasgow 1902-3 Vol. XXIV

- R. Brown The New Gas Bill for Paisley (1870, Paisley) Paisley Ref. Lib.
- D. Brownlie "The Early History of the Coal Gas Process" Transactions of the Newcomen Society 1922-3 Vol III (March 1923)
- D. Brownlie "The History of the Gas Process" Journal of the Society of Chemical Industry 1924 Vol XLIII
- R. Buchanan An Essay on the Warming of Mills and other Buildings by Steam (1807, Glasgow) Glasgow Mitchell Lib.
- R. Buchanan Practical and Descriptive Essays on the Economy of Fuel and Management of Heat (1810, Glasgow) Glasgow Mitchell Lib.
- W. Buckie "On the Inventions and Life of William Murdoch" Proceedings of the Institute of Mechanical Engineers October 1850
- R. Buckminster-Fuller Utopia or Oblivion (1972)
- H. Bumby (Coltness) "The Iron and Steel Industries of the West of Scotland" The Journal of the Iron and Steel Institute 1901 Vol 11
- C.A. Burghart "The Indiarubber Manufacture" Journal of the Society of Chemical Industry 1882 Vol. II
- J. Burke A Genealogical and Heraldic History of the Commoners of Great Britain and Ireland (1836)
- J. Butt "Legends of the Coal-Oil Industry (1847-64)" Explorations in Entrepreneurial History 1964
- J. Butt and J.R. Hume "Muirkirk 1786 - 1802 The Creation of a Scottish Industrial Community" Scottish History Review 1966 Vol XLV
- J. Butt "Technical Change and the Growth of the British Oil Shale Industry (1680 - 1870)" Economic History Review Second Series 1964-5 Vol XVII
- J. Butt The Industrial Archaeology of Scotland (1967, Newton Abbot)
- J. Butt and J.T. Ward "The Promotion of the Caledonian Railway Company" Transport History (1970) Vol 3
- J. Butt "The Scottish Iron and Steel Industry before the Hot Blast" Journal of the West of Scotland Iron and Steel Institute 1965-6 Vol 73
- J. Butt "The Scottish Oil Mania of 1864 - 6" Scottish Journal of Political Economy 1965 Vol. 12
- H.M. Cadell "The Oilshale Fields of the Lothians" Transactions of the Mining Institute of Scotland 1902 Vol. 24
- A.K. Cairncross and B. Weber "Fluctuations in Building in Great Britain, 1785 - 1849" Economic History Review 1956-7 Vol. 9
- J. Cameron Soap and Candles (1888)
- T.R. Cameron "A History of Gas Manufacture in Edinburgh" (1951) typescript for Scottish Junior Gas Assn. Edinburgh Ref. Lib.

- D. Campbell Historical Sketches of Greenock (1881, Greenock)
- R.H. Campbell "The Law and the Joint Stock Company in Scotland" in P.L. Payne Ed. Studies in Scottish Business History (1967)
- R.H. Campbell Scotland Since 1707 - The Rise of An Industrial Society (1965, Oxford)
- R.H. Campbell "Statistics of the Scottish Pig Iron Trade 1830 to 1865" Journal of the West of Scotland Iron and Steel Institute 1956-7 Vol. 64
- R.H. Campbell "Investment in the Scottish Pig Iron Trade 1830 - 43" Scottish Journal of Political Economy 1954 Vol. I
- R.H. Campbell "The Industrial Revolution : A Revision Article" Scottish Historical Review (1967) Vol. 46
- R.H. Campbell and J.B.A. Dow Source Book of Scottish Economic and Social History (1968, Oxford)
- W.A. Campbell The Chemical Industry (1971)
- D.S. Cardwell The Organization of Science in England - A Retrospect (1957) Extensive bibliography.
- A. Carnegie "On Natural Gas Fuel and Its Application to Manufacturing Purposes" The Journal of the Iron and Steel Institute 1885 Vol. I
- J.C. Carr and W. Taplin History of the British Steel Industry (1962, Oxford)
- F.F. Cartwright "The Association of Thomas Beddoes M.D. with James Watt F.R.S." Notes and Records of the Royal Society 1967 Vol 22
- J.L. Carvel One Hundred Years in Coal - The History of the Alloa Coal Company (1944, Edinburgh)
- J.L. Carvel and J.C. George The New Cumnock Coal-Field : A Record of Its Development and Activities (1946, Edinburgh)
- Centenary of the British Gas Light Company Ltd : A Short History of the Company 1824 - 1924 National Library of Science and Invention (Patent Office Lib.)
- Census of Production (1907) Preliminary Tables Summarizing Returns Under the Census of Production Act 1906 (1910, H.M.S.O.)
- E. Chadwick "Results of Different Principles of Legislation and Administration in Europe; of Competition for the Field, as Compared with Competition within the Field, of Service" Journal of the Statistical Society 1859 Vol. 22
- P. Chalmers Historical and Statistical Account of Dunfermline (1844, Edinburgh)

- W.H. Chaloner "Isaac Wilkinson, Potfounder", in L.S.Presnell Ed. Studies in the Industrial Revolution (1960)
- J.D. Chambers and G.E. Mindgay The Agricultural Revolution 1750 - 1880 (1966)
- R. Chambers A Biographical Directory of Eminent Scotsmen (Revised by T. Thomson Ed.) (1875)
- D. Chandler Outline of History of Lighting by Gas (1936) South Metropolitan Gas Company
- D. Chandler and A.D. Lacy The Rise of the Gas Industry in Britain (1949) British Gas Council
- R. Chapman The Picture of Glasgow 1812 (1812, Glasgow)
- R. Chapman The Picture of Glasgow and Stranger's Guide (1818, Glasgow) 3rd Edn.
- M.J.A. Chaptal Chemistry Applied to Arts and Manufactures (1807)
- D.A. Chatterton "State Control of Public Utilities in the Nineteenth Century : The London Gas Industry" Business History 1971 Vol. XIII
- Cheap and Good Gas leaflet in Paisley (1865, Paisley) Paisley Ref.Lib.
- S.G. Checkland The Rise of Industrial Society in England 1815 - 1885 (1969)
- S.G. Checkland The Mines of Tharsis - Roman, French and British Enterprise in Spain (1967)
- W.R. Chester Bibliography of Coal Gas (1892, Nottingham)
- H. Chubb "The Supply of Gas to the Metropolis" Journal of the Statistical Society 1876 Vol 39
- City and Guilds of London Institute Reports 1879 - 1884 Birmingham University Lib. (ref. s.per q.T.107.CS)
- J.H. Clapham An Economic History of Modern Britain :
The Early Railway Age 1820 - 1850 (1950, Cambridge)
Free Trade and Steel 1850 - 1886 (1932, Cambridge)
Machines and National Rivalries 1887 - 1914 (1938, Cambridge)
- J. Clark "The Manufacture of Patent Fuel"- a historical review Transactions of the Mining Institute of Scotland 1891-2 Vol. 13
- J. Clayton "A letter... giving an Account of Several Observations in Virginia, and in his Voyage thither, more particularly concerning Air" Philosophical Transactions 1693 Vol. 17 p.788

- J. Clayton "An Experiment Concerning the Spirit of Coals"
Philosophical Transactions (1739-40) Vol. 41 p.59
- S. Clegg A Practical Treatise on the Manufacture and Distribution of Coal Gas (1853) 2nd Edn.
- J. Cleland Annals of Glasgow (1816, Glasgow)
- J. Cleland Abridgement of the Annals of Glasgow (1817, Glasgow)
- J. Cleland The Rise and Progress of the City of Glasgow (1820, Glasgow)
- J. Cleland Statistics of Glasgow (1828, Glasgow) 3rd Edn.
- J. Cleland Enumeration of the Inhabitants of the City of Glasgow and County of Lanark for the Government Census of 1831 (1832, Glasgow)
- J. Cleland Description of the City of Glasgow (1840, Glasgow)
- A.G. Clement and R.H.S. Robertson Scotland's Scientific Heritage (1961, Edinburgh)
- F. Clifford A History of Private Bill Legislation (1887) Vol. 2
- A. and N.L. Clow The Chemical Revolution (1952)
- A. Clow "Scotland's Contribution to Industrial Development Through the Application of Chemical Science, since the Seventeenth Century" (1944) (Typescript Blackwell Prize Essay of the University of Aberdeen) Strathclyde University Library
- A. and N.L. Clow "Lord Dundonald" Economic History Review 1942 Vol. XII
- T. Cochrane (10th Earl Dundonald) The Autobiography of a Seaman (1861)
- H.A. Cockburn Memorials of His Time by Henry Cockburn (1909, Edinburgh) New Edn.
- G.D.H. Cole A Short History of the British Working Class Movement 1789-1947 (1947)
- G.D. Cole and A.W. Wilson British Working Class Movements - Select Documents 1789 - 1875 (1951)
- J. Colston The Town and Port of Leith (1892, Edinburgh)
- F. Colyer Gas Works - Their Arrangement, Construction, Plant and Machinery (1884, London)
- W.B. Cook Local Notes and Queries Reprinted from the Stirling Observer (1886, Stirling) Vol. II
- G.S. Cooper By-Product Coking (1917)
- R.D. Corrins "The Great Hot Blast Affair" Industrial Archaeology - The Journal of the History of Industry and Technology (1970) Vol. 7
- N. Cossons Industrial Archaeology (1975, Newton Abbot)
- W.H.B. Court A Concise Economic History of Britain (1954)

- A.S. Cowper The Other Sir Walter Scott - The Eighteen Twenties in Edinburgh (Law: Banking: Business: Insurance) (1971, Edinburgh College of Commerce) Nat. Lib. Scot.
- R. Craig "Lord Dundonald, Ninth Earl, the Discoverer of Coal Gas as a Luminant" - claims that Murdoch learned from Dundonald Journal of Gas Lighting 17/6/1899
- R.T. Crane "early History of Wrought Iron Gas Pipes" Gas World 28/10/1893
- J. Cranna Fraserburgh Past and Present (1914, Aberdeen)
- H. Creighton "Gas Lights" Encyclopaedia Britannica- Supplement to the 4th, 5th and 6th Editions (1824, Edinburgh) Vol. IV EDI-EQU
- F.S. Cripps "Gas Literature, English and Foreign" - Bibliography The Institute of Gas Engineers Transactions 1894 p.211
- F.S. Cripps "Classified List of British Gas Engineering Literature" ibid Vol. III p.67
- F.S. Cripps The Earliest Works on Gas Lighting - A List of Books, Pamphlets and Important References Prior to the Year 1840 (1907; reprinted from Journal of Gas Lighting 21/5/1907)
- F. Crouzet Ed. Capital Formation in The Industrial Revolution (1972)
- J.G. Crowther Scientists of the Industrial Revolution (1962)
- W. Crum "Sketch of the Life and Labours of Dr. Thomas Thomson, F.R.S." Proceedings of the Philosophical Society of Glasgow 1848 - 55 Vol. III
- W.B. Crump The Leeds Woollen Industry 1780 - 1820 (1931, Leeds) The Thoresby Society
- G.E. Davis "The Distillation of Coal and Recovery of Hydrocarbons from the Gas" Journal of the Society of Chemical Industry 1882 Vol. II
- G.H. Davis British Corporation Finance 1775-1850; A Study of Preference Shares (1936, Baltimore)
- J. Day Bristol Brass - A History of the Industry (1973, Newton Abbot)
- 'D.D.' of Kirkland The Gas Lights - A Poem (1812, Leith) Nat. Lib. Scot.
- P. Deane The First Industrial Revolution (1969, Cambridge)
- T.K. Derry and T.I. Williams A Short History of Technology (1960)
- J. Deucher "Account of Several Experiments Performed with Compressed Gas Apparatus" Glasgow Mechanics Magazine 1825 Vol III
- R. Devereux John Loudon McAdam (1936)
- P.G.M. Dickson The Sun Insurance Office 1710 - 1960 (1960)

Dictionary of National BiographyDigest of Evidence Given Before the Royal Commission on CoalSupplies 1901-5 (1905, H.M.S.O.)

W.A. Dinsdale History of Accident Insurance in Great Britain (1954)

G. Dodd The Curiosities of Industry and the Applied Sciences (1857)

H. Douglas Burke and Hare - The True Story of the Bodysnatchers (1973)

J.E. Dowson and A.T. Larter Producer Gas (1907)

R.W. Dron The Coalfields of Scotland (1902)

W. Drysdale Old Faces, Old Places and Old Stories of Stirling (1899, Stirling) II Series

A.B. DuBois The English Business Company After the Bubble Act 1720 - 1800 (1938, New York)

Baron F. Duckham A History of the Scottish Coal Industry Vol I 1700 - 1815 (1970, Newton Abbot)

Dundee Gas Commissioners Reports: 1882-3 (Nat. Lib. Scot.)

Dundee gasworks vide "The Gas Undertakings in Dundee" Gas World 1885 Vol III (4/7/85, 11/7/85, 18/7/85)

"Dunfermline Gasworks - Centenary Celebrations" Dunfermline Press 9/11/1929 Dunfermline Ref. Lib.

Edinburgh gasworks vide "The History of Gas Lighting in Edinburgh" Gas World 1886 (10/7/86)

Edinburgh Gas Light Co. List of Proprietors of the Edinburgh Gas Light Company (15th May 1821) Edinburgh Ref. Lib.

Edinburgh Gas Light Co. Illuminating Powers and Comparative Prices of Gas From Coal and Oil (1824, Edinburgh) Edinburgh Ref. Lib.

Edinburgh Gas Light Co. Report of the Edinburgh Gas Light Company (1828, Edinburgh) Edinburgh Ref. Lib.

Edinburgh Gas Light Co. Conditions and Regulations 1848-9, 1850-1

(Marginal note by W. McRay, City Archivist, dated September 1969, mentions extant plans of Leith gasometer house, which can no longer be located at Edinburgh City Archives) Edinburgh Ref. Lib.

Edinburgh - Tanfield oil gasworks vide Architectural Review 1945 Vol 97 p.134 (quoting Aus Schinkel's Nachlass 1863, Berlin)

D.H. Edwards Pocket History and Guide to Brechin (1884, Edinburgh)

D.C. Elgin "Natural Gas and Manufactured Gas" - Scottish developments since nationalization, in National Resources in Scotland - Symposium at the Royal Society of Edinburgh, 1960 (1961, Edinburgh)

A. Elton "The Rise of the Gas Industry in England and France" Actes du Ve Congrès International d'Histoire des Sciences (1950) p.492

- A. Elton "The Rise of the Gas Industry in England and France"
(no date) typescript. Institute of Gas Engineers Lib.
- A.F. Evans The History of the Oil Engine (1932, London)
- G.H. Evans British Corporation Finance 1775 - 1880; A Study in Preference Shares (1936, Baltimore)
- S. Everard History of the Gas, Light and Coke Company 1812 - 1949
(1949)
- G. Eyre-Todd History of Glasgow (1934, Glasgow) Vol. III
- W. Fairbairn Iron, Its History, Properties and Processes of Manufacture (1869, Edinburgh)
- M.E. Falkus "The British Gas Industry Before 1850" Economic History Review 1967. Second Series Vol XX
- M. Faraday Experimental Researches in Chemistry and Physics (1859)
- W.V. Farrar "Andrew Ure, F.R.S. and the Philosophy of Manufactures"
Notes and Records of the Royal Society of London 1973 Vol. 27
- A. Fergus "Sketch of the Early Years of the [Glasgow Philosophical] Society" Proceedings of the Royal Philosophical Society of Glasgow
1880-2 Vol. XII
- R.N. Le Fevre Gas Distribution Engineering (1948)
- D.C. Field "Gas Engines" in History of Technology 1850-1900 C. Singer Ed. (1958, Oxford) Vol. V
- A. Finlay A Hundred Years of Chemistry (1937)
- W. Fletcher Steam on Common Roads (1891; reprint 1972 Newton Abbot)
- J.E. Forbes A Short History of the Art of Distillation (1948, Leiden)
- J.E. Forbes "Petroleum and Bitumen in Antiquity" AMBIX 1939-49
Vols. II and III p.68
- R. Forsyth The Beauties of Scotland, Containing a Clear and Full Account of the Agriculture, Commerce, Mines and Manufactures (1805, Edinburgh) Vol. I
- G.K. Fortescue Subject Index of Modern Works Added to the Library of the British Museum (1886; various editions to 1900). Extensive Bibliography.
- E. Frankland "Contributions to the Knowledge of the Manufacture of Gas" Memoirs of the Literary and Philosophical Society of Manchester 1852 II Series Vol 10
- P.F. Frankland "The Composition and Illuminating Power of Coal Gas" Journal of the Society of Chemical Industry 1884 Vol. III

- A. Fyfe "On the Comparative Value of Different kinds of Parrot Coal, or Candle Coal, for yielding Gas, and on the Illuminating Powers of Gas at Different Distances from the Manufactory" Edinburgh New Philosophical Journal 1844 Vol XXXVI p.223
- A. Fyfe "On the Comparative Illuminating and Heating Power of Different Kinds of Coal Gas Burners, and on the Use of Coal Gas as a Source of Heat" Edinburgh New Philosophical Journal 1840 Vol. XXIX
- A. Fyfe "On the Comparative Value of Different Kinds of Coal for the Purpose of Illumination" Edinburgh New Philosophical Journal 1848 Vol. XLV p.37
- J. Gallagher and R. Robinson "The Imperialism of Free Trade" Economic History Review 1953 Second Series Vol. 6
- P. Gallagher My Story by Paddy the Cope (1939) Glasgow Mitchell Lib.
- R.L. Galloway Annals of Coal Mining and The Coal Trade Vols. I (1898) and II (1904)
- A. Gardner Strictures on Provost Murray's Gas Bill (1870, Paisley) Paisley Ref. Lib.
- W. Gardner and E.I. Cooke Chemical Synonyms and Trade Names - A Dictionary any Commercial Handbook (1948) 5th Edn.
- W.M. Gardner Ed. The British Coal-Tar Industry, Its Origin, Development and Growth (1915)
- Gas Journal Centenary 1849 - 1949 (1949) Nat. Lib. Scot.
- L. Gaster and J.S. Dow Modern Illuminants and Illuminating Engineering (1915)
- M. Gaskin The Scottish Banks - A Modern Survey (1965)
- E. Gauldie Ed. Dundee Textile Industry 1790 - 1885 : from the papers of Peter Carmichael of Arthurstone (1969, Scottish Historical Society)
- A.D. Gayer, W.W. Rostow and A.J. Schwartz The Growth and Fluctuation of the British Economy 1790 - 1850 (1953, Oxford)
- W. Gibson Coal in Great Britain- The Composition, Structure and Resources of the Coalfields (1920)
- A. Gillespie "The Recovery of Tar and Ammonia from Blast Furnace Gases" Transactions of the Institution of Engineers and Shipbuilders in Scotland 1895-6 Vol. XXXIX
- Glasgow Corporation Greater Glasgow - 1914 (1914, Glasgow)
- Glasgow Corporation Municipal Enterprises - Glasgow 1904 ; Corporation Handbook on the Occasion of the Twenty Second Congress of the Sanitary Institute in Glasgow (1904, Glasgow)

- Glasgow Corporation Municipal Glasgow - Its Evolution and Enterprises (1914, Glasgow)
- Glasgow Corporation Gas Dept. The Gas Supply of Glasgow (1935, Glasgow) Glasgow Mitchell Lib.
- "Glasgow and Its Gasworks" Gas World 1887 (4/6/87, 11/6/87, 25/6/87)
- Glasgow Courier 17/10/1805 letter (dated 11/10/1805) describing gas apparatus in Glasgow and Illumination of the Exchange.
- J.F. Gmelin "On the Chemical Knowledge which the Philosophers of the Sixteenth and Seventeenth Centuries had of the Different Gases" The Philosophical Magazine 1801-2 Vol. XI p.193
- J. Godsman A History of the Burgh and Parish of Ellon (c.1950, Aberdeen)
- Gore "Gas and Gas Lighting" - a history J.G.L. 10/3/1851 p.54
- T.B. Gourvish and M.C.Reed "The Financing of Scottish Railways before 1860 : A Comment" Scottish Journal of Political Economy 1971 Vol. 18
- L. C.B. Gower The Principles of Modern Company Law (1957)
- T. Graham Elements of Chemistry Including the Application of the Science in the Arts (1842)
- H.G. Graves "A Contribution to the History of Fire Damp" Transactions of the Institute of Mining Engineers Vol. VI 1893-4 p.241
- J.A. Green Ed A Treatise on British Mineral Oil (1919)
- Green, Miall, Thorpe, Ruchter and Marshall (Yorkshire College) Coal - Its History and Uses (1878)
- Greenock Police Board - minutes (1894, Greenock) Greenock Ref.Lib.
- F.H. Groome Ordnance Gazetteer of Scotland : Survey of Scottish Topography, Statistical, Biographical and Historical (1882, Edinburgh)
- C.Gross Bibliography of British Municipal History (1897, Harvard Historical Studies)
- H.J. Habakkuk American and British Technology in the Nineteenth Century - The Search for Labour Saving Inventions (1962, Cambridge)
- L.F. Haber The Chemical Industry During the Nineteenth Century (1958, Oxford)
- J.E. Handley The Irish in Scotland 1798 - 1845 (1943, Cork)
- J.E. Handley The Irish in Modern Scotland (1947, Cork)
- G. Haines Germanic Influence Upon English Education and Science, 1800 - 1866 : including Mechanics Institutes (1957, Connecticut College Monograph No. 6)

- H. Hamilton The Industrial Revolution in Scotland (1932, Oxford)
- J.L. and B. Hammond The Rise of Modern Industry (1967) 9th Edn.
- T. Hancock Personal Narrative of the Origin and Progress of the Caoutchouc or India-Rubber Manufacture in England (1857; reprinted 1920)
- Hanna's manufactory vide : "Messrs Hanna, Donald and Wilson of Paisley" Gas World 26/8/1885 p.405
- W. Hanna Memoirs of the Life and Writings of Thomas Chalmers (1849, Edinburgh)
- D.W.F. Hardie and J.D. Pratt A History of the Modern British Chemical Industry (1931)
- S.A. Harris The Development of the Gas Supply of North Merseyside 1815 - 1949 : A Historical Survey of the former Gas Undertakings of Liverpool, Southport, Prescot, Ormskirk, and Skelmersdale (1956, Liverpool) North Western Gas Board and History Society of Lancashire and Cheshire. Birmingham University Lib.
- J.A. Hassan "The Supply of Coal to Edinburgh 1790 - 1850" Transport History 1972 Vol. 5
- C.W. Hastings The Gas and Water Companies Directory (London) various editions.
- G.G. Henderson "Charles Macintosh" Proceedings of the Royal Philosophical Society of Glasgow 1932-4
- E. Henderson The Annals of Dunfermline 1069 - 1878 (1879, Glasgow)
- W.D. Henderson Industrial Britain Under the Regency (1968)
- W. Henry "Experiments on the Gas from Coal, Chiefly With a View to Its Practical Application" Memoirs of the Literary and Philosophical Society of Manchester 1819 second Series Vol III
- W.C. Henry "A Memoir of the Life and Writings of the Late Dr. Henry" Memoirs of the Literary and Philosophical Society of Manchester 1842 Second Series Vol. 6
- W. Henry Elements of Experimental Chemistry (1823)
- W. Henry An Epitome of Chemistry (1806, Edinburgh) Birmingham Ref. Lib.
- W.R. Herring Edinburgh and Leith Corporations' Gas Commissioners' Granton Works - A Descriptive Pamphlet (1902, Edinburgh) Glasgow Mitchell Lib.
- W.R. Herring The Granton Works of the Edinburgh and Leith Gas Commissioners : their design, construction and equipment. (1907)

- J.P. Higgins and S. Pollard Eds. Aspects of Capital Investment in Great Britain 1750 - 1850 (1971)
- R.L. Hills Power in the Industrial Revolution (1970, Manchester)
- History and Description of the Town of Inverness (1847, Inverness)
No author. , Inverness Ref. Lib.
- History of the Literary and Antiquarian Society of Perth 1784 - 1881 (No date) Nat. Lib. Scot. ref. 3/2830
- E.J. Hobsbawm Labouring Men - Studies in the History of Labour (1965)
- J. Horne Ed. Kirkintilloch (1910, Kirkintilloch)
- House of Commons Journal (Index for 1833 - 53) Vol 75 1819-20
'H.R.M.' Old Inverness (1889, Inverness)
- E. Hughes North Country Life in the Eighteenth Century - Vol.II Cumberland and Westmorland 1700 - 1830 (1965)
- S. Hughes A Treatise on Gas Works and the Practise of Manufacturing and Distributing Coal Gas (1853)
- B.C. Hunt The Development of the Business Corporation in England 1800 - 1867 (1936, Cambridge, Mass.)
- C. Hunt A History of the Introduction of Gas Lighting (1907)
- C. Hunt Gas Lighting (1900) (Vol. III of Chemical Technology or Chemistry in Its Applications to Arts and Manufactures C.E.Groves and W. Thorpe Eds.)
- R. Hunt Ed. Ure's Dictionary of Arts, Manufactures and Mines (1878) 7th Edn. Vol I
- W. Hunter Biggar and the House of Flemming (1967, Edinburgh)
- Industries of Stirling and District (1909, Stirling) Stirling Ref.Lib.
- In Parliament - Remarks Upon the Bill for Incorporating the Gas Light and Coke Company (1809, London) No author. Birmingham Ref.Lib.
- Iron and Steel Bibliographical Series (No.6) Gas Producer Practise 1902 - 36 (1936) Birmingham Ref.Lib.
- J. Irving The Book of Scotsmen (1881, Paisley)
- J. Irving The History of Dumbartonshire (1860, Glasgow) 2nd Edn.
- G.V. Irving and A. Murray The Upper Ward of Lanarkshire Described and Delineated (1864, Glasgow)
- W. Jacks James Watt (1901, Glasgow)
- G.P. James and A.G. Pool A Hundred Years of Economic Development in Great Britain 1840 - 1940 (1963)
- J.S. Jeans Western Worthies (1872, Glasgow)
- J.B. Jefferys "The Denomination and Character of Shares 1855 - 1885"
Economic History Review 1946 Vol. XVI

- F.R.J. Jervis The Evolution of Modern Industry (1960)
- J. Johnstone Lectures on Agricultural Chemistry and Geology (1844)
- T. Johnston The History of the Working Class in Scotland (1946, Glasgow) 4th Edn.
- W. Johnstone (of Messrs Johnstone, Fraser and Co.) "Gas Lighting and the Best Mode of Applying it to Buildings." Proceedings of the Glasgow Architectural Society (1865-7) Vol.VI (18/3/1867)
- W. Keddie "Early History and Proceedings of The (Glasgow Philosophical) Society" Proceedings of the Royal Philosophical Society of Glasgow 1857 Vol. IV
- A. Keith The North of Scotland Bank Limited 1836 - 1936 (1936, Aberdeen)
- J.R. Kellett "Glasgow's Railways 1830 - 1880" Economic History Review 1964 Second Series Vol. XVIII
- A. Kent "Thomas Thomson (1773 - 1852) Historian of Chemistry" The British Journal for the History of Science 1964-5 Vol. II
- A. Kent Ed. An Eighteenth Century Lectureship in Chemistry - Essays and Bicentenary Addresses relating to the Chemistry Department (1747) of Glasgow University (1451) (1950, Glasgow)
- T. Ker and the Committee of Proprietors at Tanfield Considerations Relative to the Nuisance in Coal Gas Works, with Remarks on the Principles of Monopoly and Competition (1828, Edinburgh) Edinburgh Ref. Lib.
- J. Kerr "Statement Submitted to the Inhabitants of Dundee by Order of the Directors of the Dundee Gas Light Company, in regard to the Projected New Company Supplying Gas" J.G.L. 1/2/1876 p.164; Dundee Ref. Lib. pamphlet.
- King's Treatise on the Science and Practice of the Manufacture and Distribution of Coal Gas (1878-82) T. Newbigging and W.T. Fewtrell Eds. Three vols.
- K. Knapp Chemical Technology or Chemistry Applied to the Arts and To Manufactures (1848) E.Ronalds and T.Richardson Eds.
- C.G. Knott Collected Scientific Papers of John Aitken L.L.D., F.R.S. (1923, Cambridge) Edinburgh University Lib.
- J. Knox Airdrie - A Historical Sketch (1921, Airdrie)
- A. Koestler The Ghost in the Machine (1970)
- A. Koestler The Act of Creation (1971)
- D. Laidlaw vide "The Late Mr David Laidlaw - A Chapter in the History of Gas and Water Engineering " J.G.L. 1891 Vol.LVIII p.940

- L.L. Lamborn Modern Soaps, Candles and Glycerin (1906)
- D. Lardner The Cabinet Cyclopaedia (1834)
- C.H. Lauder "The History of Coal Carbonization" in Historical Review of Coal Mining (1924, Mining Institute of Great Britain)
- T. Lawrence "Statistical Account of the Whale and Seal Fisheries of Greenland and Davis Straits carried on by Vessels from Peterhead, N.B. from 1788 to 1858" British Association Handbook 1859 Part II p. 216
- B. Lenman and K. Donaldson "The Scottish Linen Area 1850 - 1921" Business History 1971 Vo. XIII
- V.B. Lewis The Carbonization of Coal (1912)
- S. Lewis Topographical Directory of Scotland (1847)
- W.J. Liberty "The Century of Gas Lighting and Its Historical Development" The Illuminating Engineer 1913 Vol. VI. p.175
- Liebig and After Liebig - A Century of Progress of Agricultural Chemistry (1942, Washington) F.R. Moulton Ed. American Association for the Advancement of Science. Bibliography.
- J. Liebig Chemistry in Its Applications to Agriculture and Physiology (1847) 4th Edn. L.Playfair and W. Gregory Eds.
- G. Lockmann The Story of Chemistry (1960)
- J. Lothian Alloa and Its Environs (1871, Edinburgh) 3rd Edn.
- J.C. Loudon Cottage, Farm and Villa Architecture and Furniture (No date, London) New Edn. edited by Mrs Loudon after her husband's death, with Supplement. (Probably 1842; first edition 1836)
- A.W. Lyell: Torbanehill Case A Full Report of the Trial... of Mr and Mrs Gillespie of Torbanehill against Messrs Russel and Son, Coalmasters, Blackbraes (29 July 1853 - 4 August 1853) (1853, Edinburgh) Courtesy of Dr. J. Butt, University of Strathclyde.
- 'Lumen' Gas and All About It - The Gas Consumers' Vade Mecum (1872)
- G. Lunge A Treatise on the Distillation of Coal Tar, Ammoniacal Liquor, and the Separation from them of Valuable Products (1881;1909)
- H. Lyons The Royal Society 1660 - 1940 (1944, Cambridge)
- S.G.E. Lythe "The Dundee Whale Fishery" Scottish Journal of Political Economy 1964 Vol III
- W.F. Macarthur The History of Port Glasgow (1930,Glasgow)
- J.M. McBain Arbroath : Past and Present (1899,Arbroath)
- A. McCallum Pollokshaws, Village and Burgh 1600 - 1912 (1925, Paisley)
- J.M.Macaulay Ed. - J.Muir: John Anderson, Pioneer of Technical Education, and the College He Founded (1950, Glasgow)

- J.A. McCash "William Murdoch - Faithful Servant" Journal of the Institute of Mechanical Engineers 1966
- J.A. McCash "William Murdoch - 'Man of Little Showing'" The College Courant, being The Journal of the Glasgow University Graduates Association 1966 Vol. 18
- J.H.A. Macdonald Life Jottings of An Old Edinburgh Citizen (1915)
- C. Mackenzie The Vital Flame (1947)
- T.B. Mackenzie The Life of James Beaumont Neilson (1929, Glasgow) West of Scotland Iron and Steel Institute
- J. Macfarlan "George Dixon - Discoverer of Gas Light from Coal" Transactions of the Newcomen Society 1924-5 Vol V
- A. Mackie An Industrial History of Edinburgh (1963, Glasgow)
- M. Macintosh A History of Inverness (1939, Inverness)
- P. Mackie Reminiscences of Glasgow (1890, Glasgow) Written 1866 (vide Vol. II p.162); Glasgow gasworks details from 1818 memorandum book of E. McCrone, the Company Collector.
- G. Mackintosh Biographical Memoir of Charles Macintosh F.R.S. (1847, Glasgow) Glasgow Mitchell Lib.
- J. Mackinnon The Social and Industrial History of Scotland from the Union to the Present Time (1921)
- A. McKay The History of Kilmarnock (1909, Kilmarnock) 5th Edn.
- A. McLean Ed. Local Industries of Glasgow and the West of Scotland (1901, British Association for the Advancement of Science)
- D. Macleod The Clyde District of Dumbartonshire (1886)
- D. Macleod A Nonogenarian's Reminiscences of Garelochside and Helensburgh (1883, Helensburgh) Helensburgh Templeton Lib.
- John Maiben and Co. of Perth A Statement of the Advantages to be Derived from the Introduction of Coal Gas into Factories and Dwelling Houses as a Substitute for the Lights Now in Use (1813, Perth) Perth Ref. Lib.; Institute of Gas Engineers Lib.
- "R. and A. Main, gas stove manufacturers of Glasgow" Gas World Vol. VII p. 615
- G. Maltasa Coal Tars and their Derivatives (1920)
- C.A. Malcolm The History of the British Linen Bank (1950, Edinburgh)
- R. Mallet "On some Singular Phenomena of Flame from Coal Gas" - early type of aerated (bunsen) burner (432°F) British Association Handbook 1835 Dublin Part II p.49
- R.J. Mann M.D. Domestic Economy and Household Science (1878)

- G. Manners The Geography of Energy (1964)
- C.B. Mansfield "Carburetted-Air Gas Apparatus" Illustrated London News 1849 Vol. 15 p.106
- E.C.R. Marks The Manufacture of Iron and Steel Tubes (1903)
- S.P. Marks Pipe and Tube Bending and Jointing (1929)
- A. Marshall "Economics of Gas Supply" Journal of Gas Lighting 14/10/1890 p.790
- J.D. Marwick Glasgow - The Water Supply of the City with Notes on Various Developments of the City (1901,Glasgow) Glasgow Mitchell Lib.
- W.H. Marwick Scotland in Modern Times - An Outline of Economic and Social Development Since the Union of 1707 (1964)
- W.H. Marwick "The Cotton Industry and the Industrial Revolution in Scotland" The Scottish Historical Review 1924 Vol. 21
- W.H. Marwick "Municipal Politics in Victorian Edinburgh" Book of the Old Edinburgh Club 1969-72 Vol. XXXIII
- W.H. Marwick Economic Developments in Victorian Scotland (1936)
- W.H. Marwick "The Limited Company in Scottish Economic Development" Economic History Review 1934-5 Vol 3 p.415
- A.W. Mathews A Biography of William Mathews, the Expositor of Gas and Water Engineering (1899, London; limited edn. of 6 copies) Birmingham University Lib.
- W. Mathews A Compendium of Gas Lighting (1832) 2nd Edn.
- W. Mathews An Historical Sketch of the Origin and Progress of Gas Lighting (1832) 2nd Edn.
- P. Mathias The First Industrial Nation - An Economic History of Britain 1700 - 1914 (1969)
- J. Mayer "Iron Manufacture in Scotland" Journal of the Iron and Steel Institute 1872 Vol.II
- A. Meade Modern Gasworks Practice (1916)
- Memorabilia of Inverness (1822,Inverness) Inverness Ref. Lib.
- Memoirs and Portraits of One Hundred Glasgow Men (1886,Glasgow)
- S. Miall A History of the British Chemical Industry (1931)
- A. Miller The Rise and Progress of Coatbridge (1864, Glasgow)
- A.H. Miller James Bowman Lindsay and other Pioneers of Invention (1925, Dundee) Nat. Lib. Scot.
- J. Miller The Lamp of Midlothian, or The History of Haddington (1844, Haddington)
- J. Miller The History of Dunbar (1830, Dunbar)

- T.R. Miller The Monkland Tradition (1958)
- J.E. Mills Destructive Distillation (1877) Glasgow Mitchell Lib.
- "James Milne and Son" Gas World 3/1/1885 p.11
- James Milne's 'Gas Regulator' (governor) : Minutes of the Institution of Civil Engineers 19/5/1840 Vol.I; British Association Handbook 1840 Part II p.213; The Civil Engineer and Architect's Journal Nov. 1840 p.386; Mechanics Magazine 1843 Vol. 38 p.78
- B.R. Mitchell and P. Dean Abstract of British Historical Statistics (1962, Cambridge)
- B.R. Mitchell "The Coming of the Railway and United Kingdom Economic Growth" Journal of Economic History 1964 Vol.XXIV
- G.M. Mitchell "The English and Scottish Cotton Industries" The Scottish Historical Review 1925 Vol. 22
- F.J. Moore A History of Chemistry (1939)
- R.W. Moore "Historical Sketch of the Whitehaven Collieries" Transactions of the Federated Institute of Mining Engineers 1893-4 Vol. VII p.613
- G.T. Morgan and D.D. Pratt British Chemical Industry, Its Rise and Development (1938)
- J.B. Morrell "Practical Chemistry at the University of Edinburgh 1799 - 1843" AMBIX 1969 Vol. XVI
- J.B. Morrell "Thomas Thomson : Professor of Chemistry and University Reformer" The British Journal for the History of Science 1968-9 Vol. IV
- A.T. de Moulpied "Coal Gas as an Illuminant : A New Review" Discovery 1927 Vol. 8 p. 183
- A. Muir The Story of Shotts - Short History of Shotts Iron Company (1952, Edinburgh)
- L. Mumford Technics and Civilization (1946)
- A. Murdoch Light Without a Wick - A Century of Gas Lighting 1792 - 1892 (1892, Glasgow) North British Assn. Gas Managers.
- W. Murdoch's experiments vide The Montrose, Arbroath and Brechin Review (Forfar and Kincardineshire Advertiser) 31/7/1818 Glasgow Mitchell Lib.
- W. Murdoch "An Account of the Application of the Gas from Coal to Economical Purposes" 25/2/1808 Philosophical Transactions 1808
- W. Murdoch A Letter to a Member of Parliament from Mr. William Murdoch in Vindication of his Character and Claims (1809; reprinted 1892 by R.B. Prosser, London) Birmingham Ref. Lib.

- N. Munro The History of the Royal Bank of Scotland 1727 - 1927 (1928, Edinburgh)
- W.S. Murphy Captains of Industry (1901, Glasgow)
- J. Murray "Observations on the Fire Damp of Coal Mines" Transactions of the Royal Society of Edinburgh 1815 - 18 Vol. VIII
- W.F. Murray "On a New System of Firing Pottery Ware by the Use of Gaseous Fuel 19/4/1893" Proceedings of the Royal Philosophical Society of Glasgow 1892-3 Vol. XXIV
- A.E. Musson "The Great Depression in Britain, 1873- 1896: A Reappraisal" Journal of Economic History 1959 Vol. 19
- A.E. Musson Science, Technology and Economic Growth in the Eighteenth Century (1972)
- A.E. Musson and E. Robinson Science and Technology in the Industrial Revolution (1969, Manchester)
- S. Muspratt Chemistry, Theoretical, Practical and Analytical As Applied to the Arts and Manufactures (1853, 1861) 2 Vols.
- W. Naismith Handbook of Hamilton (c.1878, Hamilton) Hamilton Ref. Lib.
- J. Naismith General View of the Agriculture of Clydesdale (1806)
- A.W. Nash and A.R. Bowen The Principles and Practice of Lubrication (1929)
- 'John' (J.B.) Neilson "On The Manufacture of Gas Obtained from Coal, and On Its Value relative to Oil Gas." Glasgow Mechanics Magazine 1825 Vol. III p.105
- J.B. Neilson's Public Address at the Opening of the Extended Library of Glasgow Gas Workmen's Institute vide Glasgow Mechanics Magazine 1825 Vol. II p.191, 1825 Vol. III p.155
- A.M. Neuman Economic Organization of the British Coal Industry (1934)
- J. Needham, W. Ling, and K.G. Robinson Science and Civilization in China (1966, Cambridge)
- J. Neill Records and Reminiscences of Bonhill Parish (1912, Dumbarton)
- T. Newbigging The Century of Gas Lighting (1901; reprinted from Gas World 1900-1)
- T. Newbigging The Gas Manager's Handbook (1870; 1883)
- New Statistical Account of Scotland
- J. Nicol Statistics of Glasgow 1881-5 (1885, Glasgow)
- J. Nicol Statistics of Glasgow 1885 - 1891 (1891, Glasgow)

- Notice of Some of the Principal Manufactures of the West of Scotland (1876, British Association)
- C.A. Oakley Scottish Industry (1953, Scottish Council)
- W.T. O'Dea A Short History of Lighting (1958, H.M.S.O.)
- W.T. O'Dea Lighting - Gas, Mineral Oil and Electricity (1967, H.M.S.O.)
- O.E.C.D. The Search for Crude Oil and Natural Gas in the Area of the O.E.C.D. (1962)
- Oil Shale and Cannel Coal (1938) Institute of Petroleum.
- On The Use of Trinidad Bitumen for the Purpose of Increasing the Illuminating Power of Coal Gas (1868) Experiments by Dr.T. Anderson of Glasgow University. Birmingham Ref. Lib.
- One Hundred Years of Gas Manufacture in Manchester (1949, Manchester) Manchester Gas Dept.
- J. Ord The Story of the Barony of Gorbals (1919, Paisley)
- T. Orr Historic and Descriptive Sketches of the Joint Burgh of Motherwell and Wishaw (1925, Hamilton) Reprints from Hamilton Advertiser and County of Lanark News, A.L.Thomson Ed. Motherwell Ref. Lib.
- J. Pagan Sketch of the History of Glasgow (1847, Glasgow) - history and diag. of Mechanics Institute.
- W. Page Commerce and Industry - Tables of Statistics for the British Empire from 1815 (1919)
- Paisley Gas Light Company Circular (May 1826, Paisley) Paisley Ref. Lib. ref. P.C.2957
- Paisley Gas Question (1860, Greenock) - Reprinted pamphlets. Paisley Ref. Lib. ref. P.C.608
- R.H.I. Palgrave The Local Taxation of Great Britain and Ireland (1871)
- S. Parkes The Chemical Catechism (1816) 7th Edn. Nat. Lib. Scot.
- E.A. Parnell Applied Chemistry in Manufactures, Art and Domestic Economy (1844) Vol. I p.35
- J. Parry "On the Gases evolved from Pig Iron, Steel and Wrought Iron, and Coke, On Heating in Vacuo, and on the estimation of Carbon in the Same " - research by Prof. Graham The Journal of the Iron and Steel Institute 1872 Vol. II
- R.H. Parsons A History of the Institution of Mechanical Engineers 1847 - 1947 (1947)
- R.H. Patterson (Metropolitan Gas Referee) Gas and Gas Lighting (1877) 2nd Edn (Vol.4 of British Manufacturing Industries G.P.Bevan Ed.)

- B.H. Paul "On the Manufacture of Hydrocarbon Oils, Paraffin etc. from Peat" - apparatus on Isle of Lewis British Association Handbook 1862 Cambridge Part II p.50
- L. Pauwels and J. Bergier The Morning of the Magicians (1971) 2nd Edn.
- P.L. Payne "The Govan Collieries 1804 - 5" Business History 1960 Vol III.
- P.L. Payne Ed. Studies in Scottish Business History (1967)
- T.S. Peckston The Theory and Practise of Gas Lighting (1819)
- H. Pelling A History of British Trade Unionism (1972)
- R. Phillips A Familiar Cyclopaedia or Dictionary of the Arts of Life and Civilization (c.1830)
- Pig Iron Prices vide : Commercial History and Review (Supplement to the Economist) 1869 (XXVII) 1879 (XXXVII); prices 1845-60 Glasgow Daily Herald 1/1/1861; B.P.P. First Report of the Royal Commission Appointed to Inquire into the Depression of Trade and Industry (1886) pp. 168 (184), 139 (155)
- Messrs W.T.Pike General Trade in Berwick Upon Tweed (1894; reprinted 1972) Nat. Lib. Scot.
- R.B. Pilcher and F.Butler-Jones Eds. What Industry Owes to Chemical Science (1945, Cambridge)
- Pintsch Company Publicity Brochure (c. 1903) courtesy:Clyde Lighthouse Trustees Offices, Port Glasgow
- W. Pitt "On Converting the Smoke Arising from Steam Engines Etc. into Tar" - Dundonald's ovens Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce (1791) Vol IX
- M. Plant The English Book Trade (1965)
- J. Playfair A Geographical and Statistical Description of Scotland (1819, Edinburgh) Vol. II
- S. Pollard The Genesis of Modern Management (1965)
- H. Pollins "The Marketing of Railway Shares in the First Half of the Nineteenth Century " Economic History Review 1954 Second Series Vol. 7 .
- F. Popplewell "Seasonal Fluctuations in Employment in the Gas Industry" Journal of the Royal Statistical Society 1910-11 Vol. LXXIV
- R. Porteous Grangemouth's Modern History 1768 - 1968 (1970, Grangemouth) Burgh of Grangemouth,
- A. Porteous The History of Crieff (1912, Edinburgh)

- G.R. Porter "Iron Manufacture in Great Britain" British Association Handbook (1846) Southampton
- G.R. Porter Progress of the Nation (1851)
- L.S. Presnell Ed. Studies in the Industrial Revolution (1960)
- R. Purvis Sir William Arrol - A Memoir (1913)
- A. Raistrick Quakers in Science and Industry (1950 Newton Abbot)
- R.S. Rait The History of the Union Bank of Scotland (1930, Glasgow)
- B. Redwood Petroleum - A Treatise (1922) 4th Edn. Comprehensive; with bibliography.
- B. Redwood and G.T. Holloway Petroleum (1896)
- I.I. Redwood Mineral Oils and their By-Products (1897)
- M.C. Reed "A Note on Subscriptions to the Glasgow, Paisley and Greenock Railway" Transport History 1973 Vol 6
- A. Rees The Cyclopaedia or Universal Dictionary of Arts, Sciences, and Literature (1819)
- J.M. Reid The History of the Clydesdale Bank 1838 - 1938 (1938)
- R. Reid (Senex) Glasgow Past and Present (1884 Glasgow)
- Wemyss Reid Memorials and Correspondence of Lyon Playfair (1899)
Nat. Lib. Scot.
- Report of the Commissioners Appointed to Inquire into the Several Matters Relating to Coal in the United Kingdom (1871, H.M.S.O.)
- Report of H.M. Board of Trade - Abstract of Labour Statistics 1-3 (1893-4 to 1895-6) (1896, H.M.S.O.)
- Report to the Committee of Management of Greenock Gas Works 16 October 1860 (1860, Greenock) bound in Paisley Gas Question Paisley Ref. Lib. ref. P.C. 608
- W. Richards A Practical Treatise on the Manufacture and Distribution of Coal Gas (1877)
- (Lord Provost) D. Richmond Notes on Municipal Work (1899, Glasgow)
- J. Riley "The Rise and Progress of the Scottish Steel Trade" The Journal of the Iron and Steel Institute 1885 Vol. II
- F.W. Robins The Story of the Lamp (and the Candle) (1939, Oxford)
- E. Robinson "James Watt, Engineer and Man of Science" Notes and Records of the Royal Society 1969 - 70 Vol. 24
- E. Rogers "Manufacture of Charcoal and Coke" Proceedings of the Institution of Mechanical Engineers 1857
- L.T.C. Rolt Victorian Engineering (1970)

- E. Ronalds and T. Richardson Chemical Technology, or Chemistry in its Application to the Arts and Manufactures (1855) 2nd Edn. Vol I Part II p.562
- J.A. Ross Municipal Affairs in Aberdeen Since 1833 (1889, Aberdeen)
- R. Routledge Discoveries and Inventions of the Nineteenth Century (1876)
- F.R. Rowan "Wilson's Gas Producer for Firing Furnaces, with Some Applications". Transactions of the Institution of Engineers and Shipbuilders in Scotland 1880-1 Vol. XXIX, 1881-2 Vol. XXX
- Royal Society of London, Catalogue of Scientific Papers -
Royal Society Index 1800 - 1900 Vol III Physics Part I General, Heat, Light, Sound (1912, Cambridge)
- J.O.N. Rutter Gas Lighting : Its Progress and Its Prospects, with Remarks on the Rating of Gas Mains and a Note on the Electric Light (1849)
- J.O.N. Rutter Practical Observations on Gas Lighting (1833)
- J.S. Samuel Ed. The Lord Provosts of Glasgow From 1833 to 1902 - Biographical Sketches (1902, Glasgow)
- S.B. Saul "The Myth of the Great Depression 1873- 1896 (1969) Economic History Society.
- S.B. Saul "The Market and Development of Mechanical Engineering Industries in Britain 1860 - 1914 " Economic History Review 1967 Second Series Vol. XX
- J. Saville "Sleeping Partnership and Limited Liability 1850 - 1856" Economic History Review 1955-6 Second Series Vol. 8
- R.E. Schofield "The Lunar Society of Birmingham - A Bicentenary Appraisal" Notes and Records of the Royal Society 1966 Vol. 21
- R.E. Schofield The Lunar Society of Birmingham : A Social History of Provincial Science and Industry in Eighteenth Century England (1963, Oxford)
- A. Schuster and A.E. Shipley Britain's Heritage of Science (1917)
- J.D. Scott Siemens Brothers 1858 - 1958 (1959)
- R.E. Scott "The Story of the Hawick Gas Company" Transactions of Hawick Archeological Society 1969
- H. Scrivenor History of the Iron Trade (1854)
- Scottish Gas Board - First Report and Statement of Accounts 1 Jan. 1949 - 31 March 1950. (1950) Edinburgh Ref. Lib.
- Scottish Coalfields - The Report of the Scottish Coalfields Committee (1944, Edinburgh)
- Scotland - Memoirs of the Geological Survey - The Oil Shales of the Lothians (1927) 3rd Edn.

- A.B. Searle Refractory Materials, Their Manufacture and Uses (1917)
- A.H. Sexton "The Andersonian : A Centenary Sketch" Proceedings of the Royal Philosophical Society Of Glasgow 1896-7 Vol. XXVIII
- A.H. Sexton "The By Products of the Blast Furnaces" Proceedings of the Royal Philosophical Society of Glasgow 1895-6 Vol. XXVII
- A.H. Sexton Producer Gas (c.1903, Manchester)
- H.A. Shannon "The Coming of General Limited Liability" Economic History (Supplement to the Economic Journal) 1930-3 Vol.II
- H.A. Shannon "The First Five Thousand Limited Companies and their Duration" Economic History 1930-3 Vol II
- H.A. Shannon "Bricks - A Trade Index" Economica 1934
- J. Sharp Observations on the Practical Advantages attending the Use of Coal Gas; Including an Historical Sketch of its first introduction; description of the Meter with instructions how to read off the direction of the index; the properties of various Burners in Use and their relative economy; with a Short Essay on Cooking by Gas (1850, Southampton; 1851 Southampton 2nd Edn.)
Birmingham Ref. Lib.
- Provost Sharp "The Cotton Industry in Rothesay" Transactions of Buteshire Natural History Society 1908-9 Vol. II Glasgow Mitchell Lib.
- A. Shaw Municipal Government in Great Britain (1895)
- J.E. Shaw Ayrshire 1745 - 1950 : A Social and Industrial History of the County (1953)
- T. Shirley "The Description of a Well and Earth in Lancashire taking fire by a Candle Approached to it " Philosophical Transactions 1667 Vol II No. 6
- H. Shurer "The Macintosh - The Paternity of an Invention" Transactions of the Newcomen Society 1952 Vol. XXVII
- C.W. Siemens "On a Regenerative Gas Furnace as Applied to Glass-houses, Puddling, Heating, etc". Proceedings of the Institution of Mechanical Engineers (1862)
- Dr. Siemens "Utilization of Bye-Products in Manufacturing Coal Gas" Journal of the Iron and Steel Institute 1882
- N.J. Silberling "British Prices and Business Cycles 1779 - 1850" Review of Economic Statistics (1923, Harvard) Vol. 5
- F.W. Simms Ed. Public Works of Great Britain (1838) Part III
Nat. Lib. Scot.

- H. Simon "An Improved System for the Utilization of Bye-Products in the Manufacture of Coke" Journal of the Iron and Steel Institute (1880) Part I
- A. Simpson Agricultural Chemistry (1892)
- J. Sinclair Analysis of the Statistical Account of Scotland (1825 Edinburgh) 2 Vols.
- J. Sinclair Appendix to the General Report of the Agricultural State and Political Circumstances of Scotland (1814, Edinburgh)
- C. Singer Ed. History of Technology 1850 - 1900 (1958, Oxford)
- J. Skelton The Handbook of Public Health for Scotland (1890, Edinburgh) Glasgow City Archives
- A. Slaven The Development of the West of Scotland 1750 - 1960 (1975)
- W. Smart "The Municipal Industries of Glasgow" Proceedings of the Royal Philosophical Society of Glasgow 1894-5 Vol. XXVI
- E. Smart History of Perth Academy (1932)
- S. Smiles Industrial Biography - Iron Workers and Tool Makers (1868; reprinted 1967 Newton Abbot)
- S. Smiles Men of Industry and Invention (1884; 1905 8th Edn.)
- S. Smiles Lives of the Engineers - Vol. IV Boulton and Watt (1878)
- B.M.D. Smith and J.L. Moillet "James Kier of the Lunar Society" Notes and Records of the Royal Society 1967 Vol. 22
- R.M. Smith The History of Greenock (1921, Greenock)
- R. Smith "The Life and Works of Thomas Graham" Proceedings of the Royal Philosophical Society of Glasgow 1883-4 Vol. XV
- W. Smith "The Recovery of Bye-Products from Coal, with Special Reference to the Coke and Iron Industry" Journal of the Iron and Steel Institute 1884 Vol. II
- W. Smith "The Earliest Records of Methods for Coking of Coal in Coke Ovens for Metallurgical Processes with Recovery of Tar and Ammonia." Journal of the Society of Chemical Industry 1884 Vol. III p. 601
- "Spontaneous Combustion of Coal in Ships" The Mining Institute of Scotland 1883-4 Vol. 5 p. 23
- L.D. Stamp Ed. Land Utilization Survey of Britain (1946)
- Statistics of Glasgow (1871-85, annually, Glasgow) Glasgow City Archives.
- H. Stephens and R.S. Burn The Book of Farm Buildings, their Arrangement and Construction (1861)

- M.D. Stephens and G.W.Roderick "The British Artizan - Scientific and Technical Education in the Early Nineteenth Century" - data from Glasgow Mechanics Magazine. Annals of Science : An International Review of the History of Science and Technology since the Renaissance (1972) Vol. 29
- "Messrs A. and J. Stewart Limited, Coatbridge" Gas World 13/11/1886 p.619
- E.G. Stewart Town Gas - Its Manufacture and Distribution (1958, H.M.S.O.)
- E.G. Stewart Historical Index of Gasworks Past and Present in the Area Now Served by the North Thames Gas Board (1806 - 1957) (1957) Institute of Gas Engineers Lib.
- G. Stewart Curiosities of Glasgow Citizenship (1881,Glasgow)
- J. Stewart Falkirk, Its Origin and Growth (1940, Falkirk)
- A.H. Stirling A Sketch of Scottish Industrial and Social History in the Eighteenth and Nineteenth Centuries (1906,Glasgow)
- "Stirling Scrapbook "- newspaper cuttings. Stirling Ref. Lib.
- Stratton's Glasgow And Its Environs (1891)
- J. Strawhorn The New History of Cummock (1966,Glasgow)
- Strutt's Aerated Gas Stoves at Derby : British Association Handbook 1838 Newcastle Part II p.159
- W.T. Sugg The Domestic Use of Coal Gas (1884)
- B. Supple The Royal Exchange Assurance. A History of British Insurance 1720 - 1970 (1970, Cambridge)
- J. Swan Select Views of Glasgow (1828, Glasgow)
- P.M. Sweezy Monopoly and Competition in the English Coal Trade 1550 - 1850 (1938, Harvard) Harvard Economic Studies Vol. LXIII
- J.G. Talbot Return of Joint Stock Companies (1878, H.M.S.O.) List of Companies registered under 1862 Company Act
- A.J.Taylor "Labour Productivity and Technological Innovation in the British Coal Industry 1850 - 1914 " Economic History Review 1961-2 Second Series Vol. XIV
- F.S. Taylor The Century of Science (1941)
- G.L. Taylor On Gas Works and the Introduction of Cannel Coal Gas (Thoroughly Purified) Into the Metropolis (1848) Royal Institute of British Architects.
- G. Templeton The Joint Stock Company Directory (1865) Glasgow Mitchell Lib. ref. C. 60899

- J. Terrance Ed. Terrance's Notebook for Gas Engineers and Students (1948)
- The Appendix to the Report of the Committee of Subscribers to the Dundee Gas Light Company (1823, Dundee) Review of oil gas. Dundee Ref. Lib.
- The Edinburgh Stock Exchange 1844 - 1944 (1945, Edinburgh) Edinburgh Ref. Lib.
- "The Gas Industry in Scotland" - a historical review Journal of Gas Lighting 14/6/1887, 21/6/1887, 28/6/1887, 5/7/1887
- The History of Coke Making and of the Coke Oven Managers' Association (1936) No author. Birmingham University Lib.
- The History and Description of Fossil Fuel, the Collieries, and Coal Trade of Great Britain (1835) No author. Pub. Whittaker, London
- The Journal of Sir Walter Scott 1825 - 1832 (1891)
- The London Cyclopaedia or Universal Dictionary of Science, Art and Literature (1829)
- The National Cyclopaedia of Useful Knowledge (1860) Vol VI
- "Origins of Gas Lighting in London" Edinburgh Advertiser 30/9/1828
- The Parliamentary Gazetteer of Scotland (1851, Edinburgh)
- The Penny Magazine of the Society for the Diffusion of Useful Knowledge (1834)
- The Story of Bruce Peebles 1866 - 1954 (1955, Bruce Peebles Ltd, booklet 104)
- The Story of Helensburgh (no date, Helensburgh) Helensburgh Ref.Lib.
- The Useful Arts and Manufactures of Great Britain (c.1850) Part II. The Society for Promoting Christian Knowledge.
- The Third Statistical Account of Scotland
- J.G.J.B. Count Thivillie An Essay on the Means Hitherto Employed for Lighting Streets and the Interior of Houses, and on those which may be Substituted in their Stead (1800) Birmingham Ref.Lib.
- "Robert Thom and his Work on Water Power for the Rothesay Cotton Mills" Transactions of the Buteshire Natural History Society 1945 Vol. XIII
- J. Thomas The Springburn Story - The History of the Scottish Railway Metropolis (1964)
- A. Thompson Maryhill 1750 - 1894 (1895, Glasgow)
- F.M.L. Thompson English Landed Society in the Nineteenth Century (1963)
- T. Thompson "On Coal Gas" Proceedings of the Philosophical Society of Glasgow 1843-4 Vol. I

- T. Thompson "On the Most Important Chemical Manufactures Carried on in Glasgow and the Neighbourhood" British Association Handbook 1840 Glasgow Part II p.61
- J. Thomson The Value and Importance of the Scottish Fisheries (1849)
- R.D. Thomson Records of General Science (1836)
- T. Thomson Ed. Chambers' Biographical Dictionary of Eminent Scotsmen (1875)
- T. Thomson "Biographical Account of the late John Dalton" Proceedings of the Philosophical Society of Glasgow 1844-8 Vol.II
- T. Thomson The History of Chemistry (1830) Ch. V
- W. Thorp and C.E. Groves Eds. Chemical Technology or Chemistry in its Applications to Arts and Manufactures (1948)
- E. Thorpe Dictionary of Applied Chemistry (1928)
- Thorpe's Dictionary of Applied Science (1941) 4th Edn. Vol. V
- W.A. Tilden Chemical Discovery and Invention in the Nineteenth Century (1936)
- B. Trinder The Industrial Revolution in Shropshire (1973, Chichester)
- M. Tylecote The Mechanics' Institutes of Lancashire and Yorkshire Before 1851 (1957, Manchester)
- A. Tyrrell "Political Economy, Whiggism, and the Education of Working Class Adults in Scotland 1817-40" The Scottish Historical Review 1969 Vol. 48
- Andrew Ure The Cotton Manufacture of Great Britain (1861)
- Andrew Ure A Dictionary of Chemistry (1823; 1824 2nd Edn.)
- Andrew Ure - description of coal experiments and calorimeter vide British Association Handbook 1839 Birmingham Part II p.20
- Ure's Dictionary of Arts, Manufactures and Mines (1875) 7th Edn.
R. Hunt Ed.
- W. Vamplew "Scottish Railways and the Development of Steam Locomotive Building in the Nineteenth Century"- including Neilson and Co. Business History Review 1972 Vol. XLVI
- W. Vamplew "Sources of Scottish Railway Capital Before 1860" Scottish Journal of Political Economy 1970 Vol. 17
- R. von Wagner Manual of Chemical Technology translated by W. Crook (1892)
- H.S. Walton and W. Tulloch The Geology of the Midlothian Coalfield (1958, Edinburgh) Bibliography on oil-shales.

- W. Wallace "On the Economical Combustion of Coal Gas" Proceedings of the Philosophical Society of Glasgow 1873-5 Vol IX
- J. Warrick The History of Old Cumnock (1899)
- R. Watson Chemical Essays 1787 (4th Edn), 1796 (4th Edn.) Nat.Lib. Scot.
- R.S. Watson The History of the Literary and Philosophical Society of Newcastle-Upon-Tyne 1793 - 1896 (1897)
- W. Watson Report Upon the Vital, Social and Economic Statistics of Glasgow for 1873 (1874, Glasgow)
- W.B. Watson Abstract Statement of the Revenue and Expenditure of the Paisley Gas Light Commissioners 31 May 1869 to 31 May 1870 (1870, Paisley) Paisley Ref. Lib.
- W.H.Y. Webber Town Gas and Its Use for the Production of Light, Heat and Motive Power (1907)
- W.H.Y. Webber Gas and Gas-Making : Growth, Methods and Prospects of the Gas Industry (1918) Pitman's Common Commodities Series
- D. Weir History of the Town of Greenock (1829, Glasgow)
- G. Wherle American Gas Works Practice (1919, New York)
- J.S. Will Michael and Will on the Law Relating to Gas, Water and Electric Lighting(1894) 4th Edn
- E.E. Williams Made in Germany (1896; reprinted 1973 Bath)
- J.B. Williams Records of Civilization - Sources and Studies 4th Edn. Part II Vol. II Extensive bibliography of nineteenth century textbooks and Periodicals. Strathclyde University Lib.
- O.C. Williams The Historical Development of Private Bill Procedure and Standing Orders in the House of Commons (1948, H.M.S.O.) Vol.I
- T.I. Williams The Chemical Industry (1953)
- T.I. Williams Ed. A Bibliographical Dictionary of Scientists (1969)
- J. Wilson General View of the Agriculture of Renfrewshire (1812, Paisley)
- J.H. Wilson, The Bon Accord Repository of Local Institutions - in Aberdeen (1842, Aberdeen)
- R. Wilson Common Sense for Gas Users, being a Catechism of Gas Lighting for Householders, Millowners, and other Large Consumers, Gas Fitters, Architects, Engineers etc. (1877)
- R. Wilson An Historical Account and Deliniation af Aberdeen (1822, Aberdeen)
- H.F. Williamson and A.R. Daum The American Petroleum Industry - The Age of Illumination 1859 - 1899 (1959, Northwestern Univ.Press, Evanston)

- F.A. Winsor (?) Cow Pox and Gas Lights, Contra Malice and Ignorance, or Life Health and Fortune against Death, Disease and Poverty. A Simple Dialogue between Messrs Life & Co. and Death & Co. Published by a Friend of Truth for the Uninformed. (c.1805, London) Pub. D.N. Shury. Birmingham Ref. Lib.
- W.E. Wrigley "The Supply of Raw Materials to the Industrial Revolution" Economic History Review 1962 Vol. XV p.15
- A. Wolf A History of Science, Technology, and Philosophy in the Eighteenth Century (1962)
- W. Woodruff "The American Origins of a Scottish Industry" - rubber Scottish Journal of Political Economy 1955
- W. Woodruff The Rise of the British Rubber Industry during the Nineteenth Century (1958, Liverpool)
- L. Woodward The Age of Reform (1961, Oxford)
- J. Yeaman "Notes on Seal and Whale Fishing as Prosecuted by the North Sea Fleet hailing from Dundee" British Association Handbook 1867 Dundee Part II p.148
- G.M. Young Early Victorian England (1951, Oxford) 2nd Edn.

(9) PERIODICALS

Aberdeen Journal .

Aberdeen Philosophical Society Transactions .

All The Year Round (C.Dickens Ed.)

AMBIX - Journal of the Society for the Study of Alchemy and Early Chemistry.

Annals of Science : An International Review of the History of Science and Technology since the Renaissance.

Annals of Philosophy.

Blackwood's Edinburgh Magazine.

Book of the Old Edinburgh Club.

Chambers Edinburgh Journal.

Coke Oven Managers' Year Book.

Commercial History and Review - Supplement to The Economist.

Dundee, Perth and Cupar Advertizer.

Dunfermline Press.

Economic History - A Supplement to The Economic Journal.

Economic History Review.

Edinburgh Advertizer, Edinburgh Evening Courant, Edinburgh Evening Dispatch, Edinburgh Evening News.

Edinburgh Geological Society Transactions.

Edinburgh Journal of Science.

Edinburgh Philosophical Journal, Edinburgh New Philosophical Journal.

Engineering.

Engineering and Mechanics Magazine.

Falkirk Herald.

Galaway Advertizer (Stranraer).

Gas World, originally Gas and Water.

Gas World Year Book.

Glasgow Chronicle.

Glasgow Herald.

Glasgow Mechanics Magazine.

Greenock Advertizer.

Hansard.

Industrial Archeology - The Journal of the History of Industry and Technology.

Inverness Courier.
Inverness Journal.
Iron - An Illustrated Weekly Journal of Science, Metals and Manufactures in Iron and Steel.
Journal of Artificial Light.
Journal of Science and the Arts (Royal Institute of Great Britain)
Journal of Gas Lighting. (abb. J.G.L.)
Journal of the Insurance Institute of Great Britain and Ireland.
Journal of the Royal Statistical Society.
Journal of the Society of Arts.
Journal of the West of Scotland Iron and Steel Institute.
Magazine of Science (G.Francis Ed.)
Memoirs of the Literary and Philosophical Society of Manchester.
Minutes of the Proceedings of the Institution of Civil Engineers.
Nature.
North British Advertizer.
North British Railway and Shipping Journal.
North of England Institute of Mining Engineers Transactions.
Notes and Queries.
Notes and Records of the Royal Society of London.
Perthshire Courier.
Prize Essays and Transactions of the Highland and Agricultural Society of Scotland. . .
Proceedings of Cleveland Institute of Engineers.
Proceedings of Glasgow Architectural Society.
Proceedings of the Institute of Mechanical Engineers.
Quarterly Journal of Science, Literature, and The Arts (Royal Institute).
Reports of the British Association for the Advancement of Science (abb. British Association Handbooks)
Scots Magazine
Scottish Journal of Political Economy.
Stirling Journal and Advertizer.
Technology and Culture.
The Analectic Magazine.
The British Journal for the History of Science.
The Builder.
The Civil Engineer and Architects Journal.

The College Courant, being The Journal of Glasgow University Graduates' Association.

The Economist.

The Engineer.

The English Mechanic.

The Illuminating Engineer.

The Institute of Gas Engineers Transactions.

The Journal of the Iron and Steel Institute.

The Mechanic and Chemist - A Magazine of the Arts and Sciences.

The Mechanics Magazine.

The Mineral Industry, Its Statistics, Technology, and Trade in the United States and Other Countries (New York)

The Montrose, Arbroath and Brechin Review.

The North British Association of Gas Managers' Transactions (abb. N.B.A.G.M.)

The Practical Mechanic

The Practical Mechanics' Journal.

The Practical Mechanic and Engineers' Magazine.

The Regalty Club Transactions (Glasgow)

The Repertory of Patent Inventions.

The Royal Society of London Philosophical Transactions (abb. Philosophical Transactions)

The Schoonmaster and Edinburgh Weekly Magazine.

The Scotsman.

The Scottish Historical Review.

The Times.

Transactions of Buteshire Natural History Society.

Transactions of Hawick Archeological Society.

Transactions of the Cambridge Philosophical Society.

Transactions of the Institution of Engineers and Shipbuilders in Scotland.

Transactions of the Institute of Mining Engineers.

Transactions of the Mining Institute of Scotland.

Transactions of the Newcomen Society for the Study of the History of Engineering and Technology.

Transactions of the North of England Institute of Mining and Mechanical Engineers.

Transactions of the Old Glasgow Club.

Transactions of the Society for the Encouragement of Arts,
Manufactures and Commerce.
Transport History.

(10) COMMERCIAL DIRECTORIES

- Ayrshire Directory 1851 - 2 (1851,Ayr)
- Brown's Hamilton Directory 1855-6 and 1859 - 60 (1855,1859)
Hamilton Ref. Lib.
- D.D. Chalmers The Dundee Directory for 1856 - 7 (1856, Dundee)
- Fowler's Commercial Directory of Renfrewshire 1831 - 2 (1831, Paisley)
- Fowler's Directory of the Lower Ward of Renfrewshire (1836, Paisley)
- W. Halliburton The County Directory of Scotland (1862) Nat.Lib.Scot.
- Hood's 1880 Forfarshire Almanac and Official Directory (1880) Nat. Lib. Scot.
- Kelly and Co. - The Post Office Directory of the Merchants and Manufacturers of the United Kingdom, being a Guide to the Export, Shipping and Manufacturing Industries (1877) Nat. Lib. Scot.
- Naismith's Hamilton Directory 1878-9 (1878) Hamilton Ref.Lib.
- W. Naismith Motherwell Directory 1899 - 1900 Motherwell Ref.Lib.
- Peat and Forrest's Hamilton Directory 1894-5 (1894) Hamilton Ref.Lib.
- Pigot and Co's New Commercial Directory of Scotland for 1825-6 (1825) and For the Whole of Scotland and the Isle of Man (1837)
- Post Office Directory of Edinburgh Edinburgh Ref. Lib.
- Post Office Directory of Glasgow (annual) Glasgow Mitchell Lib.
- The Architects, Engineers, and Building Trades Directory (1868) Nat. Lib. Scot.
- The Edinburgh Almanac or Universal Scots and Imperial Register For 1836 Nat. Lib. Scot.
- The New Edinburgh, Leith and County Directory 1867-8 (1868 Edinburgh)
- The Post Office Directory of the Engineering, and Iron and Metal Trades Throughout England, Scotland and Wales (1870) Nat.Lib.Scot.
- The Southern Counties Register and Directory - Roxburgh, Berwick and Selkirk (1866) Nat. Lib. Scot.
- Threepenny Guide and Directory for Stirling, Bridge of Allan, Dunblane, Doune, St.Ninians and Bannockburn (1866,Stirling)
- Worrall's Directory of the North Eastern Counties of Scotland, Comprising the Counties of Forfar, Fife, Kinross, Aberdeen, Banff and Kincardine - 1877 (1877,Oldham) Nat.Lib.Scot.
- Watson's Directory for Paisley, Renfrew, Johnstone etc. (1868,Paisley)
- J.Watt The Angus and Mearns Directory for 1846 (1845,Edinburgh)
- Westwood's Parochial Directory for the Counties of Fife and Kinross (1862,Edinburgh)

- Thomas Baird(Govan)banker- 1194
 Banchory Gas Co.-117,675,852
 Banking/banks- 431,606,767,842,911,940,1129,1269,1317,1321*
 And.Bannatyne(Glasgow)solicitor-1123-4 Dugald Bannatyne(1755-1842)entp.683*
 T.G.Barlow C.G.E.-231*,829,1040
 John Barr(Bdg.of Weir)entrep.-84
 Messrs Barr and Craig G.E.M.- 150
 Bathgate Gas Co.-603,761,786,837,840
 H.Bartholomew(1814-85)G.E.- 276,410,550,611,633,1040,1132,1326,1727
 J.J.Becher(1635-82)scientist- 4
 G.T.Beilby,chemist-436,439-40,449,1734.
 Bell and Miller,engineers- 1155
 Bell-Coleman Refridgeration Co.-1295
 Henry Bell(1767-1830)engineer- 167
 R.Bell oil-shale chemist- 565
 Benzol enrichment- 889
 J. Beub G.E.- 378
 J.&H.H.Birley(Manchester)cotton manuf.-546
 Josoph Black(1728-1799)chemist- 5
 J.Blackwood(Dunfermline)Pt.-168
 Mr.Blaikie sen. and J.D.Blaikie(Shotts Ironworks)-137*,138,147-9,603
 Mr.Blair(Paisley)G.E.-313
 Mr.Blennerhassett - 1053
 G.Bower(St.Neots)G.E.- 640
 Boness Gas Co.-171,614,656,741,772,775,778,809
 Boness Pottery Co.- 1239
 John Bostock jn.1773-1846(Liverpool;M.D.Edinburgh)scientist- 412
 Mathew Boulton(1728-1809),Soho- 20,21
 Messrs Boulton&Watt-18,32,103,1341-4
 J.Brailat(Bristol)entrep.-82
 G.Bray(1841-1905)G.E. -1264
 W.T.Brande(1788-1866)scientist-74,408,416,418*,438,531,542,1212,1214,1642
 Sir David Brewster(1781-1868)scientist- 422
 British Aluminium Co.(Larne)- 537
 British Gas Companies in Europe- 231
 British Rubber Co.- 549
 Messrs Brodie(Paisley)G.E.M.- 345,356,607,667
 Messrs Brotherton by-prod.manuf.-585
 Broughty Ferry Muni.G.- 1070
 Mr Brown(Paisley) Pt.- 1029
 S.Brown, gas engines- 1293
 Wm.Brown ironmaster- 1069
 Henry Balfour and Co.G.E.M.- 141
 John Barr(Aberdeen)Pt.- 935
 Messrs Barr and McNab G.E.M.- 765
 Rob.Barron(Motherwell)entrep.- 84
 Bearsden Gas Co.- 1195
 Dr.Thomas Beddoes(1760-1808)- 22
 A.Bell G.E.- 449,638,1645,1727
 Rev.P.Bell(1799-1869)innovator- 97
 Benzol - 532
 M.Bernier,inventor - 475
 G.Birkbeck(1776-1841)scientist-29,689
 W.Black(Hamilton)Pt.- 962,966
 T.Blaikie(Aberdeen)Pt.-675,767,1005
 Blantyre Cotton Works- 50*,270,964
 'Blue Billy'-247*,530,537,540
 Robert Boyle(1627-91)scientist - 3
 James Boswell(1740-95)biographer-18,19
 A.Brande(Hamilton)G.E.-858,961,963
 Brechin Gas Co.- 1044
 Bridge of Weir Gas Co.- 764
 British Asphalte Co.- 552,553
 British Thermal Units - 437
 S. Broadmeadow G.E. - 310,311
 Broughty Ferry Gas Co.- 1182
 M.De Brouwer G.E.- 373,389
 J.Brown(Dundee)Pt.- 1024
 W.Brown(Dalkeith)textile manuf.- 92
 W.S.Brown(Coatbridge)iron tube manuf-
 221-4

- W. Brownrigg (1711-1800) scientist- 8 D.T. Bruce of Falkland House - 171
David Bruce-Peebles (1826-99) and Co. G.E.M. - 143, 338*, 886, 1311, 1324, 1786
John Brunton C.E.- 371, 375* 'Bubble Act' (1719-1825)- 104, 895, 946
Mr Buchanan (Catrine)- 40, 66 Duke of Buccleuch- 170, 1235
James Buchanan (Dorran hill)- 156 John Buddle (1773-1843) mine engineer- 94
R.W. Bunsen (1811-89) scientist- 573, 1271, 1642 A. Burgess G.E.- 290
W. Burn architect- 144 Burntisland gasworks- 1045
Burners (Gaslight)- 32 (in 1805), 75, 410 (caused heating), 1149, 1171, 1206, 1214
(lamps), 1249 (designs), 1251 (aerated), 1254, 1258 (gratis), 1259 (regen-
erative), 1153-5 (inefficient), 1307 (efficiency), 1630 (design);
142, 597, and 1250 (Union Jets).
John Busby (Leith) entrep.- 157 Lord Bute - 171
By-Products- 530-1 (varieties), 568 (boom '70-'80s), 575-7 (slump '84-6), 621, 632.
Cadell Family- 88*, 488 (coal), 1237 Henry Cadell (1812-88)- 501
H.J. Cadell of Cockenzie- 432 Caledonian Railway Co.- 1156
L. Campbell, Chamberlain to Duke of Argyll- 938. Canals technology- 272
CANDLES- Standard (Photometry) 711, 994, 1642
- Various 36* (disadvantages), 76, 113, 515, 882, 1215, 1218, 1328.
Candlepower- 75, 233, 421, 521, 711-2 (tested), 994, 1118 (J.B. Neilson), 1206, 1307,
1315, 1336 Mr. Carlow G.E. - 1563
Carbon Monoxide ('Carbonic Oxide')- 360-1. Carlisle Gas Co.- 891, 1164
Andrew Carnegie (1835-1919) entrep.- 94 Carron Ironworks- 18, 533
Cassel Gold Extraction Co.- 539 W. Cecil scientist- 1292
Ceres Gas Co.- 834 S. Bailie L. Chalmers (Fraserburgh)- 173
Sir Edwin Chadwick (1800-90) sanitary reformer- 1152
John Champion (Bristol) zinc manuf.- 20 Chimneys- 309, 310
Chemicals in Coal Gas- 234, 1213, 1630 Mr Christie (Stirling) Pt.- 949
Alex. Christie, coalmaster- 573 C & A Christie, coalmasters- 501
John Christie coalmaster- 211, 518 Jabez Church (1824-1875) G.E.- 308
Sir Robert Christison (1797-1882) scientist- 422*, 1630, 429, 543, 1206
City and Guilds ('South Kensington' scheme of London Institute)- 642-3, 653-4, 1337
City and Suburban Gas Light Co. (1842, Glasgow)- 771, 784, 808, 1129, 1159
City of Edinburgh New Gas Light Co (1839)- 1127
City of Edinburgh Gas Light Assn.- 1139
Civic Dignatories as Entrepreneurs- 108, 164, 165, 168, 214*, 767, 823, 931, 935,
953, 960, 962, 1006, 1108 (railways), 1128, 1130, 1133, 1243, 1165 (Rutherglen).
Civil Engineers- 144, 419, 598, 606, 856, 967. John Clayton (1657-1725) scientist-
Samuel Clegg jn. (1814-56)- 381 3, 5, 428.
Samuel Clegg sen (1781-1861)- 24, 68 (retorts), 78, 82, 91, 103, 142, 238, 242, 244,
257, 272, 273 (injury), 322, 371, 428, 1214, 1219, 1271 (cooking), 1316, 1777.
T. Clerke (Edinburgh) Lord Pt.- 1055. Lord Clinton - 180
Clydebank Shipyards (T. & G. Thomson)- 101 Clyde Lighthouse Trustees- 434

- COAL - Dry Storage Advantages 259,265; For Mineral Oils 518,519
 - Crises 504,775,807,810,875,879-87
 - Used at:Aberdeen 467,495,1135; Carluke 1164; Dundee 18,1181,
 Greenock 1181
- 'Coal Oil'- 531,541,542*,544,547,552. Coalbrookdale,Salop- 543
- Richard Cobden(1804-65)statesman-1038 J.Cochrane &Co. met.manuf.-847,1227
- Archibald Cochrane(1748-1831)9th Exrl Dundonald-11*,530,533,571
- C.E.Cockburn,Superintendent of Glasgow & S.W. Railway-477
- Coffey Still- 551
- Coke- 10,80,234(regenerative furnaces)298(poor quality)530,534-7,571(by-prod)
- 'Common Good' of Burgh- 953*,1009(Glasgow)1015,1102,1061
- Company Bye-Laws affecting consumers- 930,1112,1773
- COMPETITION - Special circumstances of gas & water Cos. 1120; Disadvantages
 1169(Lanark)1204; Between G.E.M. 1325
- Condensers-48,132,239,242,351,352(annular). Construction Industry(bricks)-1317
- Sir Wm.Congreve(1772-1828)scientist- 273,274,416,418*
- Consultant G.E.- 134,145,277,598,602-11,605(G.E.M.),645,756,855,937,1066
- CONSUMERS- Industrialists threaten rival gasworks 91,791,1239
 - As Gas Co. Shareholders 109*,164,221,741,776,787,816,911,915,
 945,1004,1006,1017,1112,1116,1121,1134(preferential shares
 allocation)1174,1176,1184,1328; Factories 956
- Contingency Funds- 741,759,834,927,953,976,1022,1032,1097,1331
- Conveyor Belts- 379 B.Cook(Birmingham)'toys' manuf.- 82
- Archibald Cook(Paisley)G.E.- 30,139,144,147,149,150,167,173,437,603,708,
 764,765,958,1640
- Cooking by Gas- 74,1271,1292(advantage to gasworks)
- Cooking Lecturers- 1286 J.T.Cooper,consulting chemist- 956
- Costorphine Gas Co.- 911 J.Cowan,retort manuf.- 290,1325
- R.C.Cowan,accountant- 456,678,854 W.&B.Cowan,gas meter manuf.- 143,1777
- Cowdenbeath Gas Co.- 447 Cost of Living- 701-3
- Messrs S.Crossley & Co.,gas meters & engines- 1295,1302,1777
- Henry Creighton,engineer-23,24,29,38*104,156,239,257,409,423,427,596,1250,
 1316
- Wm.Creighton,engineer- 17,27,1207
- Crimean War(1854-6)- 545,547 Sir Wm.Cubitt(1785-1861)engineer- 137
- A.A.Croll,gas meter manuf.- 142,289,347,630,1114,1152,1219,1279,1777
- Wm.Cullen(1710-1790)chemist- 25 Cults Lime Works,tar distillers- 554
- Cupar Gas Co.- 96,762,772,782,805,807,839,878
- Cumnock-W.Murdoch's experiments- 23 Mr Cunningham,solicitor- 898
- Cyanide recovery- 380,539
- R.Dalglish- 155,1154,1157,1163,1249 Dalry Gas Co.-147,604,607,654,764,857
- Dalkeith Gas Co.-92,170,631,763,791,801,805,810,837,841,843,890,1785
- General Sir John H.Dalrymple(1771-1853)Earl of Stair,Whig M.P.(1832)
 coalmaster- 488
- Dr Dalston,chemist-545

- John Dalton(1766-1844)scientist- 25 Davy Safety Lamp- 274
 Dawsholm gasworks(Glasgow)- 247,362,387,536,1042,1585
 Debentures- 769*,893,974,1082,1094,1197. Debt collection- 856
 Robert Dempster(1828-1913)engineer- 401. 'Depressed' Regions- 1335
 R.Dempster & Sons Ltd- 383,401*,449,579,580,613,863
 J.Dennis(Dalkeith)contractor- 450 James Dennistoun(Colgrain)banker- 155*
 Denny Consumers Gas Co.- 1168 1008
 Deposits from Consumers-857,860,997,1166. Deterioration Funds- 834,977
 J.Deuchter,scientist- 1272 T.Dewy,American G.E.- 416
 Depreciation Accounts- 415(Dundee oil-gas),823-5,844*,846-51,855(Property
 tax),1075,1092,1136,1157,1160(views of Glasgow consumers),1800
 [see also Municipal-Depreciation]
 Thomas Dick,oil-gas engineer- 425
 'District'(region)agreements- 1056,1113,1117,1146
 District-gasholders- 263*,265(Glasgow)375(frost)380,1033,1041,1119
 J.Diller(d.1789)scientist- 16 Disconnection of Supply- 755,858
DIRECTORS - Subcommittees 662-6; Active in civic affairs 664,984
 - Appointments 914,930,931; Borrowing Powers 927,973
 - Bye-Laws & Powers 907,922,930,937-8,983,985,987
 - Entrepreneurial role compared to engineers 666-9
 - Control over employees 670,700; Fees 671,930,1121; Interim
 - committees 160,163(Paisley),165(Inverness),172(Vale of Leven),
 - 173(Dalry),174(Portobello),904; Legal Protection 936,937,986
 - Skills & Experience 109,152(Moffat),153(Edinburgh),663,785,
 - 930,931,935,1131,1322*; Voting 934,984
DISCOUNTS - Various 785,861(prompt payment),872;956(unfair),969*(unjustified),
 1034(Paisley Police),1100,1148,1168,1185,1239-42,1269,1319,
 1782-4*; 159(proposed at Alloa); 1028&1239(justification)
 - For "fuel"gas 1286
 - Demanded under threat 92,477(Railways),791,872*,1060,1201,
 1239,1243
DIVIDENDS - Various 109,112,159,742,766,782,800-8,829,979
 - Bonuses 806
 - Influence on Upset Share Values 801,808,1160
 - Paid out of 'Capital' 808,966
 - Affecting Gas Price 816
 - Related to Total Sales 872
 - Controls Upon 979,1160
 Messrs Dixon,Govan & Calder Ironworks- 536. G.Dixon(Cockfield)coalmaster- 9
 J.&W.Dixon,papermillier- 446 Wm.Dixon(1753-1824)ironmaster- 23*,
 W.S.Dixon jr(Govan)- 1155 108,486*,1129,1143
 J.Dobbie & Co.,tar distillers- 556,581 Dumfries gasworks- 167,1049,1059
 J.W.Dobereiner(1780-1849)scientist- 1265. Mr Dunlop(Glasgow)millowner- 38
 Dunfermline Gas Co.- 146,164,168,389,708,756,807,872,1300
 Colin Dunlop- coalmaster at Carmyle 562,973
 - ironmaster 599,1123
 George Dunlop W.S.- 1123 Wm.Dundas(1762-1845)M.P.- 154

- Dundee Old Gas Co. - Gas price pegged 954,969,993
 - 263(site),414(oil),771,828,953,1035
- Dundee New Co.(1828)-872,953,1119 Dundee New Co.(1846)- 966,1137
- Dundee Portable Gas Light Co.- 433,844,1140
- Dundee Muni.Gas . - 828,872,1035,1049,1089,1181,1254,1284
- Mr Dunn(Greenock)G.E.- 1026 J.Dunn(Edinburgh)oil-gas engineer- 433
- Wm.Dunn(Duntocher)entrep.- 89 Dunse Gas Co.- 149,765,790,805
- Dunnachie's Star Brick Works(Glenboig)- 469
- Dyestuffs- 542(Turkey Red), 558*(aniline)
- Early Closing Movement- 1156
- ECONOMIES OF SCALE - and Market Population(capital stock) 754,854
 - Effect of Industrial Consumption 869,1201
 - Various 91*,175,323,329,482,741,798,816,872*,873,
 874*,1025,1026*,1053,1066,1080,1117,1126,1150,1176,
 1872,1239,1316,1329
- Edinburgh(Coal)Gas Co.- 157,203,742
 - prospectus(1817) 154,742,774,901
- Edinburgh & Leith Gas Co.- 1128 Edinburgh Gas Cos.(competition)- 988,
 Edinburgh Council Enforced Monopoly-973,1011,1118,1128^{1011,1054,1151}
- Edinburgh New Gas Light Co.(1845)- 1139. Edinburgh Oil Gas Co.- 1320
- Edinburgh Public Lighting- 1245-7 Edinburgh & Leith Gas Consumers Assn-1170
- Edinburgh Municipal Gasworks- 452,1051,1062,1083,1088
- Archibald W.M.Eglinton(1812-61)13thEarl, Lord Lieutenant of Ireland-931,1054
- Eglinton Iron Co.(Bartonholm Colliery)- 100,519
- Elastic Demand for Gas- 875,1202,1329 John Elder & Co.Shipbuilders- 101
- Electricity from Gas Engines- 1301-4,1336
- Electric Lighting - in 1849 1151,1268
 - Various 1170,1201,1207,1258,1308,1338,1792*
- Elgin Gas Co.- 935 Elgin Muni.Gas - 1071
- ENGINEERS(GAS) - Incompetent 132(1820's); 1149(1840's)
 - Government Inspectors suggested 1149
 - Qualifications 357,363,371,653,1322
 - Self Taught 83,84,595,632,961
- Engines(Gas) - Suction Gas 473(Acme,Grice,Globe)
 - Various 997,1293-1300
- Enrichment(Consumer's)Fittings-1251-2 'Enrichment'coals- 485,514
- Entrepreneur- 371,377*,587(by-prod.),588,653,790,899*,929,1318,1333,1561-4
- Mr Errington,G.E.- 1131
- Estimation of Demand Before Investment- 160et seq.,790,1510
- Exhausters- 234,308,310*,330*,332,356,380,383(with governor)
- Exhibitions of Gas Apparatus- 1281-9 Explosion Danger- 73,78,167-8,1212,
 1231,1260
- Explosion Danger(gasholders)- 273,778
- Eyemouth Gas Co.- 151 J.Ewing(1774-1853)ironmaster-155,156*,
 559
- John Orr Ewing(1809-78)entrep.- 1323

- W.Ewing G.E.- 693,1728,1564
- Factory Act(1847)- 1157 Fairfield Shipyards- 101
- W.Fairweather G.E.- 225,226,606,855 Falkirk(Old) Gas Co.- 1234,1254
- Falkirk Joint Stock(1845)Gas Co.- 1142 Falkirk Muni. Gas - 1051
- Michael Faraday(1791-1867)Physicist- 429,1214,1268
- W.Ferrie,partner in Messrs Bairds,ironmasters- 574. D.Ferguson,G.E.- 151
- James Ferguson,coalmaster- 489*,496,883,961. Fidelity Guarantee- 625,940
- Fires(Space Heaters)- by Maiben 74,76*,1271
- Various 1313,1315(free loan)
- Kirkman Finlay(1773-1842)entrep.- 39,40,155*. Major J.Finlay- 561
- J.Finlay & Co.,cotton spinners- 458(Deanston),39(Catrine),85
- Fireclay- 145,293,308,309 Fireproof Buildings- 41
- G.Flintoff G.E. - Finance Estimates 1808-9(Alyth),1810(Blairgowrie),1811
(Broughty Ferry),1812(Carnoustie),1813-4(Dundee),1815
(Forfar)
- Various 99,645,648,755,822,882,1035,1037,1114,1153,1157
et seq.,1172,1178
- 'Flitting'- 860 Felice Fontana,scientist- 458
- Robert Ford(Perth)- 553(by-prod.),611 Wm.Ford,glass manuf.- 90*,1129,1248
- Forfar Gas Co.- 1124,1184 Forfar Muni. Gas - 1071
- Forfeiture of Shares- 904,908 Mr Foulis(London)G.E.- 631
- W.Foulis sen. G.E.- 604
- W.Foulis jr. G.E. - 327,371-3(hydraulic stoking),437,441,462,521,539(cyanide),
641,654,718,1041,1266,1282,1287,1289(water-heater &
fire),1295(engine)
- Wm.Fraser(1813-77)(Inverkeithing)retort manuf.- 289*,290,291,1325
- Free Trade Agitation- 962,1020,1114,1133,1147. Frost Hazard- 356,1260
- Frictional Loss of Gas Pressure- 277 Furnace Fuel- 296-9
- Fullerton,Alder & Co. gas met.manuf.-143. J.R.Fussell,G.E.- 604,658
- Andrew Fyfe(1792-1861)scientist- 26*,263,264,305,307,416*,426,431,460
(water gas),1135,1275-6,1294 & 1641-2*
(engines); 1631,1539
- Galashiels Gas Co.- 327,387,497,611,612,773,775,801,837,862,880,881
- John Gamble,by-prod.manuf.- 551 Gaslight'Indispensible'-1046;see also 37
- Gas Contingent Guarantee Rate- 1043,1066,1068,1095. Gasfitters- 709-10,1790
- Gasfitters Mutual Assn.(1851)- 708 Gasholder-Tanks- 271-2
- Gasholders - 48,257,267*,268-70,273-4(explosion danger),314,327,370(large),
373(elevated guide-framing),778(finance),782,829,830(relative
cost),840
- Gasholder-House- 71,257,271*,274,419,1178. Gas Residual Prod.Co.Ltd- 578
- A.Gesner,chemist- 548 A.Gibb C.E.- 1134,1136
- Andrew Gillespie G.E.- 580,584 Wm.Honeyman Gillespie(Torbanehill)- 42,
492*
- Richard Gillespie & Co.(Glasgow)cotton spinners- 41,42*,76

- Pt. Gillies(Stirling)- 1013 Glasgow Alum & Ammonia Co.- 582,585
Earl of Glasgow- 171 Glasgow Coal Combine- 487
Glasgow(Old) Gas Co.- 155,156,208,209,487(coal),489,728,792,795,823,824,
841,848,1008,1123
Glasgow & Suburban Consumer's Gas Co.(1845)- 1142
Glasgow Consumers Gas Co.(1857)- 1155 Glasgow Gas Consumers Co.(1860)- 1164
Glasgow Muni. Gas - 828,879,1036,1057,1164
Glasgow New Gas Light Co.(1819)- 1009,1115
Glasgow Oil & Coal Gas Light Co.(1825)- 1118
Glasgow Philosophical Society- 24,29*,30,76,1282,1306
Glasgow Pneumatic Gas Co.- 443 Glasgow Street Lighting- 1261,1263
Glasgow Water Co.- 1131 Glengarnock Iron Co. Colliery- 500
Samuel & Thomas Glover,G.E.- 142,378,395(vertical retorts),449,1777
D.Gordon(1774-1829)entrep.- 282(clay retorts),428*,432,1272
J.Gordon(Cluny Castle)(Possibly Admiral Sir James A.Gordon(1782-1869)
Wardhouse,Aberdeenshire)- 218
Gourock Gas Co.- 174,1143 Gourock Rope Works- 39
Govan Colliery(early gaslight)- 23
Governors(Gas Pressure)- 90*,143,314,324*,332,338,340,382(high pressure),
641,1256,1786
J.Grafton,G.E.- 438,104,153,157,257,280,281*,312,313,371
Thomas Graham(1805-69)scientist- 67,336,350,1642
D.Grant,met.manuf.- 212,1202,1778 Granton Gasworks(Edinburgh)-378-81,1062
J.C.Grant,Earl of Seafield- 219 W.Gregory(1803-58)chemist- 551
James Ludovic Grant- 153,1355 Greenock & Suburban New Gas Light
Greenock Muni.Gas .- 161(origins),328,452-4,794,829,1015, Assn.-1024,1143
1024,1181
J.Grieve,colliery engineer- 501,931,1657. J.Grieve,Inveresk Saw Mill- 38
G.Gurney(1793-1895)scientist- 1252 D.Guthrie,entrep.- 762
Stephen Hales(1677-1761)scientist- 6 Hamilton(Old)Gas Co.- 821
Hamilton New Gas Co.- 965,1147,1564,1799
Hamilton Corporation Consumers Gas Co.- 1015,1200
Duke of Hamilton- 489*(coalmaster),562,960,962,1159
C.M.Hamilton,retort maker- 605,614,711 Dundas Hamilton,accountant- 627
James Hamilton,grocer- 156,173,1211 John Hamilton,gas met.manuf.- 1231
Thomas Hancock(1786-1865)rubber chemist- 546,547
Messrs Hanna,Donald & Wilson,G.E.M.- 141*,326,352,356*,393-4*,612,708,862
John & Robert Hart,bakers- 10,15,30,64,159,1118,1248
J.Haswell,lessee of Ayr gasworks- 489,1800. Hawick Gas Co.- 171,497,603,773
Thomas Hawkesley(Nottingham)G.E.- 965,971,1063,1120,1145,1218,1232,1233
Hazardous Investment(gasworks)- 109,161*,167,212,741,776,828,908,947,960,
1006,1202,1204,1212,1318

- Helensburgh Gasworks- 395 Helensburgh Consumers Gas Light Co.-1199
 J.Headley(London)consultant G.E.- 959 Health Hazard of Gaslights- 1213
 Edward Heard,G.E.- 429 J.B. von Helmont(1577-1644)scientist-1
 J.Henderson(Bibster)gent.- 218 John Henderson & Co. coalmasters- 491
 W.Henderson(Hamilton)solicitor- 960 J.Hepworth C.E.- 856
 Dr.Wm.Henry(b.1774)- 26*,27,242(purifiers),408
 W.R.Herring,G.E.- 378*,640,1063,1729 F.C.Hills,G.E.- 347
 Hiring-out Gas Stoves- 1281,1283(Dundee),1285
 G.R.Hislop,G.E.- 259,350(lime revivification),351,368(regenerative retorts),
 375,521,826,1256,1258,1645,1729
 J.Hislop(1832-87)G.E.- 259,352,375,608,609,610,636,640,664,1196,1197,1199,
 1729
 J.&W.Hislop,coalmasters- 519 L.Hislop,G.E.- 1644
 R.F.Hislop,G.E.- 826 A.W.Hofmann(1818-92)chemist-556
 'Holons'- 899,944 Messrs Hooper & Miller,G.E.M.- 149,605,
 610
 Sir John Hope(1781-1853)- 540,931
 John James Hope-Johnstone(1796-1878)entrep.- 152
 Hurllet & Campsie Alum Co.- 174,538,552,561*
 J.Horton,gas lamp manuf.- 1259 Henry Houldsworth- 29,42,138,156,1156
 John Houldsworth(1807-59)- 1156 Ludovic Houston(Johnstone)entrep.-156,
 540
 James Hulton,chemist- 531
 Messrs Humphreys & Glasgow,water-gas engineers- 463,466-7
 David Hunter,G.E.- 631 P.Hurll,fireclay manuf.- 302,309
 E.S.Hutton(Soho)engineer- 29,38*,156,157*. Hydraulic Main- 238,239,299
 Incandescent Mantle- 234,528,577,1207,1305-8; 568 & 1265(Welsbach)
 Inch Green Gasworks(Greenock)- 405,1029. Income Tax- 800
 Industrial Use(Town Gas)- 1309 Innovation- 1325
 Insurance(Premises with gaslight)- 37,1212,1310
 Inter-Industry Investment- 1326 Interest Rates on Loans- 732,740,1048,
 1114,1332
 Interdicts- 966(Hamilton),967(Dundee),1141(Perth),
 1200(Hamilton:Act of Suspension)
 Inverkip Gas Co.- 175 Inverkeithing Clay Retorts- 289-91
 Inverness Gas Co.- 165 Ironmasters- 598,599,638,717,829,
 879,885
 Iron Oxide Purifiers- 247,347*,349,380
 Iron Prices- 114,135,621,733,829,1321,1332. Iron(Cast)Prices- 136
 Iron Roofs(Retort House)- 63,137,264,314
 Iron Tanks & Equipment Resold- 272,273
 Ironworks & Foundries- 29,30,88,360,462(water-gas),533,534(Muirkirk),536,
 562*,572*(H.Aitken),573-5,580,631(Leith Walk),726,
 832(Devon),887(Eglinton),1069(Maryport),1235
 (Kinneil),1321

- G.A. Jamieson, accountant- 821
 John Jardine, advocate- 431
 Johnstone Gas Co.- 955
 Joint Stock Cos.- 100, 104*, 105, 153, 429 (Mania 1829), 908*, 945, 1321
 J.Z. Kay (Dundee) G.E.- 211, 289, 327, 555, 634, 967, 1035, 1225
 James Keith (Arbroath) inventor- 445
 J. Kier (Birmingham)- 17
 J. Ker & Committee of Proprietors at Tanfield- 419, 426
 Mr Kerr (Ardeer Foundry)- 447
 Stewart Kerr, engineer- 1146
 Kilmarnock Gas Co.- 742, 796
 Alfred King (Liverpool) G.E.- 276, 410, 634, 1063, 1163, 1251, 1279 (cooking)
 J. Falconer King, chemical analyst- 711, 712*, 1054*. G. Kinloch, banker- 172
 John Kirkham (Edinburgh) G.E.- 158, 631
 Kirkwall Gas Consumers Co.- 1190
 August Klönne, G.E.- 363
 James Jardine, C.E.- 144, 419
 M. Jars, colliery engineer- 11
 Hunter Jones, consultant G.E.- 1029, 1052
 W. Kemp, G.E.- 299
 Kerosene- 1289
 Christopher Kerr (Dundee) Town Clerk- 953, 1023
 Kilsyth Muni. G.- 1067
 Kirkintilloch gasworks- 1048
 Kirriemuir Gas Consumers Co. Ltd- 1188
 'Koh-i-Noor' gas- 443
- LABOURERS - Agitation 703, 713, 717, 1337
 - Bonus Payments 692
 - Displaced by Machinery 722, 723, 727, 1337
 - Economic Importance of Skilled Stokers 693
 - Free Coal & Gas 692
 - Hours 722
 - Occupational Categories 714, 715
 - Piece Work 691
 - Seasonal 681, 700
 - Wage Differentials 696, 701, 702
- D. Laidlaw- 140*, 482, 761, 949, 1087
 Messrs Laidlaw- 92, 140*, 151, 326, 370, 372, 380, 445 (carburetted air), 605, 892, 1226, 1229, 1283, 1324, 1491, 1778
 Messrs Laidlaw, Sons & Caine- 140, 369, 1069. R. Laiming, G.E.- 247, 347, 360
 Laissez Faire- 948*, 1114, 1120, 1132, 1147*. Lamp Oil- 548
 W.A. Lampadius (1772-1842) scientist- 4
 Lanark Consumers Gas Co.- 1167
 Lanemark Coal Co.- 519, 528
 Lapostolle, scientist- 15
 P. Lawson & Son, guano merchants- 565
 J.T. Leadbetter, chemist- 1644
 Layout of Gasworks- 257-9, 262 (low level), 263 (subsoil), 353-5, 387 (migration to railways)
 Leakage of Gas- 336-40, 381, 1234, 1238
 Leasing Out Gasworks- 786, 787
 Charles Lebon- 24, 103
 Philip Lebon (1767-1804) inventor- 16
 George Lee (Manchester) cotton manuf.- 33, 38, 429
 Leeds Forge Water Gas- 462
 Leith Oil Gas Co.- 1118
 Miles Leighton & Sons (Dumfries) drysalts- 213. J. Leslie, C.E.- 144, 598
 Sir John Leslie (1766-1832) scientist- 154, 421, 1630
 Lesmahagow Coal- 287, 489*, 495, 552, 961, 1030, 1164, 1167, 1658-9

- Lesmahagow Gas Co.- 150,613,614,655,768,773,810,833
- Letham Gas Co.- 446 'Leviations'- 743
- Andrew Liddell(1786-1854)- 30,139*,147,150,276,1131, 1788
- Justus Liebig(1803-73)- 564 Lime(waste)- 537
- Lime Kilns- 247
- Lime Purifiers- 15(earliest),27(Dr.Henry),239,242(inventors),244(cream),
247,345,347,380
- Limited Companies- 105,109,743,757,763,777,826,827,888-94
- Mr.Livesey(1807-71)G.E.- 289,1063 George Thomas Livesey(1834-1908)G.E.-
340,1579
- J.B.Lindsay(1799-1872)electrical engineer- 1268
- Messrs J.B.Lindsay,by-prod.manuf.-578 F.T.C.Linton,G.E.- 1063
- Liverpool Consumers Agitation- 1113 Professor Lizars(Edinburgh)- 543,1128
- Lockerbie Gas Co.- 227 Lockerbie Muni.G.- 1066
- Locomotives - Miniature 387,641
- In Gasworks 383,386
- Loan Capital - 755,758,761 et seq.,767; 768 & 926(Directors responsibility);
769(Bills),778,809,889,890,894,973(Dundee),973(Chartered Cos.),
1006(Benefits),1185(Approved by Consumers),1196,1317,1330*
- London Consumers Agitation- 1113 London Water Cos.-1120,1126
- London Provincial Portable Gas Co.- 431. Long Distance Transport of Gas- 381,
382
- Dr.Longstaff,chemist- 545
- Marquis of Lothian- 170 Marquis of Lothian's Newbattle
Colliery- 491
- 'Lots' of Shares- 185
- G.Lowden(1825-1912)electrical engineer- 1268
- George Lowe(1788-1868)G.E.- 231,289,416,531,538,1252,1639(Jet Photometer)
- T.S.Lowe,water gas engineer- 461,1327 Mr.Lowry(Greenock)G.E.- 1517, 1638
- W.Lowry(Dumfries)G.E.- 167,1209 Sir James Lowther(1674-1755)coal-
master- 8
- Lubrication Oil- 548
- Lucigen Lamp(Creosote)- 559 J.Lumsden(1778-1856)entrep.-30,1130,1322
- Lyle & Hannay(Glasgow)Lamp manuf.- 559. F.Lyon(Leith)G.E.- 158
- J.Maberley,Broadford Mill,Aberdeen-52* John Loudon McAdam(1756-1836)-438,548
- S.Macadam,industrial chemist- 349,351,1211,1644
- A.K.McCosh,chemist- 575 A.Macdonald-Lockhart- 218
- B.M.McCrae(Dundee)G.E.- 211,606,634,854,1254,1729. Wm.McGavin,banker- 1008
- J.McGilchrist(Dumbarton)G.E.- 221,326,609,640,860,1169,1729
- Charles Macintosh(1766-1843)- 29,411,543*,546(tar furnace),547,549,560
(ammonia),599,1324
- George Macintosh(1739-1807)- 7,29,560 D.MacKain,engineer- 1124
- George MacKenzie,G.E.- 440,441(Patent Coal)
- Mr.Mackenzie(Dunfermline)G.E.- 607,610,627,668
- Kincaird MacKenzie(Edinburgh)chief magistrate- 153,1008

- James McKelvie(Edinburgh)coalmaster-441. J.McKinlay(Vale of Leven)banker-172
 J.McLaren,G.E.- 639,1730 R.McLaren(Glasgow)iron tube manuf.-139
 Wm.McLaren- 1156 John Maiben(Perth)entrep.-67-76,293,1271
 J.Macpherson,G.E.- 211,367,551,669(regenerative ovens)
 R.B.Mainie(Glasgow)gas stove manuf.- 1276,1281-3,1778
 A.Malam,G.E.- 233,236,333*,1059,1266 John Malam,G.E.-143,244,282,296,322,333
- MANAGERS - Definition 600 - Annual Contracts 615
 - Bonus Schemes 658-61,665 - Blacksmithing 620
 - 'Butty' System 617 - Duties 617,619 et seq.
 - Co-operation between 350,351*,362,651
 - Engineering 612,621* - Family Skill 634,636
 - Fidelity Guarantee 625,940 - Former Employment 158,644-8
 - Holidays 661 - Institute(1848)proposed 630
 - Long Service hindered Progress 628,635*
 - Migration to England 631-3 - Part-time outside jobs 623
 - Professional Association 351,362,383,447,567,648,649,1172
 - Technical training inadequate 653
 - Tied houses 596,616*,619 - Trial-&-Error 332,629,651,652
 - Trained in oil-shale works 638
 - Trained in other engineering industries 640
 - Varied skills 146,232,666 - Worked abroad 639
- Aaran Manby,entrep.- 91,136,137 Edward Manby,ironmaster- 231*,459
 Manchester Muni.G.- 755,960,1016,1038-9,1063,1134,1161*,1170,1220
 Charles Blanchford Mansfield- 443 Manufacturers of Gasworks Equipment-
 Mr.Massie(Aberdeen)G.E.- 1215,1639 136-41,1616-26
 Prof.Alfred Marshall(1842-1924)economist- 1332
 Count de Val Marino,scientist- 459 John Martineau,entrep.- 408*,433
 Sir James Matheson- 220*,875,904 Maybole Gasworks- 149,247,250-7
 Maxim's Patent Carburettor(Benzol)-457. Mr.Maxton(Arniston Colliery)- 496
 Maxwelltown & Dumfries Gas Co.-901,1147. Mechanics Institutes- 158,682
 'Medicos'- 416,422,543 J.Merry,ironmaster- 1130
 Messrs Merry & Cunningham,Glengarnock Ironworks- 536
 Merryton Coal Co.- 573(by-prod.) W.Metcalf Ltd(Church)By-prod.manuf.-556
- METERS - Rent 959;1105,1233,1314;1777
 - Compulsory 142,963 - Cost 847,955,1141
 - Various 142,846,1155,1166,1220,1226-32,1734,1777
- 'Method of Comparisons' - 147,664,669,679,700,785,786,790,854,1118,1145
 (used by consumers),1191*,1200,1245,1319
- Midland Belt('Valley')- 182*,183,483(coalfields),688,1125,1334
 Migration of Gasworks to Railways-387-9
 Messrs A.&A.Miller(Govan)G.E.- 101 James Miller(Coatbridge)entrep.- 210
 Messrs George Miller & Co.(Glasgow)by-prod.manuf.- 490,547,548,556(dyes),558,
 577,585,964,1699,1800*
 Messrs John Miller & Co.(Aberdeen)by-prod.manuf.- 568,577,578
 Mr.Miller(Craigend)- 41 J.Millington,scientist- 274
 E.J.Mills(Glasgow)chemist- 1644 Millport Gasworks- 171

- D.Milne(Dundee)banker- 1183 Mines & Quarries lit by gas- 85
- J.Milne(Edinburgh)G.E.M.- 82,92,142*,157,208,212,278*,323,410,414,421,449,
711,847,1087,1126,1244*,1250(Union Jet),1324,
338 & 1256(Regulator)
- Prof.Minkelers(Louvain,b.1748)scientist-4,15
- Robert Mitchell(Edinburgh)G.E.- 639,1064,1730
- Moffat Gas Co.- 152 J.B.Mollerat,scientist- 374,459
- Scott Moncrieff(Fossway)Chamberlain to Duke of Buccleuch- 170
- Ludwig Mond(1839-1909)- 566 Mond Gas Producer- 473
- L.Monk,G.E.- 608,651 Lady Jane Montague(Bothwell)- 219
- Monopoly by Gas Companies- Advantages 864,954,958,1026*,1152,1204
- Various 232,411,1115,1117,1118,1333
- Henry Monteith(Carstairs)- 155,558(dyes),1007. James Monteith- 50
- Robert Monteith jr.(Carstairs)- 1143 George More-Nisbet- 209,931
- R.Moreland,G.E.- 632 T.Morton,entrep.- 159
- R.Morton(1834-1911)G.E.- 716 Motherwell Gas Co.- 741
- Mr.Muir(Kelso)copper-smith - 83 Pt Muir(Arbroath)- 1060
- Muirkirk Ironworks- early gaslights 23. Muirkirk Gas Co.- 151,763
- MUNICIPAL GASWORKS OWNERSHIP - Advantages 872,1009,1204(cf.971,1117,1120,1334)
- Depreciation accounts 1075 et seq.,1334
- Financed electricity by mortgages 1080
- Disadvantages 1004,1016; 1017 & 1243(tax on
consumers); 1038,1071,1079,1107-10,1243,1333
- Opposed by large consumers 872*,1060
- Opposed 891(Limited Liability),1016,1020,
1023,1027,1038,1049,1050,1071,1135
- Reinvested(capitalized)profits 1043,1334
- Municipal Wards Organisation- 1039,1175. J.S.Muspratt(1821-71)chemist- 557
- Musselburgh Gasworks- 377 John Murdoch(d.1806)millwright- 18
- Wm.Murdoch(1754-1839,Soho)engineer- 17*,103,283-4(retort design),374,428,1250
- W.F.Murray(Rutherglen)Caledonian Pottery- 470-3. Mr.Murray(Carlisle)G.E.- 149
- George Mushet(Dalkeith)iron founder- 92*,273,611,1616
- Naval Manpower- 406 Naval Stores- 10
- Naphtha- 531,532,533,544,550,557('stillls'),543(distilled).
- Naphtha Lamps- 1328 Naphthalene- 242
- Napoleonic Wars- 10,137,1317 Natural Gas- 93-95
- Messrs A.Neilson & Co.(Kirkland)flax spinners- 41,49*,50
- J.B.Neilson(1792-1865,Glasgow)G.E.- 24,30,88(namesake),135,139,142(Union Jet),
147,158,239,247,262,271,290(retorts),
360,414,541(tar furnace fuel),580,596-8*,
634,682,1118,1250,1632,1798
- W.M.Neilson(1819-89,Glasgow)G.E.M.- 139,145,147,150,171,598-9*,610,955,964,
1797,1799,648
- Walter Neilson(1807-85)(Summerlee Ironworks; nephew of J.B.Neilson)-139,574,575
- Pt.Nelson(Annan)- 1014 T.Newbigging,G.E.- 388

- Pollokshaws Gas Co.- 1082 H.Pooley,G.E.- 640,1730
- Pollution- 157,244(Edinburgh),426*,540-1,567(by-prod),999,1017,1065,1213,
- Population in Market Zone & Capital Costs- 119,754,854,1322. 1273,1283
- Captain A.Porteous(1783-1860)- 173 Port Glasgow Gasworks- 1019,1099,1563
- Portobello Gas Co.- 299,891,1083,1148 Preference Shares- 777*,892
- Premiums on Shares('Profit')- 808 Prepayment Meters- 1310-13
- Prerogative Issue of Stock to Existing Partners- 773,774,808(Glasgow),980,
- Pressure of Gas Supply- 635,956,964,1131, 1057(Parliamentary action
1257,1258,1271 in 1877)
- Prestonrange Colliery- 488,1640 Adam Pringle(Glasgow)- 1157
- Price of Gas- 482(& coal),789,801,864*,865-72,878,887,1191('national market'),
1201-2,1203*,1262,1326
- Price Zoning- 1080(opposed at Partick),1100,1101
- Printers- Use of gas engines 1296-7,1336. Purity of Gas- 1213
- Purifiers- See 'Lime' and 'Iron Oxide'
- Cyclone Tar Extractor 467 - Iron Sulphate 597
- A.Rackhouse,G.E.- 296 R.Ransome,agricultural engineer- 137
- RAILWAYS - Construction 106,108,675,702,733,739,767,776,1133,1321
- Manufacturing Gas 91,117,1327
- Sidings 379,387*,862,1032,1038,1041,1058,1196
- Various 106(joint stock),108,477,496-7(coal freight),534,551(by-
prod),599,739,743,821,864,957(coal prices),1071,1133,1139,1146,
1181,1184,1237,1238,1319,1323,1337
- Railway Carriage Lighting- 434,436-7 A.Rees,author- 80
- Lord Redesdale(John T.Freeman-Mitford,1805-86)- 1154
- Regenerative Furnaces- 298,310,357*,358-70. 'Regulator'(small governor)-90,
- J.Reid(Montrose)G.E.- 244,303,341,564(by-prod),631,641,1225,1730. 340,1256
- S.Reid(Edinburgh)solicitor- 154*,206,775. Renfrew Gasworks- 389,1019
- Reinvested Profits- 160,232,762,766,808,817-31,949,966,980,1051,1057,1060,
1121,1123,1129,1168,1178-9,1185,1331
- J.Renny(Arbroath)G.E.- 83*,145 Renton Gas Co.- 833,884
- 'Rent' for Gas- Advance Payment 857,957,1223
- Frequent Collections 859,1311
- 'Reserve Liability'- 742,744,768,894 Reserve Funds- 809,822,834-7,838*,841-3
(long-term investment),977,1121
- RETORTS -'Bench' 863(see also 'Oven')
- Clay 143,231,233*,281-2(Grafton),288,301-2,307,1325
- Hislop's Regenerative 368,669
- Iron 97,265,280,282,287(Glasgow),292,307,314,332
- 'Mouthpiece' 303, 686
- 'Through' & 'Stop-End' 383
- Vertical 234,375*,395-404,586,1196(Hislop),1315
- Operating Temperatures 68(Maiben),305,383
- Various 282,541(Tar fuel),663(brick),686,863,1133
- Revaluation of Shares- 766,801,820,826-7,1048,1151,1185,1331
- Revivification of Lime- 350 Moses Ricardo(London)entrep.- 412
- W.Richards,gas met.engineer- 142 John Ritchie(Ardrosson)G.E.-150,764,1321

- Alex.Ritchie(Greenock)G.E.- 149,234,563(by-prod),628,793,794,821,1027,
1029,1131,1136,1561*
- James Ritchie(Ayr;Glasgow)G.E.- 134,139,149(Maybole),211,222,602,632
- John Ritchie(Fairley Colliery)- 150 Wm.Ritchie(1790-1836)scientist- 422
- J.Robb(Aberdeen)G.E.- 1279 J.Robb(Haddington)G.E.- 302,515,1327,
1644,1777
- J.Robertson,Pt.Inverness- 165,1012
- Messrs J.B.Robertson,by-prod.manuf.-578. N.Robison,engineer- 210,1124
- Sir John Robison(1778-1843)entrep.- 29,156*,419,1248,1273
- Rochsoles Coal- 519 John Roebuck(1718-94)entrep.- 7,18,19
- J.Ross(Falkirk)by-prod.manuf.- 551,553,557,579,581
- Richard Routh(London)entrep.- 433 Rubber Fabrics- 533,543*,544-7,549
- Russel & Aitken,solicitors- 177,492*,898
- Messrs Russel & Son,coalmasters- 177,492,1326
- James Russell(Dundee)G.E.- 482,634,969.
- Messrs J.&J.Russell(Wednesbury)pipe manuf.- 136,275,276,360,1325,1511
- Sabotage- 274,369 James Saddler,aeronaut- 21
- Sale of Gas Act(1859)- 1153,1180 J.Sawyer(Annan)cotton manuf.- 1241
- A.Scott,C.E.- 599 A.Scott(Galashiels)G.E.- 611,612
- Andrew Scott(d.1885,Musselburgh)-377,461. Sir Walter Scott(1771-1832)-410,
418*,419,425
- Scottish Legal Life Assurance Co.- 1049
- Scots Law (& Companies)- 104 Scrubbers- 235,342*,343,344,380
- Scrip for Shares- 160,161 Sealed Tenders for Equipment- 134,1616
- Seasonal Market for Gas- 265,332,683,760,873,1224,1239,1284,1787,1788
- Second-hand Equipment- 144,272,273,344
- Selkirk Gas Co.- 138,148,605,763,801,840,842,1014,1174
- Geo.Shand & Co.,by-prod.manuf.- 553-5,565. James Sharp(Southampton)G.E.-1272,
1277
- SHAREHOLDERS - Liability 908 - Social Conscience 807
- Loyalty despite low profits 776,787,788,905
- Transferring Shares 909,910,1093
- Thomas Shirely(or Sherley)(1638-78)physician to Charles II & scientist- 2
- Siemens Regenerative Furnaces- 101,233,357
- C.W.Siemens(1823-88)entrep.- 357*,575(by-prod),641
- F.Siemens,scientist- gas 'producer' 468. 'Shale'- 520,521
- J.Shaw(Maryhill)ironfounder- 1193 Shaw's Water Co.Greenock- 87,103
- Sir Michael R.Shaw-Stewart- 175*,931,1015,1018. Shorter Hours Movement- 721
- Shotts Iron Co.- 107,137-8*,257,292,501(collieries),856
- A.Sinclair(Shotts Ironworks)engineer- 138,143
- Sir John Sinclair(1754-1835)chronicler- 77,78,79
- George Simpson,coalmaster- 220,441 Singer Sewing Machine Co.- 101
- Sinking Funds- 834,836-9,852(definition),1095
- Andrew Small(Dundee)tinsmith- 82 Small Consumers- 1220,1233,1261

- Small Companies- 180,181,757,788,892 'Social Compact' with Consumers-823,
841,953,1057,1121
Socialism From Above- 1004,1006,1014,1158,1332
Ernest Solvay(1838-1922)- 566 Carlisle Spedding(Whitehaven)colliery
engineer- 8
Speculators- 111,168*,177,966(Hamilton),969(Dundee),1012,
1082,1115,1131,1198(preceeding Municipal purchase)
Peter Spence(Manchester)industrial chemist- 349,538
Wm.Spittal,entrep.- 159,757 J.Spreull(Glasgow)- 30
Mark Sprott(1802,1843,Garnkirk)- 432,1320. Dr.Stancliffe,chemist- 28,82
'Spying' on Consumers- 963,1221 George Ernst Stahl(1660-1734)German
chemist- 4
Standard Life Assurance Co.- 1048
Standardization of Equipment absent- 302,303
Station Meter- 73,322*,323,792 Steam Rollers- 277
Steam Heat- Factories 41 - Gasholders 234,274,326,356*
W.T.Stears(Hull)- 181,787 Robert Stevenson(1772-1850)lighthouse
engineer- 40
Stevenston Colliery- 500
Pt.Stewart(Perth)- 1012 S.Stewart(1833-1906)G.E.-221,223,224,
351,639,1731
Stirling Gas Co.- 164,949
Stirling Muni.G.- 164,1013 Stirling & Suburban Gas Co.(1845)- 1144
Stock Exchanges- 106*,176,177,981 Stonehaven Gas Consumers'Co.- 1190
Stornoway Gas Co.- 151,170,629,655,679,875,891
Stranraer Gas Co.- 149,234,762,785,788,789,809,810,836,842,880,885,1191,1200
Street Lighting- 858,962,968,992(compared to oil costs),1183,1216,1242-9,
1261-7,1785-9*
Stromness Gas Co.- 787
William(1756-1830) & Joseph(1765-1844),sons of Jedediah Strutt(1726-97)
cotton spinner of Derby- 426,1273
Sub-contracting- 708 Suction Gas- 475,476
Wm.Sugg(1832-1907)G.E.- 1264 Sulphuric Acid- 7,585,1700
Sultzbach Ironworks- 10 Sunday Labour- 716-8,1115
G.Sutherland(Glasgow)gasworks foreman- 600. Robert Sutherland,chemist- 544
Sir George Grant Suttie,coalmaster-1640. James Syme(1799-1870)Prof.Surgery-543
W.Tait,C.E.- 144,763 Tanfield Gasworks(Edinburgh)-144,314,419
TAR - As Furnace Fuel 158,167(Paisley),233*,282(clay retorts),298-9*,438,
541,546,552,597(J.B.Neilson),604,1038
- Chemicals 1326 - Distillation 532
- at Muirkirk 548 - Uses 550,559
- Tar-works 10-2,19(I.Wilkinson),5
- Tar Distilleries 10(early patents),11,12,19(I.Wilkinson),543,545,
554(portable) - Various 530, 533,552
Jean Tardin(Tournon)scientist- 2
Mark Taylor(Edinburgh)G.E.- 139,148,149,299,327,341*,604,611,1640
John & Philip Taylor,oil gas engineers- 408,420,429,433
Technology - Imported methods 357,363,371,373,653

- Telescopic Gasholders- 234,325*,326,329*,356,369,380
- Andrew Templeton(d.1829)banker-156,672,1007. Sir Charles Tennant- 1197
- Tenements- 955,997,1156*,1220,1228,1232. John Tennant(1796-1898)-566*,1156,1163
- Charles Tennant(1768-1838) & St.Rollox chemical works- 7,30,469,490,560
- J.Terrance(1874-1955)G.E.- 640,1731 R.B.H.Thompson(1865-93)G.E.- 1732
- John Thomson(Gogarburn)banker- 139,156,159,600,1008; & his brother Andrew Thomson- 541
- John Thomson,chemist- 544
- Prof. Thomas Thomson(1773-1852)scientist- 26*,1639
- Sir Wm.Thomson(1824-1907)1st Baron Kelvin,physicist- 1301
- Pt.Thomson(Stirling)- 1013 W.J.Thorne(1857-1946)trade unionist- 719
- John Thwaite(London)consumers'leader- 1114
- 'Time Contracts' for Gas- 142,959(abused). Tolcross Gas & Water Co.- 973,1123,1365
- Tontine Buildings(Glasgow)- 31
- Torbanite Mineral- 461(for 'Hydro-Carbon Gas'),491,515,552(by-prod),1642
- Trade Cycle- 114,431; 478 & 502-14*(coal prices),653,697,701-3,728-9,857,875,879-88,958,1299,1317; 1329(variable impact on domestic & industrial consumption)
- Tradeston Gasworks(Glasgow)- 264
- Transport of Coal- 257,262(railways),487,488,496,514,1125,1135,1181
- Treasurers- 672-5,678-9(bonus),765,790,939,987,1329
- J.Turnbull,G.E.- 366 T.Turnbull v. Callander Gas Light Co.-945
- C.H.Turner,Director of Phoenix Fire Office- 39
- Edward Turner(1798-1837)scientist- 422,531,1630(see also 'Christison & Turner')
- Tweedsmouth Foundry(Berwick)- 139,148,151
- Union Gas Light Co.(Edinburgh)(1828)-1118. Universal Gaslight Improvement Co.- 572
- Union Gas Light Co.(Edinburgh)(1844)-1138
- Andrew Ure(1778-1857)- 28*,29,30,287,486,542,544,548,1118,1309
- Usury Laws- 807
- Vale of Leven Gas Co.- 111,150,172,535,654,764,768,785,820,833,850,1243
- Ventilated Gas Lights- 75,1214
- George Walker(Tillicoultry)entrep.-88. J.Wallace,scientist- 1280,1306
- Messrs W.G.Walker & Sons,by-prod.manuf.-553,579*
- Dr.W.Wallace(Glasgow)chemist- 333,351,574,1219,1253,1280,1644
- 'Washers'- 235,313,340*,641 Watering Shares- 816,950,1052
- Water-powered mills-85,103,183,1315 Water Gas- 231,612,663
- Water Supplies to Gasworks- 262 'Water-Traps'- 277
- J.Watson(b.1790)Edinburgh,gas manager- 82,157,600,634. P.Watson,G.E.- 365
- Richard Watson(1737-1816)scientist- 7,9,12.
- Robert & Thomas Watson,Turkey-Red dyers- 1193. Gregory Watt(Soho)entrep.-24,32
- James Watt(1736-1819)Soho- 7,20,22,30,41,64,71,75,595

Waverley Assn. of Gas Managers-648,1172 Way-Leave for Trenches- 418,953,963,967,
 1001,1245,1261,1316
 Weavers- 36(hours),86,89,114,152,171(Dunshalt), 762,
 880,956,959,961,988,1167(Lanark),1221-5,1318,1793(Paisley)
 J.Webster(Aberdeen)Lord Provost- 823 Messrs Weir & Co.by-prod.manuf.-581
 Carl Aur Von Welsbach(1858-1929)-1305 Wemyss Collieries- 49,491,494-5*
 West Kilpatrick(Bowling/Dalmuir)Gas Co.-222,1196
 John West(1869-1922)G.E.- 372,389 Whale Fisheries- 406*,548(oil),1320
 Whigs(Glasgow)- 1124 Cornelius Whitehouse,engineer-136,276
 T.W.Whimster(1818-1910,Perth)G.E.- 332,342,1225,1732
 Stephen White(d.1867)water gas engineer-459. Isaac Wilkinson(1704?-84)pot-
 J.Williamson(Paisley)china merchant-83 Wilson's Gas Producer- 469 founder-19
 Alex.Wilson(Glasgow)G.E.- 401*,711,1076,1108. Colin R.Wilson,ironmaster-1124
 Messrs Wilson(Hurlet)coalmasters- 487 G.Wilson(Campsie)entrep.- 174
 George Wilson- 562 G.Wilson & Co.,Kinneil Collieries- 501
 John Wilson(1782-1851)coal & iron master- 210,500*,502*,561(Hurlet),562*,574,
 James Wilson(Coatbridge)iron tube manuf. 599,1124,1235,1657,; 494 & 499
 - 1194 (Breadisholm Coal)
 John,James & W.Wilson(Bannockburn)manuf.-1144
 T.Wilson(Coatbridge)G.E.-212,636,1069,1732. W.Wilson,entrep.-171(see also P.
 H.F.A.Winsor- 64*,65,103,242,429,530,1243 Wilson & Co.- 1318)
 F.A.Winsor jr.- 375 James & Wm.Wood(Bathville)coalmasters-
 Woodall-Duckham Vertical Retorts-398,401.W.S.Workman,retort-maker- 606 521
 D.Young,G.E.- 628,1733
 James 'Paraffin' Young(1811-83)chemist- 375,439,493*,547,548(oil lamp),550,
 553,633,644,1210,1212,1252,1328,1786,
 John Young(1815-86)G.E.- 307,347,601,604,609,618,633,638,809,1172,1733
 William Young(1841-1907)consultant chemist- 83,221,223,224,233,345(scrubber),
 375(oil shale retort),377,378,438,
 448*(Peebles Process),572(& Aitken),
 609,612,638,640,668,1326,1733

Abbreviations in Index

* Principal references	Manuf. - manufacturer
By-prod. - by-products	Met. manuf. - meter manufacturer
C.E. - civil engineer	Muni.G. - municipal gasworks
C.G.E. - consultant engineer	Pt. - provost
Co. - company	
Entrep. - entrepreneur	
Gas Co. - gas company	
G.E. - gas engineer	
G.E.M. - gas engineering manufacturer	