THE HISTORY OF ILLUMINATING GAS IN BALTIMORE

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FOREWORD

The author wishes to acknowledge the assistance given to him by Mr. H.R. Cook, the General Superintendant of the Consolidated Gas Electric Light and Power Company of Baltimore, in collecting the major part of the data used herein.

He also wishes to express his appreciation of the courtesy of the Baltimore Gas and Electric News in allowing him to use various cuts from the American Gas Centenary number of their publication.

E.S.T.

THE HISTORY OF ILLUMINATING GAS IN BALTIMORE

INTRODUCTION

The collection of facts and figures on gas lighting during the past century brings forcibly to our attention the important part that the use of gas has played in the development of our modern life.

Because of the exhaustion of certain of our natural resources we have lost many products which were derived from them. This is not the case with gas, which has been cheapened and made more available to the consumer because of the great advance in the art of manufacturing and distributing the product.

We often wonder, when retracing the steps of history, how the domestic life of any community could have been carried on without gas. It was a great epoch when "artificial light became economically available for general illumination, and man, able not only to light those places where light is needed and when needed but maintained illuminated for general use the streets and ways of our cities."

"This practical application of a great scientific discovery has really changed the face of our civilization. It has, in our northern latitudes, increased the length of our working days, and thus made

us more efficient from an economical point of view. It has taken from us the sense of peril which in former days hovered during the night time over the heads of city dwellers. The economic and social effects of the commercial possibility of artificial lighting are so great as to be almost incapable of estimation. We are so accustomed to artificial lighting that we do not appreciate what it has done for us, until we see with our own eyes what the conditions are in great communities where artificial lighting is unknown."

This great industry, started in Baltimore one hundred and ten years ago, is now a gigantic national institution which brightens the life and lightens the labors of nearly every home and every individual in the land.

But, great and beneficient as are its past achievements the future may hold for gas still greater possibilities.

EARLIEST DEVELOPMENTS IN THE FIELD OF ILLUMINATING GAS

The first man to make any practical application of manufactured gas as an illuminant was William Murdock of Redruth in Cornwall, England. This statement is true if you listen to the claims of the English but if you turn your ear to the French you will hear that

Phillipe Lebon made the first discoveries and practical applications. Jean Pierre Minckelers has also a claim to priority of experiments. Alfred E. Forstall says, "Apparently Minckelers and Lebon, while working with other objects in view, preceded Murdock in their experiments with and demonstrations of illumination by means of coal gas; but Murdock was the first to work with illumination as the main object."

The phenomena of burning gas had been moted long before this time, however, for in 1659, Thomas Shirley, an Englishman, had startled his community in Lancashire by burning a well of what was probably carbureted hydrogen gas.

About 1691, Dr. John Clayton, dean of Kildare, carried certain bladders filled with gas distilled from coal about with him and when in need of light he would puncture the bladder and apply a light to the escaping gas thereby obtaining a luminous flame as long as the gas supply lasted.

In 1726 Stephen Hales, and in 1785 Jean Pierre Minckelers, of the University of Louvain, conducted successful experiments with gas obtained by the distillation of coal. Lord Dundonald, in 1787, lighted the hall of Culross Abbey by gas but no commercial application was made of it at this time.

DEVELOPMENT IN EUROPE

It may be seen then that a hundred years before the time of Murdock or Lebon it was known that illuminating gas could be obtained by the destructive distillation of coal. Murdock and Lebon can then lay claim only to the fact that they made the use of gas as an illuminant a commercial possibility.

Murdock made his first experiments in 1792 and succeeded in making illuminating gas by distilling wood and peat as well as coal. Later in 1798 at Birmingham he undertook to light the Soho Foundry, of Boulton and Watt, and in 1802 the whole front of the factory was brilliantly illuminated to celebrate the Peace of Amiens.

Lebon, in 1799, took out a patent in Paris for what he described as "a new method of employing fuel with greater utility, either for heating or lighting, and to obtain certain products therefrom." He gave an exhibition in 1802, which attracted a great deal of attention in Europe. He made an offer to supply the whole city of Paris with gas. About this time a German, F.A. Winsor, made Lebon an offer for his secret process for Germany. Although the offer was declined Winsor soon discovered the process and in 1803 produced the new illuminant for an exhibition before the Duke of Brunswick.

Winsor then went to London and in 1804 gave

demonstrations in the Lyceum Theatre. A company was formed by him and in 1807 Pall Mall was lighted. This was the first successful street lighting undertaking in the world. He applied to Parliament in 1809 to incorporate this company as the National Heat and Light Company but due to the opposition of Murdock the charter was not granted. A charter, in a very much curtailed form was finally granted in 1812 and the company was known as the Chartered Gas Light and Coke Company, from which the present London Gas Light and Coke Company has grown. In 1813 Westminster Bridge and later the streets of Westminster were gas lighted and in 1816 gas lighting was common in London although public opinion was greatly opposed to it.

Ages of tradition had to be fought, superstitions and absurd prejudices had to be combatted. Sir Humphrey Dayy was a bitter opponent. "You would have to fill St. Paul's dome," he said, "to get as much gas as you need, and then it would explode." Sir Walter Scott said of it, "there is a madman in London who is proposing to light the city with -- what do you suppose? -- smoke." He also called it a "pestilential innovation." Napoleon called the proposition to supply Paris with gas "Une Grande Folie." The pipes which supplied the House of Commons with gas had to be placed far away from the walls because it was thought by many that the flame came

through the pipes and would burn the walls down. The members of Parliament, fearful of being burnt, would not touch the pipes with ungloved hands according to the reports prevalent at the time. Wm. Shakespeare alone of the writers seemed pleased with the new light. He wrote "This is an art that does mend nature."





THE INTRODUCTION INTO THE UNITED STATES

"The first gas made in Philadelphia, or in the United States, was manufactured by M. Ambroise and Company, Italian fireworkers and artists, and was exhibited in burning lights of fanciful figures, at their ampitheatre, Philadelphia, in August, 1796," according to Watson in

his "Annals of Philadelphia."

In 1806 David Melville of Newport, R.I., lighted his house and the street in front of it with gas of his own manufacture. This preceded Winsor's lighting of Pall Mall in London but the street lighting was for such a short distance that it cannot be called the first street lighting venture in the world. Four years before, however, England had seen Murdock's public exhibition at the Soho factory. Melville made many improvements on his apparatus and on March 18, 1813 he patented his process. He lighted a cotton mill at Watertown, Massachusetts, and a mill near Providence, R.I. and also in 1817 he used gas for light house illuminating.

On Dec. 28, 1815 gas lighting was first proposed for Philadelphia by Mr. James McMurtie but the only action that could be obtained was a protest against the introduction and even as late as 1833 the people of this otherwise progressive city petitioned, "The Honorable, the Select and Common Councils of the City of Philadelphia," stating that gas was "a most inexpedient, offensive and dangerous mode of lighting; explosions, loss of life and great destruction of property have attended this mode of lighting." They considered gas "as ignitible as gunpowder, and nearly as fatal in its effects, the leakage of pipes and carelessness of stopping off the gas, furnish almost daily instances of its destructive effects, and when we

consider that this powerful and destructive agent must necessarily often be left to the care of youth, domestics and careless people, we only wonder why the consequences have not been more appalling." "It is also an uncertain light, sometimes suddenly disappearing and leaving the streets and houses in total darkness." Three years later, however the people of Philadelphia accepted the gas without fear of its great danger.

DATES OF INTRODUCTION IN THE EARLY PERIOD IN THE UNITED STATES

On June 17, 1816 the first gas company in the United States was founded at Baltimore, and other cities followed in the order named.

Boston, Mass, New York, N.Y.		1823 1825
Louisville, Ky.		1832
New Orleans, La.	*	1833
Philadelphia, Pa.		1836
Pittsburgh, Pa.		1836
Cincinnati, Ohio.		1840
St. Louis, Mo.		1846
Falls River, Mass.		1847
Newark, N.J.		1847
New Haven, Conn.		1848
Paterson, N.J.		1848
Providence, R.I.		1848
Rochester, N.Y.		1848
Washington, D.C.		1848
Buffalo, N.Y.		1848

Although the American people seem slow to accept an untried invention once its worth is proved they are quick to develop it. After its slow beginning the gas industry advanced by leaps and bounds until now it has an

approximate capitalization of \$1,100,000,000 with an output of 190,000,000,000 cu. ft. annually to 32,000,000 customers from 1,350 plants. The above figures are from Brown's Directory of American Gas Companies.

THE BEGINNING IN BALTIMORE

It was in Baltimore on June 13, 1816, at Peale's Museum, on Holliday Street, just north of Lexington, that the people flocked in to marvel at an advertised display of gas lighting. The gas that was used in the exhibition was made in a building in Watchhouse Alley, in the rear of the museum, and was of the coal gas variety.

Four days later, June 17, 1816 the first gas company in the United States was founded by the passage of an ordinance permitting Rembrandt Peale, owner of the museum and an artist of renown, William Lorman, a merchant, president of the bank of Baltimore, and the first president of the gas light company of Baltimore, Col. James Mosher, Commissioner to lay out the streets, and president of the Mechanics Bank, Robert Cary Long, an architect who designed the University of Maryland Building, Peales Museum, Holliday St. Theatre, and many other large buildings in Baltimore, and William Gwynn, a Tax Commissioner, and editor of the Federal Gazette and Daily Advertiser, to form a company to manufacture gas,

lay pipes in the streets and to contract with the city for street lighting. A fac-simile of this ordinance appears at the end of this article.

On Feb. 5, 1817, the Gas Light Company of
Baltimore was incorporated. The charter of this, the
first company in the United States appears at the end
of this article. The people of Europe and the
Philadelphians were not alone in their skepticism about
the innovation of lighting by other means than candles
or wicks, as may be seen from this extract from the
"American and Commercial Advertiser," of Baltimore,
December 30th, 1815:

"GAS LIGHTS."

"We learn by the late English papers that Covent Gardens Theater and a number of the streets of London are illuminated by gas light. They are represented as being infinitely more brilliant, more inoxious, and vastly more economical than the common lamp light by oil. One gas burner is equal to twenty common street lamps, and the saving of expense in all cases is very considerable. A shop may be lighted by gas for only 2d. per night. The largest room and even a whole street proportionately cheaper.

"We have been induced to notice this im-

"We have been induced to notice this improvement by the curious circumstance that it was first offered by the inventor to the people of Baltimore about eight or ten years ago (1805 or 1807), but the people of Baltimore then laughed at the idea. Now that it has been carried into effect in London, no doubt our citizens will look upon it 'in another light.'

"An American inventor, it would appear, can have little credit in America until he receives the sanction of the people of London, and then he has a chance of becoming fashionable on this side of the Atlantic."

If the facts presented in this article are to be accepted without any doubt it would seem that

Baltimore missed being the peoneer in this new field merely because the people accepted the scheme with mirth instead of seriousness. A different opinion, however, is held by a gentlemen, who signs himself "Bob Short"in writing to the Baltimore American, Jan. 2, 1816, as follows:

"Extract from the American and Commercial Daily Advertiser:

Baltimore, Jan. 2,1816.

American.

Messrs. Editors: - In your paper of Saturday there was a communication relative to the warming and lighting of houses by the means of gas.

I much admire the spirit which dictated the communication, it was of the most liberal cast and had for its object the encouragement of genius and the improvement of our happy country.

But, gentlemen, these objects, important as they are, are obtained too dearly, when purchased at the expense of truth. The introduction of gas for the purpose of light and heat is by no means an American invention.

In Europe it has long since been known and used, particularly in France. A French gentleman, a respectable inhabitant of this place, informed me that he saw a hotel in Rouen in

Normandy warmed and lighted in the manner alluded to more than twenty-five years ago, and that he could refer to many others who were as well acquainted with the circumstances as himself.

Be so good, gentlemen, as to make this fact known, not for the purpose of checking genius, which I admire, but to give to merit its fair and proportionate reward. In our eagerness to encourage invention, let us not appropriate to ourselves the applause which justly belongs to the tenants of the tomb. The fact is, gentlemen, we have been much imposed upon.

(Signed) BOB SHORT"

The advertisement published by Peale for his first display appeared in the "American and Commercial Daily Advertiser" of June 13, 1816, and is as follows:

EXTRACT FROM THE AMERICAN AND COMMER-CIAL DAILY ADVERTISER, BALTIMORE.

June 13, 1816.

"GAS LIGHTS."
Without Oil, Tallow, Wick or Smoke.

It is not necessary to invite attention to the gas lights by which my saloon of paintings is now illuminated; those who have seen the ring beset with gems of light are sufficiently disposed to spread their reputation; the purpose of this notice is merely to say that the Museum will be illuminated every evening until the public curiosity shall be gratified.

REMBRANDT PEALE.

An advertisement which appeared in the "Federal Gazette and Baltimore Advertiser" of Wed.

June 19, 1816 appears at the end of this article.

The Mayor and City Council, and others in

authority, apparently looked upon the display and its possibilities with favor as may be seen from the following editorial:

EXTRACT FROM FEDERAL GAZETTE OF FRIDAY, JUNE 14, 1816. EDITORIAL.

A communication published in the American this morning notices very properly the exertion of the Baltimoreans to encourage public improvements of every useful description. Instances of this liberal and praiseworthy spirit are now familiar in our city, and our constituted authorities, the Mayor and City Council, have evinced by their conduct that to the utmost extent of the means within their control, they are disposed to promote and encourage whatever may tend to the welfare of the citizens.

A new instance of this liberal disposition in the Mayor and City Council, we are gratified in having an opportunity of communicating to the public. A proposition has recently been submitted to the Mayor, by Mr. Rembrandt Peale, proprietor of the Baltimore Museum, to light the streets of this city by means of carburetted hydrogen gas; the very brilliant and pleasing light produced by that means, the citizens have had an opportunity of witnessing for several nights past in the saloon of paintings at the museum.

of witnessing for several nights past in the saloon of paintings at the museum.

The proposition of Mr. Peale was submitted to the City Council yesterday afternoon at an extra meeting called by the Mayor; and a committee of three members from each branch was appointed to examine the apparatus erected by Mr. Peale for manufacturing the gas, and to make the necessary inquiries as to the manner in which it was contemplated to light the streets of the city.

We learn with pleasure the committee was so fully satisfied, after a particular investigation, that they will unite in recommending to the City Council to authorize the lighting of the city in the mode proposed. Baltimore will therefore most probably be the first city in the United States that will enjoy the advantage of this valuable discovery, which may be truly called Light of Science.

On Monday, June 17, 1816, the ordinance which appears at the end of this article was passed with the following comment from the local newspaper:

EXTRACT FROM FEDERAL GAZETTE, TUESDAY,
JUNE 18, 1816.

The City Council held a special session yesterday afternoon, during which they passed an ordinance authorizing the Mayor to contract for lighting the city by means of carburetted hydrogen gas, and an ordinance empowering "The Gas Light Company of Baltimore" to lay pipes along the streets, squares, lanes and alleys of the city for that purpose was also passed by both branches of the City Council.*

* Taken from files of Maryland Historical Society.

Peale's Museum was crowded every night during the time of the exhibition from April 23rd to July 22nd, 1816. Scharf's History of Baltimore City and County refers to this early period with the following remarks:

"To the City of Baltimore belongs the honor of first adopting gas for street and general use, and the Baltimore Company was the first anywhere organized for its manufacture.

"The first gas lamp erected and lighted on the streets of Baltimore was on the corner of Market and Lemon streets (Baltimore and Holliday Streets); this lamp was lighted for the first time, February 7, 1817.

"The first public building lighted by gas was the old 'Mud' or Belvidere Theatre at the Northwest corner of North and Saratoga Streets."

Baltimore in 1816 was not very large and was growing only slowly. The map of Baltimore in 1801 by Warner and Hanna, at the end of this article, shows its approximate size. Even in 1836 gas was still a great

luxury and only two miles of mains had been laid.

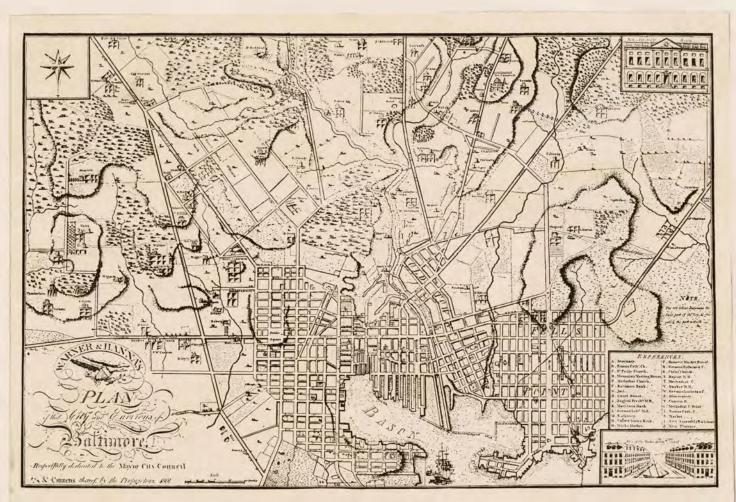
PROGRESS OF THE FIRST COMPANY

The first complete gas works erected in Baltimore was the so-called "Davis Street Works" at Saratoga and North Streets, now Guilford Avenue, and was engineered by Mr. David Pugh. This building is now used as a warehouse for the H.W. Johns Manville Co.

The holders used for storing gas were located inside of the building. The tanks containing the holders were built of wooden staves held together with heavy iron bands. The gas was also stored in small holders of about 30,000 cubic feet capacity at Liberty Street near Fayette (now Fayette and Park Avenue), the present site of the Knabe Piano Building: Later gas was stored in a more modern iron frame and brick tank holder, of 85,000 cubic feet capacity, at Davis and Franklin Streets in the rear of the Calvert Station of the Northern Central Railroad.

The old works on Saratoga and North Streets were abandoned as soon as a new plant was built, in 1847, on North Holliday Street near Saratoga Street.

This plant, of 275,000 cubic feet capacity, was used



MAP OF BALTIMORE IN 1801

until 1861 and the buildings are still standing and are pictured here. The tank holder was torn down in 1885 bxt the remainder of the structures are used by the Independent Ice Co.

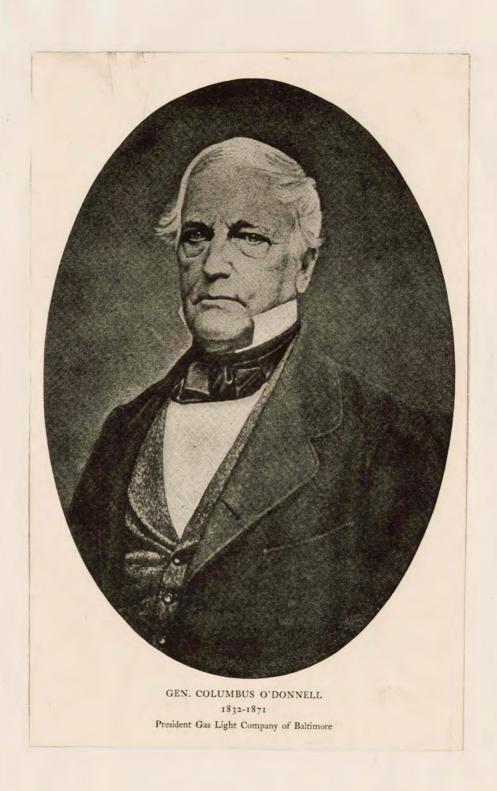
In 1855 a new plant was started at Spring Gardens, the site of the present complete works, under the direction of Mr. James M. Saunders, chief engineer.

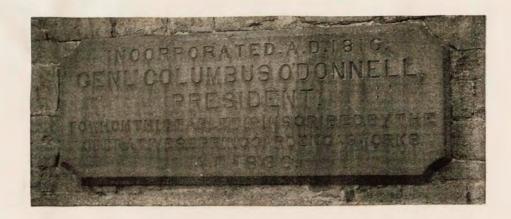
The status of the company at this time is shown by the second edition of the American Gas Light Journal of Aug. 1, 1859.

The capital of the company was \$550,000, each share \$100. The population of the gas district was 180,000 and the private consumers numbered 8,200 showing that gas was becoming less of a luxury as the price dropped lower, being at this time \$2.50 per 1000 cubic feet. There were 65 miles of mains at this time and 1800 public lamps were supplied. Baltimore was now sixth in the number of consumers. The president of the company was Gen. Columbus O'Donnell who served from 1832 to 1871 and this period reflects, through the steady advancement of the industry, his splendid work as the executive.

In appreciation of his services to the company the tablet shown here was placed on the old stone retort house at the Spring Gardens Works by the Operatives of

the Plant.





The best idea of how the plants were conducted about this time can be gained from one who witnessed the development from 1836 to 1880. This is written by Mr. J.A. Adams, an employee, in 1880:

"A brief sketch of my experience and knowledge of the Baltimore Gas Works in 1836, a period of 44 years.

"William Mitchell and myself are the only persons biving at this time, February 26, 1880, that were strictly connected with the manufacturing department of the works. * * *

"In 1836, I became an apprentice to the Baltimore Gas Company to learn the brass finishing, as they kept a shop for the manufacture of meters; gas pipe, which was made of copper, also chandeliers, brackets, fittings and so forth; everything which was used in the distribution of gas was made by them at their shops, as there was no manufactory for these

articles in this country at this time. I served an apprenticeship of eight years. Their shop was situated on an alley in the rear of 53 North Street, formerly used as E.S. Tarr's cabinet maker shop. The shop is still standing and is used by the Maryland Meter Works. * * *

"The price of gas at that time was four dollars per thousand feet. The main pipe extended up North Street to Baltimore, to Eutaw, along Saratoga from North Street east to Gay and Harrison Streets; on Gay Street from Harrison Street to Marsh Market; along South Street to Pratt; up Pratt to Eutaw; on Baltimore Street west of Market Space to Eutaw; but did not cross Jones' Falls at any point at that time. The mains were iron pipes. The service and all pipes in the stores were copper.

"There were, I believe, no dwelling houses that burned gas; it was used only in stores, public places and churches -- and in very few churches. The burners were reckoned 12, 14 and 18 dollar burners of the Argand style, and fan burners. There was no other kind of burners in use. The bat-wing had not been invented. The burners were known by this name because the consumers were charged for the amount of gas used by the hour. If a consumer wanted to pay \$12 quarter for gas light he was supplied with a \$12 burner, and if

he chose to pay \$14 or \$18 he was supplied with a burner correspondingly. Afterwards, as the water meter had been brought to perfection by Samuel Crossley of London, and the meter was considered a correct measure of gas, the Gas Company of Baltimore imported the meters which they introduced in this city and did away with charging by the number of burners per hour, and they supplied their customers from that time forward with gas by meter only, and they are now used all over the civilized world where gas is sold.

"The Company received applications for gas by contract, and Mr. Canfield, on the corner of Baltimore Street and Light Street, was the first applicant under the new system.

"The increase of the Company's business caused John Rodgers, machinist in North High Street, to engage in the manufacture of gas meters, and employed John M. Slaney, Sr., who came over from London at his (Rodgers') request and made all the meters which the Company needed (ordinarily) for some time. When the Baltimore Gas Company saw best to have the meters made at their own works, they secured the services of J.M. Slaney, and Mr. Rodgers then gave up that part of his business.

"At the early stage of the Baltimore Gas Works the retort-houses, purifying-house and all other necessary branches were on the premises, at the corner

of Saratoga and North Streets, running back to Davis Street, which is now used as a malt house. The gas was made principally from coal and -- when in an emergency -- wood; also rosin was used to make a sufficient quantity. The consumption daily was from 60,000 to 80,000 cubic feet, which very rarely exceeded 80,000, sometimes 60,000. Eighty thousand cubic feet per night was an extraordinary consumption which caused the use of wood being used pretty freely -- rosin also. They had at that time in their retort-houses -- six retorts in the one on Saratoga Street and eight in the other house -- one large "D" retort in a banch and two gasometers in the house on North Street of the capacity of 30,000 cubic feet each. There was also one on North Liberty Street, near Fayette Street, of the same dimensions, and as the consumption increased they enlarged and improved their works. And the consumption of gas was introduced into New York and all the large cities of the Union.

"After my apprenticeship with the Company, through ill-health I had to lay by for a time, and afterwards resumed work for them, and remained with the Company until 1875, and now my health has failed me and approaching years brings me very near dissolution unless an Infinite Providence interposes, and I thought proper to transmit these facts to my Nephew, Thomas

Nicholson, for a memorandum for him.

(Signed) J. A. ADAMS

February 26th, 1880.

"(The writer was told by Mr. J.Q. Adams, son of Mr. J.A. Adams, that his father lived 25 years after he wrote these facts.)"

Referring to Adams' statements concerning gas meters it is well to state here that the first gas meter made in the United States was made in Baltimore by Samuel Hill.

Gas Light--ings, a column in the Gas Journal for Jan. 2, 1860 says of the Baltimore Gas Light Company:

"Mr. Saunders sent us a prompt and full report of this, the oldest incorporated company in the United States, and one of the best therein. The stock is unsalable because it is unbuyable, it rarely changes hands, being sought eagerly for investment. The works are in fine order, and have been lately improved by a complete and extensive laboratory."

COMPETITIVE COMPANIES

In 1871 a competitive company, the "People's Gas Company" started to deliver gas from a coal gas plant, of about 1,000,000 cubic feet per day capacity,

at the foot of Scott Street. The engineer was Mr. Charles F. Dieterich.

By an agreement between these two companies
Eutaw Street became the dividing line for their
operations. The People's Company supplied the territory
west of Eutaw Street through about 59 miles of mains
while the Gas Light Company of Baltimore supplied the
territory east of Eutaw Street through about 114 miles
of mains.

NEW WATER GAS PROCESS

For the first half century that illuminating gas was in commercial use the men who were spending their time and energy for its development were concerned only with coal gas.

American of Norristown, Pa., introduced an entirely new gas which was known as water gas. This gas is produced by injecting steam into a generator where carbon, in the form of coke or coal, is being heated up to incandescence. The product of this generator, a blue water gas without illuminating power, is then passed into the carburetor where it is mixed with vaporized oil to give it illuminating value and additional heat value. These two mechanically mixed gases then go into

the superheater where they are permanently fixed or welded together by heat and emerge as carbureted water gas. Professor Lowe was granted a patent in 1873 and the first plant was installed at Phoenixville, Pa., in 1874.

Tessie Du Motay, a Frenchman, also perfected a similar form of water gas apparatus in America about this time but the process is known the world over as the Lowe process and is now more extensively used than any other, in the manufacture of gas.

Professor Lowe's first use of this gas was for a ballon which he used to make observations for the Union forces, during the Civil War, at Yorktown and Fair Oaks, Va., in 1862. The gas was generated on the battlefield.

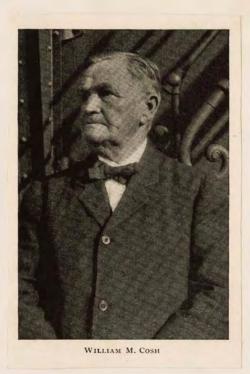
The new water gas was first introduced into the Gity of Baltimore by a new company, the Consumers'
Mutual Gas Light Company of Baltimore, in 1877.
Baltimore having the reputation of being a city of first things, took up the new system on a larger scale than any other city up to that time. An examination of the plant, which was situated at Lancaster Street, and Harris Creek, Canton, by Henry Wurtz of Hoboken, N.J., an eminent chemist, proved it to be working excellently. His only recommendation to Mr. Francis H. Hambleton, the engineer, was that the consumers' burners, which were

giving trouble, be changed from a non-conducting material to brass. He says in his report, "I have no hesitation in pronouncing this to be the cleanest gas that has come within my observation, this observation having been very extensive."

Mr. William M. Cash was the superintendent of this company and it was through his knowledge of the process gained by his association with Proffessor Lowe, the inventor, that the plant was such a great success. At first, the capacity was 1,000,000 cubic feet per day, but four years later this was doubled. The company did not confine their 51 miles of mains to any particular section of the city.

About ten days before Feb. 7, 1904, when the great Baltimore fire broke out, the plant was closed down preparatory to dismantling. The mains and services of course were badly damaged and broken so the old plant was started up again to save the city from darkness. Mr. George Beadenkopf, the engineer, was chiefly responsible that the catastrophe of having the city do without gas was averted.





LATER ORGANIZATIONS

Although the three companies that were now in existence could take care of the demand for gas the field was very lucrative and attracted new organizations.

The Equitable Gas Light Company was the next to enter the field, in 1882, by erecting a 1,000,000 cubic feet capacity plant at Severn and Bayard Streets to produce gas from wood. Later the plant used coal for the distillation process. They had about 62 miles of mains, principally 3 inch, not confined to any particular section of the city.

In 1885, the Chesapeake Gas Company was formed.

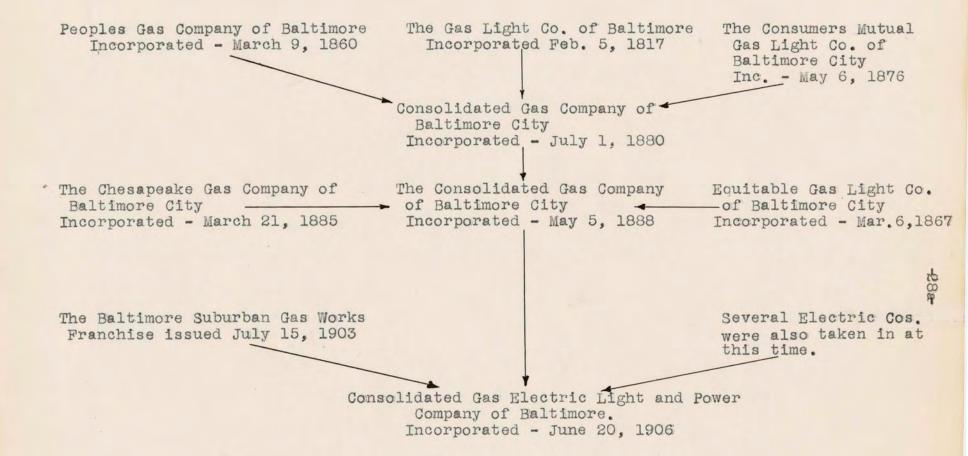
They soon combined with the Equitable Co. and subsequently shut down the plant of the latter. The Jerzmanowski process was used at first but the plant was finally remodeled to produce water gas by the Wilkinson process. The company had a good system of mains of about 98 miles and covered the best sections of the city. The plant was closed down in 1904 but the present Bayard Street Holder and Distribution Station occupies part of the property at this time.

The Suburban Gas Company, of Highlandtown, operated rather indifferently for only a few years after its formation in 1903. The plant was of 100,000 cubic feet per day capacity and supplied gas through only 5-1/2 miles of mains.

The mains of this company as well as the other systems mentioned have been worked into the present system of the Consolidated Company which covers 110 square miles of distribution area with about 750 miles of mains, the largest of which is 48 inches.

THE PRESENT CONSOLIDATED COMPANY

The Consolidated Gas, Electric Light and Power Company of Baltimore, which was formed by a consolidation of all of the six above mentioned old companies in 1906, is now being very successfully



operated. All of the gas manufacturing is now concentrated at the one works at Spring Gardens, where a complete plant with improved LoweWater Gas Apparatus was installed in 1902-1903. The capacity is about 20,000,000 cubic feet per day and even at the distant points of distribution, some seven or eight miles away, a very even pressure is constantly maintained.

The company now occupies about 58 acres and is situated so that it may be expanded enough to increase the capacity to at least five times its present output. The company had a surplus, on Dec. 31, 1924 of \$6,458,503.

The gas that is distributed to the consumers comes originally from the plant of the Bethlehem Steel Co. at Sparrows Point, through a pipe 12-1/2 miles long, to the plant at Spring Gardens. Here this coke oven gas is purified, enriched, and mixed with water gas before being distributed.

CONCLUSION

The record of this company is that for its 110 years service it has never failed in supplying the people of Baltimore with gas. This is truly a record to be proud of. If the company could pass through such a distressing catastrophe as the great Baltimore fire without

marring this record the consumers should certainly have no fear of any interruption in their gas supply in the future.

SUPPLEMENT

Containing

- 1. Views of the old gas works
- 2. An old print of Baltimore
- 3. Peale's Museum.
- 4. Extract from Federal Gazette of the 1816 Ordinance.
- 5. Original Charter of the Gas Light Company of Baltimore.
- 6. Statement of Stocks and Effects and their Investments, June 1, 1823.
- 7. Vertical Section of Coal Gas Plant, 1815.
- 8. Chronology of the Early Development of Gas Lighting.
- 9. Varying Costs.
- 10. Bibliography.

DAVIS STREET WORKS

Saratoga and North Streets, now Guilford Avenue.



Eront View



Side View

HOLLIDAY STREET WORKS North Holliday Street near Saratoga



Front View of Retort House



Side View of Retort House

HOLLIDAY STREET WORKS



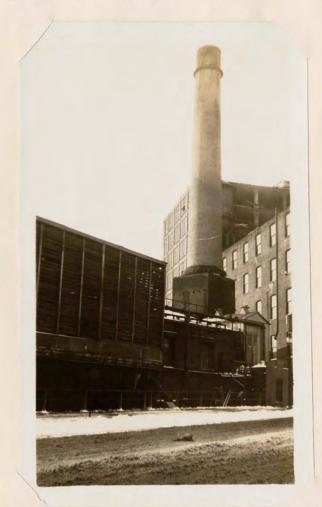
Holliday Street from Saratoga



Old Purifying House



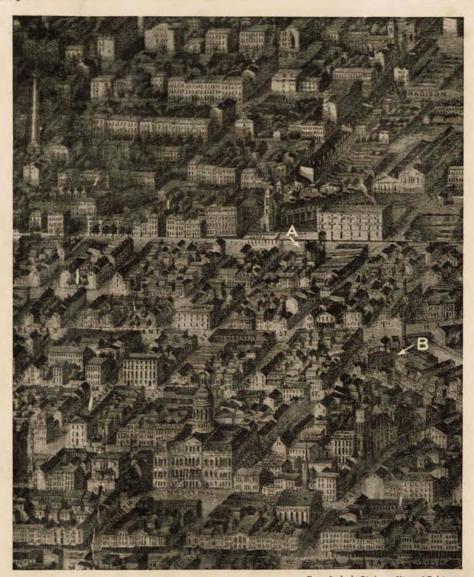
General View of Works



Rear of Retort House



Old Engine Room



From Sachse's Birds-eye View of Baltimore

CENTRAL SECTION OF BALTIMORE CITY IN 1869 Showing, A-Davis Street Holder; B-Holliday Street Holder

REMBRANDT PEALE'S MUSEUM

On June 17, 1916 a Tablet was placed on Peale's Museum. The inscription on it is as follows:

Baltimore Museum

A Pioneer Art, Historical, and Scientific Museum
Erected 1818 by Rembrandt Peale
Gas Lighting Demonstrated June 18, 1816
Occupied as City Hall, 1830-1875

Rembrandt Peale

Distinguished Maryland Artist, Naturalist, and Technologist
Founded the First Gas Company in America June 17, 1816
This Tablet Commemorates

The

1816 American Gas Centenary 1916

Consolidated Gas Electric Light and Power

Company of Baltimore







Peale's Museum as it appears to-day

From the Federal Gazette and Baltimore Advertiser Wednesday, June 19, 1816

AN ORDINANCE

To provide for more effectivity lightang the desists, squares, banks and alley of the city of dashboars.

City conneil of Estimora by Montared Prode and abstract it is expressed to the Mayer and the half of thinwell and the Mayer and the half of thinwell and the man of the control of the co

sony were not by a justice of the peace for the report pickle and per ality of Twenty childron.

See 2d, And be it enterted and ordanical that the said company shall be achieve of all the presistion of the provisions of the ordinance entitled '2m ordinance to encourage the involved tent of the provisions of the ordinance entitled '2m ordinance to encourage the involved tent of the entitled the color of th

the criters in a greater degree than the weeks of for the same pirpose.

See S. And be becaused and ordained, that the Gas Light Company of Ballimore afters aid may and they are hereby authorized with the approbation of the Mayor and the consent of the owners or occupiers of houses fronting or or adjacent to any street, square, lane or alloyed and the the lamps, pipes or other apparents to be used or necessary for highting any such street, square, lane or alloyed any part of any such treet, square, lane or alloyed any part of any such leaves or may be agreed upon by and between the said Company and the owner or occupier of such house or houses, or such terms and conditions or may be agreed upon by and he tween the said Company and the owner or occupier of such house or houses.

President of the 1st Eranch of the C. Council. HENRY PAYSON,

President of the 2d. Branch of the C. Council. Approved 19th June 1816.

EDWARD JOHNSON, Mayor, june 19





The Petapsco Manufacturing

Company,
Arther Worehaue, No. 183, Market trees,
Have constantly for sale, a very general accontinent of

COTTON YARN,
both Chain and Filling of every number from

hoth Chain and Pilling of every number from a tools.

Allo, SEWING THREAD, white and of all the must colours in horse and skeins, and rices and skeins, and their Mill on the Zangaco, which will be found to he of the same sewellent quality as heredotre.

They have also for sale a general autorimore of a high seal Dimarked Shirtings, Orillings, 1971 800 Whitehor, made of the years from their latter while the case of the Sale Dimarked Shirtings, Orillings, 1971 800 Whitehor, made of the years from their latter while the transaction forms.

O.V.D. GRAY, President latter 1972 A. Extractions Williams Williams 1972.

From the files of the Federal Gazette in possession of the Maryland Historical Society

Fac-Simile of advertisement of the 1816 ordinance granting a franchise to the Gas Light Company of Baltimore and of Rembrandt Peale's advertisement of the display of gas lighting at his Museum.

Original Charter of the Gas Light Company, of Baltimore

The first gas company in the United States

This pioneer Charter devolved upon the Consolidated Gas Electric

Light and Power Company of Baltimore

LAWS OF MARYLAND

CHAPTER CCLI

An Act to Incorporate the Gas Light Company of Baltimore Lib. TH. No. 5; Fol. 417 1816 Chapter 251 Passed February 5, 1817

1. BE IT ENACTED, by the General Assembly of Maryland, That Rembrandt Peale, William Lorman, James Mosher, Robert Cary Long, and William Gwynn, and all such persons as shall associate with them by becoming stockholders in the manner hereinafter provided, their successors and assigns, shall be and they are hereby made and constituted a body politic and corporate, by the name, style and title, of THE GAS LIGHT COMPANY, OF BALTIMORE, and by that same name, style and title, shall have continual succession, and shall be able and capable in law to sue and be sued, to plead and be impleaded, to answer and be answered, in any court of law or equity, and to make, have and use, a common seal, and the same at pleasure to alter or renew; and generally to do and perform all such acts, and make all such contracts and agreements, and purchase, lease, hold, use and possess, such lands, tenements, hereditaments, goods and chattels, as may be necessary for carrying on the manufacture of, or for procuring or collecting Gas or inflammable air, and preserving, using, and distributing the same, as a mean of giving light, or for any other useful purpose, or for lighting with Gas the streets, squares, lanes and alleys, and the houses, and other buildings and places in the city and precincts of Baltimore, or elsewhere, within this state; or for carrying on any manufacture necessary for converting to useful purposes the products of any substances which may be employed in making or procuring Gas, and for disposing of the same; Provided always, that the said company shall not, at any one time, hold or possess real and personal estate together above the value of one million of dollars, without the consent of the legislature being first obtained.

Stockholders incorporated.

2. And be it enacted, That the capital stock of the said company shall be divided into shares of one hundred dollars each, and until the sum of one hundred thousand dollars shall be expended or invested as capital, as is hereinafter described and defined, the number of shares shall amount and be limited to eleven hundred; of which number one hundred shares shall be set apart to be assigned to the above named Rembrandt Peale, over and above his proportion as a member of the company, as a compensation in full for transferring to the Gas Light Company of Baltimore, so far as respects the city and precincts of Baltimore, the patent right assigned to him by Doctor Benjamin Kugler, of Philadelphia, to use his improvements in the mode of manufacturing, collecting and using, carburetted hydrogen Gas, and also for

Proviso.

Capital Stock.

of pr ht

Affairs to be managed by five directors.

Election of directors.

the right to use in the said city and precincts, all improvements in the mode of collecting, manufacturing, and using Gas, which have been or shall be invented or discovered and published, or patented, by the said Rembrandt Peale, upon which one hundred shares no payment shall be required; and the remaining one thousand shares shall be and they are hereby equally divided and apportioned to and among, and vested in the said Rembrandt Peale, William Lorman, James Mosher, Robert Cary Long, and William Gwynn, two hundred shares to each of them in his own distinct and separate right, the amount thereof, or such part of the amount of the proportion of each, as shall not have been advanced or paid to the use of the company before the passage of this act, to be paid by them respectively to the treasurer of the company, at such times, and in such instalments, as a majority of the board of directors hereinafter mentioned shall require; and all dividends of profits, when made, shall be apportioned equally on the said eleven hundred shares, and paid to the respective owners thereof, until the number of shares shall be increased in the manner authorised by this charter.

- 3. And BE IT ENACTED, That the affairs and business of the Gas Light Company of Baltimore aforesaid, shall be conducted and managed by a board of five directors, and by such officers and agents as they, or a majority of them shall appoint; and the said Rembrandt Peale, William Lorman, James Mosher, Robert Cary Long, and William Gwynn, are hereby appointed and constituted directors of the said company, and authorised to act as such, until, by transfers of the stock, or additional subscriptions pursuant to this charter, the number of stockholders shall be increased to ten, or upwards, and until the first Tuesday in June thereafter, and the election of a board of directors by the stockholders.
- 4. AND BE IT ENACTED, That on the first Tuesday in June next, after the number of stockholders in the Gas Light Company of Baltimore aforesaid shall amount to ten or upwards, and on the first Tuesday in June annually thereafter, the said stockholders, or so many of them as shall attend in person or by proxy, at the place which shall have been appointed by the board of directors for the purpose, shall elect, by ballot, from among the stockholders, five directors, to serve for one year and until the next election; the ballots shall be received and counted by such two or more judges of the election as shall have been appointed by the board of directors; each stockholder shall be entitled to vote in person or by proxy, one vote for every share of stock he shall hold at the time of the election; and the five stockholders who shall receive the greatest number of votes shall be declared duly elected directors; notice of the time and place of holding each election shall be given to the stockholders in such manner as the by-laws of the company shall provide; and if from any cause an election of directors shall not take place on the day so appointed, an election may be held on such subsequent day, within thirty days, as the directors then in office shall appoint and notify as aforesaid, or at such time as the by-laws of the company shall provide.

5. And BE IT ENACTED, That the directors hereby appointed, and those which shall be elected as aforesaid from time to time, or a majority of them, shall have power, and they are hereby authorised to appoint, at their pleasure, from among the stockholders, a president of the company, who shall possess such powers, perform such duties, and be entitled to such compensation, as the by-laws made in conformity to this charter may provide; to fill all vacancies which shall be caused in their own board by death, resignation, removal from the state, or ceasing to be a stockholder; to appoint a treasurer and secretary of the company, or vest both offices in the same person, for such time and on such terms as they may think proper; to appoint or employ, and in their discretion to dismiss or remove, so many factors, agents, clerks, and other persons, as the affairs of the company may in their judgment from time to time require; and to do and perform or authorise all such acts, and make, revise, alter or annul, all such by-laws and ordinances, rules and regulations, not inconsistent with the laws of this state, or of the United States, as the said board of directors, or a majority of them, may deem convenient, useful or necessary, for exercising or carrying into effect the powers above enumerated, and all other powers, rights and privileges, granted to or vested in the Gas Light Company of Baltimore aforesaid, or in the directors thereof, by this act, or by any ordinance of the mayor and city council of Baltimore; and in general, for the better managing and conducting the business and promoting the interests of the said company, or for the improvement of the natural and lawful advantages of the property, rights and privileges, vested in or owned by the said company, in as full and ample a manner as any corporate body within this state may or can do.

6. AND BE IT ENACTED, That all costs and expenses which have been or shall be incurred by the said company, in purchasing or procuring lands and houses; in procuring the necessary materials for erecting buildings; in making, procuring and fixing, or fitting for use, machinery, utensils and apparatus; and in making and laying the pipes for conveying the Gas through and along the streets, squares, lanes and alleys, of the city and precincts of Baltimore, together with the wages and other charges paid, and which shall be paid to the officers and other agents for superintending and performing the same, shall be deemed and considered an expenditure or investment of the capital of the said company; and, when the sums so expended or invested as capital shall amount to one hundred thousand dollars, if the directors, or a majority of them, shall deem it useful or necessary to employ a further amount of capital for the uses and purposes authorised by this charter, they may from time to time, in such manner and on such terms as their by-laws shall provide, receive subscriptions for, or sell and dispose of, so many additional shares of stock over and above the eleven hundred herein before authorised, as they shall think necessary, not to exceed in the whole five thousand five hundred shares; the amount of such additional shares to be used and invested as capital in the manner and for the purposes herein before described.

Their Powers.

Expenses of company to be considered as an investment of capital. Certificates to be issued to stockholders.

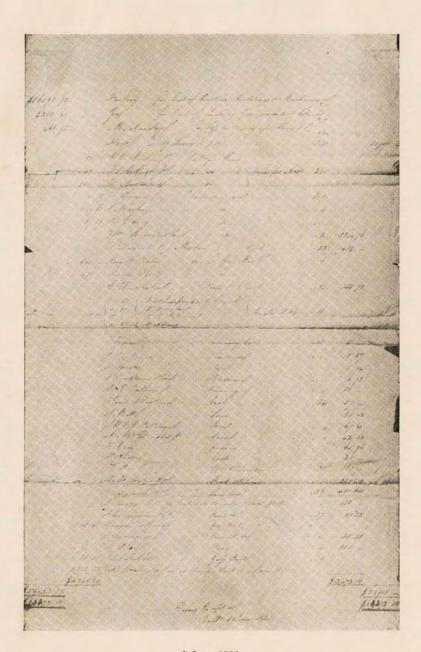
7. AND BE IT ENACTED, That certificates under the seal of the company shall be issued to each of the stockholders for so many shares of capital stock, from time to time, as shall be equal to the amount actually paid by him, or to which he shall be entitled; and each stockholder may sell or otherwise dispose of, and transfer, any share of stock for which he shall have obtained a certificate; but the certificates for the one hundred shares to be set apart for Rembrandt Peale, on which no payment is required, shall not be issued until the first day of June in the year eighteen hundred and eighteen, unless authorised by a resolution of the board of directors. Every person who shall become the owner of one or more shares of the said stock, by purchase and transfer, or by devise, or operation of law, shall thereupon become a stockholder in, and a member of the Gas Light Company of Baltimore aforesaid, within the intent and meaning of this act; and every person who shall be divested of all his stock in the said company by transfer, or by operation of law, shall thereupon cease to be a stockholder; and the said shares of stock, as to all legal purposes, shall be considered personal estate, and shall be assignable by transfer, and the certificates therefor renewable in case of loss, in such manner and under such restrictions, as the by-laws to be made by the directors may provide.

Rights, &c. granted by city council to company vested in them.

8. And be it enacted, That all and singular the rights, permissions, power and privileges, granted to the Gas Light Company of Baltimore, by an ordinance of the mayor and city council of Baltimore, passed on the nineteenth day of June, in the year eighteen hundred and sixteen, entitled, "An ordinance to provide for more effectually lighting the streets, squares, lanes and alleys, of the city of Baltimore," are hereby vested in and confirmed to the Gas Light Company of Baltimore, as incorporated by this act; and the said company hereby incorporated, shall be authorised, entitled, and bound to do and perform, all acts, and subject to all restrictions and penalties authorised and permitted, required or imposed, by the said ordinance, as fully to all intents and purposes, as if the said company had been incorporated before and at the time of passing the said ordinance.

Stock answerable for contracts of company.

9. And be it enacted, That all the property, estate, and joint stock of the said company, shall be bound and answerable for any contracts or engagements made or liability incurred by the directors thereof, or through their agency, or by their authority; but the stockholders shall in no wise be answerable or liable therefor in their individual capacities, or private estates; and the service of any judicial process upon the president, or any one of the directors, shall be a sufficient service upon the corporation.



1 June 1823

Fac-simile of a Statement of Stocks and Effects and their Investments—
Gas Light Company of Baltimore

[Transcript of the fac-simile on the opposite page]

Statement of Stocks and Effects and their Investments

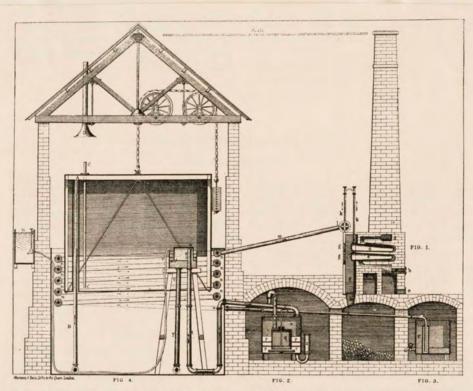
1 June 1823

		Factory . for Cost of Erecting Buildings &	
\$56,598.92		Machinery, etc F. 15	
6 .		Gas for Cost of Making Gas, proceeds	
2,355.65		of Coke, etc F. 10	
.60 00		Merchandise for Loss by fixing up Store	
468.95		etc F. 32	
		Stock, for 519 shares @ \$100 Fo. 30	51,900
		0 0 0 1 1 11 6 61	3-,,,
		J. I. Cohen, Jr. do D. Raymond do Acct. Fo. 25	
	100 —	W. Gwynn . balance of acct Fo. 1	
	4.78	J. Mosher do 4	
	89.39	K. C. Long do	8,814.76
		Will. Borman con . do	1,484
		J. Donnen te J. Mooner	*,+*+
	340 —	Kellib t I cale due loi Gas Reit	
	470 —	Rubens I care do	255.72
			355.73
		37 First Independent Church	
	18.52		
		15.— P. G. Robinson Debts " 18	
		2.25 H. Allen)	
		T. Towson Chimney Cap . "18	5.—
		P. Poultney Hardware " "	18.37
		W. Brooks Rope " "	5.94
		T. Poultney & Son . Hardware " "	6.98
		R. E. Ruthven Tinning, etc " "	20.—
		House & Woolen . Coal "34	57.—
		J. Mott Lime " "	38.62
		J. W. & E. Patterson Iron " "	67.61
		A. McDonald, Jr Sand " "	42.62
		F. Cry Paving ""	65.96
		Y. Brown Coal ""	30.—
		H. Price do & Lumber "35	363.90
		Balto. Water Co Rent & Repair " "	251.50
		C. Constable & Co Lumber "36	401.64
		J. Brooks, Ex'r for Frederick Snyder,	
		Claim \$280 . " "	150.—
		J. Carnighan & Co Paints, etc " 37	61.33
	306.40	Warren & Wood . Gas Rent ""	
	3	J. Carnighan Cement, etc " "	31.21
		D. Pugh Wages ""	200.—
	21.55	Jno. Talbot Gas Rent "39	
	2 818 22	Coke, Coal, Tar, etc. on hand & Rent	
	2,010.33	to 1 June 1823	
			\$12,472.16
	\$4,948.64		A14/

\$59,423.52 \$64,372.16 \$51,900.

\$64,372.16

Errors Excepted
Balto. 1 June 1823.



VERTICAL SECTION OF A COAL GAS PLANT, AS BUILT ABOUT 1815, EMBODYING THE PRINCIPLES USED TODAY Copied from Accum's Practical Treatise, 1815, and King's Treatise on Coal Gas

1754 Dr. Joseph Black discovered carbonic acid gas (carbon dioxide).

1755 Coal discovered in Ohio, U.S.A.

1760 Theory of Specific Heat, and of Latent Heat, propounded by Dr. Steven Black.

1762 Oil street lamps first lighted in New York City.

1766 A gold medal offered by the French Academy of Science as a prize for the best essay on street lighting, won by Lavoisier.

1767 Hydrogen discovered in water by Henry Cavendish.

- 1774 Oxygen discovered by Joseph Priestly in England, and by Charles Scheele in Sweden.
- 1775 The composition of atmospheric air discovered by Lavoisier.

1776 The water lute (water seal) invented by Priestly.

1781 A patent granted to the Earl of Dundonald for distilling coal.
All the products of distillation were mentioned except gas.

1781 The gas holder invented by Lavoisier.

1784 Jean Pierre Minckelers lighted gas distilled from coal as a demonstration to his class in the University of Louvain.

1790 Anthracite coal first mined in Pennsylvania.

1792 William Murdoch distilled coal in an iron retort and conducted the gas seventy feet through tinned iron and copper tubes to light his house and grounds at Redruth in Cornwall.

1797 Murdoch lighted with gas his house and office at Old Comnock.

- 1798 Murdoch lighted with gas one of Boulton and Watt's shops at Soho, near Birmingham.
- 1799 Murdoch invented the "D" slide valve (used in steam engines and gas meters.)
- 1799 (Sept.) Philippe Lebon (in France) patented a "Thermolampe" for the production of gas by distillation from wood, coal, etc.
- 1801 Lebon lighted with gas his house and gardens in the Rue St. Dominique, Paris.
- 1802 (Apr.) Murdoch gave a public display of gas lighting at Soho to celebrate the Peace of Amiens.
- 1803 Frederick Albert Winsor began experimenting with Lebon's gas apparatus at Hyde Park, London.
- 1804 Murdoch built gas works and lighted Boulton and Watt's shops at Soho.
- 1804 (May) Winsor obtained first English patent for gas-making apparatus.
- 1804 Winsor gave a public display of gas lighting at the Lyceum Theatre, London.
- 1805 Murdoch built gas works and lighted the cotton mill of Messrs. Phillips & Lee at Manchester; nine hundred burners were supplied.
- 1805 Samuel Clegg built gas works and lighted the cotton mill of Mr. Henry Lodge, near Halifax.

1806 Edward Heard patented a process of using lime as a purifier.

- 1806 David Melville, in Newport, R. I., lighted his house with coal gas.
 - 1806 (Dec.) Lead pipes were laid in Pall Mall, London, by Winsor. These were the first gas mains laid in a public street.
 - 1807 (Jan. 28th) One side of Pall Mall lighted with gas.

1807 (June 4th) Both sides of Pall Mall lighted with gas.

1807 (July 12th) First meeting of gas stockholders (proposed National Light & Heat Company, London).

- 1823 The Boston (Mass.) Gas Light Company established.
- 1824 (Jan. 19th) Broadmeadow patented the exhauster.
- 1825 The gas governor invented by Samuel Crossley.
- 1825 New York Gas Light Company established.
- 1825 Benzole discovered by Faraday.
- 1825 First gas lamps in Brooklyn, New York.
- 1828 First gas works in Boston, Mass., built on Hull Street.
- 1829 (Jan. 1st) First gas lamps in Boston lighted in Dock Square.
- 1830 Manhattan Gas Light Company established in New York.
- 1832 Meters first manufactured in the United States by Samuel Hill, in Baltimore, Maryland.
- 1833 (Mar. 19th) A dry meter invented by James Bogardus, an American engraver, was patented by Miles Berry.
- 1833 (Oct. 12th) The Telescopic Holder patented by Hutchinson, engineer of the London Metropolitan Gas Company. This holder was invented in 1824 and described in Creighton's Encyclopedia.
- 1835 Gas meters manufactured in New York by Young, and in 1836 by Samuel Down.
- 1840 Meters adopted by the London and Westminster Gas Light and Coke Company.
- 1843 Wm. Richards made a dry meter with two diaphragms, two slide valves and a dial, which, with minor improvements, is the meter in use today.
- 1846 Gas meters made legal in France.
- 1849 A company formed in Boston, Mass., by Mr. George Darracott, to manufacture meters.

DATES OF GAS LIGHTING IN PRINCIPAL CITIES OF THE WORLD

- 1807 London, England.
- 1816 Liverpool, England.
- 1816 Baltimore, Md.
- 1817 Manchester, England.
- 1818 Sheffield, England. Glasgow, Scotland.
- Edinburgh, Scotland.
 1819 Birmingham, England.
- Bristol, England. Paris, France. Brussels, Germany.
- 1822 Munich, Germany. Belfast, Ireland.
- 1823 New York, N. Y.
- 1825 Amsterdam, Netherlands. Hanover, Germany. Ghent, Belgium. Rotterdam, Netherlands.
- 1827 Berlin, Germany.

- 1828 Boston, Mass.
- 1829 Dresden, Germany.
- 1832 Louisville, Ky.
- 1833 Vienna, Austria. New Orleans, La.
- 1834 Havre, France.
- 1835 Caen, France.
 Amiens, France.
 Bologne, Italy.
 St. Petersburg, Russia.
 Lyons, France.
- 1836 Philadelphia, Pa. Pittsburgh, Pa.
- 1838 Nantes, France. Leipsic, Germany.
- 1840 Cincinnati, Ohio. Montreal, Canada.
- 1841 Manchester, N. H. Sydney, Australia.

1842 Toronto, Canada. San Francisco, Cal. 1843 Halifax, Canada. Toledo, Ohio. 1844 Hamburg, Germany. Ottawa, Ill. 1845 Madrid, Spain. 1855 Vera Cruz, Mex. 1846 Rouen, France. 1856 Atlanta, Ga. St. Louis, Mo. Melbourne, Australia. Warsaw, Russia. 1847 Falls River, Mass. 1857 Scranton, Pa. Breslau, Germany. Newark, N. J. St. Paul, Minn. Copenhagen, Denmark. 1848 New Haven, Conn. Paterson, N. J. 1858 Tasmania Island. 1860 Portland, Ore. Providence, R. I. 1861 Malta Island. Rochester, N.Y. Washington, D. C. 1862 Shanghai, China. Hong Kong, China. Buffalo, N.Y. 1849 Quebec, Canada. 1863 Smyrna, Asiatic Turkey. Norfolk, Va. 1864 Alexandria, Egypt. Cleveland, Ohio. 1865 Bombay, India. Detroit, Mich. Rio Janeiro, Brazil. Syracuse, N.Y. Christchurch, New Zealand. 1867 Moscow, Russia. Utica, N.Y. 1850 Chicago, Ill. Kansas City, Mo. Columbus, Ohio. Los Angeles, Cal. Hartford, Conn. Oakland, Cal. Worcester, Mass. 1868 Ceylon (Island). Kingston, N.Y. Omaha, Neb. 1851 Hamilton, Ohio. 1869 Stockton, Cal. 1852 Indianapolis, Ind. 1870 Leeds, England. Memphis, Tenn. 1871 Yokohama, Japan. Buenos Ayres, Argentina. Minneapolis, Minn. 1853 Brockville, Canada. 1872 Tokyo, Japan. Rome, Italy. Montevideo, Uruguay. Heidelberg, Germany. 1873 Seattle, Wash. Milwaukee, Wis. 1878 Cologne, Germany. 1854 Belleville, Ill. 1879 St. Johns, Newfoundland. 1885 Tacoma, Wash. Nice, France. 1887 Spokane, Wash.

> (From Gas Institute News, April 1, 1912) By W. R. MORGAN, San Francisco, California (From Pacific Gas and Electric Magazine)

St. Joseph, Mo.

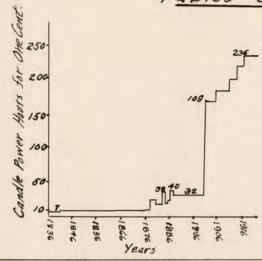
VARYING COSTS

No other necessity of household use has been so cheapened and improved during the last century as has gas.

"Coincident with an increase of 1700% in the amount of night lighting, not including fire light, of an American city family, in average circumstances, using gas for lighting, there has come a reduction in the cost of the years' lighting of thirty-four per cent or approximately \$7.50 per year; and that the cost of lighting per unit of light -- the candle hour -- is now but 2.8% of what it was in the first half of our century."

These facts by Mr. Walton Clark the President of the Franklin Institute are proved by the tables given below prepared by the Gas and Electric News of Baltimore. President Wagner of the Consolidated Company says, "The new gas rates give to the people of Baltimore a Gas Service which for low cost, uniformity of quality, and pressure, and dependability and adequacy of supply has never before been equalled in any community."

Tables of Varying Costs.



Gas Illumination. Candle Power Hours for one cent, including maintenance, in Baltimore, Md. From 1836-1916.

Period Source of Light Sperm 311 8750

1855 and Candles 8750

1855 And Candles 12373

Relative Amounts of Illumination in 1865 and Candles 12373

Resonance Merosene 90155

Resonance Merosene 90155

The home of the Average Family 1905 Gas From 167900 of average means at Different 1915 Gas From 167900 240900

Periods of Time.

Sperm Oil
and Candles Period Relative Costs per year and Costs per 82.50 1000 Candle hours for illumination in the \$23.25 1855 Kerosene . 81.88 and Candles 1865 28.3¢ home of the average family of average 1885 Keroseke 1895 and 695 \$12.19 means at different periods. 1905 GAS From 7.03 \$ 20 6.94 Cost per year Cost per 1000 Candle Hours

DOMESTIC RATES

1836, \$12.00 per burner per quarter; about \$4.00 per M cu. ft. 1841, \$4.00 per M cu. ft.

From September 1864 to November 1870, \$3.00 per M cu. ft.* From November 1870 to November 1876, 2.75 per M cu. ft. From November 1876 to March 1878, 2.50 per M cu. ft. From March 1878 to July 1, 1880, 1.50 per M cu. ft. From July 1880 to January 1881, 1.90 per M cu. ft. From January 1881 to March 1883, 1.95 per M cu. ft. From March 1883 to October 15, 1884, 1.00 per M cu. ft. From October 1884 to July 1885, 1.60 per M cu. ft. 1885 to February From July 1886, 1.50 per M cu. ft. From February 1886 to June 1888, 1.00 per M cu. ft. 1888 to June 15, From June 1900, 1.25 per M cu. ft. From June 15, 1900 to Sept. 1, 1905, 1.10 per M cu. ft. From Sept. 1, 1905 to July 1, 1910, 1.00 per M cu. ft. From July 1, .90 per M cu. ft. 1910 to July 1, 1913, From July 1, 1913 to January 1, .80 per M cu. ft. 1916, .75 per M cu. ft. From January 1, 1916 to February 1, 1916, From February 1, 1916 to Date .75 per M cu. ft. .35 per M cu. ft. and

*Plus 25 cents for Government Tax.

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Dr. Frank Johnson Goodnow, President of Johns Hopkins University.

Arthur Grahm Glasgow, Consulting Engineer, London.

Charles P. Steinmetz, President of the Illuminating Engineering Society.

J.E. Aldred, Chairman of Board of Directors of the Consolidated Gas Electric Light and Power Co. of Baltimore.

Articles by these men appeared in the Baltimore Gas and Electric News.

EARLIEST DEVELOPMENTS

Mills and Rowan "Fuel and its Application" (London 1889)

Samuel S. Wyer "Producer Gas and Gas
Producers" published by the "Engineering and Mining
Journal" (N.Y.)

F. Fischer, "Chemiche Techologie der Brennstoffe (1897-1901) "Gasformige Heigstoffe" in Stohmann and Kerl's "Handbuch der techisihen chemie, 4th edition.

Georg Lunge, a German Chemist.

INTRODUCTION INTO THE UNITED STATES

Walton Clark, Pres. of Franklin Institute Philadelphia, "The History of Gas Lighting."

THE BEGINNING IN BALTIMORE AND TO THE PRESENT DAY

George Beadenkopf, Chief Engineer of the Consolidated Co. up until 1923,

"History of Gas Lighting in Baltimore" American Gas Light Journal

Reports of Inspector of Lights and Meters in Baltimore.

Various Articles published in the Baltimore Gas and Electric News from time to time.