The Marketing of Gas Lighting in America: 1909 – 1916

Regina A. Greenwood, Kettering University, USA
Charles D. Wrege, Cornell University, USA

In the early 20th century 70 percent of lighting in the USA was supplied by gas. By 1909, however, the market position of the gas industry was under threat from electricity; in defense, the gas industry made extensive marketing efforts from 1909 – 1916 to make consumers see gas lighting as more desirable, economical, and progressive. Whereas the electric industry used a variety of marketing techniques to inform the customer and provide the customer with first-rate service, the gas industry had not. It waited to provide service to the customer, inform the customer about gas lighting, make aesthetically pleasing gas lamps, update product lines, and have consistent, cohesive marketing plans and campaigns until it was too late. By the 1920s electric lighting had an unassailable market position. This paper examines the efforts of the gas industry to maintain its market position and the factors that contributed to its eventual decline.

THE MARKETING OF GAS LIGHTING IN AMERICA: 1909 – 1916

In the United States, the subject of gas lighting is usually confined to the outdoor lamps used to illuminate the walls and driveways of suburban homes or the "restored" portions of urban areas. In the early years of the 20th century, however, 70 percent of residential and commercial lighting in the USA was supplied by gas. The extensive use of electric lighting was not to arrive until the 1920's and 1930's. The introduction of the high efficient Tungsten filament incandescent electric lamp in 1908, was the first major threat to the gas lighting industry.

By 1909, the gas industry had awakened to the problem and from 1909 – 1916 extensive marketing efforts were made to increase the desirability, economy, and progressiveness of gas lighting in the eyes of the consumer. Campaigns to market modern gas lighting were conducted in both commercial and residential applications, but this paper will focus on residential gas lighting because the marketing efforts were more extensive and employed active sales campaigns and media coverage.

While outdoor gas lighting is the most familiar form of gas lighting today, residential gaslights are still in use. They are found, primarily, in homes located in remote areas where self-generated electricity is too expensive as compared to propane or natural gas. They are also used in recreational vehicles a source of illumination.

THE DISCOVERY AND COMMERCIAL INTRODUCTION OF INCANDESCENT GAS LIGHTING

In 1885, Earl Auer von Welsbach, a student of Robert Bunsen, the inventor of the Bunsen burner, invented the first durable mantle. (The mantle is a mesh bag, like a tea bag. Its woven structure is dipped in a material that will allow it to retain its skeletal structure as it burns. The mantle must be ignited and burnt as it glows and gives illumination.) He discovered that cotton fabric impregnated with thorium and cerium salts could be incinerated to produce a white ash of hard oxides. When placed in the flame of the Bunsen burner the oxides glowed brightly but still retained the skeletal structure of the cotton.

By 1891, Von Welsbach found that a mantle of ninety-nine percent thorium and one percent cerium gave a brilliant incandescence. Von Welsbach's improvement of the mantle, however, was not appreciated by the gas light industry because his incandescent mantle provided a large volume of light with a small consumption of gas, thereby reducing revenues. (Highlands 1895)

Gas lighting in residences, from 1890 to 1908, was provided primarily by flat flame burners not using mantles. (A "batwing" burner is shown in Figure 1.) These burners consumed 67 cubic feet of gas for every 100 international candle power hours of use at a cost of 7.55 cents per 1,000 candlepower. Von Welsbach's incandescent, upright mantle consumed only 7.8 cubic feet of gas at a cost of 0.88 cents per 1,000 candlepower. That is, Von Welsbach's mantle consumed 59.2 cubic feet less of gas for the same candlepower, thereby reducing company revenues. (Blinks 1911)

Only one company, the United Gas Improvement Company of Philadelphia, recognized the value of Von

Welsbach's invention in combating the slowly increasing use of electric lighting in residences. They purchased the United States patent rights to the incandescent mantle and formed the Welsbach Incandescent Light Company with headquarters at 404 Henderson Street, Camden, New Jersey, to manufacture mantles (FTC, Document 92, 70th Congress, pp. 322 – 332).

By 1900, manufacturing by the Welsbach Company was so advanced it appeared that "gas lighting would attain a superior position which it would be difficult to retain for electricity . . . (and) . . . The electric lamp could follow the flat-flame burner into oblivion" (Barham 1912, p. 8).

THE NATIONAL COMMERCIAL GAS ASSOCIATION AND THE MARKETING OF RESIDENTIAL GAS LIGHTING

The National Commercial Gas Association was formed in 1904; its primary objective was "the development of the rise of gas and the promulgation of methods necessary for its sale." (Constitution and by-laws of the National Commercial Gas Association Article II) In other words, they were going to market gas as an energy source.

During its thirteen-year career, the National Commercial Gas Association developed several objectives to promote the use and marketing of gas lighting to meet competition from electric lighting. These were outlined in 1916, shortly before the termination of the association (Scofield 1916):

(1) Proper soliciting for new installations.
(2) Replacement of all old installations.
(3) Proper maintenance of gaslights.
(4) Increased use of industrial gas lighting.
(5) Additional use of store gas lighting. (409-421)

From 1900 to 1906 there was intense competition between gas and electric companies as they fought each other for market share over the entire field of light, heat and power . . . The field was disputed bitterly and each side took all the business it could set " . . . and the intense desire to get business usually obscured the operation of profit" (Stannard, 1909, p. 83).

By 1908, however, the industry changed drastically with the increased merger of gas and electric companies into so-called "Combination" companies distinct from straight gas companies. Profit, however, still was secondary due to a struggle within these companies between the gas-trained men and the electric-trained men. In 1909, however, the situation changed and the desire for increased profits dominated as profits became the key deciding factor to determine whether "the company wishes to encourage certain class of business to be operated by gas or electricity" (Stannard 1909, p. 84).

With this new strategic goal, the main methods developed to market residential gas lighting from 1909 to 1916, were primarily special residential sale campaigns and maintenance of gaslights by the gas company.

The problem of antiquated gas light fixtures was of great importance to both the straight gas companies and the combination companies. Electric light fixtures, almost from the start, were works of art, designed to be attractive to the consumer. Gas fixtures, on the other hand, were utilitarian and not particularly graceful. Part of this situation was due to the early engineering need for upright incandescent gas lamps to use unsightly "stacks" to secure the necessary flow of air for the incandescent mantles, and the tendency of gas men to merely supply the gas and not worry about the design of the fixtures.

Gas companies felt secure that despite the increased use of high efficiency electric lamps, gas was still cheaper than electricity for illumination and would, therefore, prevail. Electricity was more convenient since one merely turned a switch to obtain light, against lighting gaslights with a match. But the majority of customers was unwilling to pay extra for the convenience of electric lighting and retained gas lighting. Both straight gas companies and the gas division of combination companies realized these customers could be profitably and satisfactorily handled by gas lighting.

While the gas light companies felt safe, forces were at work to change the industry drastically. In 1905, General Electric Company had purchased the patent rights to the German tungsten filament electric lamp, which consumed only 1 watt per candle costing 1.4 cents per 1000 candlepower. The lamp was introduced commercially in 1908, severely threatening the continued existence of gas lighting.

THE GAS LIGHTING INDUSTRY REACTS TO THE TUNGSTEN ELECTRIC LAMP

The initial reaction of the gas light industry in 1909 was to concede the more affluent customers to tungsten lamps and to concentrate on providing light to less affluent customers. At the time, almost all-existing residences in urban areas were already piped for gas with more expensive homes piped for gas and also wired for electricity. In these homes so-called "combination fixtures" were in use providing both gas and electric lighting because the service provided by electric light companies was still so undependable that the more affluent provided for back up through gas lighting. While the older homes were only piped for gas, many new homes had only electric wiring and this resulted in less use of gas lighting.

Marketing efforts by gaslight companies were, however, almost non-existent. They merely supplied the gas with the customers purchasing their own mantles and fixtures. They may have purchased gas lighting apparatus from the stores operated by the gas light companies, but more frequently the apparatus were purchased from hardware stores or door-to-door salesman selling cheap mantles and fixtures. The increased case of electric wiring

in new homes and buildings was detrimental to any expansion of gas lighting beyond existing gas piping and, as a result, the industry had to focus primarily on the older homes piped for gas lighting years before. This market, however, was quite large and by 1910, the gas light industry devised new marketing strategies to bring gaslights to such homes.

Two methods appeared most successful to stop any decline in gas lighting use: "special campaigns" to increase the use of more modern gas lights by consumers and residential maintenance programs to keep residential gas lights in the most efficient operating condition. The "special campaign" approach was the more appealing because it used direct marketing of new gas lamps to replace older, less efficient, lamps. The "special campaign" approach was also used to market gas irons, stoves, water heaters and stoves. (See Figure 2.)

ILLUMINATING ENGINEERING AND MODERN GAS FIXTURES HELP TO MARKET GAS LIGHTING

In 1911, E. Leavenworth Elliott, a prominent illuminating engineer, explained the value of illuminating engineering for gas lighting. Elliott outlined how gas lighting had been raised on the old "hit or miss" plan as compared to how advantageously high-efficiency tungsten electric lamp installation used illuminating engineering. He stressed that "gas will continue to be used as illuminant just as long as it is materially cheaper than other illuminants, but no longer" (Elliott 1911, p. 104). But, he argued, the "supremacy of electric lighting at the present time is due in no small measure to the failure of gas lighting to put forward its other merits" (Elliott 1911, pp. 104 – 105). In addition, "illuminating engineering applied to gas light means that each installation would be put in a such manner to give gas all the advantages of which it is capable in economy, appearance, and quality of illumination produced" (Elliott 1911, p. 115).

Elliott's remarks were enhanced by Charles Ummach who briefly outlined the need for modern gas lighting fixtures (Ummach 1911). Ummach said the term "gas fixture" had been dropped by fixture manufactures in the past few years in favor of "lighting fixture". This change had occurred because electric companies, in promoting the sale of electric lamps, "introduced a classy, up-to-date decorative effect in lighting fixtures, and the Gas Companies at no particular time have devoted much effort to the sale of their product by the rise of gas lighting appliances; . . .." (Ummach 1911, p. 282). Electric companies made deep inroads on gas lighting by convincing the gas consumer that electricity provided better service and the modern fixture for electric lighting provided a more decorative effect.

Ummach argued that modern gas fixtures should be manufactured as to give the best result from the lighting standpoint without destroying the decorative effects possible with gas. Although electricity could provide a great number of lighting effects, Ummach said the same effects were possible in gas lighting through the use of the inverted gas burner and a similar type of upright incandescent gas burner. These two types of burners are shown in Figure 3, 4, and 5.

Ummach further suggested gas companies should look into adopting the indirect method of gas lighting, which required the consumption of more gas thus increasing revenues. He admitted, however, that very few installations had been made of this system. A pioneer in indirect gas lighting, Carl H. Grof of Indianapolis, was present at the meeting and he outlined how he first had used inverted burners to light the company's main office, but later replaced them with upright burners. He further explained that he had the Welsbach Company supply new reflectors and painted the ceiling white to get more reflected light.

SPECIAL CAMPAIGNS AND THE DIRECT MARKETING OF MODERN GAS LIGHT FIXTURES

Bolstered for the remarks of Elliott and Ummach, efforts were made in 1912 to acquaint the customer with modern gas lighting and to market the latest gas light fixtures. The most progressive gas light companies accomplished the bulk of the work: Public Service Gas Company of New Jersey, United Gas Improvement Company of Philadelphia, Indianapolis Gas Company, Milwaukee Gas Light Company, People's Gas Light and Coke Company of Chicago, The Brockton Gas Light Company, and the Consumers Gas Company of Toronto, Canada.

James Hanlan of the Public Service Gas Company outlined the Concept behind the special campaigns and the marketing of gas light fixtures in December 1912. Hanlan said that gas companies had to conduct special marketing campaigns because of the need to "take radical steps in the sale of their product, in order that they may secure a full measure of return for the service they render their consumers, which return they were being deprived of, owning to the installation by consumers of appliances of poor material workmanship and construction."(Hanlan 1912, p. 199) Hanlan focused on residential lighting campaigns.

Hanlan's comments on special residential lighting campaigns were based on his own experience in running special campaigns. He also reported the large number of campaigns conducted in 1912: one hundred and seventy-six companies conducted Residential Lighting Campaigns selling one half million reflex lights and 15,000 AVC lamps. During the 1912 campaign in New Jersey alone over 32,000 new reflex lights were sold and installed under residential maintenance contracts. (See Figure 6.)

RESIDENCE LIGHTING CAMPAIGNS VERSUS RESIDENCE MAINTENANCE SERVICE

Ever since Thomas Edison began marketing the Edison incandescent electric lamp (what we call the light bulb) in small towns in 1883, the Association of Edison Illumination Companies had, at no cost to the customer, replaced the lamps of residential customers under a lamp renewal contract. By this contract the electric company made monthly visits, removing all old lamps and replacing then with new lamps. The Edison Companies had used this service because the early Edison lamp filaments of split bamboo tended to break easily. Once broken, the inoperative lamp used no consumption of electricity and, therefore, produced no revenue for the company (Wrege & Greenwood 1999).

When incandescent gas mantles were introduced in 1893, a similar situation existed in regard to easily broken mantles. As a result, a few gas companies initiated gas lighting maintenance programs in which, under contract, the company visited residences periodically, replacing broken mantles, adjusting the gas fixtures, and cleaning glassware without cost. This residence maintenance service was, however, expensive and only offered by a few companies.

Harlan saw the Special Lighting Campaigns as providing many benefits of a residence maintenance service without the expense of providing such a service. More important, he saw the campaigns as a way of replacing obsolete gaslights with the latest Reflex Mantle Light designed by the Welsbach Manufacturing Company. He described the advantages of the Welsbach Economical Home Light in the return postcards provided to customers who purchased a light during the campaign. (See Figure 7.) (Harlan 1912)

Although Harlan outlined elements of the Special Lighting Campaigns, some of the more important ones are summarized below. As can be seen, many aspect of sales and marketing techniques are represented in his extensive list:

1. Renaming Appliances. According to Harlan, it was advantageous to rename an appliance that was the subject of a special campaign with a name that would be associated with comfort economy or service: Welsbach Economical Home Light, Cottage Arc Light, "V. G. I. Home Lights" as shown in Figures 8, 9, and 10.
2. Selecting The Most Modern Lamp. Harlan considered the lamps mentioned above were the most modern lamps available and the lamps to be utilized in the campaigns.
3. Establishing a Price to Insure Service with Every Sale. Harlan said purchasing lamps of superior merit would allow establishing a price that would enable the company to provide a complete service (installing and adjusting lamps).
4. Campaigns Were Expensive. The cost of conducting a campaign (especially if a lot of advertising was used) was quite heavy, but could be absorbed by the proper selling price of the lamp.
5. Various Methods of Advertising Should Be Employed. Harlan said some companies had relied almost entirely on newspapers; others combined newspapers, gas bills, stickers and sheet car signs and others newspapers, leaflets and postcards left at residences during visits. Two of these methods are shown in Figures 1 and 2. He also stressed the advantage of having window displays and signs in company stores as shown in Figure 13.
6. Methods of Paying The Men Who Would Sell the Lamps. At the Public Service Gas Company, straight commissions were used. In his 1912 campaign, Harlan paid the following commission on new lamps sold without any maintenance:

> Some companies pay a salary and a commission, others pay a straight commission. We have tried both and the majority of our managers favor a straight commission. The average straight salary paid is usually one dollar a day plus commission, ranging from twenty-five cents up for Residential Lamps selling at $2.25. (Harlan 1912, p. 214)

When the lamps were sold with maintenance, the following commissions were paid:

> In our Lighting Campaign we paid forty cents straight commission on the sale of $2.25 Royal Reflex Lamps and fifteen cents commission on a $1.60 No. 4 small Reflex Lamp, and twenty percent commission on the sale of mantles and glass wear. (Harlan 1912, p. 215)

THE ADVANTAGES OF RESIDENTIAL GAS LIGHT MAINTENANCE IN MARKETING GAS LIGHTING: A 1913 OUTLOOK

In 1912, President C. W. Hare of the National Commercial Gas Association, appointed a Committee on Indoor Lighting to examine methods to promote the use of indoor gas lighting. In 1913 the committee reported, "Gas lighting needs greater publicity. The public is not sufficiently familiar with the later development" (Report 1913, p. 323). The committee also examined the use of residential maintenance plans to insure the customer had best gas lighting.

Much attention was focused on the economy obtained by the use of gas for illumination and a chart was prepared

to graphically demonstrate "the improvements made in the last thirty-three years in both gas and electric lighting" and shows that whenever there was a radical improvement in the one system of illumination, there was always a corresponding development in the other with gas lighting in the lead." (Report 1913, p. 324) (See Figure 14.)

The committee acknowledged that, while during the Special Lighting Campaigns consumers might be instructed in the maintenance of gaslights, this instruction was costly. Instead, the committee favored maintenance by gas company employees. Such maintenance could be of two types: 1) "Gratuitous, each installation being visited at fixed intervals, the labor being supplied free and the customer charged only for the material used for replacing, repairing, etc." or, (2) "A charge may be made of a definite sum per month or per year, in consideration of which the Company agrees to maintain the installation in perfect condition, furnishing all labor and material by visits at regular intervals..." (Committee 1913, p. 324).

The residence burner maintenance program of The Consumers Gas Company of Toronto was described by the committee in great detail since this program was also tied to the marketing of gas lamps and other appliances. A description appears in Figure 15.

While the committee acknowledged the value of special lighting campaigns it also urged that salesman "competent to advise concerning selection of fixtures, portables, etc should also canvass residences. The systems of lighting to be used under different circumstances such as indirect and semi-indirect which depends largely on the color of walls and ceilings" (Committee 1913, pp. 330-331).

MORE EFFORTS TO SELL GAS LIGHTING: A REVIEW OF RESIDENTIAL NEEDS

Robert F. Pierce, chairman of the Committee on Illumination for 1915, considered the importance of residential gas lighting to be of paramount importance, above that of the marketing of modern gas fixtures and other gas appliances. Pierce argued that 40 percent of the gas consumed by residential customers was for gas lighting so this was the most dependable consumption. In all seasons of the year, in all kinds of weather, homes had to be lighted; therefore, gas lighting was the most dependable sources of revenue for the gas company. Further, if the best possible service was given to insure the best in gas lighting, it becomes an automatic advertisement for the local gas company.

To accomplish this goal, Pierce stressed the need for the proper maintenance of gas lamps. He outlined some of the existing plans: "Lamps may be rented and maintained for a fixed charge each month, or sold and a separate agreement for maintenance, or . . . at simply the cost of the material. In a few instances lamps are being maintained absolutely free." (Pierce 1915, pp. 137 – 138)

Pierce also discussed the merchandising of gas lamps, which he divided into, first, buying and second, selling. In buying lamps, he stressed purchasing fixtures and domes in finishes made to withstand heat and discoloration and designed to fit a standard stem or chain. Inverted bowls and fixtures should be purchased in the same way. Since they were the best sellers for residences, large amounts should be purchased.

Considering the various fixtures available, residential lighting and the locations where various types should be used played an essential part in marketing gas light. Pierce briefly outlined the following along with illustrations:

1) Semi-indirect fixtures offered the widest range of use. Small units (shown in Figure 16) were most suitable for hall or den lighting or larger units (shown in Figure 17) for dining room or living rooms.
2) Direct fixtures (shown in Figure 18, p. 168) were best for the kitchen or the laundry. Side brackets, (see Figure 19, p. 171) were the most popular for dining rooms, halls and bathrooms. Portable lamps also were included and useful for the living room and den.

It was clear that the available gas light fixtures in 1915 covered a large number of units that rivaled electric light installations. They had to be displayed as modern gas lamps in gas company stores. (See Figure 20.)

THE NEED FOR A VARIETY OF DESIGNS IN RESIDENTIAL GAS LIGHTS: 1916

Criticism of the use of combination gas and electric lighting fixtures in residences was renewed in 1916. In a paper on this topic, J. P. Zingg of the Public Service Gas Company, argued that gas men were failing to emphasize that modern gas fixtures were ideal for central lighting and more advanced than any electric light fixtures when it came to design, economy and attractiveness. Furthermore, incandescent gas lighting was superior since it made it possible for an individual to sew or read without eye strain as demonstrated by the "Cottage Arc" lamps advertisement. (See Figure 21.)

In a similar paper, Samuel Synder of United Gas Improvement Company of Philadelphia said that gas companies in the past few years had recognized the possibilities of retaining or even expanding the use of gas lighting by directly marketing gas fixtures either through special campaigns or in their own stores. Unfortunately, said Synder, "little attention was paid to the need for a variety of designs, artistic appearance or construction of the fixtures sold." (Synder 1916, p. 527) Companies considered fixtures "merely as support for lighting units and well content with displaying and offering for sale fixtures of the cheapest workmanship, generally of inartistic design and frequently of faulty construction." (Synder 1916, p. 527)

Finally, Synder said there were huge opportunities for more lighting units and that most lighting "installations over five years old are out of date and the replacement with fixtures of modern design is well worth extensive effort." (p. 554)

ARGUMENTS OVER SYNDER'S APPROACH

G. F. Smith (Jersey City) Public Service Gas Company said center gas lighting should not be conceded to electric lighting; this, to him, would be a mistake. "Even for a combination company, the conceding of all center lighting to the electric man is a step in the wrong direction . . . and . . . 98% of the gas lighting burners comes from center outlets." "With the indirect and the new horizontal kinetic burner.. (there should be not) very much inconvenience in straight gas lighting." "In New Jersey, we sold something like seventy thousand G. E. Z. lamps last year . . . and . . . twenty or thirty thousand small single units." (1916, p. 554)

W. A. Morris of Wilmington, Delaware, commented, "In the promoting of gas lighting we are dealing largely with a sales problem. The last requirement to successful merchandising of any commodity is a thorough knowledge of your goods and a firm belief they offer advantages over those of your competitors. It is my belief that this branch of our industry lacked confidence and enthusiasms on the part of the promoters of the gas interests." (p. 554)

Norman MacBeth of the Lighting Journal expressed criticism of gas lighting men. He said Zingg's statement that "in years gone by the gas man experienced no difficulty in maintaining his sales and that he was able, in addition, to make substantial increases." (p. 554) MacBeth said "I do not believe that during the period Mr. Zingg refers to, gas companies made sales. Their business was largely the result of purchases by the consumer, purchaser of gas lamps from the dealers and a service connection by the gas company. In most locations the gas company was merely in business. The consumer had to go to the company's office and sign an application for service, and the company was most notable for its indifferences to the kind of service rendered. A very large proportion of our gas lighting business is still in a similar manner in the hands of the consumer and the dealer in cheap lamps. If piping in buildings are falling off and gas lighting is not being given the attention which it is entitled, it is merely because service is not being sold to the purchasers . . . Information concerning the advances that have been made and the better enjoyment available in one locality is not widely spread through the neighborhoods." (p. 554) MacBeth said the trend in New York City apartments was for no central outlets with lighting provided for with sidewall brackets and baseboard outlets for table lamps.

THE ATTITUDE OF THE WELSBACH INCANDESCENT LAMP COMPANY TOWARDS GAS LIGHTING IN 1916

When the United Gas Improvement Company formed the Welsbach Incandescent Light Company in 1887, it built a small factory in Camden, New Jersey. Despite the les supportive attitude towards gas lighting held by many gas companies, some 40 million-gas mantles were sold per year. Anticipating the continual need for mantles, the Welsbach Company built a new building adjacent to the older one in 1916. In a 1992 study of the building by the New Jersey Department of Environmental Protection, it was determined that the use of thorium in the manufacturing of the gas mantles in the Welsbach building until the 1940s rendered the building contaminated by radiation.

Another study, made by students of Cherry Hill West High School and Camden High School, included a survey of the former Welsbach site, later called the General Gas Mantle Company. Their interesting history is partially reproduced below:

> The Welsbach Gas Mantle Building was constructed of reinforced concrete with unusual window areas and was exceptionally well ventilated. The cost of the building was over 1 million dollars in 1916. Individual rooms were set up to accommodate each step of the process: knitting, hardening, dipping, etc. The women employees had their own their own facilities in the factory consisting of restrooms, music rooms, reading rooms, writing rooms, dressing rooms, and a hospital.
>
> During the manufacture of gas mantles in the early 1900's; ore containing radioactive thorium was processed. The thorium added to the gas mantles made them glow brighter when lit. As gas lighting was replaced by the electric light, the market for gas mantles dried up. The factory stopped manufacturing in the early 1940's.
>
> The process of making gas mantles involved several steps, beginning with the knitting of the cotton/silk fabric. In the saturations step the fabric is saturated in lighting fluid. This fluid contains the thorium and cerium salts. The fabric is then dried on wood or glass forms and then carefully plaited together. An asbestos cord is drawn through to form a loop. The fabric is shaped to fit a mantle by fitting it over a wooden form. It was estimated that American consumers used 40,000,000 mantles per year when gaslight was being used. (Camden Radiation Investigation – History 1996, pp. 1-2)

The interesting point about the construction of this building is that according to Robert F. Pierce, the chief engineer for Welsbach, the company believed that in regard

to gas lighting, "The economic position of the gas industry has tended to restrict development to the refinement and elaboration of existing types rather than to encourage increasing diversity in the application of gas to lighting." (Pierce 1917, p. 164)

Pierce illustrated his point by diagrams showing the use of a new type of lamp design where fixture discoloration from the heat from the combination of the gases was eliminated by "providing an air space between the inner and outer shell, and a deflector which ejects the combustion products with sufficient velocity to carry them several inches from the top of the lamp . . . The elimination of fixture discoloration by this method is complete." (Pierce 1917, p. 170) He further said the design was applied to lamps ranging from 85 to 250 candlepower. (See Figure 22.) Using horizontal inverted burners in semi-indirect gas fixtures to obtain extremely bright illumination was seen by Pierce as an important step. The new Welsbach mantles did not require chimneys, cylinders or stacks allowing more freedom of design. "As long as each mantle required enclosures in a chimney or cylinder. The output of individual lighting units was limited to 300 candle power." (Pierce 1917, p. 180) He illustrated a semi-indirect fixture that could produce 2000 candlepower as shown in Figures 23 and 24 (Pierce 1917, pp. 180 – 181).

Unfortunately, these new improvements arrived too late to help in the marketing of gas lamps in the years after 1917.

THE DECLINE OF RESIDENTIAL GAS LIGHTING MARKETING EFFORTS DUE TO WORLD WAR I AND ITS AFTERMATH

The extensive marketing efforts in 1909 – 1916 by the members of the National Commercial Gas Association to promote modern gas lighting was severely curtailed by the advent of World War I. As a consequence of the war, the by-products of the coal and water gas used by gas companies, such as benzol, commanded high prices because of their use in munitions (Gartley 1918). Further the high price of oil used in the manufacture of water gas made the gas companies secure legislation to permit them to reduce the heat units they furnished. This action allowed them to manufacture water gas more cheaply and to remove from the gas ingredients useful for lighting purposes.

The effect on gas lighting was especially felt by people still using open flame burners since the candlepower of the gas was reduced from 16 candlepower to 14 candlepower. Consumers using incandescent gas mantles suffered a loss of light because the B. T. U. was reduced from 670 to 565 units (Benzal from Water Gas 1916, p. 11).

In May 1917, residential and industrial gas light maintenance (stressed so much from 1910 to 1916) was jeopardized because gas light solicitors and maintenance men were classified as non-essential, effectively influence the continuation of residential gas lighting (Liet, 1919, pp. 102 – 112). Without the service staff, campaigns and maintenance programs collapsed. Similarly employed people in the electric industry were deemed essential for the war effort. Electric industry programs continued throughout the War.

Another contributing factor to the decline of any marketing efforts for gas lighting was the formation of the American Gas Association in 1918 (Proc. Organization Meeting, American Gas Association 1919). The National Commercial Gas Association supported gas lighting whereas the American Gas Institute focused on using gas for cooking and heating.

From 1919 to 1921, several efforts were made to market gas lighting by re-establishing the illumination committee of the National Commercial Gas Association. A number of surveys were made concerning the relationship of gas lighting sales to total gas sales in the United States. The results revealed the "practically half of the gas (exclusively) companies are enthusiastically and aggressively after gas lightings. One-half are letting gas lighting go by the board . . . Generally speaking, the combination companies are not interested in gas lighting." (Piser 1921, p. 102).

In 1921, the American Gas Association concluded that the lack of youthful enthusiasm for gas lighting was the cause of a decline in gas lighting:

> In the last analysis, it is not gas itself, it is not because it is less efficient, because it is less healthy, certainly not because its light is less beautiful . . . that it is losing out as an illuminant. It all hinges on the fact that electricity has the enthusiasm, the courage, and the vision of youth; the gas industry has been dozing. (Gas Lighting - - is it passing? 1920, pp. 441 – 442).

In 1922, 1923 and 1924, a number of campaigns were initiated to aggressively market gas lighting but by 1924, these efforts were considered a failure and residential gas lighting declined because, as John J. Quinn said, there was nothing available, "nothing new, merely adaptations of old principles." (Quinn 1924, p. 184). This approach, however, merely echoed the goals outlined by Pierce in 1917.

MARKETING RESIDENTIAL GAS LIGHTS IN THE YEAR 2000

Fifty one years ago, Arthur Bright said that gas lighting "is still used in a few places, it has been reduced to a vestige of its former importance. (Bright, 1949, p. 213) One would assume that in the year 2000, residential gaslights would have completely disappeared. This, however, is not the case; gas lighting is still in everyday use both in the United States and Canada.

In Canada, Gas Equipment Supplier distributes Falk Gas Lights, which are used in homes, cottages, cabins and boats. Falk gaslights are available for use with propane and

natural gas and produce the illumination from a 75-watt incandescent electric lamp. Falk lights are provided by three models: a double ceiling pendant, a double wall light, and a single wall light as illustrated in Figure 25. They are marketed through the Internet at http://www/gas/ca/gasbur/falk/html. It is interesting to note that the design of these lamps is similarly to what we considered in 1916 as "fixtures of the cheapest workmanship, generally of inartistic design," as shown in Figure 26. (Synder 1916, p. 527)

In the United States, Humphrey Gas Lights are distributed by B. Paulin and Company and used in homes, cabins, boats and recreational vehicles. The Humphrey gaslights are supplied in four different models as shown in Figure 27. They are marketed through the Internet at http://www/marksrv.com/gaslight.html.

One important note should be made concerning the safety of gas lighting then and now. A significant problem not fully recognized before 1930, in the manufacture and everyday use of gas lighting was the employment of thorium in incandescent gas mantels to make them incandescent. The early methods of producing gas mantles had the mantels dipped in thorium and cerium salts in the form of lighting fluid. These chemicals saturated the cotton and silk fabric of the mantles and produced a brilliant incandescence when the gas lamp was in use. As the lamps aged, however, the thorium decayed producing an odorless, colorless gas, Radon, which emitted alpha radiation and caused cancer in human beings. Present-day gas mantels use yttrium, which is lower in brightness than thorium but is not radioactive and less subject to decay. As a result, today's gas lamps are safer than any of the old lamps. The gas light promoters of 1909 – 1916, however, were ignorant of the radioactive dangers of gas mantles.

It is sad to note the passing of an industry that had led in market share and was first to market in providing inexpensive, obtainable, dependable illumination for residential and commercial customers. It can even be difficult to understand how an industry with so much advantage could loose to a newcomer like electricity, an energy source that many viewed with suspicion and even fear. The answer lies in marketing. Whereas the electric industry used a variety of marketing techniques to inform the customer and provide the customer with first-rate service, the gas industry did not. It waited until it was too late to provide service to the customer, inform the customer about its product, make aesthetically pleasing products, update it product lines, and have consistent, cohesive marketing plans and campaigns.

Without good marketing, the residential gas lighting industry sank into little more than a provider of novelty products.

LIST OF FIGURES

Figure 22. Inverted Gas Lamp, 1916 Design. (Robert F. Pierce, "Recent Developments in Gas Lighting," *Illuminating Engineering Practice*, 1916, p. 172)

Figure 23. Semi-indirect Gas Fixture, 1916. (Pierce, 1916, p. 180)

Figure 24. Semi-indirect Gas Fixture, 1916 Fixture. (Pierce, 1916, p. 181)

Figure 25. Advertisement for FALK Gas Lights from Internet.

Figure 26. Samuel Synder, "Replacing Old Types with Modern Fixtures,"1916, p. 533.

Figure 27. Advertisement for Humphrey Gas Lights from Internet.

REFERENCES

Barham, Basil. 1912. The Development of the Incandescent Electric Lamp. *London: Scott, Greenwood & Son, London.*

"Benzol from Water Gas," The Utilities Magazine, 1916, Vol. 1, No. 7, p. 11.

Blinks, W. M. 1911. Comparative Costs and Efficiency of Gas Electric and Gasoline Lighting. *Proceedings National Commercial Gas Association:* 301 – 338, Hereafter cited as *NCGA*.

Bright, Arthur A. 1949. *The Electric Lamp Industry.* New York: MacMillan Company.

Camden Radiation Investigation – History, Camden High School and Cherry Hill West High School, N. J., 1995 – 1996.

Elliott E. Leavenworth. 1911. Illuminating Engineering and Its Application to the Gas Industry. *NCGA*: 97 – 123.

Federal Trade Commission, Document 92, 70th Congress.

Gartley, William. 1918. Relation of the Gas Industry to the Military Necessities of the Nation. *Proceedings of Organizational Meeting of the American Gas Association*: 48 – 59.

"Gas Lighting . . . Is it Passing?" 1920. *American Gas Association Monthly* (July): 441 –444.

Harlan, James. 1912. Special Campaign. *NCGA*: 189 – 264.

Highlands, S. M. 1895. Incandescent Gas Lighting. *Light, Heat and Power:* 270 – 275.

Lieb, John. 1919. Report of National Committee on Gas and Electric Service. *National Electric Light Association*: 102 – 112.

MacBeth, Norman. 1910. Illumination. *NCGA*: 386 – 417.

Robert Pierce. 1915. Report of the Committee on Illumination. *NCGA*: 126 – 182.

Robert Pierce. 1917. Recent Developments in Gas Lighting. *Illuminating Engineering Practice.* New York: McGraw Hill Book Company: 164 – 182.

Piser, Charles. 1921. Sales of Gas for Lighting. *American Gas Engineering Journal*: 102.

Quinn, John. 1924. The Gas Company as Merchandiser: More Effort – More Sales. *Proceedings New England Association of Gas Engineers*: 184.

Scofield, Thomas. 1916. Report of the 1916 Illumination Committee. *NCGA*: 409 – 421.

Smith, G.E. 1916. Discussion of Synder Paper. *NCGA*: 554.

Stannard, Clare. 1916 The Best Policy to Follow to Increase Gas Sales. 1909, NCGA: 83 -

Synder, Samuel. 1916. Replacing Old Types With Modern Fixtures. *NCGA*: 526 –

Ummach, Charles. 1911. The Modern Gas Fixture. *NCGA*: 282 – 300.

Wrege, C. D. ,Greenwood, R. A., and Hodgetts, R. A. 1911 Early Marketing Strategies in the Electric Industry: Lamp Renewal Programs. *Marketing History Conference Proceedings*, Michigan State University.

Zingg, J. P. 1916 Combination Gas and Electric Lighting of Residences. NCGA: 507 - 509.

Figures available from first author upon request:

Regina A. Greenwood, Kettering University, 1700 West Third Avenue, Flint, MI 48532