PUBLIC STREET ILLUMINATION
IN WASHINGTON, D.C.
An Illustrated History
by
Sarah Pressey Noreen

GW Washington Studies
No. 2

George Washington University
Washington, D.C.
This is the second in a series of monographs on the city of Washington written by members of the George Washington University. The focus throughout the series will be on Washington as a major urban center rather than as the federal capital. The series will present extended, specialized studies of selected aspects of the city contributed by representatives of various academic disciplines. Publication of these monographs is made possible in part by a grant from the Eugene and Agnes E. Meyer Foundation.

Editorial Board

Letitia W. Brown
*American History and Civilization, GWU*

Francis C. Rosenberg
*Columbia Historical Society*

Stephen W. Burks
*Political Science and Public Affairs, GWU*

Dianne B. Seiffer
*Washington Center for Metropolitan Studies*

Dorn C. McGrath, Jr.
*Urban and Regional Planning, GWU*

Anthony M. Yeze
*Economics, GWU*

Roderick S. French, *General Editor*

Additional copies of this number can be ordered from the Division of Experimental Programs, George Washington University, Washington, D.C. 20052. Please enclose payment with order:

- 1-15 copies $3.50 each
- 16 or more $3.00 each

Previous Number Available


contemporary photographs by mary mitchell

cover design by linda patill

© Copyright The George Washington University May 1975
PUBLIC STREET ILLUMINATION
IN WASHINGTON, D.C.

An Illustrated History

Sarah Pressey Noreen
Introduction

One of the aims of this monograph series is to make available the results of research on Washington for use in comparative studies of urban development. In recent years students of American cities have given increasing attention to two factors: (1) the role of technological advances in shaping urban life, and (2) the legacy of artifacts in our urban environment. The story of street lighting involves the combined consideration of these two topics.

Ms. Noreen's study reveals again the singular fortunes of a city directly controlled by the Congress of the United States throughout most of its existence. With respect to her subject the capital city has sometimes been uncommonly progressive, sometimes far behind other metropolitan areas. One value of her work is to provide the historical background for those critical policy decisions on lighting that must be made by the new government of the District of Columbia.

The original text of this study is much longer than the present monograph and contains many additional illustrations. Certain important themes such as floodlighting are dealt with in more detail. The complete study can be consulted in the library of George Washington University.

RSF
Public street lighting in Washington, D.C., will be relatively unaffected by the energy crisis of the 1970's. The seventy thousand municipal streetlights will not be dimmed or removed as streetlights were during economic or fuel crises in the past. Public opinion has created a national climate in which street lighting appropriations from Congress are not only favorably funded, but inviolate. This was not always true.

To understand the changed role of street illumination in Washington, it is necessary to review the history of public lighting: the technological advances in oil, gas, and electricity; the changing social patterns brought about by increasing use of the hours previously dark; and the aesthetic heritage in the design of street lighting fixtures.

Although public illumination involves street lighting, floodlighting, advertising, searchlights, sports arenas, parking lots and all outdoor lighting, this study is primarily concerned with street lighting. No attempt will be made to cover commercial or other types of lighting, and very little will be said of ornamental floodlighting.

There is a wealth of technical materials available on this subject, written in the language of illuminating engineers, and a paucity of literature on the social and aesthetic aspects of the topic. In this monograph I have concentrated on street lighting fixtures in the City of Washington as aesthetic objects with broad social implications. Lighting elements, whether oil, gas, or electric are a subtle reflection of a city's values. The lamps, therefore, are discussed and illustrated throughout the narrative as urban artifacts.

Chapter one presents a condensed survey of the origins of modern municipal lighting in eighteenth-century England and her colonies. This background is necessary for an understanding of the state of lighting technology and of public attitudes which prevailed when the federal government moved from Philadelphia to Washington in 1800.

From the time that George Washington stipulated in his Building Code that local buildings must be at least three stories high so that the city would not appear insignificant, some people have been concerned about the physical image of Washington. The image-making potential of street lamps, however, appears not to have been appreciated locally until the arrival of the Beaux Arts designers in the early twentieth century. Daniel Burnham, Francis Millet, and Henry Bacon realized that street lamps were not merely functional but could contribute to the classical image of Washington which they wished to strengthen.

In Washington the street is the connecting link between the branches of government and the pathway to all federal buildings. On some local roadways the street lamps preceded the pavement. They were the first and most interesting street furniture. One of the earliest secondary functions of the street lamp was to display street identification. After the introduction of electricity the street lamp became incrusted with traffic signals and directional signs. In more recent times it has tended to be lost among multiplying mailboxes, trash receptacles, telephone booths, newspaper vending machines and various other street fixtures.
The streetlight does not retract into the sidewalk with the coming of the dawn. The lanterns are very visible pieces of street sculpture. But, in contrast to purely decorative ture, every streetlight design is duplicated hundreds if not thousands of times.

Lampposts are also architectural accessories. The history of American architecture is reflected in them: Colonial, Classical Revival, Gothic Revival, Beaux Arts, Art Nouveau, Art Modernistic, and most frequently, Eclecticism. The names of streetlamps reveal their inherent image-making quality: the Delmonico, the Renaissance, the Prince Albert, the Pennsy Avenue, the Fifth Avenue, the Newport, the Philadelphia. All nomenclature used in this study is taken from the vocabulary of streetlight manufacturers, industrial designers or architects.

With the exception of the Pennsylvania Avenue lighting styles, it is difficult to date with precision most street lamps in Washington because they often survive in modified forms. The original lantern may be replaced with one in a newer style; sections of shafts are interchanged or refit to add height; some bases have stood for over one hundred years supporting numerous figurations. Some street lamps have been truncated to support other pieces of street furniture as police and fire call boxes.

Illustrations of the oil lighting era are necessarily limited to lithographs and engravings from 1840 onward. My investigation was aided by the eye of the camera. I have seen photographic collections at the Library of Congress, the Columbia Historical Society, the National Academy of Fine Arts, the Washington Gas Light Company, the Potomac Electric Power Company, the Department of Highways and Traffic, the Welsbach Corporation street lighting laboratories in Baltimore and Philadelphia, the New Orleans Public Service, Inc., independent lighting companies in Philadelphia, Public Lighting in London, and the Science Museum in London.

The idea for this study originated with Harold Skramstad, Jr. It was carried out with the constructive advice of Frederick Gutheim. Robert Truax, Curator of Prints and Photographs, Columbia Historical Society, provided extraordinary assistance in locating and dating pictures of street lamps in Washington and converting many old photographs into slides. The slides remain my personal records, but the entire collection of photographs from all sources which I amassed as documentation for this study is deposited at the Columbia Historical Society.
Contents

Preface ................................................................. v
List of Illustrations ............................................... viii
1 The Origins of Municipal Lighting ............................... 1
2 Oil Lighting in Washington 1800-1848 ............................ 5
3 Gas Illumination in Municipal Lighting ......................... 8
4 The Contributions of Olmsted and Shepherd .................... 13
5 Gas Lamp Designs in Washington ................................. 17
6 The Emergence of Electric Lighting ............................... 23
7 The New Technology and Aesthetics .............................. 28
8 The Official Design of 1923 ....................................... 31
9 Depression, War, Crime, Politics and Lighting .................. 35
10 The Quantity and Quality of Light ............................... 41
   Appendix A Lights of General Governmental Agencies ........ 44
   Appendix B Floodlighting ......................................... 50
   Selected Bibliography .............................................. 52
List of Illustrations with Credits

Figure

1. Times of the Day-Night by Hogarth (Science Museum, London)
2. Vauxhall Gardens, 1804 (Science Museum, London)
4. View of Bullfinch Scroll Lamps on West Terrace of the Capitol, 1840 (Columbia Historical Society)
5. Oil Lamp on E Street, N.W., Daguerreotype by John Plumbe, Jr., 1846 (Library of Congress)
6. Rotal Lights on the Capitol Grounds according to Frederick Law Olmsted’s Plan (Edward Taylor II)
7. City of Washington Statistical Map No. 5 Showing Location of Gas Lamps, 1881 (Geography and Map Division of Library of Congress)
9. Grape and Ivy Standard, 15th and New York Avenue, before 1880 (Library of Congress)
10. Grape and Ivy Standard on Capitol Grounds (Collection of Robert Triax)
12. Grape and Ivy Post with Maloney Lamp (D.C. Department of Highways and Traffic)
13. Classical Revival Lamppost on Capitol Grounds (Photograph by author)
15. Victorian Hexagon Gas Lamp at Thomas Circle, 1870’s (Potomac Electric Power Company)
17. 16th Street Gas Standard Electricified (Potomac Electric Power Company)
19. Newport Style Gas Lamp in Montrose Park, Georgetown (Photograph by author)
20. The Traditionaire on Corcoran Street, N.W. (Edward Taylor II)
21. Cast-iron Gas Lamp Pedestals (Edward Taylor II)
22. Hutchin’s Insurance Building, 10th and D Streets, N.W. (Potomac Electric Power Company)
23. Pennsylvania Avenue Arc Light, 1895-1910 (Potomac Electric Power Company)
24. Arc Light, San Jose, California
25. Enclosed Arc Light on Pennsylvania Avenue, 1910-1925 (1917 photograph, Potomac Electric Power Company)
26. Ornamental Incandescent Lighting, 1910 (Potomac Electric Power Company)
27. Ornamental Arc Light with Sectional Globe at Union Station, 1908 (Potomac Electric Power Company)
28. Pennsylvania Avenue Style Lights in Commercial District (Potomac Electric Power Company)
29. Family of Posts Adopted in 1923 (D.C. Department of Highways and Traffic)
30. Henry Bacon’s Twin Lamp (Edward Taylor II)
31. Cleaning Daniel Burnham’s Sectional Globe (Potomac Electric Power Company)
32. Cleaning the 1923 Washington Globe (Potomac Electric Power Company)
33. Highway Department Mercury Vapor Lamp Design Proposal #1, 1956 (Potomac Electric Power Company)
34. Highway Department Mercury Vapor Lamp Design Proposal #2, 1956 (Potomac Electric Power Company)
35. Highway Department Mercury Vapor Lamp Design Proposal #3, 1956 (Potomac Electric Power Company)
37. Incandescent Light in Rock Creek Park (Photograph by Abbie Rowe—Courtesy National Park Service)
38. Curved Bracket and Fluted Standard in Rock Creek Park (Photograph by Abbie Rowe—Courtesy National Park Service)
39. Mt. Vernon Highway Light #1 (Photograph by Abbie Rowe—Courtesy National Park Service)
40. Mt. Vernon Highway Light #2 (Photograph by Abbie Rowe—Courtesy National Park Service)
41. 1953 Bronze Mall Light (Potomac Electric Power Company)
42. The Saratoga (Edward Taylor II)
43. 1962 Park Service Light (Edward Taylor II)
44. Frustum Light of RLA (Edward Taylor II)
45. L’Enfant Plaza Light (Edward Taylor II)
46. Pennsylvania Avenue and the Capitol (Edward Taylor II)
CHAPTER ONE

The Origins of Municipal Lighting

A well-lighted street is an urban necessity today, but for thousands of years a fixed lighting system in the streets was beyond the technical capability and economic competence of man. The language of every culture is rich with metaphors derived from darkness and light. The ability to use the hours of darkness for human purposes, to turn night into day, was always a goal, but until the middle of the eighteenth century urban dwellers were as familiar with the angles of the sun and the phases of the moon as those who toiled in agriculture.

Some ancient cities made attempts at artificial illumination, but they were the exception not the rule. Centuries before the Christian era the Chinese channeled gas escaping from beds of bituminous coal into bamboo tubes and conveyed it thirty miles to Peking to light the streets. ¹ However, even in Imperial Rome there was no street lighting except during festivals. Public celebrations were among the earliest occasions for ambitious attempts to defeat darkness, but these were temporary achievements.

In the fifth century A.D., Antioch devised a street lighting system of oil lamps suspended from ropes. A contemporary description tells of its efficacy:

[The citizens of Antioch] have shaken off the tyranny of sleep; here the lamp of the sun is succeeded by other lamps, surpassing the illumination of the Egyptians; with us night differs from day only in the kind of lighting. Trades go on as before; some ply their handicrafts, while others give themselves to laughter and song.²

Allowing for the hyperbole in this account, it appears that commercial interests were the prime instigators of Antioch’s street lighting and that considerable progress had been made since the time when the burning fagot was the only source of artificial illumination.

Authentic references to street lighting in the next thousand years are meager, but the indications are that iron baskets of burning wood, primitive oil lamps, and candles were used to some extent. During the Middle Ages most cities enforced curfews intended to discourage the populace from going about at night.³ In 1417 the Mayor of London made what probably was the first attempt at comprehensive street lighting when he ordered “lanthorns with lights to bee hanged out on the winter evenings betwixt Hallowtide and Candelmasse”.⁴ The citizens considered their taxes heavy enough, so they put the lanterns up but did nothing about lighting.

the candles. Resistance on the part of the householder to paying for street lighting is a continuing theme in the story of public illumination.

In 1558 Paris installed pitch-burning vases at important intersections, but it wasn't until the seventeenth century that roving bands of arsonists and increasing numbers of muggers and cutthroats brought about a need for street lighting in the central sections of Amsterdam (1669), Hamburg (1689), and in many other European towns about the same time. In London the Great Fire of 1666 destroyed so much of the central area of the city as to make the erection of smoking, flaming torches unnecessary and unthinkable for several years.

By 1694 London was sufficiently restored for Edward Heming to receive a license to place the convex outdoor oil lamp which he had perfected in front of every tenth house between Michaelmas and Lady Day. He was empowered to charge each householder a small fee for this service. In so doing he was to become the pattern, the vested lighting interests—the traders and their representatives, in this case—protested official sanctioning of the new technology of outdoor oil lighting. "Tallow candles in lanthorns will be cheaper than any sort of lamp." "The aforesaid lamps or lucidaries are merely novel devices and the public should be encouraged they will cause much more such intrudings in other arts and mysteries." The horners, tinner, and spinners of cotton and other trades believed their rights to have been violated. In spite of this opposition, Heming's oil lamp continued to be erected in London. A contemporary account by Celia Fiennes of her travels at night through "Hide Parke" during the reign of William and Mary stated, "Ye whole Length of this parke is a high Causey... and on Each side are Rowes of Posts on which are glass houses Cases for Lamps which are Lighted in ye Evening and appears fine as well as safe for ye passenger."*6

The lack of an inexpensive, efficient light source was only one cause for the slow development of street lighting. A municipal lighting system was not considered by everyone to be a desirable amenity in the eighteenth century. Among the common people there was a strong religious and moral resistance to street lighting that was to persist in varying degrees through the gaslight era of the nineteenth century. The feeling existed that by erecting street lamps municipal authorities were interfering with the divine plan of the world which had preordained darkness at night. There was a suspicion that those who went out at night were evily disposed and necessary to go abroad at night, God had provided a moon. Illuminated streets would induce people to remain out of doors, leading to an increase in crimes and other ailments. If the streets were lighted, fear of darkness would vanish and drunkenness and depravity increase. Light would frighten the horses and was an aid to the thief. And, finally, the contemplation of the streets would rob festive occasions of their charm, joyousness, and festivity. Although these reasons did not prevail, they were seriously put forward as late as 1816 in the Cologne Zeitung as arguments against street lighting. If a householder held any of these views it is easy to understand why he resisted being compelled to pay for a street lamp in front of his house.

Lower-class footpads and upper-class revelers were principal agents

---

*O'Dea, Social History, pp. 96-98.
*W. Symonds, "Some Early English Lighting Devices," The Magazine Antiques, XXI, No. 6, pp. 604-6
stimulating the development of modern municipal lighting. (Illustration #1) In 1736 the City of London, with an abundance of both types, applied to Parliament for the authority to establish a municipal lighting system to be maintained by the city at a cost to all property holders. Approval was granted for the first major installation in the western world: 5,000 oil lamps burning on an all-night schedule. The English method of taxing property owners for street lighting continued in some American cities, including Washington, well into the nineteenth century and was equally resisted on this side of the Atlantic.

By 1738, two years after the initial installation, there were 15,000 oil lamps on London streets. Parallel development of oil lighting systems occurred in cities throughout Europe, although London maintained a reputation for the rest of the eighteenth century as the best-lighted city. The acceptance of oil for the light source brought a demand for cheaper and better oil. Most of the oils available gave the same amount of light; therefore, excellence of oil was measured by degree of combustion, noise, smoke, and smell. The better vegetable oils, such as rape oil, coconut oil, groundnut oil, and olive oil were practically odorless, but England was a country with an abundance of fish oil which was inclined to be malodorous. There is little evidence available that tells what the light source was in the early lamps, but it was possibly tallow, which is rendered animal fat. England was a pastoral country and mutton tallow was readily available. Early in the eighteenth century the pursuit of the sperm whale began, and by 1750 the New England fisheries were producing great quantities of sperm whale, shark, and fish oils to be used to light the lamps of Europe. The most desirable oil for street lighting was spermaceti, but even sperm oil had a tendency to putrefy. This was a constant problem in the oil lighting era because oil vaults were stored in the central city near the lamps.

London's municipal lamps were simple round glass globes with a reservoir for oil. (Illustration #2) A watchman was employed to fill the cup with oil, lay a wick or wicks in it, and light it. He returned before dawn to snuff the light, trim the wicks, and clean the globes. These were the lamps which created the nocturnal London familiar to Benjamin Franklin. He was impressed with their inefficiency, as we shall see in a moment.

There was no street lighting in any of England's colonies before 1750, but in the late colonial period a social change was taking place in the urban centers that differentiated the seaport cities from the back country—the development of an active night life. As people began using the streets after dark for pleasure or for business they wanted more protection against

---

*Christelow, "The Rise and Decline", p. 6.

criminals, revelers, galloping horses and the physical hazards of the unpaved streets.

Throughout the years of settlement when food was scarce there was domestic lighting. Outdoor lighting was used mainly for warning sett for example, the pine fagots in an iron cresset that gave Beacon Hill its name. Colonial citizens did not wish to burn the fats and oils needed to taint them, and most lighting media were edible.

In eighteenth-century America there were only five communities which could truly be considered urban areas. The order in which they installed street lights was not according to size. There were sporadic attempts at lighting throughout colonial history, but these dates mark the beginning of continuous municipal lighting.

<table>
<thead>
<tr>
<th>City</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philadelphia</td>
<td>1751</td>
</tr>
<tr>
<td>Newport</td>
<td>1752</td>
</tr>
<tr>
<td>New York</td>
<td>1761</td>
</tr>
<tr>
<td>Charles Town</td>
<td>1770</td>
</tr>
<tr>
<td>Boston</td>
<td>1774</td>
</tr>
</tbody>
</table>

Philadelphia had the most bearing on the story of street lighting, Washington because it was the home of the federal government for years prior to its relocation on the banks of the Potomac in 1800. In his autobiography Franklin stated that he had not initiated the January 1 legislation "for enlightening the streets, lanes, and alleys," but he did take credit for improving the design of the London globe lamp which had been adopted by Philadelphia in its first system.

I therefore suggested the composing them of four flat panes, with a long funnel above to draw up the smoke, and crevices admitting air below, to facilitate the ascent of the smoke; by this means they were kept clean, and did not grow dark in a few hours, as the London lamps do...and an accidental stroke would generally break but a single pane, easily repaired.  

The practical consequences of Franklin's innovation were enormous; aesthetic consequences were equally significant; Franklin had given Philadelphia a distinctive piece of street furniture that became a symbol of the city almost as well known as Independence Hall. (Illustration #3)

During their sojourn in Philadelphia the members of Congress became quite familiar with the problems of maintaining a street lighting system the days of sperm oil. In the House of Representatives on September 1791, a motion was made by Mr. Wells concerning the storage of oil for lamps in the cellar of the County Courthouse. The Congressman explained the "odor of effluvia arising from said oil under apartments lotted to the Congress of the United States." There were also citizen complaints in the newspapers regarding the stench of burning oil in summertime.

In spite of these shortcomings, Philadelphia's seven hundred street lamps represented the most advanced system of public lighting in this country. In 1800 Congress left that progressive place for a village with no street lamps whatsoever.

---

1. "Boston's tardiness in erecting a municipal street lighting system is interesting in view of the fact that Boston supplied whale oil for the lamps of Europe and other American cities. This city, the tinderbox of the Revolution, did not decide to legally tax people for lighting until 1772. After Ben Franklin threw the tea into Boston Harbor, they welcomed a cargo of glass globes from England. At the end of that month the port was closed to commerce by the British, but the Bostonians had their street lamps."


CHAPTER TWO

Oil Lighting in Washington 1800-1848

When the seat of government moved from the wealthiest city in the country to the sparsely settled junction of the Potomac and Anacostia Rivers in 1800, street lighting was one of those issues the federal government considered to be a municipal responsibility. Such divisions of responsibility were decreed without reference to financial realities. The theme of municipal poverty was set from the start in Washington as most land uses were tax exempt and wealthy property owners were few. A vigorous commercial sector, usually the initiator of lighting systems elsewhere, failed to develop here. Congress, while occupying the choice real estate, did not vote the financial assistance needed for physical improvements in the young city. At the same time, with its customary logic, Congress threatened to move elsewhere if Washington did not soon become a worthy urban center.

The reality the early capital villagers lived with was the beginning of a system of broad avenues and streets, greater in width than any elsewhere in the country. Broad avenues gave rise to high expectations, but the adorning of the streets with pavement, sidewalks, and street lamps did not soon follow. The Jeffersonians, who fought for a capital in the South, were in power in the early decades of the nineteenth century, and their belief in a small central government and the virtues of agrarian life contributed to the keeping of the city in the status of a village. Street lighting, moreover, was thought to encourage an active night life which might foster the evils of northern urban living in the new capital.

The first recorded request to the city for street lighting was made December 18, 1801, for lamps to be erected at the New Jersey Avenue Bridge, another on A Street North, one near M Street Bridge and “one on a tree near the turn from the Capitol into Pennsylvania Avenue.” In response to this request the city council appropriated $100 for the placing of lamps “on the most public avenues and streets.” They may have been erected and maintained at private cost because the annual city budget shows no appropriations for supplying oil or paying a lamp tender for a number of years. In contrast to Philadelphia where a widespread traffic in spermaceti products existed long before the Revolution, whale oil was an expensive commodity locally and difficult for Washingtonians to obtain. The lamps were erected on Pennsylvania Avenue in 1803 but remained dark because neither the city nor Congress appropriated funds for oil and a lamplighter. The cost of maintenance, then as today, far exceeded the cost of the street lamp.

---


15 Bryan, p. 509.
manufacturing, it is more likely that a local blacksmith forged some unique but not uniform designs.

Although the design of the early Pennsylvania Avenue oil lamps remains unknown, there are several prints and engravings depicting the Bulfinch scroll lamps on the West Terrace of the Capitol. (Illustration #4) The forty-eight wrought iron oil lamps were unquestionably designed by Charles Bulfinch, Architect of the Capitol from 1818 to 1829. The design was executed by a local blacksmith, T. James Martin, who made railings, scroll lamps, and assorted ironwork for the Capitol.20 These lamps provided the only public illumination in the City of Washington in the 1830’s.

The only other pictorial evidence of oil lamp design is found in a daguerreotype acquired by the Library of Congress in 1973. (Illustration #5) They have dated it 1846 at the latest, 1844 at the earliest. The lamppost on the corner is surely a municipal lamp because there was no Congressional appropriation for this street in the 1840’s. The lamp must be oil because gas lighting was not introduced until the end of 1848. However, the fixture itself is in the (then) latest Philadelphia style with four tapered glass panels under a glazed roof. It differed considerably from the Franklin lamp which had a solid metal roof. It also was attached directly to the lamppost rather than on a curved bracket connection.

This meager evidence as to the designs of oil lamps in Washington suggests none of the simplicity of colonial oil lamps. They rather reflect the romantic, ornamental garden spirit of Andrew Jackson Downing’s work.

***

The lighting of the section of Pennsylvania Avenue from the President’s House to the Capitol in the early 1840’s did not substantially change social life in Washington. Night life in the capital city had been conducted only on the most limited scale from the beginning. In the Jefferson years the legislators withdrew to the boarding houses where they lived without their families but with their political kin. The only active night life in the first half of the nineteenth century occurred in the executive suburb west of 15th Street where people connected with the administration extended their workday with an elaborate round of teas, “at homes,” card parties, receptions, dinners and balls.21 This nocturnal activity was feasible because of the proximity of the participants who were led on their rounds by a servant carrying a pierced tin lantern or a flambeau. As for all those citizens who did not live in the socially active executive suburb, they arose at dawn, ate dinner at three o’clock when the government stopped work for the day, and participated in “evening” activities, such as visiting friends, courting, and attending band concerts between dinner and twilight.

Although urban living remained on a modest scale in the capital city, an important precedent had been set by the 1842 appropriation. Congress had recognized a modicum of responsibility to provide street lighting in the City of Washington. Once Congress admitted a limited obligation to the residents of the community, it soon turned to a new illuminant that was being introduced in cities and towns throughout the country. Within a few years Congress itself would move Washington into the gaslight era.

20 Bill submitted to the Commissioner of Public Buildings by T. James Martin, Washington, July 1, 1879; Received payment March 9, 1871. Located in the Office of the Architect of the Capitol.
CHAPTER THREE

Gas Illumination in Municipal Light

The first half of the nineteenth century was a period of much debate in Europe and America over the merits of various forms of replacements for the traditional whale oil lamps. An English engineer, Richard Murdoch, lighted the streets outside the Soho M. turing plant in Birmingham with the inflammable vapor of coal to offset the Peace of Amiens in 1802. This was probably the first outdoor use of lighting in modern times.22

The public generally denounced Murdoch's device as dangerous and impractical, but Murdoch's success attracted the attention of a number of ingenious and speculative persons including a German entrepreneur, Winsor. Winsor is generally credited with being the father of gas lighting, but his "invention" was nothing more than an adaptation of Murdoch's device. Winsor's great contribution lay in convincing a doubting public of the safety and practicality of gas lighting. He promised his invention would "abolish smoke, and chimney sweeping, and eventually pay off the national debt," and that "it was more congenial to the lungs than oxygen gas.

Largely through Winsor's flamboyant efforts, public prejudice against gas lighting was removed, if not the national debt. London instigated a municipal system of gaslighting in 1812 which served as a model for similar systems throughout Europe and America. Thus, shortly after the establishment of the District of Columbia, the use of gas for street illumination became technically feasible and a municipal reality in England.

In 1804 Benjamin Hentry demonstrated the use of interior gas lighting for Washingtonians in his home on Pennsylvania Avenue.23 In 1816, a group of Washington businessmen, aware of events in London, attempted to form a Washington Gas Light Company. For reasons more likely related to the newness of the town than the novelty of the illuminant, the petition was not responded to and Congress was not petitioned to franchise the company. Washington thereby missed the opportunity to be the first city in the United States to light its streets with gas.

Philadelphia, the initiator of oil lighting and so much else in American urban life, also missed this opportunity. In April of 1816 the artist Willson Peale constructed a gas apparatus in the steeple of the State (now Independence Hall) by means of which he proceeded to light the Peale Museum on the second floor of the building.24 Peale's performance would have delighted his old friend Benjamin Franklin, but it cast a negative public opinion of the new illuminant. The project of municipal...
For a city of 40,000 people without a commercial base, Washington was not particularly tardy among American cities in converting from oil to gas. Street lighting. But as Washingtonians realized, their city was the national capital and, hence, should be a standard for comparison with cities no less important in this country but abroad. Year in and year out Washingtonians petitioned Congress to franchise a gas company, not only for their own benefit but also because they were host to Congress and many visitors. In 1840 a no less influential person than Robert Mills, architect of the Capitol, presented a thorough study on illumination to Congress that concluded carbonized hydrogen gas was safer, more manageable and economical than oil. Congress did nothing.27

The primary reason Washington was over thirty years behind Baltimore in obtaining the new illuminant was the lack of promotional activity on the part of the inventors. In the nineteenth century, convincing Congress to franchise any company to operate in Washington took flamboyance. Every word a derivative of flambeau. Washington did not receive the attention of an effective, flamboyant inventor of gas lighting until 1846.

As the home of the Patent Office, Washington served as the mecca for inventors. Among them were several who had developed new processes for producing gas for illumination from various oils, fats, and woods in place of coal. Cities which elected to convert to gas could choose from a large number of processes. The fuel known as “coal oil” originally was produced from coal, but the same term was also applied to early petroleum distillates: gas, gasoline, naptha, kerosene, camp turpentine, and various other natural oils and resins and gases were used for early street lights as replacement fuel for whale oil.

One of the crowd of inventor-promoters on the scene in this period was James Crutchett. He had secured a patent on a gas illuminant made from rosin extracted from pine wood which he called “solar gas” because it produced a light he considered similar to the rays of the sun. Successfully crusading for the adoption of his gas lighting system in Cincinnati, St. Louis, and Dayton, Crutchett arrived in Washington in 1846. His timing was propitious: other major cities in the country had gas light residents of Washington were annually petitioning Congress to franchise gas company; and the great chandelier in the House of Representatives just collapsed from the weight of the oil lamps!

Crutchett bought a house at North Capitol and C Streets, constructed a small gas plant on the property, and erected nine gas lamps around it in a manner of F.A. Winsor in Pall Mall. The gas lights attracted the attention of the city, but more importantly, of Congress, which authorized $17,500 for Crutchett to demonstrate his invention on the Capitol grounds between August 1847 and June 1848.28 He constructed a ninety-foot mast of Bulfinch’s wooden dome to support a giant lantern six feet in diameter with many powerful gas burners inside. Crutchett erected this mast in August 1847. Congress voted to remove it in June 1848 after it had been struck by lightning several times and the glass frequently shattered by the wind. According to Robert Mills in the 1848 Guide to the Capitol, this single lamp was intended to light all the public grounds as well as Pennsylvania Avenue, and was calculated to be visible as far away as Baltimore. (Light in the

28United States Statutes at Large, vol. 9, p. 267.
engineers believe this was actually possible because there was no other lighting between Washington and Baltimore to interfere.29"

Before the giant lantern and mast were removed a local newspaper reported:

The solar gas burnt in and about the Capitol is universally admired, and it has been found to be a saving to that building over oil of five hundred dollars per annum. It would be a matter of great public interest if these gas lights could be substituted for the oil lamps now burnt on Pennsylvania Avenue and around the Public Departments. Nothing tends to the security of a city more than good lights in the streets, as many of the robberies and other crimes are committed in the darkness of night.30

A group of enterprising citizens led by Benjamin B. French, Chief Clerk of the House of Representatives and the man who supervised and paid Crutchett, purchased Crutchett's patent rights and petitioned Congress to incorporate the Washington Gas Light Company.31

On August 12, 1848 Congress appropriated "$10,000 for laying gas pipes from the main gas works on the Capitol grounds to the foot of 15th Street on both sides of Pennsylvania Avenue, and to purchase 100 lamp-posts and lanterns."32 Congress went into the business of manufacturing gas on its own property, and supplying and maintaining its own equipment.

In the 1820's, '30's, and early '40's when many cities were converting to gas lighting there was not a foundry in the country where long iron pipes were cast, and every foot of street main was imported from England.33 But the gas mains installed on Pennsylvania Avenue in 1848 apparently were made locally. They were of such poor quality and leaked to such a dangerous degree that when Congress voted to remove them four years later they also removed themselves from the gas business. The Washington Gas Light Company transferred the gas works from the Capitol grounds and installed larger and better piping owned by the company.34 Congress retained control over the design of lighting fixtures on the Capitol grounds, but it is uncertain when they gave up control over the style of lamps on Pennsylvania Avenue. The young gas company, in an effort to attract customers from local residents and merchants, switched to making gas from coal instead of James Crutchett's expensive oil product, solar gas.

There was continuing confusion over whether public street lighting was a federal or a municipal responsibility. On the eve of the Civil War Washington had eight hundred public gas lamps many of which were erected and maintained by the federal government.35 However, the Corporation running the affairs of the city in the 1860's gave up lighting public lamps under their purview for the duration of the war.36 Congress

---

29This lighting principle is once again under consideration today. At the time of this writing, a proposal has been submitted to erect a single light, either sodium or arc, on a 150-foot mast on Union Station and then eliminate the need for street lights in Union Station Plaza. Department of Highways and Traffic proposal submitted to the Redevelopment Land Agency on lighting the new Visitor's Center.
31Albert W. Aymond, ed., Growing with Washington (Washington, D.C.: Judd and Detweiler, Inc., 1941), pp. 23-24. The involvement of political figures in the public utilities was endemic throughout the nineteenth century. While acknowledging the unreasonable use of political privilege, and the existence of outright corruption and graft in both gas and electric lighting, their discussion is beyond the scope of this study.
33McMaster, Wealth of the People, p. 127.
35A comparison with the number of public lamps in other cities indicates that Washington enjoyed little more than a village level of illumination during the trying years of the war.
36New York 16,976, Baltimore 1,800, Philadelphia 5,000, St. Louis 1,250, Boston 2,265, Providence 320.
demonstrated its annoyance with the city for this curtailment of ser during the war by insisting as a condition of an 1866 appropriation lamps on the corridors of federal interest would be lighted.

Provided that the corporation of Washington City shall light their street lamps with seven feet burners, twenty-one nights each month, from dark until daylight, and that no part of this appropriation shall be disbursed until it is proved to the satisfaction of the Commissioner of Public Buildings that said corporation have so lighted their street lamps.37

This kind of incentive for local initiative was no longer needed. problems of municipal finances did not disappear, but in the years fol ing the Civil War the City of Washington came of age as an urban cent new street lighting system was just one aspect of a comprehensive pro, of civic improvements undertaken in the next decade.

CHAPTER FOUR

The Contributions of Olmsted and Shepherd

In the 1870's two dissimilar men devoted a great deal of attention to the common subject of public illumination in Washington: Frederick Law Olmsted as landscape architect of the Capitol grounds and Alexander Robey Shepherd as director of Public Works for the city. Olmsted's interests were primarily aesthetic, Shepherd's primarily functional, but the combination of their efforts transformed the nighttime city.

When Olmsted was appointed to relandscape the Capitol grounds in 1874 he discovered a number of new lampposts to have been recently installed. Congress had appropriated money for an unspecified number of new fixtures in 1871 and 1872 and for an additional eighty in 1873. These were the first appropriations for lampposts since the initial installation in 1848-49.\(^{18}\)

The invention of outdoor gas lighting had made nocturnal lighting a practical and aesthetically pleasing addition to the art of landscaping. As a matter of record, Olmsted had only been converted to the idea that nighttime illumination of public grounds was generally beneficial a short time before assuming the assignment from Congress.

As president of the Department of Public Parks in the City of New York Olmsted sent an inquiry in 1872 to many people in charge of public grounds to elicit an opinion as to whether installing gas lighting was a good idea. His inquiry stated:

There are two points upon which advice is sought. Ist. Whether experience indicates that a ground the extent and character thus described, [Central Park] in the central part of a city of a million people will be found, when gas-lighted, to be a desirable place of popular resort at night, or whether the occurrence of accidents and offences against morality and decency is likely to be seriously larger within it than in the streets and other public places free from coverts of rocks and low foliage?

2nd. Whether experience indicates that the number of gaslights which would be necessary to secure a satisfactory degree of convenience and safety in the public use at night of such a ground would be seriously harmful to its trees?

A considerable number of replies to Olmsted's inquiry was received, mainly from Germany. The result was that starting in 1873 Central Park was open at night until nine o'clock in the winter and eleven o'clock in the summer. Although the Capitol grounds are considerably different from Central Park, Olmsted probably had the same reservations at first about

\(^{18}\) Statement of Appropriations and Expenditures, pp. 14-17.
installing gas lighting but decided the merits outweighed any possible to the trees or offences against morality.  

Olmsted initiated the practice in Washington of surrounding p buildings with rostral lights, a design element not practical when the public buildings were erected. Six granite and marble rostral gas lights an integral part of his landscaping of the eastern entrance to the Capitol. These six oversized bronze and glass lanterns placed on granite piers cost $1,386 each, and were flanked by sixteen bronze lampposts with twin kerosene costing $600 each. These lights were designed to be used with gas and created an entirely different mood from the rostral lights specifically for the Library of Congress across the street which were design be fitted with electricity.

Alexander R. Shepherd, whose statue stands unexplained in front of the Capitol Building, was a good friend of General Grant. Shepherd and his cohorts convinced the President to abolish the old municipal government and to organize a territorial government in which they were the appointed leaders. Shepherd was first the Director of Public Works and later Governor of the Territory of the District of Columbia. He is remembered for his extensive public works program which the city so badly needed after the Civil War. He also contributed substantially to the myth that Washingtonians were financially irresponsible and should not be trusted with their own affairs.) Under Shepherd’s aegis, concurrent with other street improvements, the largest street lighting program to date was initiated. Among the many unpaid bills that were Shepherd’s legacy was one for $26,000 for gas fuel and lampposts.

Alexander Shepherd was one of the first Washingtonians to make his fortune locally. He was, among other business ventures, president of the R. Shepherd Company, Plumbers, Steam and Gas-Fitters, located at Pennsylvania Avenue. During the time he was Director of Public Works for Washington, he submitted bids to make and install the new lampposts on the Capitol grounds. The original letters are in the Office of the Architect of the Capitol.

20th May, 1872

Mr. Edward Clark,
Dear Sir,

The cost of running cast iron pipe and setting fifty-eight (58) lampposts in the east and west grounds of the U.S. Capitol, will be Twenty-Four Hundred and Forty-Five Dollars ($2445).

Yours, respectfully,
Alex R. Shepherd & Co.

May 27, 1872

General O. E. Babcock,
Comm. of Public Buildings and Grounds
General,

We will furnish and fit on the posts forty-eight lamps, as per

---

*Frederick Law Olmsted, Jr. and Theodora Kimball, eds. Frederick Law Olmsted. "Inquiry Regarding Park Ligh."

*Agreement for furnishing and erecting complete the Bronze and glass work for the Lamps to be erected on the Grounds of the Capitol, Washington, D.C. Signed by Edward Clark, Architect U.S. Capitol, and James & Kirkland 39.

*Information concerning Alexander Shepherd is extracted from Bryan, National Capital, and Green Village Capitol.
sketch submitted, if made square, at $11.50 each; if made octagonally, at $20 each to be finished in any color you may designate.

Very respectfully,
Your Obdt servant
Alex R. Shepherd & Co.

Several other companies also submitted bids to make the new lighting fixture "as per sketch submitted." While there is no evidence that Shepherd's company received the contract for the new gas lamps on the Capitol grounds, because there is no record who did, it is a reasonable possibility that his company contracted with the city for the installation of the many new municipal lights.

An idea of what Shepherd and Olmsted accomplished in their lighting programs of the 1870's can be obtained by examining the unique Statistical Map of the City of Washington compiled by the U. S. Engineers to accompany the annual report of the Commissioners of the District of Columbia to Congress in 1881. (Illustration #7) On the eve of the Civil War Washington had eight hundred public lamps. A few more were added on Maryland Avenue and on Sixth Street by the federal government during the war, but the majority of lamps in this survey were installed under Shepherd. The gas lamps are indicators of the residential pattern of the city after the Civil War. Olmsted's new landscaping and lighting also are clearly revealed. The lighting of Lincoln Park, Dupont Circle and Logan Circle, indicates the importance placed on adequate lighting of parks and circles.

* * *

For more than thirty years, from 1848 to 1881, gas was the sole illuminant used in lighting the streets of Washington, but in this relatively brief
period the gaslight turned street illumination from an amenity into necessity. During these decades the increased lighting changed the texture of the nighttime city and brought about a reordering of most people's daily schedules. The dinner hour became progressively later. The theatre, which had entered city life in the 1830s, was no longer restricted to daytime performances or early evening openings. The concentration of gas lamps on the Mall made evening lectures at the Smithsonian both possible and popular.

As a result of Alexander Shepherd's lighting program lampposts were scattered continuously throughout the residential city, not just erratically in front of buildings of federal interest. Gas lighting gave a cohesiveness to the community which encouraged people to venture out at night for more important social engagements. By this time more Congressmen were bringing their families to Washington with them each year, and as a consequence evening social activities were planned throughout the city, not only in the executive enclave.

Gas lighting signified other kinds of progress as well. Until the success of this public utility, there was a popular belief that private business could be successful in Washington. Local businessmen had shown foresight in attempting to organize a gas company during the rebuilding of the following its destruction by the British in 1814, but the company did not materialize. Year after year in the 1840s the local citizenry petitioned Congress to charter a gas company. When it did so in 1848 Washingtonians supported it and proved that the city could support a private business. Although the government gave the company substantial orders for gas, utility would have collapsed without popular support. The success of this business encouraged other local business development.

The gas company was chartered initially to provide street lighting, and gas offered other possibilities not available with the former fuel. Once mains were installed on a street, individual homes could be connected to the mains giving them a continuous supply of gas for domestic lighting, eventually for cooking and heating. By the time electricity entered the street lighting field, street lamps were only ten percent of the gas company's business.

Both street and domestic lighting were affected by the discovery of oil in Pennsylvania in 1860, which started an era of cheap and prolific supply of kerosene. Kerosene was used in street lamps in neighborhoods beyond gas mains. For one important example, all the "gas" lights across the Anacostia River were fueled with kerosene.

The public wanted street lighting. It had changed civic life by making wide variety of evening activities possible. When municipal appropriates to light the gas lamps were irregular or terminated as they were during the Civil War, many Washingtonians reacted by installing private lamps in front of their homes, some beautifully decorated and bronzed.
CHAPTER FIVE

Gas Lamp Designs In Washington

The gas street lamp can be viewed historically as an item in the cast-iron architectural era. In the early 1840’s, several cast-iron buildings were erected in New York. The California gold rush hastened the establishment of the new technology with its demand for instant houses and even complete towns. The cast-iron dome of the Capitol was one of the construction wonders of the age.

It was only a short step from the development of the cast-iron hollow column for structural purposes to the use of cast-iron in street lamps. Cast iron appealed to the practical men involved in street lighting; it was economical and had a greater resistance to fire and vandalism than any previous material. Cast iron appealed to architects, designers, and builders; it was easy to incorporate decorative elements for every conceivable taste. Although Washington was not an industrial city, there were a number of local foundries producing ornamental iron work.

The initial order in 1848 called for the newly franchised gas company to erect lamps on Pennsylvania Avenue and throughout the Capitol grounds. (They also lighted the President’s House to the delight of President Polk.) Funds were appropriated for one hundred lamps. For unstated reasons they were cast in two different configurations:

The iron lamp posts for Pennsylvania Avenue, and to be placed around the Capitol grounds, were cast in this city by skillful and experienced workmen, and are much admired by persons of refined taste for their beauty and peculiar adaptation to their particular localities. These posts are already set on the north side of the avenue, and will be continued around the Capitol grounds. The posts for the inside of the Capitol grounds are now being cast and will soon be completed. They will be more massive than those upon the avenue and around the grounds, of a different figure, and perhaps less chaste and beautiful in their proportion and appearance. The lamps are the same pattern as the lamps in Philadelphia and will ere long be placed upon posts and lighted.\(^{42}\)

Commissioner Douglas’ statement reveals that in the middle of the century Washington was still oriented toward Philadelphia, even though he indicated that only the lantern was Philadelphia in style. It is possible, although not probable, that the pattern of the standard cast in this city was unique and designed to reflect Washington’s image. It is more likely that the designs of the two lampposts also were variations of popular Philadelphia styles. The fact that one pattern was thought appropriate for Pennsylvania Avenue, but a style more heroic in scale necessary on the Capitol grounds, implies Congress was creating a special area for itself. The

---

President's House received the same lamps as other houses on Pennsylvania Avenue, but the Hill received special consideration.

In the thirty-year heyday of gas, Washington street lamps ranged the classically simple, reeded post to the most Victorian rococo travaganza. Fortunately photography developed during the cast-iron and we have a visual record of the great variety in gas street lamps in monumental and non-monumental Washington. The most important examples of these lights are described and illustrated in the next few pages.

1. Square Pattern Lantern with Glazed Roof (Illustration #8) The square pattern lantern with the glazed roof appears far more frequent in Washington photographs than the lantern with the solid metal roof. The lamp is equipped with an inefficient open flame burner which served as a beacon than a true light. It is difficult to determine the design of the finial in this photograph; it does not appear to be an eagle. The eagle was adopted as the national bird June 20, 1782, but the eagle finial was widely used in Washington until the early incandescent period. The lamp was produced with a solid metal roof favored by practical men who considered light cast on upper stories of buildings and on trees as wasteful in design to Ben Franklin's oil lamp. In England this style was called the Winsor, although F.A. Winsor's use of it was a half-century before Franklin's.

2. Grape and Ivy Standard (Illustration #9) The Grape and Ivy standard was used on Pennsylvania Avenue at the time of the Civil War. It was one of the earliest ornamental designs used on lamp posts in Washington and may be the original design mentioned by Commissioner Doolittle. The Grape and Ivy was a common decorative pattern in both colonial and nineteenth-century iron work in Philadelphia. In 1853 street identification was placed on the square lantern in contrast to Philadelphia where signs were attached to corner buildings. This photograph also shows an early multiple use standard; in the early days of the postal service, the mailbox was frequently cast with the lamp post. Although individual posts were replaced with a simpler style, the Grape and Ivy remained on Pennsylvania Avenue until gas lights gave way to the electric arc in the early 1890s.

Illustration #10 is a photograph taken before the completion of the iron dome and prior to the landscaping and lighting changes of the 1920s. The lamp post is the Grape and Ivy pattern and may be one of the original ones. The lantern has a decorative edging not found on lanterns elsewhere in the city.

Four custom built eight and one-half feet high lighting standards are the Grape and Ivy pattern were erected on 10th Street in front of Ford's Theatre as part of the restoration of that historic site in 1971. The central paned lantern (Illustration #11) is six feet four inches high and the same design as lanterns used in Philadelphia prior to the Civil War designate a theatre.

The photograph in illustration #12 shows the Grape and Ivy standard after the Philadelphia style lantern was replaced by the Maloney lam centennial Exposition in Philadelphia in 1876 there was a gas lamp which used a naphtha distillate, a by-product in the production of kerosene. Martin Maloney, a Philadelphia businessman and inventor, the possibilities of using this in street lighting and invented the Maloney lamp. On top of the traditional square frame he fitted a small tank to supply the lamp's fuel.
#8 Square Pattern Lantern with Glazed Roof

#10 Grape and Ivy Standard

#12 Grape and Ivy Post with Maloney Lamp
liquid naptha gas which was converted to illuminating vapor by the burner. The lamplighter filled the small tank each night with just enough fuel to last until morning.  

3. Classical Revival (Illustration #13) On the Capitol grounds there are over thirty Classical Revival lampposts which are at least a hundred years old and may be the original lampposts installed in 1848. There are numerous photographs of the downtown area taken between 1870 and 1900 which show the Classical Revival lamppost and hexagon globe indicating that a style used around an important public building influenced municipal style. (Illustration #14) During these years many streets had arc lights and gas lights existing together.

4. Victorian (Illustration #15) The hexagon globe which first appeared during the oil lighting era in Philadelphia was a popular Victorian shape in addition to appearing on the Capitol grounds and in the commercial areas, it was used as an expression of civic pride throughout the park system. These exuberant lighting fixtures went very well with the mansard roof and Second Empire style. They were erected just before the advent of electric and represent the highest point of decorative fantasy which the Washington lamppost attained.

5. Philadelphia Style Gas Lamp (Illustration #16) Shortly after the ornamental lighting standards appeared on the Capitol grounds and Pennsylvania Avenue, the simple Philadelphia style was erected in various parts of Washington. It is the earliest gas lamp produced on a large scale and probably was the most common street lamp in Washington, and is the most frequently used height for pedestrians on the average residential street.

The Philadelphia style lamp has proved a satisfactory street lamp for centuries; in the whale oil day the lantern was attached to a wooden post and in the mid-nineteenth century the lantern was connected to a cast-iron stand. It is dignified in appearance, easy to climb, and throughout its long history has provided support for the slightly intoxicated and the waiting lover. It is surprising that this street lamp, a proven product, receives so little attention from those concerned with urban renewal and historic ambiance.

This simple reeded gas light standard was ubiquitous in Washington and a number remain on streets in Georgetown and Anacostia. When they were electrified a round ball globe was used. (Illustration #17 shows a gas standard at 16th and Oak Streets, N.W., prior to 1925.) On special streets, such as 16th Street, ornamental eagle and street identifications were added.

6. Boulevard Style (Illustration #18) The Boulevard, the penultimate gas lighting styles in America, appeared in the 1890's. It was designed to be used with the Welsbach mantle, and the round globe appeared for the first time in the United States since its rejection by Benjamin Franklin. This manufacturer's nomenclature for this light conjures the image of the grand residential avenue that was part of the fashion in the Second Empire period. In Washington the Boulevard was used extensively in the development of the Northwest section of the city at the turn of the century.

7. The Newport (Illustration #19) The last style of cast-iron gas lamp to appear in Washington was the Newport, more ornamental than the Boulevard. This lamp was selected by Newport, Rhode Island, as the street light for its most important streets in the days of the palatial mansions.

---

before World War I. The lamp was designated a work of art by the New York City Art Commission. It was erected in many circles and parks in Washington shortly after World War I, and was used throughout the Smithsonian grounds until 1935.

8. The Traditionaire (Illustration #20) When two blocks of Corcoran Street, Northwest, were restored in 1970 the residents requested a streetlight different from any available. They rejected the stark functionalism of the modern pendant light and also the classical detailing of Henry Bacon’s standard. With the help of the Department of Highways and Traffic they selected this model, called the Traditionaire, from a lighting catalog. Whose tradition? Certainly not Washington’s. The Grape and Ivy standard or the Philadelphia lamppost, both of which were part of Washington’s nineteenth-century lighting tradition, were not made available to the interested citizens of Corcoran Street who spent time, money, and energy restoring the Victorian character to their neighborhood in other respects.
Although gas was the sole illuminant for over thirty years before a competition from electricity, the peak of gas lighting in Washington not reached until May 1, 1926, when there were 12,371 gaslights burns the city. Within a relatively few years the 1923 decision to convert street lighting to electricity was enforced. The last three public gas lights were turned out June 23, 1934—with one exception. For undetermined reasons fifteen Newport style gas lamps were left burning in Mont Park, Georgetown, and these are the only gas lights municipally financed the city today. Reproductions cast in the original molds of this style are still available and would be an excellent choice for some urban renewal areas.

The many truncated gas light standards supporting other pieces of furniture such as police and fire call boxes are the physical legacy of the light era. (Illustration #21) But there is also a legacy of design. The design of gas streetlight lamps in Washington were excellent. They reflected architectural styles of the period: Classical Revival lamps enhanced Capitol grounds and the downtown; ornamental Grape and Ivy lamps complemented the main ceremonial avenue and the developing Victor red brick city; the simple Philadelphia style looked well on any street, particularly the Federal streets of Georgetown; the Boulevard lamp a elegance to the spreading residential streets; the Newport was an integral part of the landscape architects' layout of Washington's park system.

With the exception of the Classical Revival lamppost, all of these are available today for the historic preservationists and those conceiving with urban renewal. The Classical Revival lamppost is a very good design and a mold should be made before it disappears completely from Capitol grounds. This is an excellent choice to use in revitalizing the downtown. This handsome light could return to the streets it once graced. A hexagon lantern would be prohibitively expensive, but the square lantern is suitable and available.

At considerable expense, molds were made of the Grape and Ivy lamp for the restoration of Ford's Theatre in 1971. This is an appropriate choice for neighborhoods desiring to create a nineteenth-century atmosphere to be hoped that those who are working to restore the historical charm of streets and neighborhoods throughout the capital will seek the authenticity in street lamp designs as in other aspects of their projects.

---

CHAPTER SIX

The Emergence of Electric Lighting

The controversy over the merits of electricity versus gas lighting for America’s streets began early in the 1880’s. It remained unresolved for the next forty years, and as a consequence dual or mixed systems existed in municipal lighting throughout that period.

Although gas lighting had been the first major improvement in artificial illumination since the invention of the outdoor oil lamp, electricity would shortly demonstrate an even greater effect upon the lives of people. Until 1880 exterior illumination differed little from domestic lighting, but with the invention of the arc street light municipal lighting took on a new character. Electric arc lighting, a far brighter medium than gas, brought about so many changes in the lives of both city and country dwellers that the natural allocations of hours of light and hours of darkness became meaningless for the first time in history.

The decade opened with the announcement of an innovation which promised to improve greatly both domestic and public lighting. On January 27, 1880, Thomas A. Edison secured a patent for a carbon filament lamp. However, Edison refused to release his incandescent light for almost three years; this led to wholesale ordering of the already available arc light.

Arc lighting itself was not new. Sir Humphrey Davy had demonstrated arc lighting before the Royal Society in 1808. From that time on inventors were absorbed with the possibilities of municipal arc lighting, but the difficulty lay in supplying continuous power to the arc for indefinite periods. This obstacle was overcome with the invention of dynamo-electric machinery in the 1870’s.

At the Philadelphia Exposition of 1876 an American, Moses G. Farmer, erected an al fresco exhibit of three huge, glaring arc lights. In 1878 a Russian engineer, Paul Jablonskoff, successfully installed arc lamps on one half mile of the Avenue de l’Opera in Paris. This first example of municipal arc lighting was dramatically more impressive than gas light. American response was particularly enthusiastic.

In 1879 Charles F. Brush erected twelve carbon arc lights around a public square in Cleveland. Later that year San Francisco, using Brush Company equipment, became the first American city to adopt the new technology for public illumination. Brush and Farmer were but two of many inventors obtaining patents on arc lights; cities had a bewildering variety of equipment from which to select. New York erected carbon arc lights in 1880, Philadelphia in 1881, and soon they were deployed in an abundance unmatched anywhere in Europe.45

In contrast to the inventors of arc lights, Edison insisted on solving the

problems of supply and distribution before releasing his light for public use. He also wanted to be certain of the economic soundness of his venture. The area he selected for his first power station was chosen by means of a kind of scientific market survey. Edison wanted a broad cross section of potential users. The historic Pearl Street Power Station was located in an once-fashionable section of lower Manhattan that by 1882 contained number of slum streets with tenements and small factories as well as various financial institutions. The opening of the Pearl Street Power Station on September 4, 1882, started a new era in street lighting—and founded the “Third Avenue EL” architectural style of power plants.

The rival industry, however, was far from quitting the field. Only six years later Dr. Carl Auer Von Welsbach, an Austrian chemist, patented a device that prolonged the life of gas lighting for decades. Welsbach, a pupil of Bunsen whose burner formed the heating element, patented the incandescent gas mantle in 1885. This mantle impregnated with a chemical mixture produced a street light that was from eight to ten times brighter than an open flame. Called the Auer mantle in Europe, it was not widely installed there. Called the Welsbach mantle in this country, it was not released for use here until 1895. The greater efficiency and the cheaper cost of incandescent gas made wholesale conversion to electric lighting economically unjustifiable, a point Europeans seemed to comprehend better than Americans. Many towns in Europe never converted to electricity because they had gas light systems that functioned perfectly well.

* * *

 Whereas the government had sponsored both oil and gas lighting, electricity was introduced into Washington by businessmen. This indicated the emerging strength of the commercial sector because in the 19th century (like all other public services) was completely under Congressional jurisdiction.

The government could have found its own good reasons to sponsor new technology. For example, Congress often met at night. Historically, however, the impetus for permanent illumination has not been so much on enable man to use the added hours for work as for his enjoyment. Washington was also a city of frequent celebrations: Independence Day, George Washington’s Birthday, visits of foreign dignitaries, American military victories, and predictably festivals organized every four years or so around the inauguration of a president. It was the celebration of those quadrennial festivals which led indirectly to the introduction of electric street lighting in Washington.

When James Garfield was preparing to assume office in 1881 electricity lighting was feasible for the first time, and it was chosen for the inaugural festivities. In reporting this temporary illumination on March 5, 1881 the Star stated:

The contrast of the whiteness of the electric lights...and the yellowness of the thousands of gas burners elsewhere produced a fine effect. None of the numerous scenic events of the day or evening surpassed this.

---

*Edison's motivations were commercial as well as technological. His target was not the electrical competition, but the gas industry. He studied its operations until it could be said he knew more about the gas industry than anyone else. Most urban centers had established gas works in the first half of the nineteenth century. By the time it received Edison's attention gas had become a multimillion dollar industry, and street lighting accounted for only ten percent of its business.


---

24
The military bands were positioned under the lights, and in a spontaneous reaction people danced in the street.

Later in 1881 Washington prepared for another celebration, the centennial of the Battle of Yorktown. While plans were being formulated, Garfield was assassinated, and it was decided to proceed only with the illumination aspects of the original plans. Late on the evening of October 20, 1881, after a number of failures, Pennsylvania Avenue was brilliantly illuminated by electric arc lights erected by the Brush Company of Baltimore.

The Pennsylvania Avenue display, which lasted only a few nights, caught the imagination of a Washington businessman, Stilson Hutchins, owner and publisher of the recently established Washington Post. He made a visit to Edison in Menlo Park, New Jersey, and developed plans to put up continuous electric arc lighting in the commercial area of Washington.

In January of 1882 Stilson Hutchins and his newly formed Heisler Electric Company put a small dynamo near the Post Building which at that time was located at 10th and D Streets, Northwest. (Illustration #22) The dynamo fed ten arc lights with milk glass globes, but the central attraction was an unshaded bulb attached to the outstretched hand of Mercury on the third level above the street. This was many years before an exposed bulb came to be considered unattractive.
The merchants of F Street pompously engaged the Heisler Company to install arc lights not only on the sidewalks but suspended in the middle of the street from 9th to 15th Streets. On July 3, 1882, this new system was turned on. The merchants on 7th Street quickly followed suit. Electric lighting was in the process of transforming urban shopping habits; people were attracted to the stores on F and 7th Streets during the evening hours. This was one of the factors which led to the commercial preeminence of the streets, a status they continued to enjoy for nearly a century.

This dazzling phenomenon did not go unremarked on Capitol Hill. Congressman Murch of Maine declared on the floor of the House:

In this modern age of progress, the old gas lamps should be done away with entirely. Let any member of the House walk along F Street and see the line of magnificent illuminators in that street, equally (sic) almost to broad day light.⁴⁹

In spite of this inspired rhetoric, not even Pennsylvania Avenue among those streets of particular federal interest was graced with arc lights until 1885.⁵⁰ The earliest of Pennsylvania Avenue arc lights was starkly functional with a conical hood from which dropped the carbon arcs. The open carbon arc had a number of serious technological defects: an unsteady light source, poor distribution of light, and the necessity of daily trimming by lamp tender. But the age of electricity had come to Pennsylvania Avenue and a safe, well-lighted street was within the technological capability of man.

Some time after 1895 the Potomac Electric Power Company installed the first ornamental arc lights on Pennsylvania Avenue. (Illustration #2.) It had a simple telescoping standard topped by a ball with an eagle finial. Between the eagle and the arc light was a decorative art nouveau bracket. Perhaps because it was used on Pennsylvania Avenue, the eagle became popular finial on many of the early incandescent lights in the city. The iron arm was designed originally to facilitate cleaning the open arc light, but anticipated design accommodations for automobile traffic.

⁴⁹Congressional Record—House, July 8, 1882, p. 1820.
⁵⁰Many writers on the history of Washington give a later date. I am using the statement of the electric company that in stalled the arc lights on Pennsylvania Avenue. The work was completed in November, 1885, according to the Proceedings of the National Electric Light Association held at Baltimore on the 10th, 11th, and 12th of February, 1886.
Even with these advances, municipal lighting was not progressing rapidly enough for some citizens. As late as 1893 the state of street lighting in Washington elicited a strong letter to the Star from Captain Powell, Engineer Commissioner for the District, in which he accused Congress of not appropriating enough money to have Washington well lighted.

Visitors to the National Capital find an ever-present topic in the gloom which settles over the city after nightfall. Only two or three of the principal streets are lighted by electricity. There were in operation at the close of the last fiscal year, 5,496 gas lamps, 322 electric arc lamps and 700 oil lamps (kerosene). The price for each electric light is $180, said to be the highest price paid in the United States. Although this condition of affairs has been the subject of bitter complaint, Congress shows no disposition to remedy it.51

Captain Powell need only have had a little patience. The introduction of electric arc lighting would soon transform Washington as it would every city. Insatiable for energy and wasteful of light as it was, the arc light nonetheless created a new way of life. It first changed the shopping habits and then affected a broad spectrum of activities. Adaptation of this new idea in street lighting for other purposes was rapid. One of its most significant applications was in the outdoor construction trades. The Paris Exhibition of 1878 would not have opened on time had the builders not had the use of arc lights.52 Other high-powered light sources have augmented the arc in recent years, but a walk down any Washington street at night where the subway is under construction will affirm that the arc light is very much in use today.

* * *

The larger question in the field of street lighting raised but not really debated in the 1880's was: Is there room in the urban scene for a variety of lighting media or is the goal simply more and brighter street lights? Is uniformity of technology in street lighting mandatory?

Fifty years after the introduction of electric lighting, cities throughout this country decided in favor of the newer technology in all new installations. Washington decided in 1923 to remove all of its gaslights, but this was not true of other cities. As late as 1948 Philadelphia had 22,700 gas lights. Baltimore, the city which inaugurated gas lighting in America, still had 16,000 at that date. Boston had 10,000, Chicago 4,400 and Cincinnati 3,000.53

Vested interests always opposed the introduction of a new lighting medium: candle makers resisted oil dealers; together they resisted gas light; gas resisted electricity; arc lighting resisted incandescence, all for reasons of private advantage. This time there was a new factor contributing to the opposition to change. A strong public sentiment had developed in many cities for retaining gas lighting for aesthetic considerations.

51_Star, September 25, 1893.
52_O'Toole, Social History, p. 117.
53_Star, July 15, 1948.
CHAPTER SEVEN

The New Technology and Aesthetics

The extensive gas lighting program of the 1870's gave Washington an illuminating system that was regarded as both functional and attractive. The advent of electricity so shortly thereafter made the gas lights seem more decorative than functional, particularly on the many wide avenues of the city. This is not to say gas lighting was gloomy; it was not. It has only been in recent years that electric incandescence achieved the ambience of gas light. The problem was one of range of illumination. The eight- to ten-foot gas lights were effective on narrow residential streets, but they barely pierced the darkness on Pennsylvania Avenue.

Electric arc lighting promised greater efficiency, but the new technology and its new designs also raised new aesthetic issues in public lighting. These issues were not made easier to resolve by the fact that six different companies were franchised by the city between 1882 and 1900 to install arc lights in the downtown district. The two major debates in the 1880's centered on the size and style of the lighting fixture and on overhead wiring.

Electric wires were not the first strung on local streets. Telegraph wire had been proliferating since 1845. The Chesapeake and Potomac Telegraph Company began adding its poles and wires in 1878. With the advent of electricity the skies became noticeably crowded.

In England all overhead wiring had been banned by law from the outset but Americans, who have a blind love affair with each new technology waited until overhead congestion reached the level of crisis. Philadelphia had set aesthetic standards in the oil and gas light eras; on this matter she was joined by Washington and Chicago in passing laws requiring subterranean wiring within the "fire limits" of the central city by the end of 1885 with fines up to fifty dollars per day for noncompliance. Others cities tended to subordinate the demand for underground wiring to the demand for the new lighting medium of electricity. The early action by Washingtonians requiring electric wires be placed underground eventually affected other wiring as well. On June 20, 1902, an act of Congress required the removal of telephone poles and wires. On March 3, 1905, a second act required the removal of telegraph poles and wires within the fire limits.

The gas company argued on both sides of the question of underground wiring. Because it would be a great expense for the electric company, they were naturally in favor of it. The gas company also seriously argued that there was not enough room for the wires underground: they would get

---

nO'Dea, Social History, p. 102.
The theme running through these conference reports is that the public was demanding underground wiring but many engineers in this infant industry didn't have the technical knowledge required to do it.
nWashington Herald, October 13, 1906.
nWashington Post, October 13, 1906.
tangled with the gas and sewer lines. In the 1889 litigation the gas company claimed that the new electric companies did not have the right to rip up the pavement, even though other public utilities continually did just that.

The other major aesthetic issue concerned the design of the new fixtures. Arc lights were made on an entirely different scale from oil or gas lights. (Illustration #24) Masts 250 feet high were built in Cleveland; 160 feet high in New York; 50 feet was common. Initially it was more than a matter of scale. The first generation of arc lighting fixtures made no pretense of being ornamental.

All of this was changed, for the nation's cities generally and Washington in particular, by the magnificent display of electric lighting staged by the World's Columbian Exposition in Chicago in 1893. Twenty-one and a half million Americans were dazzled by the “White City.” This fair changed the course of American architecture and affected the design of what had become an architectural accessory—the municipal street lamp. After the fair had demonstrated that the classical motif could be adapted to industrial America, the lighting manufacturers' catalogues reflected the change from the romanticism of the Victorians to a reliance upon Rome for architectural detail.

The Columbian Exposition generated the City Beautiful Movement in urban planning. Two of the designers of the fair, Daniel H. Burnham and Francis D. Millet, shortly became active in the transformation of Washington's public illumination. The creators of the White City not only brought the classical themes of the fair to Washington, but they also used electricity rather than gas as the lighting element in their plans for the redesign of the nation's capital.

Burnham, as chairman of the McMillan Commission, was particularly involved in the design of lamps surrounding major buildings and in bridge lighting. Millet was concerned about the design of the ubiquitous municipal street lamp.

In 1910 when Burnham became chairman and Millet vice-chairman of the newly created Commission of Fine Arts, their efforts brought about the adoption of the first official lighting specifications for monumental and residential Washington: specially designed arc lighting for Pennsylvania Avenue and similar classically inspired incandescent lighting for the other city streets. (Illustrations #25 and #26) The design specified by the Commission happened to be that of an ornamental arc light with sectional globes.

#25 Enclosed Arc Light on Pennsylvania Avenue, 1910-1925

#26 Ornamental Incandescent Lighting, 1910

#27 Ornamental Arc Light with Sectional Globe

*O'Dea, Social History, pp. 100-101.
identical to those at Burnham’s Union Station. From 1910 to 1925 this
gateway to the city and the main ceremonial avenue shared this distinctiv
lighting. (Illustration #27) A simple classically fluted standard was adopte
for all lighting.

The 1910 action differentiated Pennsylvania Avenue from other street
not only by the design of the globe but also by the quantity of light. The new
arc lighting gave Pennsylvania Avenue a level of light greater than the
connecting streets lighted by incandescence. The new enclosed arc light had
the advantage over the open arc light of requiring trimming only about
once a week. Within a few years, however, the commercial sector copied
not only the enclosed arc but also Burnham’s design thereby destroying the
uniqueness of Pennsylvania Avenue and the Union Station Plaza. (Illustra
tion #28)

There were those who protested the use of the “imported” classical theme
in the capital of our democracy, but Washington had several classically in-
spired buildings before the City Beautiful transformation. There were also
neoclassical street lamps throughout the Capitol grounds at this time.
Classical motifs are always in style for Washington’s public illumination.

The Millet-Burnham solution for municipal lighting was actually very
restrained in a period when they might have erected triumphal Roman
lights. The feeling that the new lighting was not grand enough was ex-
pressed in a letter to the Superintendent of the U.S. Capitol Buildings and
Grounds from C.C. Barick, president of Union Metal Manufacturing
Company, a designer and manufacturer of street lamps. He warned against
installing such a “dubious street lighting system” around the Capitol
grounds, and admonished him not to attempt

to make your system conform to the so-called ornamental system
which is being installed on the streets of the City of Washington. This
installation is generally considered by illuminating experts as being so
imperfect and inadequate that it could not but be a mere temporary
proposition. 59

Technically, Mr. Barick proved to be correct. By 1915 the Mazda incandes-
cent lamp with a coiled tungsten filament operated at more than twice the
efficiency of Washington’s new lights, but the simple classical design
elements were incorporated into the next official lighting and remain with
us today.

#28 Pennsylvania Avenue Lights on 9th Street, NW

59 Letter from C.C. Barick to Elliot Woods, Superintendent U.S. Capitol Building and Grounds, July 8, 1912, located in
the Office of the Architect of the Capitol.
CHAPTER EIGHT

The Official Design of 1923

In the early 1920's cities throughout the country reevaluated their lighting needs. For the first time vehicular considerations altered both the scale of the fixtures and the intensity of the light itself.

In the post-World War I period there was also an exuberance in public illumination fixtures never achieved again. Cast-iron and glass torches were specifically created to project a desired urban image. Los Angeles designed distinctive standards for each prominent boulevard. Salt Lake City's new light displayed a large Indian head. San Francisco and New Orleans, in addition to magnificent double- and triple-globe fixtures, conceived new lighting for special sections of each city—Chinese dragon lanterns and French Quarter electrified gas lights respectively. Philadelphia erected an ornate Beaux Arts light, the antithesis of the Franklin lamp. London and all the English seaport cities erected lamps in a maritime configuration. There was a world-wide trend in street lighting: new street lamps were used to tell visitors how a city saw itself.

On May 23, 1923, the Board of Commissioners appointed a Committee on the Lighting Needs of the District of Columbia to prepare a comprehensive plan. This committee attracted the talents of members of the Commission of Fine Arts, principally Henry Bacon, architect of the Lincoln Memorial. The chairman of the committee was J. E. Wood, Assistant Engineer Commissioner of the District. The other members of the committee were:

Warren B. Hadley, Electrical Engineer, D.C.
Walter C. Allen, Executive Secretary, Public Utilities Commission, D.C.
J. Franklin Meyer, Bureau of Standards
R.B. Patterson, Potomac Electric Power Company
James S. Melhenny, Washington Gas Light Company
A. R. Cheyney, American Institute Electrical Engineers

The committee gave particular attention to the question of the relationship of new lighting to Washington's fine system of street trees. In 1923 there were more than one hundred thousand trees lining the streets: elms, red and pin oaks, lindens, Norway maples, etc. Most trees were not conifers and, therefore, responded well to floodlighting. The increased height of the street lamps made the trimming of some trees necessary, although directives were issued not to destroy the beauty and symmetry of the trees. Tree removals were not tolerated. Many of the previous street lamps were only ten to twelve feet high and shone directly into the motorists' eyes. The 1923 lights were sixteen to eighteen feet high. This meant that the trees

---

80The committee's report is located in the street lighting file of the Commission of Fine Arts. Information was also extracted from the Minutes of Meeting of Commission of Fine Arts 1925.
obstructed the light which formerly annoyed motorists and at the same time the light shining through the trees created a pleasing effect.\textsuperscript{44}

The committee grappled with the question of uniformity versus special area lighting and decided in favor of a uniformity of technology; all gas lights were to be replaced over a period of seven years. It was also recommended that more arc lights be incorporated into the new system because they were still superior to many incandescent lights. (Arc lights were used in Washington until 1930.) The intensity of the illumination, the quantity of light assigned to Washington streets is of interest.

\begin{tabular}{|l|c|}
\hline
Character of Street & Lumens \\
\hline
Pennsylvania Avenue & 800 \\
Principal business streets & 275-400 \\
Secondary business streets & 135-200 \\
Main traffic arteries & 100-125 \\
Residential streets, boulevards and parks & 25-50\textsuperscript{2} \\
\hline
\end{tabular}

In the 1923 plan, as in 1910, Pennsylvania Avenue was designated the best lighted street in the city. Lighting expressed in lumens represents intrinsic brilliancy at the source, and Pennsylvania Avenue is very wide. It was also recommended that the standards be equipped so that ornamental banners could be suspended from them.

Although the committee recognized the need for diverse intensity, the various lights were encased in seven similar lamp standards designed in the classical tradition. (Illustration \#29) The five single posts ranged in height from twelve to eighteen feet and were essentially elongations of the twelve foot Millet lamppost already in use in the city. The classical motif was pre-ordained by Burnham and Millet who had engineered the official design.
specifications for residential and monumental areas in 1910. By 1923 those standards were sufficient to make removing them feasible.

Henry Bacon, a New York architect and member of the Commission of Fine Arts, designed a twin lamp specifically to express the dignity of the federal city. The report indicates that this lamp was intended originally only for use on Pennsylvania Avenue between the Capitol and the Treasury, but the committee decided that "in all propriety it can be used at other points of particular interest." (Illustration #30)

The designers and technicians had the cooperation of the manufacturer, Lombard and Ludvig, Inc., a local firm on 14th Street, N.W. Lombard and Ludvig were willing to execute a special design for the nation's capital with the knowledge that other cities were copying ideas originating in Washington. Not only the cities which welcomed the imperial architecture of the City Beautiful movement, but cities such as Los Angeles and New Orleans copied these lights.

Strong iron rods were placed in the original lampposts because automobiles broke twenty-five to forty per month. That monthly rate is far greater in the 1970's, but today breakaway posts are installed.

The greatest unifying feature of the 1923 lighting system, and the one which gave it its popular nomenclature, was the rippled, Grecian-urn-shaped Washington Globe. The Committee on Lighting Needs wrote:

The present sectional arc lamp globe on account of its construction has never been properly maintained, although the expenses in this connection has (sic) been abnormally high. (Illustration #31)

The new globe adopted for use throughout the entire lighting system was
rippled glass flushed with alabaster. (Illustration #32) It was purposely open and unshaded to illuminate the many street trees in the city. The committee report stated:

The new globe is so shaped that it will retain only small amounts of deposited dirt and can readily be cleaned. Its adoption is also urged as a means of harmonizing the appearance of the lighting equipment of the entire city. There are available globes of many odd shapes so designed for technical or commercial reasons, which though popular for a time, eventually become obsolete. By the selection of a classical form, such as proposed, the permanency is assured.45

After fifty years, two of the standards of the 1923 family of posts are still in active use—the sixteen foot single lamp and the Henry Bacon twin. The ovoid-shaped globe is still used throughout the city on old gas lamps as well as all survivors of the 1923 system, but it is currently made of plastic. (Vandalism is a problem as old as streetlights themselves.)

The 1923 lighting system was a synthesis of the ideas of people interested in efficiency and economy, proponents of the best technology of the day, and people with aesthetic sensibilities. Together they conceived a unified system of public illumination to express the dignity of the nation's capital, to harmonize with various types of public and private architecture, to be in scale with the buildings and sensitive to the street trees, and to provide various levels and intensity of illumination. The needs of the pedestrian were considered, as were the demands of the automobile. The Washington Globe system was created for the uniqueness of Washington. The blending of the talents of a variety of people interested in appropriately lighting the federal city also stands as a monument to human cooperation.

The atmosphere of Washington streets created by the installation of the 1923 lighting system in combination with the many trees was captured by John Dos Passos:

We walked out southeast toward the Navy Yard. This was still the Washington I remembered: The shadowy streets choked with trees where all the life seemed to be going into vegetation, the street lights shaded and muffled in green leaves, families sweltering till bedtime sprawled out on their front stoops or hunched on chairs in tiny dooryards; men in undershirts, dank little half-naked children sitting out in swings, stout women fanning themselves on settees, old women panting in rockers under lowhanging branches, light filtering through the green leaves, the shadows of branches thrown on brick walls, the young men and girls and boys lined up limply at the dingy soda fountains dimly lit on the corners, the feeling of slack life stagnant in a jungle.

We had come out into the open spaces of trees and grass and shrubbery in front of the Library of Congress before we noticed there was a moon.46

---

45 Ibid., p. 5.
CHAPTER NINE

Depression, War, Crime, Politics and Lighting

ALTHOUGH the 1923 comprehensive lighting system cost $1,250,000, Congress readily appropriated the funds and also voted to install automatic traffic control signals at the same time. The program was substantially completed when the depression reduced revenues available for public services.

Shortly after President Roosevelt made a well-publicized statement that he wanted Washington to be the most beautiful residential city in the world, the guardians of Washington's street lighting funds, led by Texas Congressman Tom Blanton, voted to cut $68,700 from Washington's street lighting appropriations for the fiscal year starting July 1, 1934. This resulted in a thirty-three percent cut in street lighting: 1,006 street lights were extinguished, 5,394 were dimmed, and one bulb and one globe were removed from 183 of Bacon's twin lights. H.P. Caemmerer, Executive Secretary of the Commission of Fine Arts, complained that the enforced economy destroyed the beauty of Henry Bacon's design. But District officials believed that the removal of one globe graphically depicted Washington's plight, and for two years Bacon's amputated light served as mute evidence to visitors that the Congressional guardians of Washington's street lighting funds were capricious and irresponsible.

Lighting in the business section was more severely curtailed than on residential streets. Businessmen complained vehemently. But Congress was not in session until the latter part of the dark year, and they withheld lighting funds the next year as well. Citizens associations and civic groups raised a storm of protest, and finally on February 24, 1936, the District Commissioners ordered restoration of full service, not because Congress appropriated the money, but because the Public Utilities Commission ordered the Potomac Electric Power Company to reduce its charges to the city.

The statistics collected during the two years of reduced street lighting dramatically demonstrated that it was a false economy: nighttime traffic deaths were up thirty percent, burglaries and vandalism increased substantially, and nighttime shopping declined.

Another congressional manipulation of Washington's street lights was attempted in 1945. Chairman Randolph of the House District Committee submitted a plan to extinguish certain street lights so that the word "WASHINGTON" would be spelled out for the benefit of people flying

---

*The information in this section is compiled from newspaper accounts and editorials from 1934 to 1936 in The Post, The Star, and The Times Herald.

"Washington Star, December 22, 1935; February 12, 1936"
over the city. The District Commissioners were not enthusiastic about a mammoth sign running from Irish Street south to R Street between 16th Street and Georgia Avenue. They thought street lights were designed to do many things, but not to spell.

* * *

The people involved in conceiving and implementing the 1923 lighting system were aware of the temporary nature of their creation. The cast-iron lampposts were designed to last several hundred years, but the technology of the light source was made obsolete by two major inventions in the 1930s: mercury vapor and sodium vapor lamps. Each was almost shadow-free and had little glare, but both were exceptionally poor for color rendering. The ghoulish blue-green light of the mercury vapor lamp, caused by the absence of red, was corrected by a fluorescent wash, but the peculiar yellow-orange quality of the sodium vapor has never been color corrected satisfactorily.

The continuing quest for better lighting was motivated by the increasing use of the automobile. Particularly in the City of Washington, where public transportation was inadequate, the developing suburbs required well-lighted arteries to the city and good illumination became of the greatest economic importance to nighttime Washington.

The automobile demanded far more light than the pedestrian, and it is this demand that has dominated the design of lighting fixtures and the quantity and quality of light in recent decades. Driving efficiency at night is very much affected by shadows and glare, but practically unaffected by color.

The first major inroad into the unified 1923 lighting system occurred in 1956. In this confrontation the forces of function were represented by the Department of Highways and Traffic, and aesthetic considerations were
articulated by the Commission of Fine Arts. In spite of the 1923 precedent, when the Commission took an active role in the design of new lighting standards, in 1956 they perceived their role to be one of vetoing highway department selections rather than initiating a new design for Washington.

In 1956 Washington was behind other major cities in street lighting progress. Mercury vapor lamps promised dramatic improvement in the situation. The first mercury vapor lights in Washington were installed in 1956 on Massachusetts Avenue from Ward Circle to 49th Street to coincide with the opening of a new shopping center. After a few more installations of 25-foot, starkly functional pendant lights, the Department of Highways and Traffic unilaterally decided to replace all of the 1923 lighting standards which they called “antiquated” and “obsolete.” The Commission of Fine Arts politely disagreed. Then the Department of Highways and Traffic erected several styles of modern, twenty-five foot or higher street lights in the vicinity of the National Gallery of Art and invited the Commission to select one. (Illustrations #33, #34, and #35)

The highway department had very good reasons for wishing to upgrade lighting in Washington in technical terms. But all of the choices they gave the Commission were highway style lights capable of encasing mercury vapor lamps which at that time were not color corrected. The 1923 engineers had been sensitive to the value of lighting street trees, but the 1956 technicians ridiculed that idea as “wasted light.”

The Commission of Fine Arts opened Pandora’s Box by approving a pendant style light. (Illustration #36) They specified a straight, not a curved arm, a long, fluted, tapering shaft, and limited its installation to the outlying sections of the city. After receiving this initial approval, the highway department installed pendant lights in the downtown commercial
areas; they were enthusiastically received by the merchants. Then they erected others on inner arterial streets. When they appeared on M Street there was vociferous protest from the Georgetown citizens groups. Fine Arts Commission Chairman David E. Finley wrote several letters denouncing the mercury vapor lights in all residential areas and near the monuments, while the highway department was reporting to the District Commissioners that they had received approval from the Commission for a thirty-two-foot, fluted steel pole! Finley wrote to the District Commissioners that the Commission disapproved the new modernistic standards in the monumental areas, but had approved them for the Baltimore-Washington Parkway. When the pendant lights were erected in front of the building occupied by the Commission of Fine Arts, the Commission again politely reminded the highway department of the limits of their approval. The highway department firmly explained that they had already erected 7,147 pendant lights in the city and had 21,274 more in stock. In December 1957 they stated that they had invested $1,245,580 in this project.

The net result of the controversy between the Commission and the highwaymen was that the pendant lights were removed from Constitution Avenue and the wholesale replacement of the Bacon light was stopped, but not until 1965. By that time the highway style pendant light, the first inroad into the unified lighting system of 1923, had been emplaced in substantial numbers.

* * *

Too many social benefits have been expected from the simple street lamp from the time of its invention. Crime and street lamps have been connected in the public mind since the first oil lamps were installed in Hyde Park during the reign of William and Mary. The same level of expectations were often expressed in this country. The chairman of the lighting committee in Freehold, New Jersey, wrote to a manufacturer of gas lamps in 1899:

And the Board of Commissioners consider it [the recently installed gas lighting system] economical—as the perfect lighting of the streets saves us the expense of a police force—which otherwise would be considerable in a town of nearly 5,000 inhabitants.71

This is a particularly difficult subject to discuss objectively in regard to Washington because the feelings are stronger than the facts. One indisputable fact is that some years after World War II the philosophy of street lighting in the Department of Highways and Traffic underwent a significant change. The primary goal of lighting changed from the convenience and safety of drivers to support for police efforts to make the streets safe for people.72 In the words of John Hartley, Assistant Director of the Department of Highways and Traffic:

The streets of our Nation’s Capital have been poorly lighted insofar as the application of street lighting for crime deterrence was concerned. Approximately eight years ago (1962-63) we embarked on a street lighting program based on traditional illuminating Society Vehicular and Pedestrian Traffic standards. It was completed with the exception of downtown and Georgetown in early 1969.73

Mercury vapor lamps were the heart of the 1963 lighting program. By 1969 twenty thousand of them had been installed at a cost of two and one-

---

71Glaus, Legend of a Corporation, p. 3.
72The factual information in this section was obtained from the Street Lighting Division of the Department of Highways and Traffic articles in the Washington Post and Star; an interview with an article by John Hartley, Assistant Director of the Department of Highways and Traffic, "Nighttime Revival in the Nation’s Capital," Nation’s Cities, December, 1970, pp. 22-23.
half million dollars. Mercury vapor was four times brighter than incandescent light. It reduced silhouette vision so that a dog, man or car appeared three-dimensionally and in color. The color happened to be a blue-green unflattering to people. Public protest brought about a color correction which made the lighting tolerable. After that the main objections to the new mercury vapor lamps were the lighting of third-floor bedrooms and the loss of the Henry Bacon standard.

The conversion of the highway department from lighting streets primarily for automobiles to lighting streets for crime detection was brought about by very real street events combined with national political considerations. Washington had been labeled the crime capital of the nation. Moreover, after the civil disturbances of 1968 a fear settled on the city. Nighttime shopping declined, churches cancelled evening services and meetings, evening assemblies of all kinds were avoided whenever possible. It was apparent that Washington street lighting levels, based on traffic requirements alone, accomplished very little in the area of nighttime crime reduction.

Mayor Walter Washington sent a directive to all municipal departments asking for suggestions on how to improve the situation. A home interview survey conducted by the Council of Governments in 1968 listed ten important problems facing the metropolitan area; sixty-two percent of the people responding felt that crime was the number one problem. The problem of public distress was real and a number of local authorities were concerned.

Mayor Washington and the City Council concluded that a shift to sodium vapor lighting would be effective toward reducing crime. Since their invention in 1932 these lights had been used in Europe on bridges and in low-lying areas. They were very effective in fog conditions and are often referred to as "sodium fog lights." At the time city officials made this policy decision, there were only thirty-four sodium lights in Washington, all of them on the accident-plagued Anacostia Freeway Bridge. With the full support of the Nixon administration, Congress and the District appropriated funds for an experimental program in lighting by sodium vapor in four areas with high crime rates. Thus Washington became the first city in the country to use high-intensity sodium vapor lights primarily as a weapon against crime.

Congress appropriated $365,000 to begin installation of the new lights. In February 1970 a select group of Board of Trade members were invited to inspect the installations. The group was greatly impressed and urged the relighting of the entire downtown business areas. By the end of March 1970 downtown 7th Street, Northwest, was relighted.

In April 1970 the Redevelopment Land Agency recommended to the Department of Highways and Traffic that improved lighting be given high priority among the improvements considered in the urban renewal areas affected by the events of 1968. In May 1970 RL A provided $110,000 for the relighting of the so-called riot corridors.

The news media gave the sodium lighting program favorable publicity from the start. And in contrast to the reception given the highway department's mercury vapor program in the early 1960's, there were increasing community requests for the sodium lights. In May 1971 RL A approved $600,000 for the installation of additional lights in urban renewal areas. In June 1971 the Law Enforcement Assistance Administration ap-
proved a grant-in-aid request under the Safe Street Act of 1968. The total cost was $210,000 with the highway department providing forty percent of that amount. This money was used to light major business arteries which experienced high rates of nighttime crime: Georgia Avenue, Northwest Columbia Road, Northwest, 18th Street, Northwest, U Street, Northwest and Martin Luther King, Jr. Avenue, Southeast.

The highway department had to solve one practical problem before installing any sodium lights downtown. A way had to be found to convert the Henry Bacon twin lamp to use sodium. The highway department has learned to respect this distinctive fixture as a result of its earlier conflict with the Fine Arts Commission.

Sodium vapor bulbs contain a mixture of mercury and sodium vapor. Because the unit requires a great deal of voltage to ignite, a transformer is needed, but no company made a transformer small enough to be used in the Washington globe. After some experimentation, General Electric developed a transformer on the proper scale. This enabled the Bacon lights to be used in the relighting of downtown streets, and in May 1972 it was also installed on Pennsylvania Avenue between the Capitol and the Treasury.

Public demand for the new lighting has been strong in every area of the city except the Northwest. At the end of the current lighting program fully one-half of the city's lights—35,000—will be sodium vapor.

President Nixon, who did not normally address himself to District of Columbia affairs, invited District policemen to a ceremony at the White House on April 19, 1972. He called Washington "the street lighting capita of the nation," an updating of his 1968 campaign reference to it as the "crime capital of the nation."4

Washington's sodium lighting program was closely watched by cities across the nation.

Based on correspondence we have received from other cities, it appears that Washington is indeed leading the way in crime deterrent street lighting. Representatives from communities such as Miami, Boston, Dallas, Birmingham, Nashville and 11 other cities have contacted us in regard to our program. These contacts can be attributed in a large measure to the various trade journals and other magazines which have given the program here in the District wide-spread publicity—some referring to it as a new, exciting, departure from traditional street lighting practices.5

Whether the facts justified the enthusiasm continues to be debated. About the best that can be said for all the statistical data collected on Wash ington is that lighting is probably not very effective against crimes of passion but may have an impact on robbery, grand larceny and auto theft. The most optimistic articles on the subject of the relationship between sodium vapor lights and crime reduction were prepared by General Electric, the Potomac Electric Power Company, the Department of Highways and Traffic, the Illuminating Engineering Society, the Committee to Re-elect the President and the Law Enforcement Assistance Administration.

Even though the precise significance of the statistics can be questioned, it is difficult to be critical of an idea that works. The decrease in fear can be measured by the increase in nighttime shopping and the resumption of nighttime church and civic activities downtown. Urban behavior is very much a matter of attitudes, and the new lighting helped to return the streets to the people.
CHAPTER TEN

The Quantity and Quality of Light

There have been major quantitative and qualitative changes in Washington’s illumination since the introduction of high intensity sodium vapor lighting. The quantity of light measured in lumens output far exceeds any previous level, but the quality of light is far lower than any previous form. Throughout most of its history Washington has been consistently underlit for a city its size; the role of “street lighting capital of the nation” is a new and uneasy one.

It was precisely because Washington was underlit that the highway department initiated the first mercury vapor lighting program in 1956. The installation of twenty thousand mercury vapor lamps in the next decade tripled the quantity of light produced by the lamps which they replaced. Then, beginning in 1969, the sodium vapor luminaire was introduced; it generates twice as much light as the mercury vapor. By January 1974 there were 17,803 sodium vapor lights in the city.

The lowered crime statistics—assumed to be in part a consequence of the new lighting—put the District in a favorable funding position with Congress. In round figures Congress appropriated $80,000 in 1970 for new lighting equipment. In 1973 Congress voted $500,000 for that purpose. At the rate of 7,000 new sodium lights per year, installations will continue until there are 35,000 of them on Washington streets.

The consequences of this great quantity of light being cast over the city during 4,200 hours per year must be examined to determine in what way such a magnitude of light affects the whole balance of urban living. At what point does the quantity of light exceed necessity? At what point is the biological stress on people, birds and trees unacceptabe? In a city unaccustomed to a favorable funding position with Congress, the inclination is to take everything it can get, but parameters need to be set. Is there such a thing as enough light, and when is that point reached?

The National Capital Park Service is conducting research into the effects of the sodium lights on street trees, but they feel it is too early to release any results. One scientist hypothesized that a tree with a life cycle of one hundred fifty years would probably live out the cycle in one hundred. No study is being conducted on the birds who don’t seem to know when to sing and when to sleep. And what of the thousands of city children who can’t see the Milky Way?

It was vital to city life that the crime rate in Washington be lowered. The time has come now to look beyond individual streets and take a larger view of the city. When there are no dark shadows left for lurking will the criminals move to other cities? At what point does Washington stop erecting sodium lights and start looking for the deeper sociological roots of crime? What is the minimum number of sodium lights needed to give the
public security and peace of mind? Washington is a pioneer city in this field, and local decisions will be very influential.

If controlling the quantity of light in the city becomes an important goal, there are a number of actions Washingtonians could take. They could ask for a reconsideration of the design of the street lamp. If the Bacon light is to be retained, the lumens output must be dropped. If it is important to retain the present luminosity, a new street light which directs the light downward but is also aesthetically pleasing could be designed for Washington.

Because there will be a conversion to a Metro transportation system in a few years, there will be less need to use the automobile. All lighting which is intended exclusively for the benefit of the automobile could be diminished. The time has come when it is reasonable to place more responsibility for lighting traffic corridors on the vehicle itself.76

The quantity of light in Washington is no longer an indicator of the growth or progress of the city. The quality of light has become a more significant indicator of our urban values. Bertrand de Jouvenel expressed it well when he said, "Technology determines what is feasible, not what is pleasant." Street lights could be effective and attractive.

Most of the technical writings on the subject of sodium vapor lights make such statements as, "Sodium vapor lights are very economical when color discrimination is unimportant." But in the nation's capital, where street lighting is done on a grand scale and in combination with floodlighting of the national landmarks, color discrimination is important and the sodium color is unacceptable.

"City lighting is an art that can turn the urban landscape into an entirely new experience," said Wolf Von Eckardt.77 The new experience for Washingtonians is on the order of a psychedelic show. Instead of evincing a sense of national drama, the sodium lights project a sense of national carnival. In addition to the peculiar coloration, which is unlike anything in the natural color spectrum, sodium vapor lights put stress on the eyes. The eye is forced to adjust to the intensity of the light, and those with an acute sensitivity to glare experience pain similar to driving into the afternoon sun.

Today John Dos Passos could never write about a Washington street with "street lights shaded and muffled in green leaves." The trees don't muffle the sodium lights. After a few years, every year with more sodium lights the public may accept them as they accepted overhead wiring in many areas of Washington. People who would never think of having exposed wiring in their living room accept it on public streets. People who would never tolerate peculiar colors in their homes will accept them in the public environment. With familiarity comes public acceptance. But there will be profound changes in life in Washington if the quantity of light continues to increase and the quality of light continues to decrease.

* * *

Washington has a peculiar problem in that a variety of agencies are

---

76Kurt W. Riegl, an astronomer at the University of California, promotes this idea. "Where only automobiles are involved, it might make sense to abolish street lights and allow improved automobile headlights systems to do the same job. High intensity vapor lamps could be developed for automotive use and used in conjunction with headlights mounted on car lamps and windshielded, tilted at 45 degrees to the vertical. The headlights in use today are generally recognized to be inadequate for nighttime driving at high speeds, but if their luminosity were increased by a factor of 20 or so much of the need for 24-hour nighttime lighting would disappear." Kurt W. Riegl, "Light Pollution," Science, Vol. 179, Number 4080, X March, 1973, p. 1290.

Edison of Milwaukee was selected. The company's brochure recommends this style for patios and parking lots to blend with modern building designs. (Illustration #44)

Redevelopment Land Agency

The District of Columbia Redevelopment Land Agency (RLA) conducted large scale urban renewal projects in Washington throughout the 1950's and 1960's. In 1962 RLA requested permission to replace all of the Henry Bacon fixtures in Southwest Washington. They wanted a "New Look for the New Southwest." The Commission of Fine Arts again urged that a good modern light be designed for Washington. The problem was given to Stanley Sherman, an architect with RLA, who conceived a streetlight he calls a "Frustum Light." (Illustration #45) Many details were specified for him: the transformer, the fluted standard, the type of light and the luminaire. All that was left to design was the shade. Mr. Sherman had two conceptions made up into models; one was octagonal and painted bronze, the other was circular and painted gray. The Commission of Fine Arts selected the latter. After it became part of the highway department's stock, it was used in many areas. Therefore, this light no longer indicates an urban renewal area.

In almost every RLA project, the professional personnel engaged have shown no inclination to use the RLA light. They have created special designs of their own. One example will illustrate the resultant problems: the L'Enfant Plaza lighting designed by Araldo Cossutta for the I. M. Pei firm. (Illustration #46) In the first place, RLA does not do the maintenance. Since the days of oil lighting servicing streetlights has been more expensive and troublesome than the initial installation. In the case of L'Enfant Plaza, RLA turned the care of the lights over to the highway department. The lights are excellent multiple use standards and the cluster of bubbles is being imitated throughout Washington in private buildings. The highway department, however, will install no more of them on public streets because they are an expensive use of energy. Moreover, moisture condensation has required drilling holes in each globe.
APPENDIX B

Floodlighting

Floodlighting is not an urban necessity, but it is a particularly important facet of public illumination in Washington. The silhouettes of floodlighted buildings are generally considered to be inspirational. This type of illumination is intended to distort, to raise the luminosity of a surface beyond that of its surroundings. It makes visible the cherished monuments while suppressing the (for these purposes) distracting details of the city. By reducing the contrasts obvious in the daytime city, floodlighting can produce an air of tranquility and enhance the grandeur of the nation's familiar architectural symbols.

Floodlighting was not technically feasible until the introduction of the arc light in 1880. For most of the nineteenth century the only artificial public illumination in Washington, other than the glow of street lamps, was a light within the lantern of the dome of the Capitol used to signal when Congress was in session. On August 30, 1894, twelve large arc lights were placed over the head of the Goddess of Freedom while other lamps were arranged around the base of the statue. For unstated reasons this first floodlighting experiment was abandoned after a trial period.¹

The next attempt to floodlight the dome of the capitol was in connection with President Wilson's inauguration March 4, 1917. This was sufficiently successful for Congress to decide to light the dome whenever it was in session. In August of that year Congress voted to illuminate the dome until the end of the war as a source of inspiration to the troops and to people passing through the city.

In 1923 incandescent searchlights were mounted on Olmsted's rotunda lights and bronze twin lamps in the east front plaza and on wrought-iron pedestals in the west plaza. The lighting of the dome of the Capitol has been a fixed splendor in nighttime Washington ever since.

The Committee on the Lighting Needs of the District of Columbia in 1923 recognized the special problem of lighting Pennsylvania Avenue between the Treasury and the Capitol so as not to interfere with the lighting of the dome.

This focal point of illumination should be preserved by allowing no street treatment to detract from the artistic effect. Accordingly, the committee has not seen fit to fix the standard of intensity for this special treatment.²

In the Kennedy years there was increased illumination of public buildings. When Lyndon Johnson was President he complained of the needless expense of both interior and exterior illumination at the White House. President Johnson was expressing an attitude toward floodlighting that is deeply ingrained in the American people, namely, that floodlighting is an extravagance. Since 1923 the floodlighting of Washington's streets and trees has been referred to frequently as "wasted" light.

In the last five years Washington has witnessed a dramatic change in the appearance of the nighttime city. One of President Nixon's projects early in his first administration was to make Washington the "street lighting capital of the nation." His lighting program as a crime deterrent was discussed elsewhere, but the new street lamps were only background to a major lighting program in the monumental core of the city. To avoid comparison with President Johnson, the White House announced that this undertaking was "Mrs. Nixon's idea and the money to pay for it

²Correspondence of the Committee on the Lighting Needs of the District of Columbia, February 15, 1924.
came from a surplus left over from the Nixon inaugural in 1969." A new outdoor lighting system of metal halide lights was installed at a cost of $355,000 to light the White House and downtown federal buildings like the other city landmarks.

The new luminescent created a visual connection between all of the major landmarks. Washington has never been more impressive than on the clear warm evenings of 1973. (Illustration #47) Such floodlighting could be justified financially, but in terms of energy consumption it could not and a reduction in ornamental lighting has taken place.

The important point about floodlighting, which has not been grasped, is that it should not "flood"—it should lightly wash. Harshly floodlighting a facade to expose every recess and detail is not desirable. A luminous wash should gently pull the main architectural features of a building out of the surrounding darkness. Good floodlighting inspires, it does not dazzle.

In the lighting of the Lincoln Memorial, surely one of the most inspirational buildings in Washington, the attention was drawn to the attic. Henry Bacon never intended the attic to be such a dominant feature of his building. The essential problem in floodlighting is that the light comes from the wrong direction—from below rather than as the sun illuminates. It functions as footlights and tends to make buildings theatrical. Ornamental floodlighting must be developed as an urban art to rid us of "Facadeism" or the cardboard effect.

The recent floodlighting of the monumental core inspired the vernacular city; commercial buildings increased their lighting. Office buildings along K Street, for example, were floodlit. This is not ornamental lighting; it is advertising and should be so considered. This lighting clutter acted as a distraction from the monumental city.

One of the early objections to street lighting was that the constant illumination of the streets at night would rob festive illuminations of their charm and the public might not come out to find out the cause for celebration. Of course, this does not apply to twentieth-century street lighting, but it is somewhat applicable to floodlighting. When ornamental lighting is resumed, the floodlighting should be judicious, not only because of the great amounts of energy consumed, but because it would be aesthetically more pleasing as well.

\[\text{Illustration #47}\]


\[\text{Washington Post and Evening Star, December 16, 1970.}\]
Selected Bibliography

Books


**Directories and Guide Books**


**Manuscript and Newspaper Collections**


**Photographic Collections**

Columbia Historical Society, Washington, D.C.

Commission of Fine Arts, Washington, D. C.

Department of Highways and Traffic, Washington, D. C.


Library of Congress, Prints and Photographs, Washington, D. C.


**Reports and Articles**


*The Evolution of A Community*. Concerns Anacostia. No information on publication and date.

Bell, J. Franklin, LTC. “Street Lighting Versus Street Trees”, *American City*, October, 1928.


**Unpublished Materials**


Sarah Prosser Noreen majored in history as an undergraduate at Randolph-Macon Woman's College. She has a master's degree in American Studies from George Washington University. Ms. Noreen most recently was Researcher and Coordinator of Exhibits for The American Freedom Train Foundation. Her earlier work included contributions to a major research report on the history of lighting, heating, ventilation and air conditioning in federal government buildings.