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Author

Holden, Alfred

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LIGHTING THE NIGHT: Technology, Urban Life and the Evolution of Street Lighting

Alfred Holden

It was described as the longest electrical hook-up in U.S. history that February night in 1928, when Thomas A. Edison, in his laboratory at Fort Myers, Fla., pulled a switch that turned on the new streetlights of Bellingham, Washington. Instantly the city was flooded with light. Cheers rose from thousands of people, some of whom had come hundreds of miles to witness the event. A band struck up the national anthem, and downtown stores were resplendent with window displays befitting a great event in a city's history.¹

But in another sense this event was a last hurrah. Electric lighting, part of the technological revolution in which few aspects of American life were not transformed by electricity, was by now nearly ubiquitous. Its role in American life had been shifting, from novelty to amenity to necessity, and it would continue to do so until light became invisible in the public's consciousness except when disaster cut the wires or the bulb burned out.

Street lighting, by nature, was one of the most public aspects of this technological revolution. Sometimes with a splash, at other times nearly invisibly, it has not only reflected struggles over opportunities and hazards presented by technology, but also helped mold attitudes toward community life and shaped places profoundly.

The celebration at Bellingham, where 271 ornamental concrete poles supported pairs of frosted glass and cast-metal lamps lit incandescently, reflected the excitement that greeted the early years of street lighting. Today's towering thruway floodlights, with clusters of powerful sodium-vapor bulbs that beam a day-bright orange glow along miles of highway, respond to other demands and values. The use of high-intensity light in cities says much about the triumphs and anxieties of modern living and our thirst, seemingly unquenchable, for more light.



**The story of street lighting
in North America is bound
up with changing technolo-
gies and changing attitudes
toward urban life.**

Photos by Alfred Holden.

How have places and people shaped street lighting, and been shaped by it? Two themes that are common to American history emerge. First, great industries with much at stake in creating demand for their product led the way in shaping public attitudes toward street lighting and determining the public's will to buy it. And second, once the technology was accepted and commonplace it faded from public consciousness. This changed the way people lived with light and left what lighting did to America's urban nightscape unnoticed — until that nightscape had changed dramatically, along with ways of thinking about places and patterns of living in them.

Street lighting, unlike many phenomena of the Industrial Revolution, did not suddenly burst on the urban scene. For millennia, efforts had been made to create light in public places, both to expunge primal fears of the night and extend the boundaries of human activity. The advent of gaslight in the early nineteenth century made street lighting a "system" for the first time, with fuel taken from a central, steady source and distributed on a wide scale.²

Within a generation this technology was universal in urban areas and had greatly altered the way people lived. Gaslight "brought about a reordering of most people's daily schedules," Sarah Noreen wrote about Washington, D.C., in the gaslight era. "The theatre, which had entered city life in the 1830s, was no longer restricted to daytime performances or early evening *olios*. The concentration of gas lamps on the Mall made evening lectures at the Smithsonian both possible and popular."³ By the 1870s dynamo electrical machinery permitted a strong, steady current, and electric lighting for home, workplace and city became possible.

Gaslights were replaced with electric lighting, but only partly because of the merits of the new technology. The great corporations born of the Industrial Revolution, including the swiftly emerging electrical industry, not only commanded vast resources for research and development but also sought markets for their products just as scientifically. Events such as the World's Columbian Exposition at Chicago in 1893 and expositions at Buffalo in 1901 and St. Louis in 1904 were seized upon by firms like Westinghouse and General Electric as showcase opportunities. As intended, the dazzling lights of the fairs awed millions of Americans. Along with the fairs' ordered, neoclassical, monumental exposition buildings, electric light, including street light, became part of America's collective vision for its future.

Electric light conquered the night in our cities and towns at both a formal political level and, quite literally, on the street. One outgrowth of the fairs was the City Beautiful movement, whose proponents (including leading architects, municipal officials and citizens) advocated the use of planning and architecture to resolve the chaos of the nineteenth-century city. City Beautiful projects made ample use of lighting for streets, parks, public libraries, train stations and government buildings. Night light could highlight and "edit" the visually cacophonous workaday world and make it seem ideal.⁴

At the turn of the century, incandescent light was preferred over other technologies for its sparkle and uplifting character; the newest innovation was the tungsten "Mazda" lamp, which cast a brighter, purer, white light that rendered its environment in truer colors. Engineers looked longingly at the bright-

How do your streets look when the sun goes down?

Street-ology

Do they sparkle with white light? Do they discourage crime and rowdyism? Do they safeguard traffic and pedestrians? Do they draw people from far and near to go "window shopping?" Are they a credit to your city administration? Are they an inducement to live and do business in your city? Are they a shining example of what a good lighting company can do for a city? Do they cause you to hold up your head in honest pride? Do they increase the value of your real estate? Do they advertise the city?

If you live in a G-E Lighted Town, you can give an emphatic "YES" to every question.

If you can't say "yes" ask the nearest G-E Street Lighting Engineers to help you make these dark highways into bright "White Ways."

GENERAL ELECTRIC COMPANY
Schenectady, N. Y. Sales Offices in Principal Cities

Lighting manufacturers made sales by appealing to civic pride.
From *The American City*, 1917.

City Beautiful-inspired streetlights graced wealthy residential districts as well as main thoroughfares.

ness of electric arc lights, but their harsh blue-green or amber color was incompatible with the practical goals of street lighting and with the City Beautiful vision. City Beautiful advocates rejected new technologies that promised brighter, more efficient light, including a type widely used today, sodium vapor. "Engineers should not cling too closely to the most efficient and economical devices," the 1912 meeting of the Illuminating Engineering Society was told, "for lighting must be made agreeable to the eye."⁵

A broader picture of what urban lighting was becoming can be found in a phenomenon that reached every community of any size in the country: The Great White Way. White Ways (the term may have come from the "White City" World's Fairs, or the nickname for brightly lighted Broadway in New York) usually consisted of City Beautiful-inspired lamp posts installed along the principal street of a city or town. The pedestrian-scaled, ornamental posts were topped with one to five frosted white globes or rippled, sparkling translucent acorn tops that provided modest levels of illumination and reduced glare to a minimum.⁶

Stock fixtures of endless variation were available from manufacturers. But such was the enthusiasm that Kansas City's Municipal Art League held a design competition⁷ and Los Angeles commissioned different designs for each main boulevard.⁸ Most designs reflected an ornate, classicist Beaux-Arts flavor, but they steadily evolved as technology and requirements changed: Lantern-like fixtures, inspired by the gaslights they replaced, quickly gave way to round or oval globes atop classical posts.

The streetlights were, perhaps, incongruous in the ordinary context of Main Street, but White Ways satisfied the public's thirst for spectacular effects and served as highly visible symbols of progress. They were frequently put in after lobbying by civic or business groups, who saw in them the prospect for greatness and prosperity, or were afraid of being left behind. In some cases, local merchants underwrote White Ways in a gesture of civic pride and boosterism.⁹

That groups other than the electrical equipment manufacturers became a force behind urban lighting expansion suggests both the success of the industry's efforts at the great fairs and the speed with which the utility of electric lighting was accepted as a requisite of modern life. "How do your streets look when the sun goes down?" General Electric asked the municipal readership of *The American City* in 1917. "Do they sparkle with white light? Do they draw people from far and near to go 'window shopping?' Are they an inducement to live and do business in your city?"¹⁰ GE's "Street-ology" advertising played on light both as science and magic.¹¹



An Event Worth Celebrating



GRAND OPENING

THE WHITE WAY

Program

7:00 P. M.—Singing Before Residents at Presbyterian Church

7:30—Opening of the Big Concert at Five by Francis Best and singing in America, Court House Square

7:35—Songs, Lullaby Chorus and Best Solo, "The Bells of St. Mary's"

7:40—Address, Mayor C. Livingston

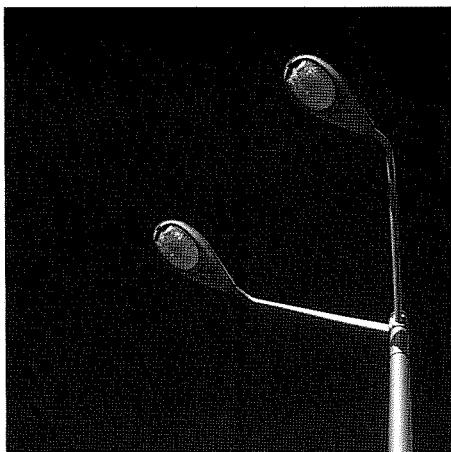
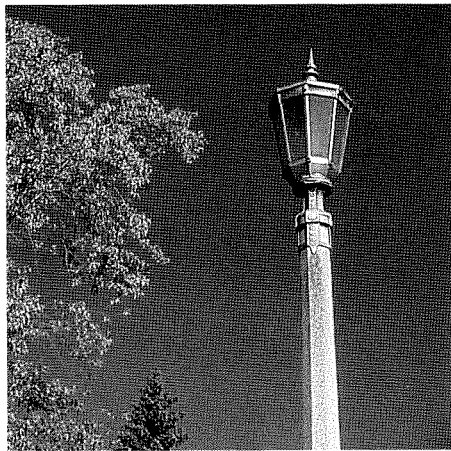
7:45—Turning on New Boulevard Lights, Mayor Fairs

Only a few months ago, Mt. Clemens, Mich., celebrated the opening of its new White Way, in which King standards were used. The feeling of civic pride, increased safety and improved trade from such an installation, may be possessed by any city. Our Engineering Department is available to help solve your lighting problems at any time.

King Manufacturing Co.
53 West Jackson Blvd. Chicago, Illinois

Cities without a Great White Way were made to feel behind the times.
From *The American City*, 1933.

Top: A common streetlight until the 1960s was a bare bulb under a porcelain reflector.
Center: 1930s-era ornamental streetlight.



Bottom: The cobra-head, sodium-vapor streetlight, here with twin lamps, was ushered in because of concerns about efficiency and functionalism.

Selling America on Light

Today's emphasis on street lighting as a requirement of automobiles and a security device can be traced to the era between the wars, particularly the rise of automobile culture after World War I.

In 1926, *The American City*, a magazine that had long advocated City Beautiful ideas, explored how street lighting might mitigate traffic hazards. It recommended bracket-type standards that held the lamp over the street, instead of the type of lighting found in the business district. These would enable drivers to see farther and put a sheen on the pavement, so obstacles would appear as silhouettes. Poles were to be higher, ostensibly reducing glare in motorists' narrow, horizontal field of vision.¹² In 1930 the Illuminating Engineering Society published a street lighting code that it urged municipalities to adopt. Urban streets were classified by traffic count, with higher light levels recommended as traffic increased.¹³

The lights of the great world's fairs of the 1930s were no less spectacular than those of a generation earlier: New York's 1939 World's Fair introduced fluorescent lights and added neon and glowing glass blocks to a palette that, in the previous generation of fairs, had included only floodlighting or strings of bulbs to outline buildings. More prophetic for the future of lighting, however, was General Motors' Futurama, which portrayed an automotive utopia of cities knitted together by a system of four-lane, limited-access highways.

Streetlight fixtures evolved in response to the age of streamlining, when industrial designers stripped ornament and applied windswept curves to virtually everything. By the late 1930s, the streetlight had emerged sleek, slim and poised for the future. The most popular designs consisted of a 20-foot concrete, pressed metal, or slightly dressier cast-iron standard, from which a spare, functional bracket projected.

But the Great Depression slowed the spread of this dazzle. Many jurisdictions opted to save money by halting public lighting expansion (municipal street lighting did become eligible for federal financing under the National Recovery Act) and even turning off lights.

The industry turned to the fears and emotions of Americans to sell street lighting, exploiting and mirroring growing anxiety about urban life. "Any reduction in essential service... may very well turn out to be a net loss... resulting from increased accidents and crime," the International Association of Electricians warned.¹⁴ Americans would be "sold" on vastly improved street lighting because they "don't want to be bumped off by a gun or a car on a shadowy street."¹⁵

The industry also dusted off technology that had earlier been shelved. Sodium vapor, for example, had been written off because it painted the landscape an eerie pinkish orange. But

with more cars and less money around, it now had attractive qualities. An 80-watt sodium vapor lamp produced as much light as a 215-watt incandescent.¹⁶ There still were complaints about the garish environment sodium vapor created, assuaged by the expectation that its use would be “confined to highway lighting and to other outdoor lighting where color discrimination at night is of little importance.”¹⁷ Engineers counselled that the color was “not objectionable” at low intensities and would improve night vision in fog. General Electric trumpeted sodium vapor’s color as a virtue. In 1936 it ran a bright orange advertisement for the trade, urging municipalities to “make sure GE Sodium Lighting is considered.”¹⁸

These efforts, combined with the massive road-building that followed World War II, would bring the lights of the highway — their highway-defined shapes, and the orange glow of sodium vapor followed by bluish mercury vapor light — to the dense city. The shift was a reflection of disparate changes in society, and it was not without irony. Light was being called on not only to speed traffic but to mitigate decline caused by phenomena the automobile helped bring about: exodus to the suburbs, disintegration of urban public transportation, and the carving up of neighborhoods by automobile corridors.

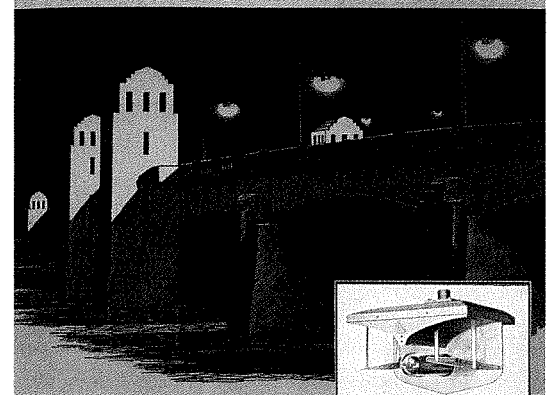
There were contradictions in this progress. The number and brightness of new fixtures often cancelled out the new technology’s increased efficiency. “10 times as much light . . . for only 2 1/2 times more electrical current” was the equation on the boardwalk at Seaside Heights, N.J., in 1952.¹⁹ This mirrored a less advertised element of street lighting campaigns, to “sell public utility executives . . . that it can be profitable to them too.”²⁰ And there were technical problems, inexplicably absent from many discussions. Lights very bright at the source, such as mercury- and sodium-vapor lamps, caused the eye’s pupil to contract, causing glare that called into question the gain from brighter illumination.

But the perception of safety may have derived by now more from the visibility of light than from the actual need for vision. And the industry and its customers took care in their discussion of color, referring to sodium-vapor as a “soft golden glow” and mercury’s blue as “romantic and futuristic” or, in one case, as “glamorous.”²¹ American cities gradually took on a blue or orange glow that may have been otherworldly but was, finally, accepted.

Thus, the popular perception of street lighting was changing. In the late 1930s, nighttime appearance was still sufficiently a source of pride that it often was pictured on the linen-finish postcards of the day. But in 1942, *The Little House*, a children’s book that tells the story of the building of cities through the eyes of a small house, found lighting to be a different

General Electric hoped to turn
the orange glow of sodium
vapor light into a selling point
in this ad.
From *The American City*, 1936.

Voters judge your administration by the good it does



SODIUM LIGHTS
Give Distinction to Bridges . . . and
Greater Safety to Night Traffic

General Electric sodium lighting has been selected for the General Edwards bridge, between Lynn and Revere, Mass.; for the Hampton Boulevard and Campestella bridges at Norfolk, Va.; for the San Francisco-Oakland Bay bridge where 922 luminaires are soon to be installed.

Investigate G-E sodium lighting. The coupon will bring you information: where it should be used, and why, its technical advantages of high efficiency and excellent light distribution as well as the unique attractiveness of its soft, golden-orange light.

Make sure that G-E sodium lighting is considered, not only for bridges, but for traffic circles, railroad grade crossings, dangerous intersections, underpasses, and for highways. You are invited to call in our engineers for advice and recommendations. General Electric Company, Schenectady, N. Y.

GENERAL ELECTRIC

Send me no publications GEA-246 and GEA-248 on sodium lighting.

Name _____
Address _____
City _____ State _____



A policeman every 50 yards!

Efficient, modern street lights . . . are like auxiliary policemen . . . Their revealing glow drives law-breakers away. They . . . help prevent crime by lighting up the dark corners where crime breeds. Here's a pertinent fact. In one city crime decreased 41 per cent in those sections where better street lighting was installed. Good street lighting makes police work easier. With well lighted streets, traffic speeds up . . . accidents decrease . . . business improves. If there's a limited city budget to be met, an economical installation may be had through careful planning. Substantial savings may be made by checking both original costs and maintenance cost . . . by wise selection of standards . . . by proper spacing. If these involve complex problems, Graybar's experienced street lighting specialists are both well qualified and willing to help you solve such problems.

Graybar
STREET LIGHTING

By the 1930s, lighting manufacturers began to appeal to fears of urban crime.
From *The American City*, 1933.

emblem: "Now it was not so quiet and peaceful at night. Now the lights of the city were bright and very close, and the street lights shone all night. 'This must be living in the city,' thought The Little House, and she didn't know whether she liked it or not."²²

Enlightened Questions

The relighting of the American city continued apace through the 1960s. Firms marketed double and triple versions of the universally used lamp that became known as the cobra head, for its resemblance to a serpent. But by the early 1970s, as sodium-vapor began to beam from sea to sea, some were asking if all this light were needed and whether it contributed, through psychological or other factors, to the decline it was installed to halt.

America's cities were neither thriving nor crime-free, and if high-intensity lighting was an attempt to compensate for other, larger societal ills that had brought this about, it wasn't working. A study in Norfolk, Va., undertaken for the city's redevelopment authority in 1974, questioned conventional views of the relationship between lighting and safety, after user-surveys disclosed "definable and quite low levels of illumination which were regarded as satisfactory ..."²³ In Toronto, the city council halted conversion to sodium-vapor lamps in the 1980s, deciding 30,000-plus postwar incandescent street lights contributed to the safety and vitality of the city.

In the 1990s, technology seems to promise the chance to relight cities in ways that better complement the environment. Metal halide, an improvement on bluish mercury vapor, is mentioned and specified more often; its whiteness comes close to incandescent though it falls short of matching the latter's warm sparkle. Compact fluorescent lights sometimes are used outside; at a boardwalk on Lake Champlain in Burlington, Vt., the lighting character convincingly approaches incandescent.

The question remains whether generations who grew up with sodium-vapor lamps and accustomed to urban decline and expressway culture care for or would support a change. The ability of light to create comfortable places must now be weighed against the perceptions that high intensity light is necessary and comfort in the public realm unimportant. This might help explain why, paradoxically, the lighting industry is heading in several directions.

An official from the Holophane Co., a major manufacturer of street lamp glassware, said public dissatisfaction was so great with sodium-vapor that it would be replaced by new sources within 10 years.²⁴ But sodium- and mercury-vapor lamps also stand on the doorstep of high-intensity lighting's last frontier

— homes, interior public spaces of office buildings, subway stations, transportation terminals and apartment buildings. Their economy understood if not always realized, the intense quality of their light familiar if unimproved, and fixtures cheap and plentiful, they offer a path of least resistance to a public accepting of conventional justifications and claims.

Obscured by the stresses, anxieties and pressures associated with modern life is the question of whether people are thriving under these bright lights. Our understanding of basic matters like the human eye's latitude to adjust to vastly different light levels has not been heeded, as Harvard University's William Lam tried eloquently to remind modern lighting engineers.²⁵ Fear, often based in grim reality, and expectations for technology remain the most potent fuels for lighting public places in the 1990s. They obscure better understanding of light as a shaper of architecture, place and real security and comfort. Urban light, which had briefly created remarkable city environments, has become a catalyst in their change, and arguably their erosion. ●

Notes

1. "New Street Lighting System in Bellingham, Washington," *The American City* 39:6 (December 1928), 92.

2. Willy Rotzler, *L'homme et la lumière* (Zurich: La maison Adolphe Feller S.A., Horgen, 1959), 56.

3. Sarah Noreen, *Public Illumination in Washington D.C.* (Washington, D.C.: George Washington University, 1975), 17.

4. David Nye, *Electrifying America* (Cambridge: MIT Press, 1990), 49.

5. C.F. Lacombe, "Street Lighting and Fixtures in New York City," *The American City* 8:4 (April 1913), 519.

6. An alternative was the festoon, or a string of bulbs hung across main streets, which was cheaper than the heavy ornamental lamps. The lighting industry commented that festoons were appropriate for festivals but "might well lack the dignity and grace becoming to a city under normal conditions" and "invariably [give] the street the appearance of being roofed over... contrary to the feeling of openness and freedom which the street should possess." See E. Leavenworth Elliot, "The New Street Lighting," *The American City* 2:6 (June 1910), 255.

7. George H. Bowles, "What Kansas City Has Done towards an Ornamental Street Lighting System," *The American City* 6:5 (May 1912), 783.

8. "New Street Lights Increase Trade 35 Per Cent," *The American City* 38:5 (May 1928), 130.

9. C.L. Eshelman, "Modern Street Lighting," *The American City* 6:2 (February 1912), 47; Elliot, 254.

10. "How do your streets look when the sun goes down?," General Electric advertisement in *The American City* 17:6 (December 1917), 588.

11. Outside business districts, more modest street lamps, not to mention nets of wires, were the norm, from New York's famous Bishop's Crook to a "beer mug," or a bare bulb on a bracket hung from a utility pole.

12. "Arterial Traffic Streets," *The American City* 35:6 (September 1926), 313.

13. "An Authoritative Street Lighting Code," *The American City* 43:5 (November 1930), 150.

14. "Municipal Lighting Operators Point Out Folly of Street Lighting Cuts," *The American City* 47: 4 (October 1932), 110.

15. Alden Welch, "The City of Tomorrow Night," *The American City* 59:8 (August 1944), 95.

16. "Highway Lighting by Sodium Vapor Lamps," *The American City* 48:7 (July 1933), 83.

17. L. A. S. Wood, "Possibilities of Street Lighting Improvements," *The American City* 48:11 (November 1933), 91.

18. Advertisement by General Electric in *The American City* 51:1 (January 1936): 33.

19. "They Say That Fluorescent Mercuries Make You Glamorous on Seaside Heights Boardwalk," *The American City* 67:5 (May 1952), 167.

20. Hal M. Bourland, "Electrical Industry Launches Broad Street Lighting Promotion Campaign," *The American City* 59:8 (August 1944), 101.

21. "They Say That ...," *op. cit.*

22. Virginia Lee Burton, *The Little House* (Boston: Houghton Mifflin, 1942), 20.

23. William Lam, *Perception and Lighting as Formgivers for Architecture* (New York: McGraw-Hill, 1977), 81.

24. D.C. Doherty, chairman, Toronto Hydro, in letter to Toronto City Councillor Howard Levine (August 23, 1990).

25. Lam, 1.

The magic effect of incandescent street lamps during a snowstorm in Toronto. Photo by Alfred Holden.

